



UNIVERSITY OF READING

Exploring Saudi Adolescents' Perceptions of  
Emotional Eating with the Purpose of Informing the  
Design of an Online Health Awareness Programme

A Thesis Submitted for the Degree of Doctor of  
Philosophy

Institute of Education

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## **DECLARATION**

I confirm that this is my own work and the use of all material from other sources has been properly and fully acknowledged.

Maali Abdulrahman H. Aloudah

## DEDICATION

*First of all, praises and thanks to Allah, the Almighty.*

*This thesis is dedicated to*

*The greatest people in my life*

*My Dear Parents: Sarah Alhassan & Abdulrahman Aloudah*

*For their encouragement, blessing, prayers and endless love.*

*My gorgeous husband and my soulmate*

*Hamad Alhassan*

*who has been a constant*

*source of support and encouragement during the challenges of study and life. I am truly*

*thankful for having you in my life.*

*My Lovely Sweet Children*

*Abdullah, Majed, Aljoharah, Remas, Sereen and Abdulrahman,*

*who made this journey with me.*

*I am really grateful for your emotional and practical support.*

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*who shared a dream with me, thank you for your encouragement.*

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## **Abstract**

This study explores emotional eating (EE) among adolescent students in Saudi Arabia, which is defined as a change in food consumption in response to emotional triggers (Economy, 2013). Additionally, the study sets out to contribute to raising awareness about the prevalence of emotional eating among Saudi Arabian adolescents and to use this information to inform the design of an online health awareness programme that supports healthy eating and healthy behaviour for this population, the first study to do so for this population.

Data were collected using a questionnaire and one-to-one semi-structured interviews. A total of 304 male and female adolescents (ages 12-15) completed the questionnaire, while 12 female students, who showed a high level of emotional eating, engaged in a one-to-one interview.

The questionnaire data revealed there was a wide range of levels of emotional eating between individuals, with the males showing a lower level than the females. A variety of emotions were reported to affect eating, including boredom, anxiety and sadness, but positive emotions as well, notably happiness and comfort. The obese students reported a higher level of emotional eating than the others. The sociocultural environment of Saudi Arabia appeared to contribute to the students' eating behaviour, mainly in respect of positive emotions, for example, during meetings with friends and relatives, weekend holidays, social and religious events, and fasting days. There was a high association of food with social occasions and festivals. Recommendations are made for the treatment for emotional eating, including mindfulness in eating, because it helps to moderate emotional eating as well as raising self-compassion.

This study's results aimed to inform the design of an online health awareness programme based on various suggestions from the female students in the light of existing literature, who provided essential inputs regarding the social networking apps, functions, features, and overall design of such a programme.

## Table of Contents

<b>Abstract</b> .....	<b>vi</b>
List of Figures .....	xi
List of Tables.....	xi
List of Appendices .....	xiii
List of Abbreviations and Acronyms.....	xiii
<b>Chapter 1 Introduction</b> .....	<b>1</b>
<b>1.1 Overview</b> .....	<b>1</b>
<b>1.2 Research Background</b> .....	<b>3</b>
<b>1.3 Why Focus on Adolescents?</b> .....	<b>7</b>
1.3.1 Adolescents and Emotional Eating .....	9
<b>1.4 Statement of the Problem</b> .....	<b>10</b>
<b>1.5 Researcher’s Position Statement</b> .....	<b>13</b>
<b>1.6 Aims of the Study and Research Questions</b> .....	<b>14</b>
<b>1.7 Structure of This Thesis</b> .....	<b>15</b>
<b>Chapter 2 The Context of the Kingdom of Saudi Arabia</b> .....	<b>17</b>
<b>2.1 Introduction</b> .....	<b>17</b>
<b>2.2 Characteristics of the Population of Riyadh City</b> .....	<b>17</b>
<b>2.3 Islam and the Kingdom of Saudi Arabia</b> .....	<b>18</b>
2.3.1 Managing Emotions in Islam.....	18
2.3.2 Eating Behaviour in Islam .....	19
2.3.3 Fasting in Ramadan .....	21
<b>2.4 The Impact of Globalization on Eating Habits in Saudi Arabia</b> .....	<b>22</b>
<b>2.5 Background of the Education System in Saudi Arabia</b> .....	<b>24</b>
2.5.1 Education in the Intermediate Stage.....	24
<b>2.6 Health Policies in Education</b> .....	<b>26</b>
<b>2.7 Summary</b> .....	<b>30</b>
<b>Chapter 3 Literature Review and Conceptual Framework</b> .....	<b>31</b>
<b>3.1 Introduction</b> .....	<b>31</b>
<b>3.2 Adolescence</b> .....	<b>31</b>
3.2.1 Nutrition for Adolescents .....	33
3.2.2 Adolescents, Body Image, and Eating Disorders .....	33
3.2.3 Emotional Well-being and Mental Health for Adolescents .....	36
<b>3.3 Eating Behaviours and Food Choices</b> .....	<b>38</b>
3.3.1 Eating Awareness (‘Mindful Eating’).....	39
3.3.2 Eating Patterns .....	42
3.3.3 Types of Eating Behaviours.....	47

3.3.4 Eating Disorders.....	52
<b>3.4 Emotional Eating .....</b>	<b>61</b>
3.4.1 Background of Emotional Eating .....	61
3.4.2 The Role of Emotions in Eating Behaviour.....	62
3.4.3 The Difference between Emotional and Physical Hunger .....	65
3.4.4 Emotional Overeating (EOE) and Emotional Undereating (EUE).....	67
3.4.5 Gender Differences between Emotional Eating .....	68
3.4.6 Factors That Contribute to Emotional Eating and Eating Disorders .....	69
<b>3.5 Theoretical Background of Emotional Eating .....</b>	<b>77</b>
3.5.1 Overview of Theories of Emotional Eating .....	78
3.5.2 Psychosomatic Theories .....	82
3.5.3 Perspectives on Positive Emotions and Eating .....	84
3.5.4 Choice of Theoretical Framework for This Study with Justification.....	86
<b>3.6 Conceptual Framework .....</b>	<b>86</b>
3.6.1 Theories and Perspectives of Emotional Eating .....	88
3.6.2 Factors Affecting Emotional Eating .....	88
3.6.3 Informing the Design of an Intervention and an Online Health Awareness Programme for Adolescents. ....	89
<b>3.7 Interventions for Emotional Eating .....</b>	<b>91</b>
3.7.1 Mindful Eating Techniques .....	91
3.7.2 Awareness Programmes on Healthy Eating.....	93
3.7.3 Online Programmes on Healthy Eating.....	94
<b>3.8 Summary.....</b>	<b>113</b>
<b>Chapter 4 Research Methodology.....</b>	<b>115</b>
<b>4.1 Introduction .....</b>	<b>115</b>
4.1.1 Study Aims and Research Questions .....	115
<b>4.2 Rationale for the Chosen Research Methodology .....</b>	<b>116</b>
4.2.1 Introduction.....	116
4.2.2 Research Paradigm .....	116
<b>4.3 The Research Sample.....</b>	<b>120</b>
4.1.2 Sampling Strategy.....	121
4.1.3 Sampling of Schools.....	121
4.1.4 Sampling of Participants.....	122
<b>4.4 Data Collection Instruments .....</b>	<b>125</b>
4.4.1 Questionnaire.....	126
4.4.2 Semi-structured Interviews .....	131
<b>4.5 The Pilot Study and the Main Study.....</b>	<b>132</b>
<b>4.6 Data Organization and Analysis .....</b>	<b>134</b>
4.6.1 Analysis of the Quantitative Data.....	135
4.6.2 Data of the Interviews.....	137
<b>4.7 Research Quality .....</b>	<b>139</b>
4.7.1 Ensuring Data Quality and Verifiable Conclusions.....	139
<b>4.8 Ethical Considerations .....</b>	<b>141</b>
4.8.1 Permission and Approval.....	142
4.8.2 Informed Consent.....	142
4.8.3 Confidentiality .....	143

4.9 Summary .....	144
<b>Chapter 5 First Phase Findings: Quantitative Survey.....</b>	<b>145</b>
5.1 Introduction.....	145
5.2 Content Validity and Internal Consistency of the Questionnaire.....	145
5.2.1 Content Validity .....	145
5.2.2 Internal Consistency of the Questionnaire .....	145
5.2.3 Structural Integrity of the Questionnaire .....	146
5.3 Section 1: Student Demographics.....	147
5.3.1 Year of Study and Age.....	147
5.3.2 Weight, Height, and BMI .....	148
5.3.3 Age at First Period (Females Only) .....	152
5.3.4 Family and Household .....	152
5.3.5 Educational Level of Parents .....	154
5.3.6 Ownership and Type of Residence .....	155
5.3.7 Number of House Staff .....	156
5.4 Section 2: Factors Associated with Emotional Eating .....	157
5.4.1 Influence on Body Shape .....	157
5.4.2 Influence on Food Choices.....	158
5.4.3 Predisposition to Eating.....	158
5.4.4 Food and Drink That Appeals.....	159
5.4.5 Emotions Associated with Eating.....	160
5.4.6 Is Healthy Eating a Problem for Young People in Saudi Arabia?.....	161
5.5 Section 3: Elements of an Online Healthy Eating Awareness Programme .....	161
5.5.1 Preference of Social Networking Apps .....	161
5.5.2 Preferred Features of an Online Healthy Eating Programme .....	161
5.5.3 Applications/Websites to Prompt Healthy Eating .....	162
5.6 Section 4: Eating Behaviour and Emotional Eating.....	162
5.6.1 Emotional Eating.....	163
5.6.2 Emotional (Psychological), Personal, Social and Cultural Factors for Eating .....	163
5.6.3 Level of Emotional Eating .....	163
5.7 Hypotheses Testing.....	164
5.7.1 Tests of Normality Homogeneity .....	165
5.7.2 Differences in Eating Behaviours by Gender .....	167
5.7.3 Differences in Emotional Eating by Gender .....	168
5.7.4 Differences in Emotional Eating by Year of Study .....	169
5.7.5 Differences in Emotional Eating by Mothers' Education .....	169
5.7.6 Differences in Emotional Eating by Fathers' Education .....	170
5.7.7 Differences in Emotional Eating by the Number of Individuals at Home .....	171
5.7.8 The BMI Is Related to the Emotional Eating of the Students .....	172
5.8 Summary .....	173
<b>Chapter 6 Second Phase Findings: Qualitative Data (Interviews).....</b>	<b>174</b>
6.1 Introduction.....	174
6.2 Theme 1: Online Resources on Healthy Eating.....	175
6.3 Theme 2: Popular Online Resources .....	177
6.4 Theme 3: Functions and Features of an Online Healthy Eating Programme .....	179
6.4.1 Sub-theme 1: Functions and Features of an Online Healthy Eating Programme .....	179

6.4.2 Sub-theme 2: Frequency of Content Updating.....	181
6.4.3 Sub-theme 3: Format (Type) of Information .....	182
6.4.4 Sub-theme 4: Imagery To Be Used .....	183
<b>6.5 Theme 4: Applications on Healthy Eating.....</b>	<b>184</b>
<b>6.6 Theme 5: Online Content That Influences Eating Habits and Healthy Eating.....</b>	<b>186</b>
<b>6.7 Theme 6: Suggestions for the Design of a Healthy Eating Programme.....</b>	<b>188</b>
<b>6.8 Summary.....</b>	<b>190</b>
<b><i>Chapter 7 Discussion of Quantitative Findings.....</i></b>	<b><i>192</i></b>
<b>7.1 Introduction .....</b>	<b>192</b>
<b>7.2 Theme 1: Eating Behaviour, Dietary Choices and Emotional Eating.....</b>	<b>192</b>
7.2.1 Eating Behaviour in Adolescents .....	192
7.2.2 Exploring Emotional Eating in Adolescents .....	194
<b>7.3 Theme 2: Factors That Contribute to Emotional Eating in Adolescents.....</b>	<b>197</b>
7.3.1 Emotional Factors.....	197
7.3.2 Personal and Sociocultural Factors.....	199
<b>7.4 Summary.....</b>	<b>202</b>
<b><i>Chapter 8 Discussion of Qualitative Findings and Informing the Design of an Online Health Awareness Programme.....</i></b>	<b><i>204</i></b>
<b>8.1 Introduction .....</b>	<b>204</b>
<b>8.2 Discussion of Theme 3: Intervention for Emotional Eating .....</b>	<b>204</b>
8.2.1 Suitability of Online Resources for Programmes on Healthy Eating.....	204
8.2.2 Existing Applications on Healthy Eating .....	206
8.2.3 Criteria of Design of an Online Awareness Programme .....	207
8.2.4 Preference of Social Networking Apps .....	212
8.2.5 Suggestions for the Design of a Healthy Eating Programme .....	212
8.2.6 Changes to the School Curriculum .....	214
<b>8.3 Informing the Design of the Online Health Awareness Programme.....</b>	<b>215</b>
8.3.1 Background.....	215
8.3.2 Rationale and Principles for the Programme.....	219
8.3.3 Framework of the Proposed Health Awareness Programme .....	221
<b>8.4 Summary.....</b>	<b>228</b>
<b><i>Chapter 9 Conclusions and Recommendations.....</i></b>	<b><i>230</i></b>
<b>9.1 Introduction .....</b>	<b>230</b>
<b>9.2 Summary of the Findings .....</b>	<b>231</b>
9.2.1 Theme 1: Eating Behaviour and Emotional Eating in Adolescents .....	231
9.2.2 Theme 2: Factors That Contribute to Emotional Eating in Adolescents .....	233
9.2.3 Theme 3: Adolescents' Perceptions towards Online Health Awareness Programmes .....	234
9.2.4 Informing the Design of an Online Awareness Programme .....	234
<b>9.3 Contributions to Knowledge .....</b>	<b>235</b>
<b>9.4 Limitations .....</b>	<b>237</b>
<b>9.5 Recommendations .....</b>	<b>238</b>
9.5.1 Recommendations for Further Research.....	239
9.5.2 Recommendations for Parents.....	239

9.5.3 Recommendations for Teachers, Supervisors and Social Workers.....	240
9.5.4 For the Ministries of Health and Education .....	240
<b>9.6 Dissemination of the Research Findings .....</b>	<b>241</b>
<b>9.7 Summary .....</b>	<b>242</b>
<b>References .....</b>	<b>244</b>

## List of Figures

Figure 3.1 <i>Eating Patterns</i> .....	42
Figure 3.2 <i>The Spectrum of Weight-Related Disorders</i> .....	56
Figure 3.3 <i>Spectrum of Eating Disorders</i> .....	57
Figure 3.4 <i>The Influence of Emotional Eating on Eating Behaviours</i> .....	60
Figure 3.5 <i>The Disordered Eating Continuum</i> .....	60
Figure 3.6 <i>The Cycle of Emotional Eating</i> .....	84
Figure 3.7 <i>The Conceptual Framework of the Study: Theories, Factors, Impacts of Emotional Eating, and Aims</i> .....	87
Figure 3.8 <i>The Principal Contents of the Conceptual Framework of the Study: Theories, Aim, Research Questions, Methodology, and Informing the Design of an Online Health Awareness Programme</i> .....	90
Figure 4.1 <i>Diagram of the Sampling Technique Followed by the Study</i> .....	125
Figure 4.2 <i>Data Analysis in Qualitative Research (Creswell, 2014, p. 197)</i> .....	138
Figure 5.1 <i>Distribution of Sample by BMI (Males N=144, Females N=141)</i> .....	150
Figure 5.2 <i>Emotions Associated with Eating</i> .....	160
Figure 5.3 <i>Level of Emotional Eating of Boys and Girls</i> .....	164
Figure 5.4 <i>Boxplot for the Composite Test Score for Each Theme (Axis)</i> .....	166
Figure 5.5 <i>Boxplot for the Composite Test Score for Gender in Theme 1 (Axis I)</i> .....	166
Figure 5.6 <i>Boxplot for the Composite Test Score for Gender in Theme 2 &amp; Theme 3 (Axis II and III)</i> .....	167
Figure 6.1 <i>Sub-themes Associated with Functions and Features of an Online Programme</i> .....	179
Figure 8.1 <i>Objectives of the Proposed Programme</i> .....	222
Figure 8.2 <i>Components of the Health Awareness Programme</i> .....	224
Figure 8.3 <i>Next Steps</i> .....	228

## List of Tables

Table 2.1 Health Programmes Implemented in Schools .....	28
Table 3.1 The Differences between Mindless Eating and Mindful Eating (Kristeller, 2014) .....	41
Table 3.2 Key Terms Associated with Eating Disorders .....	54
Table 3.3 Differences Between Emotional and Physical Hunger (Spangle, 2008).....	65
Table 3.4 Theories Related to Emotional Eating.....	78
Table 3.5 Basic Principles and Practice of Mindful Eating.....	92
Table 4.1 The Distribution of Sample by School Type and Student Grade .....	123
Table 4.2 The Distribution of Female Students by Year Grades for the Interviews .....	124
Table 4.3 The Contents of the Questionnaires .....	130
Table 5.1 Pearson Correlation Coefficients for Perceptions of Emotional Eating.....	146

Table 5.2 Correlation Coefficients between the Total Score of Axis Two and Three .....	146
Table 5.3 Cronbach-Alpha Stability Coefficients for the Resolution Axes .....	146
Table 5.4 Distribution of Sample by Year of Study and Gender.....	147
Table 5.5 Distribution of Sample by Age.....	147
Table 5.6 Distribution of Sample's Weight by Gender and Year of Study .....	148
Table 5.7 Distribution of Sample's Mean of Weight by Gender and Year of Study .....	148
Table 5.8 Distribution of Sample by Height.....	149
Table 5.9 Distribution of Sample's Height by Gender and Year of Study.....	149
Table 5.10 Distribution of Sample's BMI by Gender .....	150
Table 5.11 Means and Standard Deviations of the Sample's BMI by Gender and Year of Study .....	151
Table 5.12 Distribution of Girls by Age at First Period .....	152
Table 5.13 Distribution of Sample by Persons They Live With.....	152
Table 5.14 Distribution of Sample by Birth Order .....	153
Table 5.15 Distribution of Sample by Number of Siblings.....	153
Table 5.16 Distribution of Sample by Number of Persons Living in the Household.....	154
Table 5.17 Distribution of Sample by Father's Educational Level .....	155
Table 5.18 Distribution of Sample by Mother's Educational Level.....	155
Table 5.19 Distribution of Sample by Ownership of Residence .....	156
Table 5.20 Distribution of Sample by Type of Residence.....	156
Table 5.21 Distribution of Sample by Number of House Staff .....	157
Table 5.22 People's Influence on Body Shape .....	158
Table 5.23 Influences on Food Choices .....	158
Table 5.24 Increased Predisposition to Eating .....	159
Table 5.25 Food That Appeals.....	159
Table 5.26 Drinks That Appeal .....	159
Table 5.27 Emotions Associated with Eating.....	160
Table 5.28 Is Healthy Eating Viewed As a Problem for Young People in Saudi Arabia? .....	161
Table 5.29 Preference of Social Networking Apps .....	161
Table 5.30 Features of an Online Healthy Eating Programme.....	162
Table 5.31 Applications/ Websites that Prompt Healthy Eating .....	162
Table 5.32 Level of Emotional Eating.....	163
Table 5.33 The Questionnaire Themes.....	165
Table 5.34 Shapiro-Wilk's Test of Normality and Levene's Test of Homogeneity of Variance for the Three Themes: Eating Behaviours of Adolescents, EE and Factors of EE .....	166
Table 5.35 Outcomes of Mann-Whitney Tests for Differences in Eating Behaviour by Gender.....	168
Table 5.36 Outcomes of Mann-Whitney Tests for Differences in the Emotional Eating by the Gender.....	169
Table 5.37 Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Year of Study.....	169
Table 5.38 Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Mothers' Education .....	170
Table 5.39 Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Fathers' Education .....	171
Table 5.40 Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Number of Individuals at Home .....	172
Table 5.41 Outcome of Kruskal-Wallis Test for Differences in Emotional Eating by the BMI.....	172
Table 6.1 Themes Derived from the Interview Data .....	174

Table 6.2 Details of the Interviewed Female Students.....	175
Table 8.1 Keywords Related to the Format (Type) of the Information.....	217
Table 8.2 Keywords Related to Programme Design .....	219
Table 8.3 Components of the Health Awareness Programme.....	225

## List of Appendices

Appendix 1 Questionnaire. ....	324
Appendix 2 Interview questions .....	333
Appendix 3 Example of the thematic analysis of the interview .....	339
Appendix 4 Information sheets and consent forms for all parties (English and Arabic versions) .....	343
Appendix 5 Permission from the MoE .....	365
Appendix 6 Questionnaire of Garaulet .....	367
Appendix 7 Emotional Eating Questionnaire .....	368
Appendix 8 Ethical Approval documents & Risk Assessment Form for Research Activities .....	369
Appendix 9 Axis I: Eating Behaviours of Adolescents.....	376
Appendix 10 Axis II: Emotional Eating Level.....	378
Appendix 11 Axis III: Emotional (Psychological) Factors for Eating.....	380

## List of Abbreviations and Acronyms

ACOG	American College of Obstetricians and Gynecologists
AN	Anorexia Nervosa
APA	American Psychiatric Association
ARFID	Avoidant/Restrictive Food Intake Disorder
BED	Binge-eating Disorder
BMI	Body Mass Index
BN	Bulimia Nervosa
CM	Concept Mapping
DEB	Disordered Eating Behaviour
DERS	Difficulties in Emotion Regulation Scale
DPAS	The WHO Global Strategy on Diet, Physical Activity and Health
DSM	Diagnostic and Statistical Manual of Mental Disorders (DSM-5) of the APA
EAT	Eating Among Teens (Project)
ED	Eating Disorders
EDNOS	Eating Disorder Not Otherwise Specified

EE	Emotional Eating
EOE	Emotional Overeating
EUE	Emotional Undereating
EW	Emotional Well-being
FAO	Food and Agriculture Organization of the United Nations
FPS	Food Portion Size
HCD	High Commission for the Development of Arrayed
HDL	High-density Lipoprotein
IDEFICS	Identification and Prevention of Dietary and Lifestyle-induced Health Effects in Children and Infants Study
KSA	Kingdom of Saudi Arabia
MH	Mental Health
MoE	Ministry of Education
MoH	Ministry of Health
MS	Microsoft
NEDC	National Eating Disorders Collaboration
NES	Night Eating Syndrome
NIMH	United States' National Institute of Mental Health
OECD	Organization for Economic Co-Operation and Development
OHI	Oral Health Information
OSFED	Other Specified Feeding and Eating Disorders
OSN	Online Social Networks
OWOB	Overweight or Obese
PA	Physical Activity
PE	Physical Education
PHC	Primary Health Care
PMS	Pre-menstrual Syndrome
RCT	Randomized Control Trial
SH	School Health
SSB	Sugar-sweetened Beverages
T2DM	Type 2 Diabetes Mellitus
UCD	User-centred Design
US	United States
WHO	World Health Organization

# Chapter 1 Introduction

## 1.1 Overview

The consumption of food is a fundamental element of an individual's existence. However, an individual's association with food itself is complex. While some may believe that food is merely for consumption, there is growing awareness that food and emotions are related and the manner in which the latter influences consumption of the former is increasingly being scrutinised. A significant reason for this scrutiny is that globally, issues of mental health account for a considerable load of disease on adolescents. It is evaluated that a fifth of adolescents will receive a mental disorder yearly. Additionally, depression is one of the main reasons of disability (WHO and partners, 2017). This means that adolescents' mental health as well as well-being need to be more critically recognized as a substantial component of the adolescents' health (United Nations Sustainable Development Knowledge Platform, 2019). Moreover, mental health issues may impair negatively healthy eating. Polivy and Herman (2005) clarified that the relationship between mental health and eating is bi-directional, as one's psychological state or mood can influence the way and quantity people eat, and vice versa, eating influences people's mood and psychological well-being.

Therefore, understanding the associations between healthy eating and mental health is essential to promote and improve strategies to support healthy eating. As a result of the increase in the relation between mental states and dietary patterns over the last decade, a new field of mental health and nutrition appeared as a way for prevention called "Nutritional Psychiatry" (Owen & Corfe, 2017). El Ansari et al. (2014) found in their study in three UK countries there is a link between eating unhealthy' foods (e.g., fast food, snacks, sweets, cookies) and perceived stress and higher depressive symptoms in students, both male and female. There is also a link between eating 'healthy' foods (e.g., cooked vegetables, salads, fresh fruits) and perceived stress and lower depressive symptoms in both students male and female. Moreover, an important reason for this scrutiny is the increase of overweightness and obesity across the globe, especially in children and adolescents (aged 5-19 years) (World Health Organization [WHO], 2018a). Statistics published by the WHO (2018a) indicate that worldwide levels of obesity have nearly tripled since 1975. In 2016, more than 1.9 billion adults (18 years and older) across the globe were overweight (BMI  $\geq$  25) and of these, more than 650 million adults were obese

(BMI  $\geq$  30). Another report on global health risks (WHO, 2009) reported that across the globe, overweightness and obesity was the fifth-most (out of 19) prominent mortality risk factor.

Research indicates that there has been, and continues to be, considerable interest in and, hence, scrutiny of the association between food and emotions, as not only a facet of human behaviour but also from the perspective of the impacts of this association on emotional and physical health. For instance, nearly 25 years ago, Fitzgibbon et al. (1993) highlighted that the theories supporting obesity's psychogenic origins had been replaced by theories that placed emphasis on the intricate interactions between hereditary, biological, and sociocultural aspects. Subsequent researchers, such as Evers et al. (2013), Koenders and van Strien (2011), and O'Reilly et al. (2014), among many others, have also drawn attention to the influences on food intake, and that food intake may sometimes be utilised as a mechanism to cope with negative (and sometimes positive) affect. Generally, emotions and cognitions impact eating behaviour highly and could discourage the ability of people to control their eating (Antonioni et al., 2017).

Nevertheless, in this domain, there has been limited awareness of the impact of underlying factors on the eating behaviour of adolescents in the KSA, leading to a critical gap in the research literature. In particular, there seemed, to this researcher, to be a lack of a logical, theory-based scrutiny of the different facets that may influence the eating behaviour of adolescents in this country. For instance, a recent doctoral study by Hefni (2017) scrutinised theories related to health behaviour, such as the Health Belief Model (Champion & Skinner, 2008), (Stages of) Behaviour Change Theory (West, 2005), Theory of Reasoned Action ([TRA], Hansen et al., 2004), and the Social Cognitive Theory [SCT] (Bandura, 2004), and examined disease prevention and health promotion from the social cognitive perspective., and included a high-level scrutiny of the association of emotions, social setting, and eating behaviour with childhood obesity. However, Hefni's focus was on using an education-based intervention programme to prevent and control childhood obesity. In other words, the emphasis was on intervention through modification of diet and activity, and not on the considerable role of underlying factors on eating behaviour.

Moreover, while there were interventions that were directly aimed at this population by governmental and administrative bodies who have initiated some endeavours for these interventions, their effectiveness seemed to be limited, as most of such developments are of recent origin and consequently in a nascent stage. Further, given that present day

adolescents across the globe, in general, and in the KSA, in particular, are considerably more Internet-savvy than their predecessors, online interventions or programmes directed specifically at adolescents seemed to be lacking in the country.

Adolescence is a critical stage of an individual's existence where there is significant change, physical and emotional. They are no longer children, but not yet adults. Moreover, they have an increasing sense of their individuality and a feeling of control over things that pertain to their comfort, health, and well-being. Hence, the researcher posited that they can perhaps be guided into eating-related behaviour that is healthy, both from emotional and physical perspectives. This present study, therefore, is an attempt to gain awareness about the eating behaviours of Saudi Arabian adolescents aged 12-15 years studying in different intermediate schools (Grades 7-9) in Riyadh. The purpose of such an inquiry is twofold. First, it aims to facilitate awareness regarding eating habits and behaviours in adolescents. Second, it aims to use the information obtained through the study to inform the design of an online programme that supports healthy eating for this population. This thesis places emphasis on the perceptions of adolescents with regard to emotional eating in the context of the Kingdom of Saudi Arabia (KSA). In particular, this study focuses on the associations between emotions, the mind, the body, and food, acknowledging that these are complex.

In this chapter, the research background is first described to introduce the reader to the current context of the Kingdom of Saudi Arabia. This will be followed by the reasoning for focusing on adolescents and an introduction to emotional eating in adolescents. Subsequent sections provide more details about the statement of the problem for the study and the researcher's position statement. Finally, the aims of the thesis are highlighted.

## **1.2 Research Background**

The KSA, an Islamic Arab nation, is the twelfth largest nation in the world and the biggest in the Middle East. With an area of around 2,150,000 square kilometres, the KSA occupies about four-fifths of the Arabian Peninsula (Al-ban, 2016). The capital of the country is the city of Riyadh, located in the middle. The population of the country exceeds 33 million people, 31.52% of whom are under 15 years of age. In fact, the majority (72.18%) of the population is aged between 15 and 64 years, with a mere 3.22% aged over 65 years (KSA General Authority for Statistics [GASat], 2018).

The last few decades have seen the KSA undergo a rapid and extensive nutritional and epidemiological transition (Alshammari et al., 2017). Oil revenues have fuelled rapid economic development leading to significant modifications in the existence of the common Saudi individual. Principally, there has been a move from the traditional Saudi lifestyle to a Western one distinguished by unhealthy dietary patterns and inactivity (Mabry et al., 2016; Sibai et al., 2010). It must be noted that dietary patterns, across the globe, reflect that the intake of foods that are sweeter and energy-dense than before has progressively increased. Moreover, processed food is replacing foods high in fibre (Popkin, 2006). The transition to a greater consumption of protein and fats is also reflected in the greater availability and intake of meat products (Sibai et al., 2010). Sibai et al. (2010) add that the availability of oil in “oil-rich countries”, such as the KSA and Kuwait, contributed to changes in lifestyle and occupation, and then transfer from traditional habits of food, for instance, resulting in a considerable decrease in the consumption of fruits, vegetables, cereal, and whole grain. In fact, the supply of oil has almost doubled in the KSA and correspondingly the intake of animal protein and fats by adults accounts for a significant proportion (nearly a third) of the calories consumed daily (Adam et al. 2014; Alissa et al., 2006). These changes have contributed to a significant increase in the incidence of obesity and associated persistent conditions, such as cardiovascular disease and type 2 diabetes, in the country (Al-Faris, 2017).

Moreover, research in the last two decades indicates that people of all age groups, residing in both rural and urban areas in the Kingdom of Saudi Arabia, are affected by obesity. Indeed, at least one third of adults, one fifth of adolescents and one tenth of children are obese (Al-Ghamdi et al., 2018; Al-Khaldi et al., 2014; Alqarni, 2016). The chief reasons for this have been identified as poor food choices, such as increased intake of fats, and lack of physical activity, that is, more sedentary lifestyles (Alqarni, 2016; Alturki et al., 2018; Al-Rethaiaa et al., 2010; Bin Horaib et al., 2013).

On the other hand, being underweight needs more attention because it is considered a public health issue, as several studies have indicated the prevalence of underweight among Saudi adolescents. For instance, a study by Althayidi et al. (2018) conducted on 849 Saudi male and female adolescents aged 12-18 years found that 50.4% of the participants had a normal weight, 25.7% were underweight, and 24% had overweight or obesity. Likewise, a recent study by Hijji et al. (2020) was conducted on 12,463 Saudi male and female adolescents. It found that 14.9% of the participants were underweight, and 45% of them

were happy about their weight. Moreover, the study found that the group most likely to purge was females in the age of 10-14 years.

The situation is also exacerbated by the fact that in the school-education sector, the staff and students, in excess of 900,000 and 7 million, respectively, work six hours a day on average (Ministry of Health, 2010). The lack of the breakfast time (15-30 minutes) is considered as a reason of not consuming breakfast (Al Turki et al., 2018). Typically, schools in the KSA have an early start to the day due to the hot weather (e.g., 6:30 am or 7 am) and also close early (e.g., 1:45 pm). As a consequence, there is usually a single mid-morning break when students can eat (Elyas, 2018), and possibly participate in recreational activities or social interactions, as in schools across the globe (Baines & Blatchford, 2019). This provision of a single break or a reduced break time is not unusual, as it seems to be the pattern in other countries, such as the United Kingdom (Baines & Blatchford, 2019), where break times have been reduced to provide more time for instruction and learning. Eid et al. (2018) draw attention to the lack of school meal programmes “to support meal time, duration, and meals content with regards to quality and quantity” (p. 251). Hence, it is evident that the timetable for the school day does not provide sufficient time for meals and consequently students have to choose food items that can be consumed quickly, that is, fruits, fast foods, or beverages. Nevertheless, the preference of students seems to be leaning towards fast foods, as observed in a study by Almuhanha et al. (2014), who reported that many school children in Riyadh were consuming fast food every day in school as a morning snack and/or as lunch.

Additionally, physical activity is regarded as a problem because of the traditional costume and the weather. There is evidence (e.g., Al-Bakr et al., 2016; Elyas, 2018; Human Rights Watch, 2012) that the Saudi school curriculum is inadequate from the perspective of the required provision of necessary resources and physical activities in Saudi schools. In particular, the curricula for boys and girls differ with regard to physical education, as this has been offered only for boys, whereas girls were taught more feminine subjects such as “Home Economics” until the year 2017, which would help them become good wives and mothers or take up feminine occupations in the workplace, such as cooking and sewing (Alharbi, 2014). This has caused many students not to cultivate physical activities, which has resulted in many becoming overweight or obese (Al-Khaldi et al., 2014). Nevertheless, it must be noted that even with male students, the time allocated for physical education reduces as they advance through school. The time

allocated per week for physical education in primary school is three hours (divided into two equal length sessions). This reduces considerably for students in middle and secondary school to a single session 45 minutes in duration (Elyas, 2018).

However, the government of Saudi Arabia has not been idle and the increased global awareness of the problem of obesity has resulted in the implementation of the WHO Global Strategy on Diet, Physical Activity and Health (DPAS) in the country (WHO, 2006). The World Health Assembly (WHA) Resolution WHA57.17, which endorses DPAS, encourages Member States:

"to strengthen existing, or establish new, structures for implementing the strategy through the health and other concerned sectors, for monitoring and evaluating its effectiveness and for guiding resource investment and management to reduce the prevalence of noncommunicable diseases and the risks related to unhealthy diet and physical inactivity"; [...] and "to define for this purpose, consistent with national circumstances: [...] (d) measurable process and output indicators that will permit accurate monitoring and evaluation of action taken and a rapid response to identified needs" [...]." (WHO, 2006, p. 5)

Accordingly, the country's Ministry of Health (MoH) implemented the Diet and Physical Activity Strategy in 2006 and the Obesity Control Programme in 2013 (Al Eid et al., 2017). These programmes are aimed at all age groups in the KSA (Al Eid et al., 2017). A further initiative launched collaboratively by the MoH with the MoE in 2017 is the "Rashaka Initiative Programme (RIP)." The objective of this initiative is to support healthy lifestyles by enhancing eating behaviour, intensifying physical activity, and enhancing awareness of the risks related to obesity. This initiative acknowledges the appropriateness of schools for interventions to prevent obesity. This programme is in the nascent stages of implementation via training, awareness events, workshops, and the development of national guides for families, educators, and specialists, such as doctors, nurses, nutritionists, and health counsellors, and it is expected that such an initiative will significantly facilitate the reduction of childhood obesity in the country (Al Eid et al., 2017).

In this regard, there are no changes in policy and practice regarding school breaks and meals. A recent study by Aldubayan and Murimi (2019) found that the Saudi policy clarifies what is not allowed to be provided in school canteens. In contrast, it fails in

delivering and directing what should be served to promote the nutritional value of the catered meals. Also, Bushara et al. (2017) found that the nutritional situation in schools was weak because the foods provided in schools were unhealthy. This study recommended applying regulations and rules to boost healthy food.

### **1.3 Why Focus on Adolescents?**

Adolescence is a critical stage for maintaining and developing emotional and social habits, which are significant for mental health and emotional well-being. Worldwide, it is estimated that 10–20% of youth face mental health issues (WHO, 2019 a). The American College of Obstetricians and Gynecologists (ACOG) (2017) reported that one in every five adolescents aged 9–17 years was diagnosed with a mental health issue. Likewise, emotional disorders generally emerge over adolescence besides anxiety or depression (WHO, 2019 a). The U.S. Department of Health and Human Services (2017) pointed out that depression, anxiety, attention deficit-hyperactivity, and eating disorders (ED) are considered as the prevalent mental health issues in adolescence. In this regard, WHO (2019 a) clarified the factors that cause disability and illness among adolescents globally as follows. Anxiety is the ninth factor for adolescents aged 15–19 years and sixth for those aged 10–14 years. Furthermore, depression is the fourth factor for adolescents aged 15–19 years and fifteenth for those aged 10–14 years. As a result, emotional disorders can affect adolescents' school attendance and schoolwork, as well as social withdrawal, which leads to loneliness and isolation (WHO, 2019 a). Further, eating disorders usually emerge through the adolescence stage and are characterized by abnormal and extreme eating behaviours (e.g., insufficient or excessive eating). The prevalent conditions of ED are anorexia nervosa, bulimia nervosa and binge eating disorder (WHO, 2019 a).

As mentioned previously, the prevalence of overweight or obese children is rising dramatically in both developed and developing nations. A study by Ng et al. (2014) reported that the occurrence among children and adolescents in developed countries had increased substantially to 23.8% of males and 22.6% of females being either overweight or obese. The increase was also seen in developing countries, rising from 8.1% to 12.9% for males and from 8.4% to 13.4% in females (Ng et al., 2014). Overall, approximately 43 million children have been classed as overweight or obese across the world (de Onis et al., 2010; Wang & Lim, 2012).

Overall, it would seem that the early recognition of emotional eating can facilitate significantly the prevention and treatment of issues related to weight control and disturbed patterns of eating. Scholars (e.g., Levitan & Davis, 2010) have observed that adolescence is an important period in the lifetime of an individual and is accompanied by bodily development and weight gain along with significant stress. In this study's context, WHO (2018b) highlights that adolescence and early adulthood is typically when eating disorders develop. Thus, it would appear that adolescence is a suitable period for the early intervention and prevention of different mental health conditions, including emotional disorders, eating disorders and disturbed patterns of eating (WHO, 2018b). This is explained further in Chapter 3.

Childhood underweight, overweightness and obesity can contribute to significant health hazards in children, such as asthma, hyperlipidaemia, hypertension, sleep apnoea, fatty liver disease, prediabetes, type 2 diabetes, and orthopaedic and emotional issues (Ornelas et al., 2014; Paulis et al., 2014). Emotional issues include poor self-worth, depression, and weak societal dealings (Kelsey et al., 2014; Shivpuri et al., 2012). In the KSA, the World Health Organization (2011) reported that 30% of the children are obese. A study by Al Dhaifallah et al. (2015) reporting the figures from a National Growth Study indicated that 11.3% of children aged 5-18 years in the KSA were obese. More specifically in terms of age, 11% of females and 7.8% of males aged 5-12 years were obese, whereas the prevalence of obesity among females and males aged 13–18 years was respectively 12.1% and 13.8%. Overall, 23.1% were overweight, and 11.3% were obese or severely obese (El Mouzan et al., 2010; Musaiger, 2011).

It is noteworthy to consider the prevalence of underweight among Saudi adolescents, as several recent studies reported that. For example, Antony and Azeem (2019) stated that 26.4% of Saudi adolescents are underweight, while Alasmari et al. (2017) indicated that 33.1% of Saudi adolescents (age ranged 15 years old) were underweight.

The rationale for focusing on adolescents in this study is that a considerable segment (about a third) of Saudi Arabia's population is aged less than 15 years, and 15% (approximately) of the Saudi population is aged between ten and 19 years (GAStat, 2018). Understand the eating behaviour, including emotional eating, of current adolescents will assist in providing mechanisms to reduce their dysfunctional eating patterns and obesity, and prevent further related issues as they grow older. It is significant to consider here that EE may lead to over or under eating among adolescents. For example, emotions could

increase the opportunity of unhealthy eating when not hungry, such as raising the consumption of rich calorie foods and decreasing the consumption of vegetables and fruits (Jalo et al., 2019). As noted earlier, eating disorders usually emerge during adolescence (WHO, 2018b; 2019 a). Hence, it is highly desirable to develop an intervention to promote mindful and healthy eating and behaviours among adolescents, the principal goal of the present study.

### ***1.3.1 Adolescents and Emotional Eating***

It has been suggested that uncontrolled eating occurs widely both in overweight children and adolescents (Goossens et al., 2009) and in underweight (Vainik et al., 2015a). Adolescents face dramatic changes and have to learn to deal with new challenges in school and societal existence, while simultaneously contending with new and powerful emotions (Hannon, 2018; Van der Graaff et al., 2014; Yeager, 2017), so it is not surprising that Goossens et al. (2009) observed a significant relationship between anxiety and depression and the absence of control of eating in such individuals.

Emotional eating is defined as “dysfunctional coping with stressful events and can result in either increased food intake or in food avoidance” (Messerli-Bürgy et al., 2018, p. 256), where dysfunctional eating relates to change in eating behaviour in response to negative emotions. Recently, researchers have viewed EE as a response not only to negative emotions but also positive one as well (Bongers et al., 2016; van Strien et al., 2016). It is associated with modification in eating behaviour due to adverse emotional forces and agitation (Wardle et al., 2001). In other words, emotional eating relates to eating as a reaction to adverse emotional conditions or emotional triggers (Frayn et al., 2018). It has been recognized as an “obesogenic” characteristic that promotes increase in weight, and, eventually obesity, both in children and adults (Crocker et al., 2011; Geliebter & Aversa, 2003). Péneau et al. (2013) observed that regular incidences of emotional eating were reported by the majority (57%) of overweight adults.

In general, emotional eating is connected with greater rates of snacking, eating in reaction to everyday pressures, and higher intake of foods with greater calorific and fat levels, as assessed in the laboratory or through self-report (Camilleri et al., 2014). It also appears, over time, to be a significant aspect associated with body weight (Keller & Siegrist, 2015). Emotional eating was reported in the psychosomatic theory of Bruch (1964) and termed as the failure to distinguish between hunger sensations and hunger pangs caused by emotions (Heatherton & Baumeister, 1991; van Strien & Ouwens, 2007).

Emotional eating results from pressure caused by emotions, as proposed by Konttinen et al. (2010). Moreover, it is considered that psychological problems are associated with emotional eating and that such issues significantly contribute to disorders related to body image, weight and eating habits (Allen et al., 2008; Stice et al., 2002). The relationship between emotional eating and symptoms of depression was confirmed by Ouwens, van Strien, and van Leeuwe (2009), who observed that major bouts of depression cause either an upsurge or a downturn in appetite. Furthermore, a negative relationship has been found between emotional undereating (EUE) and weight (Domoff et al., 2015).

Conversely, positive feelings, such as success and happiness, can also increase people's desire to eat, the rationale being that emotions lead to increased consumption of food which in turn results in increasing their feelings of happiness and moreover, people believe that their happiness will not be complete without food (Bongers et al., 2013a; Hertz, 2019). However, most of the previous research has associated emotional eating with negative emotions and ignored the effect of positive emotions on eating behaviours. Consequently, there is a need for research to understand the relationship between positive feelings and emotional eating because it is possible that they are as, if not more, significant as negative feelings (Bongers et al., 2013b). Kenardy et al. (2003) found that the consumption of food took place more in a positive as opposed to negative mood. Moreover, Ashurst et al. (2018) found there was a significant association between positive and negative emotions with food choices. Furthermore, participants were more likely to consume sweets in positive rather than negative emotions. Nakata and Kawai (2017) stated that a positive mood makes people enjoy more the taste of food and consume more. The insight gained from the current study will be of assistance in giving more attention to the critical role that positive emotions play in emotional eating.

#### **1.4 Statement of the Problem**

The preceding discussions have highlighted that several programmes have been initiated in the KSA to increase the awareness of health among the Saudi young people (Al-Hashem, 2016). Moreover, school-based programmes and interventions have been investigated to assess their efficacy in dealing with the problem of childhood and adolescence obesity (9–16 years) (Hefni, 2017). Moreover, there is some evidence of research on the food habits of different groups of young people in the country, such as among young women aged 18-28 years (El Hamid Hussein, 2014), female university students aged 22-24 (Al Qauhiz, 2010), male adolescents aged 12-20 years (Al-Rukban,

2003), and male university students aged 18-24 years (Al-Rethaiaa et al., 2010). These studies of adolescents and young adults suggest that lifestyle factors, such as insufficient physical activity, skipping of breakfast, infrequent intake of fruits and vegetables, and increased intake of sweetened beverages, are a significant basis for obesity (Al-Hazzaa et al., 2012; Bajamal et al., 2018). These lifestyle factors are the outcome of changes to the traditional Saudi lifestyle (Mabry et al., 2016; Sibai et al., 2010).

Additionally, although several studies claimed to study adolescent eating habits, the inclination was to scrutinise the habits of older adolescents aged over 18 years (e.g., Al Qauhiz, 2010; Al-Rethaiaa et al., 2010; El Hamid Hussein, 2014) or to examine broader age ranges, such as 12-20 years (e.g., Al-Rukban, 2003). Nevertheless, several studies across the past two decades have confirmed that unhealthy eating behaviours were prevalent among Saudi teenagers (Al-Adawi et al., 2002; Al-Subaie, 1998; Moradi-Lakeh et al., 2017).

Despite being aware that eating behaviours are determined by emotions, it is difficult to gauge how this actually works, as different individuals have different thought processes (Macht, 2008). According to Levitan and Davis (2010), the connection between eating behaviours and emotions is a complicated subject, and thorough study is needed to arrive at some understanding of it. However, most of the previous research has examined emotional eating in regard to negative emotions and ignored positive emotions. Consequently, there is a need for research to understand the relationship between positive feelings and emotional eating because it is possible that they are as significant as negative feelings, if not more so (Bongers et al., 2013b). Kenardy et al. (2003) found that the consumption of food took place more in a positive as opposed to negative mood. Just as eating habits and behaviours are governed by emotions, so emotions are also governed by eating behaviours (section 3.4.2).

However, despite the increase in awareness and interest to promote health among the Saudi people, only limited attention has been paid to how emotional well-being relates to making the right food choices, sensible eating behaviour, and maintaining normal weight. Additionally, student perceptions and experiences around emotional eating have not been researched in the country, although adolescence would seem to be a suitable period for early intervention and prevention of eating disorders, as this is when these typically develop (WHO, 2018b). Also, programmes for building awareness of healthy eating

behaviour in schools play a crucial role in building health, preventing disease, and the personality development of adolescents (Moradi-Lakeh et al., 2017; Naeem, 2013).

Therefore, adolescents need support in developing the emotional strength that can aid them in dealing with and recovering from adverse situations. Moreover, such strength can eventually help avert the occurrence of mental health issues in later life. It is evident that among adolescents, several emotional distress symptoms are associated with the reasons and conditions of eating disorders (section 3.3.4 and 3.4.6.1) (Howard et al., 2017) and emotional eating (Hertz, 2019) (section 3.4.2).

In other words, there is a gap in research related to students' awareness of emotional eating and the factors that influence this. Moreover, a lack was perceived with regard to programmes that could build this awareness in a manner that is appealing to students. Therefore, this present study aims to explore factors that may contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and inform the design of a relevant online health awareness programme that addresses their needs. This age range was chosen for various reasons. First, this is when students in the KSA leave primary school and enter intermediate school. Second, the researcher believed that adolescents in this age range would provide insights regarding the matter under consideration, as on the one hand they had not left childhood very far behind and on the other they had not yet entered young adulthood. Moreover, adolescence is a critical stage for maintaining and developing emotional and social habits, which are significant for mental health and emotional well-being. Worldwide, it is estimated that 10–20% of youth face mental health issues (WHO, 2019 a). Furthermore, the American College of Obstetricians and Gynecologists (ACOG) (2017) reported that one in every five adolescents aged 9–17 years was diagnosed with a mental health issue. Likewise, emotional disorders generally emerge over adolescence other than anxiety or depression (WHO, 2019 a). The U.S. Department of Health and Human Services (2017) pointed out that depression, anxiety, attention deficit-hyperactivity, and eating disorders (ED) are considered as the prevalent mental health issues in adolescence. Thus, it would appear that adolescence is a suitable period for the early intervention and prevention of different mental health conditions, including emotional disorders, eating disorders, and disturbed patterns of eating (WHO, 2018b). Additionally, these eating disorders generally start during adolescence and are aggravated during transitional stages of individual growth and development (WHO, 2018b; 2019 a). Further, since children and adolescents spend considerable time in the school environment,

schools have been recognized to be the ideal environment to encourage robust emotional health and identify preliminary modifications in behaviour and hints of emotional troubles (YoungMinds, 2017).

The study of Allihaibi (2015) indicated that there were negative attitudes to eating among female students aged between 15 and 19 years in the KSA. Nevertheless, there is a significant lack of reporting with regard to the incidence of eating disorders in Saudi Arabia. A recent study by Taha et al. (2018) endeavoured to fill this gap by scrutinising the incidence among 1,200 female undergraduate students (age 17-33 years; median age of 21 years) from Taif University, KSA. Taha et al. (2018) found that 35.4% of the students could be categorised as at risk for eating disorders. Thus, this study has drawn attention to the issue of eating disorders in the KSA, and its alarming finding highlights the need for a study like the present one to develop an intervention to increase awareness of healthy eating among adolescents before they grow old enough to study at university.

The present study is the first of its kind in Saudi Arabia and the second study in other Arab countries, as only one previous research has investigated the process of emotional eating in Middle Eastern adolescents (Bahrain) (Alalwan et al., 2019), but in a different age group, namely undergraduates ( $20 \pm 3$  years), Therefore, this is the first study to contribute to the literature of emotional eating among adolescent students aged 12-15 years in the KSA and Middle Eastern countries (section 9.3).

### **1.5 Researcher's Position Statement**

I am a citizen of Saudi Arabia with a keen interest in food, in general, and its impacts, in particular, two facets which have resulted in my pursuing undergraduate and graduate studies in Nutrition. My interest in the domain of eating-related behaviour was born when as a young Home Science teacher working in a girls' school in my country, Saudi Arabia, I noticed that the food intake of my students was often inconsistent and that their dealings with food varied in different situations. That is, there would be instances where they consumed large quantities of food and others where they did not eat anything at all. Sometimes they would eat large quantities of a certain item of food for several days and then seemingly develop an aversion to it and strictly avoid it. Moreover, their food intake changed with the situation, such as they ate more or less when they were anxious about something.

I tried to explore factors that may influence such eating behaviours by scrutinising published material about eating behaviour and the relationship between emotions, food and body, to find something that could be done to help all adolescents. My growing awareness in this matter turned my initial interest and curiosity about eating behaviour and the relationship between emotions, food and body, into a wider concern about the physical health and well-being of my people. I found that previous researchers (e.g., Fox et al., 2016; Gall et al., 2016; Herle et al., 2018) have drawn attention to the eating behaviour of adolescents, in general, and the so-called "Emotional Eating", in particular, in attempts to explain emotional overeating (EOE) and emotional undereating (EUE). Moreover, I knew from personal experience that the Ministries of Health and Education had collaborated on several initiatives (I describe these further in Chapter 2) to promote health awareness, in general, and healthy eating behaviours in schoolchildren, but these did not seem to be very effective, as recent research continues to report about increasing levels of obesity and underweight in the KSA (e.g., Algarni, 2016; Shori et al., 2017). I decided then that I would attempt to investigate emotional eating with a view to support further school-based interventions around healthy eating and inform further research and practice around helping adolescent students manage their eating behaviour and food intake in a healthy fashion. This thesis reflects my journey in this regard.

## **1.6 Aims of the Study and Research Questions**

The aim of this study is to contribute to raising awareness about the prevalence of emotional eating among Saudi Arabian adolescents aged 12-15 years and to use this information to inform the design of an online health awareness programme that supports healthy eating and healthy behaviour for this population. Moreover, the study will contribute to the broader literature on emotional eating among adolescents. The population for the study will be adolescent males and females aged between 12 and 15 years studying in different intermediate schools in Riyadh city in the KSA. Riyadh was chosen due to its prominence as the country's capital and also the characteristics of its population, who are representative of the country's changed lifestyle. Further, it has the highest proportion of Saudi citizens in the country (KSA General Authority for Statistics [GASat], 2016). Moreover, a mixed-gender population was chosen since the problem of childhood and adolescent obesity and underweight are not limited to a single gender and the researcher believed that a balanced perspective would be more beneficial to the wider community.

The objectives of the research are as follows:

- To identify the prevalence of emotional eating in adolescents aged 12-15 years in the KSA;
- To understand the emotional, personal and sociocultural factors influencing the eating habits of (and contributing to emotional eating in) this population;
- To identify potential components to inform the design of an online health awareness programme; and
- To provide recommendations based on the study findings to government and administrative authorities in the KSA to improve programmes related to the emotional and physical health status of adolescents in the country.

The following research questions were formulated in line with the objectives of the study:

1. How do Saudi adolescents' eating behaviours and dietary choices relate to emotional eating?
2. How do emotional, personal, and sociocultural factors contribute to emotional eating among this population?
3. What are the perceptions of Saudi adolescents with regard to informing the design of an effective online health awareness programme concerned with healthy eating and healthy behaviour?

## **1.7 Structure of This Thesis**

The thesis is organized into nine chapters to explore the focus on the eating behaviour of adolescents and emotional eating.

Chapter 1 introduces the study and presents the background, rationale, researcher's position, and aims of the research.

Chapter 2 provides insights regarding the context of Saudi Arabia, such as the influence of Islam, the background of the education system, and health policies. Further, an overview is provided of the population of Riyadh city.

Chapter 3 offers a review of existing literature on subjects of critical significance to the study, such as adolescence, emotional well-being and mental health of adolescents, eating behaviour, and emotional eating. Also, it presents the theoretical background of existing theories associated with emotional eating, the development of the conceptual framework for the present study, and finally, awareness programmes on healthy eating.

Chapter 4 describes the methodology utilised to conduct the study and explores the selection of a suitable research paradigm and philosophical perspective for the research paradigms. Moreover, the research design, and methods of data collection and analysis are described.

Chapters 5 and 6 present the findings from the first and second, or quantitative and qualitative, phases of the study.

Chapter 7 discusses the study's quantitative key findings in the light of extant literature.

Chapter 8 discusses the study's qualitative key findings and informs the design of the online health awareness programme based on the findings of the study.

Chapter 9 provides the conclusion to the thesis and offers recommendations drawn from the findings.

## **Chapter 2 The Context of the Kingdom of Saudi Arabia**

### **2.1 Introduction**

As this study is conducted in the cultural environment of the Kingdom of Saudi Arabia, a brief overview of the country is now provided. This chapter is composed of five main sections: the first section describes the characteristics of Riyadh city where the study is set; the second describes the relationship between Islam and the KSA; the third section explains the impact of the globalization on the eating habits in the KSA; the fourth section introduces the education system in the KSA; and the final section focuses on the health policies in the field of education.

### **2.2 Characteristics of the Population of Riyadh City**

Riyadh is the capital of the Kingdom of Saudi Arabia and is strategically placed at the centre of the country (High Commission for the Development of Arriyadh [HCD Arriyadh], 2017). It was an important centre for the dissemination of Islam across the Arabian Peninsula and the rest of the Islamic world (HC Arriyadh, 2017).

Riyadh was chosen as the setting for this study because it is one of the fastest growing cities in the world. Moreover, it is characterised as a youthful city because more than half of the population is aged less than 15 years (HCD Arriyadh, 2017). The citizens of Riyadh are well educated with 10% having completed primary education, 18% having completed the intermediate stage, 32% having completed secondary education, 22% holding Bachelor's degrees, and 2% holding postgraduate degrees (Master and Ph.D.). The total illiteracy rate in Riyadh was 4.7% in the 2016 Demographic Survey, which is the lowest in the KSA (GASat, 2016). The percentage of illiteracy among males was 1.8% and among females 6%.

Further, there are multiple styles (types) of families in Riyadh: the single family, which consists of spouses and children; the extended family, which consists of spouses, children and relatives; and single individual families. Another significant consideration is the Saudi families' social context and the effect of different people in the family's life. The average size of the family in Riyadh is five to seven people, usually consisting of parents, their children, and possibly the maid. Besides, several kinds of caregivers, such as fathers, siblings, grandparents, uncles, and aunts, can influence the types of food which children consume (Hughes et al., 2013). The results of the survey showed that in 2017 the pattern of

the single family was predominant at 86.64%, while the percentage of the extended family was 7.75%. This trend reflects new requirements and patterns of living, especially in the size and type of housing. Accordingly, the survey showed that 52% of the population lived in villas, while 42% lived in apartments and 2.5% lived in old houses. For the ownership of housing of the Saudi families it showed that the percentage of ownership of housing for Saudi households is 56%; 40% are tenants and 3% of Saudi families live in homes provided to them by their employers (High Commission for the Development of Arriyadh, 2017). The McKinsey Global Institute (2015) stated that household income of the Saudi family had increased from 2004 to 2013 by up to 75%, driven by greater employment in the public sector and wages.

## **2.3 Islam and the Kingdom of Saudi Arabia**

Saudi Arabia is located in south west Asia and is the largest country in the Arabian Peninsula (World Factbook, 2019). The KSA is considered to be at the heart of the affection of Muslims across the world because it is home to the two places of the utmost significance and reverence for them. That is, the KSA is home to the two holy mosques of Mecca and Medina, and its ruler is also known as the Custodian of the Two Holy Mosques (HCD Arriyadh, 2017). Being the birthplace of the Prophet Muhammad (PBUH – Peace Be Upon Him), the KSA is also the birthplace of Islam and where the Holy Qur'an was revealed to the Prophet (Motoaly, 2008). According to tradition, the Prophet Muhammad received the Holy Qu'ran by revelation in Makkah in Arabic (Alhamed et al., 2004). Consequently, Arabic is the most widely used language in the country. Moreover, due to this, the education system of the KSA is based on the Holy Qur'an and the Sunnah (holy sayings) of the Prophet Muhammad.

The next sub-sections describe eating behaviour in Islam and relatedly, fasting in Ramadan. This is followed by the eating habits of families in the KSA.

### ***2.3.1 Managing Emotions in Islam***

The Islamic education system pays important attention to human emotions in considering them as an essential element of the human soul. Islam encourages its followers to handle their emotions in such a way that they can keep a balance between self-satisfaction and others' interests. Extreme emotions (negative or positive) are rejected in Islam as uncontrolled emotions could have destructive consequences. For instance, extreme positive emotions (happiness) could lead people to exaggerate celebrations and

sometimes lead them to get drunk or overdosed on drugs. In contrast, extreme sadness can have destructive consequences such as isolation, even committing suicide, and attempting to harm other people. In this regard Mohammed (PBUH), the prophet of Islam, says: "How wonderful is the case of a believer; there is good for him in everything and this applies only to a believer. If prosperity attends him, he expresses gratitude to Allah and that is good for him; and if adversity befalls him, he endures it patiently and that is better for him" [Muslim, Book 1, Hadith 27].

In short, this means that Islam guides Muslims to control their emotions in both cases; sadness and happiness. Thus, controlling emotions will affect the eating behaviours of individuals because eating behaviours are highly affected by emotions (Antoniou et al., 2017).

### ***2.3.2 Eating Behaviour in Islam***

In general, Muslims tend to follow Islamic nutrition practices regardless of their ethnicity or present location. Islamic nutrition practices were defined in the Holy Qur'an 14 centuries ago, as recommended by the Prophet Muhammad in the Sunnah. Islamic nutrition practices are formulated to substantiate the intellectual, moral, economic, social, political, and scientific aspects of human life. In order to promote healthcare, Islamic nutrition recommends certain guidelines, such as (1) eating only according to the body's needs and avoiding excessive food intake; (2) following a healthy diet that provides sufficient quantity of the nutrients, which is important to maintain bodily health; (3) consuming meals at particular times (not specified how many meals) and avoiding food in between; (4) selecting and consuming appropriate foods (lawful (halal) and healthy food (The Holy Qur'an: Surat Al Ma'idah, verse 88); and (5) consuming meals in the sitting position (Bukhaaree, Hadith No. 5376).

Islamic teachings also provide other key insights with regard to food and eating. For instance, cleanliness and hygiene are extremely important in Islamic teaching. Maintaining hygiene is highly recommended in all the processes related to the preparation and preservation of food, along with maintaining the cleanliness of the body, personal belongings, and the surrounding areas. According to the teachings of the Prophet Muhammad, dental and oral hygiene needs to be taken care of by using a tooth cleaner called a Miswak, which is extracted from a particular tree known as 'Arak'. It is also recommended that hands should be washed and cleaned before and after meals and also

certain body parts should be washed (ablution) before prayers (Ibn Maajah Hadith No. 493).

Muslims all over the world believe that food and water are supplied by Allah for survival and health maintenance. They practise saying “Bismallah”; which means the name of the God “Allah”, before a meal and “Alhumdulliah” after a meal, which means thank God, to express their gratitude to Allah (Bukhaaree, Health No. 5376). The Holy Qur’an and Sunnah recommend that Muslims should eat moderately according to their requirements of a general good health and not overeat, as the Qur’an and Sunnah indicate that Allah does not appreciate extravagant drinking and eating (Ali, 2011; Ibn Maajah, Hadith No. 3268). That is, the Qu’ran indicates that Muslims must be mindful in eating and would seem to advocate neither overeating nor undereating. The Prophet Muhammad suggested that one’s stomach should never be completely full, with one-third being filled with food, one-third being filled with drink, and the remaining one-third being kept empty to allow room for breathing. Essentially, moderation in eating is the critical concept for equal status in health and diet. Moderation in eating is also an instrumental interventional approach to prevent weight gain and support weight maintenance (van Dellen et al., 2016). Additionally, food must be consumed in small bites and the diet must be well-balanced (Ahmed et al., 2017; AlTirmidhee, Hadith No. 2380 ). This suggests that food must be consumed slowly and properly chewed in order to facilitate easy digestion. Moreover, it is suggested that water must be consumed in the sitting position and in order to avoid choking, water should be sipped and not gulped down, and to drink water in three batches to breathe between them out of the pot (Bukhaaree’s, Hadith No. 45631).

Furthermore, Islamic teachings suggest that food be consumed with family, relatives, and friends, without any distinctions being made regarding status, that is, who is rich or poor, during the sharing of a meal (Muslim, Hadith No. 2059). Meals are shared amongst family members, relatives, and friends, and consumed from one plate. Moreover, it is prohibited to eat pork and consume wine (all alcoholic beverages). Furthermore, animals are slaughtered in the Islamic way "Halal" and after mentioning the name of God, as mentioned in the Holy Qur’an (Surat Alanaam, verse 121).

Nowadays, Muslim people strive to adopt the way of early Muslims’ life because a lot of eating habits and food kinds have changed during the years. The eating habits of the old Muslims were consuming specific amounts of healthy and nutritious food, which are enough to satisfy their hunger and meet their nutritional needs, such as vegetables and

fruits. The agricultural technology has encouraged the production of food, which makes plenty of food available. Besides, food production has become developed in processing methods. This change in food from the past to present clarifies the nutritional differences and eating habits of early and current Muslims (Ahmed et al., 2017). Early Muslims were recognized as semi-vegetarians because they consumed a low amount of meat. They practised the eating behaviour of Prophet Mohammed, as it is well established in the Hadith literature that the Prophet eats meat rarely, and mostly on particular occasions and as a guest. His favourite foods and usual diet were water, dates, vinegar, yogurt, honey, bread, barley, and grapes. It was a widespread practice of early Muslims to eat a lot of fruits as an essential portion of their diet (Ahmed et al., 2017).

Bonne (2007) clarified that religion could establish food habits and influence people's decisions regarding buying meals when looking at Islam as an entire path of life that has provided abundant instructions on how to react with food. Recently, it has been recommended to consider and follow early Muslims in their eating habits (Alam & Mohamed Sayuti, 2011). However, some people only concentrate on religion rites without considering some different significant aspects, such as their eating habits (Ahmed et al., 2017). Moreover, Soesilowati (2011) explained that the role of the social culture which people live in could control their behaviour related to a subjective norm.

In general, the family is expected to take responsibility for providing and consuming healthy home-made food and controlling weight gain amongst family members (Al-Khaldi et al., 2014). Most Saudi families follow the Islamic culinary and dietary recommendations, and have their meals together. Generally, the Saudi diet consists of high calorie foods in the form of proteins, fats and carbohydrates, such as meat, dairy, eggs, bread, and sweets, which can cause excess weight and obesity (Bin Horaib et al., 2013). This is accompanied by a tendency to avoid fruit and vegetables (Adam et al., 2014).

### ***2.3.3 Fasting in Ramadan***

In conformance to the fourth pillar of Islam, people in Saudi Arabia fast every day in the month of Ramadan (Zaw et al., 2016). Ramadan, the sacred season of the year; is the ninth month of the Islamic calendar, which consists of 29 or 30 days. Fasting signifies the stopping of eating, drinking, and sexual intercourse from sunrise until sunset (Bakhotmah, 2011). The wisdom of imposing fasting is to exercise restraint (self-control), teach patience and experience hunger to remember the poor and the needy everywhere (IslamQA, 2014). As mentioned in the Holy Qur'an and by the Prophetic Sunnah, it is obligatory for every

healthy adult Muslim to fast. However, there are exceptions as follows: persons with intellectual disabilities; children until they reach puberty; pregnant and breastfeeding women; the chronically ill or elderly; travellers; and those who are unwell at the time of fasting. Nevertheless, the last-mentioned are required to compensate the lost days later or feed the poor in their stead (Laway & Ashraf, 2015).

As a result of this temporary change in daily life, the home and work life systems adapt to accommodate fasting. As an example, government working hours, shops, and markets are adjusted during fasting. Sleep times also change, especially if the month of Ramadan is during the summer season, and children have no school (Hammad, 2017). However, the change in daily life systems during the month of Ramadan because of fasting and abstinence from eating and drinking for long periods can lead some people, especially young people, to eat more either at night, when the fast is broken, or at sunrise prior to the commencement of the day's fast. Most of the foods consumed at these intervals are typically high in calories, for example, fatty or sugary foods, such as sweetened dates, Kabsah (a traditional dish containing rice and meat), and deep-fried sambosas with a minced meat filling (Bakhotmah, 2011).

## **2.4 The Impact of Globalization on Eating Habits in Saudi Arabia**

Since 1932, the KSA has assumed universal importance because it is considered one of the world's largest producers and exporters of oil. The discovery of massive oil reserves in Saudi Arabia in the 1930s encouraged opening up the country to global markets and to the Western influence, which made the globalization era appear alongside the oil era (Vassiliev, 2013). This led to raising the family's socioeconomic status, which is considered one of the various factors that could affect adolescents' eating habits and the food types they eat. For example, parents' education and family income are strongly suspected to be associated with the way their children eat (Moreno-Maldonado et al., 2018). The change in the lifestyle from a hardy tribal lifestyle to a more urban lifestyle, the affluence due to the country's oil reserves, and the accompanying "nutrition transition" has changed the food and the way the people eat from traditional food to fast food (Moradi-Lakeh et al., 2017; Nasreddine et al., 2018). Consequently, the citizens' activity levels have reduced, and their diets now include more significant amounts of rice, fat, sugar, and wheat flour than prior to oil discovery. For instance, the dietary energy intake of the population of the KSA not only exceeded the recommended levels but increased one and a half times,

from 2,100 kcal/capita/day to 3,078 kcal/capita/day, in the years of 2001-2007 (Adam et al., 2014).

Furthermore, the increases in disposable income and urbanisation have increased the Western influence on fast foods and sugary drinks, including advertising these on social media and selling them to Saudi people. This led to increasing the consumption of fast food, which is linked to the epidemic of obesity in developed and developing countries (Abou-Korin & Al-Shihri, 2015). Also, Abou-Korin and Al-Shihri (2015) pointed out that childhood obesity in a developing country, such as Saudi Arabia, has been associated with high socioeconomic status. Hence, one problem with the increased income in Saudi Arabia is that it has increased the consumption of fast food. Moreover, the sale of fast food in the country amounts to several billion dollars (Naeem, 2012).

Further, globalization had an impact on the role of women in increasing their opportunities to have a job, which led to an increased dependence on housemaids in the place of the mother. Queiroz and Coelho (2019) pointed out that the increase in the number of women workers and the change in household structure, such as the number of children, has led to an increase in eating outside the home. A further significant aspect of the change in the Saudi family from the extended family to a single-family type (nuclear family) is that it has increased the dependence on the housemaids for childcare, housekeeping, and cooking (Hefni, 2017). This could be due to the fact that women are either going out to work or are less willing to take up household chores. Regardless, the increased income has caused many families to hire nannies, and home maids from outside the country, who introduce different types of foods and new methods of cooking in the homes, leading to a decrease in the number of traditional Saudi meals served in Saudi houses (McKinsey Global Institute, 2015). The implication of this dependence leads to limited parental supervision of children, which may lead them to develop unhealthy food-related behaviours, such as the intake of large quantities of unhealthy foods, or to depend on maids without supervision or instruction. As a result, fewer meals are prepared in the traditional manner, which are cooked in a healthy way at home. In this regard, Hefni (2017) highlights this aspect as one of the probable causes of unhealthy food intake and uncontrolled weight gain, which in turn leads to obesity.

## **2.5 Background of the Education System in Saudi Arabia**

The purpose of this section is to provide an overview of the education system in Saudi Arabia, including its education policy, objectives, and the structure of the school day. Since Saudi Arabia is in a strong position in producing oil and natural gas, it has been able to implement a policy in which primary and secondary education is provided free of cost to pupils (Alqifari, 2010; Ministry of Finance, 2018). Provision of free education is possible due to the fact that more than 25% of the national budget of Saudi Arabia is earmarked for the education sector and the "health and social development" sector (Ministry of Finance, 2018).

The education system of Saudi Arabia comprises twelve years of compulsory education, six years of which are at primary school level, followed by three years at intermediate school level, and the last three years at secondary school level (MoE, 2016). It intends to promote understanding of the Islamic way of life to students, to help them realise the values and ideals of Islamic teachings, and to enable them to become self-reliant by acquiring the necessary knowledge and skills. Such an educational system helps to realise the hidden potential of youth and bolsters them to be productive enough to benefit society at large (Ministry of Education, 2018; World Data on Education, 2011). The number of Saudi students in 2017/2018 was 4,895,466. The number of schools in the city of Riyadh is 4,000 and the number of students is greater than 1,200,000 (Ministry of Education, 2017).

The school day in the public schools starts at 7 am and ends at 12:30 pm (for primary schools), and at 1 pm (for intermediate and secondary schools). Moreover, the school day involves around 30 minutes for a breakfast break, which in some schools is divided in two breaks (15 minutes for each) (Ministry of Education, 2017).

### ***2.5.1 Education in the Intermediate Stage***

Intermediate school has been in existence from the year 1378 AH (1959) and covers three years of learning, after primary education and before secondary education, with two semesters in each academic year. Intermediate school education is provided by three kinds of institutions. These are public intermediate schools, Koranic schools and intermediate scientific institutes. Public intermediate schools are the most prevalent schools, comprising 94% of boys' schools and 95% of girls' schools. The curriculum of intermediate schools recommends 33 classes per week, in which various subjects such as Arabic, Islamic studies, basic knowledge, mathematics and social sciences are to be learnt. English can also be studied as a second language to enable students to learn about various cross-

country cultures and effectively communicate with the modern world. There is no major difference in the curriculum for boys and girls, except for one subject, where boys are taught physical education whereas girls are taught more feminine topics such as “Home Economics”, which includes cooking, sewing, and drawing (Al-Ghamdi & Abdul-Jawad, 2010; Alharbi, 2014).

In Saudi schools, PE is considered one of the basic subjects in all boys schools but has not offered for girls’ public schools until the year 2017 (Samargandi, 2018); and female students have instead of PE the subject "Home economic". Community culture and tradition play a huge role in designing and developing the school curriculum. This is why the curriculum design committee always has a community culture expert to put their feedback in designing the curriculum materials. This is very necessary to avoid any misunderstanding or a community clash with education institutions (Quennerstedt & Larsson, 2015). In 2017, the MoE allowed girls public schools to have PE classes for two classes weekly (90 minutes). Nevertheless, Al-Hazzaa (2018) stated that so far the PE classes have not done enough because of the lack of suitable places in schools, as well as the lack of awareness of the importance of PE classes. Moreover, the PE classes have the shortest time allocation in the school curriculum because PE is not considered as a main or a core class in the school curriculum (Al-tamimi, 2009; Alturki et al., 2018). Furthermore, PE is treated as a dispensable class, so some teachers replace it with other classes, such as math or science, if they feel behind in their classes (Meqdad, 2009). Meqdad added that most teachers consider PE as a rest or a break class more than a class with full of skills and activities. Such an attitude about PE affects negatively the PE teachers when they need to teach or plan a PE class. As a result, the teachers do not have the motivation and the positive attitude to teach PE as a serious class such as math or science (Samargandi, 2018). Thus, these negative behaviours could affect students to have an attitude of physical inactivity. Even today, Al-Hazzaa (2018) and Alturki et al. (2018) pointed out a large percentage of schools' girls lacked proper information and skills on how to exercise or to be physically active. According to a national survey, 60% of the entire Saudi Arabian population is physically inactive. Furthermore, 90% sit consecutively for more than two hours daily (MoH, 2013). To counter this phenomenon, health education counselling should be provided in primary health care (PHC) centres to encourage PA (Alahmed & Lobelo, 2018). Therefore, it is recommended that a national policy encouraging active living and discouraging inactivity be established.

The next section describes the health policies in education in the KSA and highlights various health aspects, including the concept of School Health.

## **2.6 Health Policies in Education**

The purpose of this section is to describe the various policies related to health in the Saudi educational system. School Health is defined as a group of concepts, principles, regulations, and services to enhance the health of children at school, as well as teachers and staff, in an attempt to reinforce the health of the whole community during schools, in an effective collaboration with schools and the health authorities of the community (Ministry of Health, 2018a). Various health aspects, such as health education, nutrition, oral health, nursing, environmental health, preventive medicine, epidemiology, and biostatistics are included in the concept of school health. Unfortunately, the initial implementation of School Health programmes did not draw attention to obesity or indeed anything related to eating.

The Ministry of Education (MoE) in collaboration with the Ministry of Health (MoH) promotes health programmes not only amongst school students, but also amongst teachers and other people involved with educational institutions. The MoH also stresses the development of therapeutic services and the promotion of healthcare services in areas where they are required the most. Health programmes are part of the school health priorities, and there are many advantages to the health programmes at the school level in Saudi Arabia. Students and adolescents are being made aware of personal and general hygiene and are encouraged to engage in physical activities. They are also taught to prevent serious health problems by consuming nutritious meals at regular intervals and by developing healthy habits, like maintaining oral and dental health, avoiding smoking and following safety measures to prevent injuries.

However, a study by Al-Khaldi et al. (2014) drew attention to the lack of a national programme in Saudi Arabia to prevent and control obesity. In this study, the authors suggest that individuals “must understand that food items with high calories such as rice, dates, creams, chocolates, soft drinks, fast food, sweets, full cream (milk, cheese, Laban, Yogurt) should be taken in low amounts while vegetables, fruits should be consumed daily. They should know how to read food labels and what they mean” (Al-Khaldi et al., 2014, p. 50). Hence, it can be inferred that there is no uniform approach used by school health programmes to guide students with regard to the specific details of nutritious meals.

Moreover, the focus in the country seems to have been directed towards obesity, which is the outcome, generally, of unhealthy eating behaviour.

Due to the link of obesity with many chronic diseases, such as cardiovascular disease, type 2 diabetes, arthritis and other diseases, which have an impact on the health, social and economic side, the MoH in cooperation with the MoE adopted an initiative to reduce the rate of obesity in students in schools. This initiative aimed at enhancing the lifestyle of students by improving dietary behaviour and increasing physical activity and raising awareness of the health risks of obesity and prevention methods, recognizing that school is the appropriate place for preventive interventions (Ministry of Health, 2018a).

Although substantial attention has been given to the provision of healthcare and healthy lifestyles, the notion of healthy eating behaviour is not explicitly called out. Thus, there is a need for the creation of awareness programmes which can facilitate healthy eating behaviour in school students. In order to adopt comprehensive development plans focused on preventive healthcare services at all levels of education in public and private schools, a need for establishing a public administration centre was identified due to the rapid increase in health consciousness and the need for curative services in Saudi Arabia. The preventive healthcare systems implemented through school health programmes in Saudi Arabia prompted the authorities to pay further attention to developing therapeutic services. Table 2.1 describes these programmes.

**Table 2.1**  
*Health Programmes Implemented in Schools*

<b>Programme</b>	<b>Description</b>	<b>The executing agency</b>	<b>Duration</b>
“Your food is your life”	This is a diet awareness programme offered by trained personnel to elementary school students in a semester. The trainer could be any individual from the school health department or the educational supervisory department. In some cases, well-educated students can also offer to volunteer to such causes.	Initiative with a voluntary company	Finished
“Health-promoting schools programme”	A national programme applied as a standard procedure in all schools that promotes healthcare facilities in which the following sequence is followed: Defining a health-promoting school; implementing the health concept; and assessing the schools that followed the healthcare procedure.	Initiative with a voluntary company	Finished
“Students' healthy drawings programme”	This is a health programme that uses drawings made by students to understand their interpretation of health concepts and their level of awareness.	Initiative with a voluntary company	Finished
“School milk programme”	A national programme that involves the joint efforts of the public and the private sectors in order to spread awareness about the importance of milk, prevention of osteoporosis, and tooth decay.	Initiative with a voluntary company	Finished
“Initiative to reduce the rate of obesity among students in schools (fitness)”	An initiative to reduce the prevalence of obesity and enhancing healthy lifestyle and raise awareness of the health risks of obesity among children and adolescents in the school age in Saudi Arabia by 5%, started in 2016/2017 over the next five years in the selected schools (Ministry of Health, 2018c).	The MoH in cooperation with the MoE	Temporary - Ongoing

It can be seen from this overview of health programmes that their emphasis is about health in general and there is lower (or lack of) emphasis about nutrition and eating behaviour/habits. Hence, it appears that there is a scope for more programmes specific to health awareness programmes related to healthy eating behaviour in Saudi Arabia.

Regarding school canteens, there is a strong partnership between the MoH and the MoE working to modernize the regulations and requirements. In addition, there is a need to determine the relevant roles and tasks to achieve complementarity in achieving the goals, which falls under the development and modernization steps of Saudi Arabia in its Vision 2030 and the National Transition Programme (The Unified Guide to Supervising on School Canteens, 2018). Running school meals and canteens should be compatible with healthy international standards. Saudi public schools deal with many companies operating school canteens in one city to create a spirit of competition and hard work without using

legislation or guidance for the provision of school meals. For private schools, they make contracts with caterers to sell snacks or fast foods, which are mostly unhealthy. Also, it is allowed for students to bring their foods from home (Al-Jaaly et al., 2016). Based on allowed food, Al-Jaaly et al. (2016) stated that in Saudi Arabia, it is recommended by the School Healthcare Department to put a restriction on the sales of high sugar and high-fat foods in school canteens, such as unhealthy beverages, candy snacks, sugars, and preserves. Also, it is encouraged at all school levels to consume fresh milk, dates and natural sweets as sources of energy (Al-Jaaly, 2012). In Al-Jaaly et al.'s (2016) study, they found the problem with school canteens is that there is no legislation to enforce and inspect these recommendations. Also, the policies and regulations which applied to provide school meals are different between Saudi public schools and private schools. As the private schools have self-management of the school canteen, they are free to choose the contractors who supply their foods. Moreover, 77.5% of the foods and beverages items which are provided at Saudi school canteens include high content of sugar, salt and fat (Al-Jaaly et al., 2016). Therefore, the school environment plays an important role in nurturing and sustaining good eating habits because most students consume at least one snack or one meal in their school canteen on most days of the week for several years (Ministry of Health Singapore, 2018). This means school meals could offer an essential contribution to the nutrient and energy intake of adolescents. They are mostly the top option in comparing with other food sources, such as takeaways and cafés, which can exist around the school (British Nutrition Foundation, 2018a).

Al-Jaaly et al. (2016) pointed out that schools have a vital role in promoting and contributing to the healthy status and behaviours of students as compared with other institutions in society because through their canteens, healthy options of meals and snacks can be offered. Hence, many health policies and decisions could be implemented in education regarding healthcare and healthy lifestyles. On this basis, care and attention to these canteens and giving them priority in healthcare is not secondary, but it is a significant task that rests with those responsible. So, to promote the health of students and to create a healthy and ideal food environment, it is necessary to provide and improve a range of services, and strategies that promote their health and nutritional behaviour at school (The Unified Guide to Supervising on School Canteens, 2018).

## 2.7 Summary

The objective of this chapter was to present the context in which the present study has been undertaken. Accordingly, the characteristics of the population of Riyadh were described, as the study was conducted in this city. In addition, the demographics of the population, including the nature of the accommodation, family size and types, and income in the city, were presented.

The background of Saudi Arabia was discussed to reveal how the underlying influence of the Saudi culture and its Islamic aspects could govern and direct the eating behaviour of adolescents in the country. Eating behaviour in Islam was then examined with the objective of providing insights into the religious influences on eating behaviour in the country. Relatedly, the ritual fasting practices followed by citizens of the country during the month of Ramadan were described. This was followed by the typical eating habits of Saudi families. Moreover, the chapter explained the impact of globalization and Western culture on eating and drinking habits. This resulted from the effect of oil discovery on changing the lifestyle of people in the KSA from a hardy tribal lifestyle to a more urban lifestyle and its implications in changing the food and the way that people eat from traditional food to fast food.

The chapter also described the background of the education system in Saudi Arabia. Finally, a description of the existing health policies associated with education was presented, commencing with an overview of school health in Saudi Arabia. Further, this section provided insights regarding health policies and decisions regarding healthcare and healthy lifestyles in education, the priorities and aims of school health in the KSA, and the experiences of school health, including school canteens.

## **Chapter 3 Literature Review and Conceptual Framework**

### **3.1 Introduction**

The purpose of this chapter is to review the literature, theoretical background and conceptual framework associated with the research topic under consideration. The first section is an introduction, and the second pertains to various aspects of adolescence. The third section scrutinises eating behaviour, while the fourth delves into the concept of emotional eating. The fifth section offers the theoretical background of emotional eating. The sixth section presents the conceptual framework to provide deeper awareness of the study. The seventh section examines existing research related to awareness programmes on health eating. The last section is a summary of the chapter.

### **3.2 Adolescence**

Adolescence is associated with a particular chronological stage of an individual's life associated with physiological changes. According to the United Nations Development Programme (UNDP, 2009), an individual aged between ten and 19 years is classified as an adolescent. This decade is considered to be the most crucial period of an individual's existence, as it involves the transition of an individual from late childhood to early adulthood (United Nations Children's Fund [UNICEF], 2011). Also, this is the stage of a person's life in which many physiological and psychological changes take place, and the growth rate of both of these aspects is at its maximum. Furthermore, this rapidity of growth is linked with cognitive, and hormonal and emotional changes (Blakemore et al., 2010; Patton et al., 2016). Puberty typically indicates the beginning of adolescence and can occur at different times for individuals. For instance, boys mature later than girls, and some individuals mature later than others. Thus, though the onset of puberty varies from person to person, it is generally assumed that for girls, adolescence begins at the age of around 11 years whereas it usually starts at the age of around 13 years for boys (Sawyer et al., 2018). Moreover, in girls puberty reaches its peak at around 12 years (Marceau et al., 2015). Similarly, the end of adolescence also seems to vary as it has been reported to end around 17-19 years in girls and by 20 years in boys (Curtis, 2015). These ages differ from one country to another, being highest in poorer countries and lower in developed countries, due possibly to the quality of nutrition and the genetic features of a population (Corley et al., 2015).

An important feature is the great variability that exists in both of the timing and size of the growth speed among genders and between individuals (Ellis et al., 2011; Marceau et al., 2011). Health and the quality of nutrition are considered to play a major role in the physiological changes in adolescents (Department for International Development, 2009).

The Islamic legal traditions indicate that puberty marks the end of childhood without specifying any particular age, as individual differences are acknowledged. Moreover, they agree that the principal condition for entry into this stage for girls is menstruation whereas for boys it is nocturnal emissions. However, adolescence in Islam is regarded as a phase when individuals become competent, from physical and religious perspectives (Zia Ul-Haq, 2004). Thus, at this stage, individuals are deemed to be fully liable to perform their religious duties but are neither recognized as having entered adulthood nor as having attained full maturity (Tabatabaie, 2015). Thus, it appears that the Islamic understanding of adolescence and its facets do not correspond fully to the Western perspective, which does not consider religious responsibilities or voting according to the political maturity to make civil decisions, as an integral part of adolescence.

Further, adolescence is a critical phase of the neurological development of an individual. As in childhood, the adolescent brain continues to be malleable and experiences restructuring and refinement in the adolescent period (Griffin, 2017). Changes to the brain indicate that more than other age groups, adolescents are likely to look for novel experiences and take chances, a phenomenon which can make taking care of their health challenging. Nevertheless, it is a significant element of their progression to adulthood (Griffin, 2017).

Adolescence is also a phase during which an individual's health behaviour is modelled (Hagell et al., 2013). At this vulnerable stage, teenagers need to learn to manage their behaviour and impulses, develop a moral compass, be sensitive to serious issues, and assess new life situations based upon their past experiences. This seems to be especially true in the KSA, where adolescents are considered to be adults when it comes to the fulfilment of religious traditions. Moreover, increased control and accountability is sought, accompanied by an increased significance of peer groups and the influence of peers. Nevertheless, families continue to hold a place of significance in the adolescent's existence (Hagell et al., 2013).

### ***3.2.1 Nutrition for Adolescents***

Good nutrition is considered as one of the biggest investments which can be provided to support welfare globally, in general. In the case of children and adolescents, in particular, it would appear that nutrition is essential to support their growth because it enhances brain development, reinforces learning skills, encourages a productive adulthood and drives a more sustainable future (UNICEF, 2017). Similarly, an emotionally healthy attitude towards life could help adolescents to experience new things and to be aware of any further risks. This suggests young people need training and education on healthcare and self-care, which helps them establish lifelong healthy habits (Hagell et al., 2013).

While adolescents' need of nutrients is almost comparable to other age categories, adolescents require more of some nutrients through the duration of their quick growth, for instance, calcium. Adolescents also require higher amounts of minerals and vitamins compared to their nutrient requirements when they were younger. Moreover, the needs may vary by individual (Rolfes et al., 2020).

However, research indicates that some adolescents may consume more than they need, leading to increased occurrence of obesity or overweightness, particularly when accompanied by inactivity (British Nutrition Foundation [BNF], 2018b; WHO, 2004). Conversely, research also indicates that some adolescents eat less than that recommended, leading to the development of eating disorders (section 3.4.2 and 3.4.6). For example, the status of eating disorders, such as anorexia nervosa, reaches its peak among adolescent females aged 15-19 years (BNF, 2018), while the peak of the risk for males is earlier, from 13 years (Zerwas et al., 2015). Further, some adolescents may practise inappropriate ways to control their weight, such as skipping meals, smoking or stopping fattening food from their diets (e.g., dairy products and red meat). In general, restricting one's diet, particularly when an entire food group is eliminated, leads to deficiency in nutrition and problems in future life, not just for adolescents but for all individuals. Thus, a healthy lifestyle is one of the most important priorities that needs support and encouragement during the teen years. Moreover, maintaining good habits during adolescence is likely to benefit health during adulthood and aging (BNF, 2018).

### ***3.2.2 Adolescents, Body Image, and Eating Disorders***

Cash and Smolak (2011) described body image as “the psychological experience of embodiment” (p. xiii). Accordingly, it is a wide-ranging concept with intellectual, emotional, and behavioural facets (Liechty et al., 2016). For instance, body image can

include a person's complete satisfaction with their body, body consciousness, physical fitness, assessment of appearance, supervision of body, and perceptual correctness of body proportions (Menzel et al., 2011; Smolak, 2004).

Cultures and the media place emphasis on the looks and appearance of women in particular (Haugen et al., 2014), which can pressure them to diet, whereas studies (e.g., Leit et al., 2002; Pope et al., 2000) have indicated that men have lower exposure to societal and media compulsion to diet. Nevertheless, men also experience social pressure to be more masculine through subliminal messages received, for instance, through male action figures or magazine centrefolds (Greenberg & Schoen, 2008; Leit et al., 2001).

Although research related to body shape (satisfaction and dissatisfaction) has been limited in countries in the Middle East, such as Saudi Arabia (Al-Otaibi et al., (2013), it can be inferred that due to the progressive Western influence (Al Othaimen et al., 2007) there is a greater awareness of body shape and attractiveness among individuals. Traditionally, however, there has been a preference for heavier (slightly overweight) women in the Arab cultures (Musaiger, 2013; Musaiger & Shahbeek, 2001; Rguibi & Belahsen, 2006). Also, it would appear that while the all-cover nature of the abaya (for women) and thawb (for men) disguise a person's figure and give the impression of sameness (Buchele, 2008), there appears to be an increasing diversity in individual perceptions with regard to what constitutes an attractive body shape. For example, adolescent females who had a normal-weight perceived themselves to have overweight, while obese women perceived themselves to have normal weight (Albeeybe et al., 2018).

Further, when compared to boys, adolescent girls tend to be more conscious about their physical attributes and appearance (Black et al., 2010); hence, they are more likely to adopt disordered eating patterns, that is, they are likely to adopt one of many disturbed eating patterns (Costa et al., 2008; Weiss et al., 2006). Such body-consciousness can lead to a preoccupation with dieting, which may adversely affect eating behaviour, psychosocial development, and nutritional status (Mallick et al., 2014). Adolescent girls who feel unhappy with their physical attributes and appearance may be affected by various factors, such as age (Grower et al., 2019; Neumark-Sztainer & Hannan, 2000), dietary habits (Cash & Pruzinsky, 2004), family environment (Voelker et al., 2015), peer pressure (Valois et al., 2019; Webb & Zimmer-Gembeck, 2014), and economic and sociocultural background (Abraham & Birmingham, 2008; Voelker et al., 2015).

In order to study various individual concerns regarding body image, a Body Dissatisfaction scale based on the Eating Disorder Inventory (EDI-BD) was developed by Huang et al. (2007). They found that compared to older women, female adolescents had serious concerns about body image and their thought processes often led them to become emotional eaters. Indeed, most of the participants (657 female adolescents) surveyed by Huang et al. (2007) were worried about being overweight and conscious of their physical shape. Their dissatisfaction with their body image led to them having lower self-esteem than their male counterparts. Young people whose dissatisfaction with their body image causes them to feel distress and have low self-esteem are at higher risk of emotional eating, which can lead to binge eating disorder (BED) (Buckroyd, 2011).

Moreover, such discontentment with physical appearance and size may lead to the onset of eating disorders, which mainly affect adolescents and young adults. In some cases, people in older age groups can also develop such disorders, but eating disorders in older adults were not widely known about until recently (see section 3.3.4). Moreover, there is evidence that such disorders are increasingly prevalent among adolescents and even younger individuals (Holm-Denoma et al., 2014). Further, eating disorders are recognized to be among the most common health challenges besetting adolescents, third only to obesity and asthma. Also, the period between 14 and 19 years is the peak age for commencement of these disorders (Kakhi & McCann, 2016). In other words, there is considerable research support for the emphasis of the present study on adolescents aged 12-15 years, as this is evidently a high risk group for eating disorders. Eating disorders will be discussed in more detail in 3.4.6 and 3.4.

According to a health survey conducted on adolescents aged between 11 and 15 years in England in 2011, more than 33% of females and about 25% of males were attempting to lose weight, possibly due to dissatisfaction with body image, as it was furthermore found that eating behaviours and health attitudes correlated with the size and weight of their bodies. Additionally, it was found that more than 25% of the surveyed young people were not making any attempt to lose excess weight (Craig & Mindell, 2012). According to the UK's Health and Social Care Information Centre (2014), the majority of persons admitted to hospital for the treatment of eating disorders were female adolescents aged 15 years and male adolescents aged 13 years. It must be noted that the number of females admitted with an eating disorder was about nine times more than males. Thus, it would appear that it has become imperative to raise awareness among teenagers and educate them about adopting

healthy practices to avoid the various risks associated with eating disorders and unhealthy eating behaviours.

Further, it has been revealed in prior research (e.g., Al Sabbah et al., 2009; Bearman et al., 2006) that all girls and boys are disappointed with some facet of their appearance in general, wanting, for instance, to be slenderer or more muscular. So much so, that many adolescents and early adults acknowledge trying out disturbed eating behaviours (Quick & Byrd-Bredbenner, 2013). Disturbed eating behaviour indicates behaviour such as meal skipping or fasting, consumption of laxatives or diet pills, self-induced vomiting, binge-eating, and so on (Croll et al., 2002; Quick & Byrd-Bredbenner, 2013). Moreover, adolescent females tend to be more conscious than males about their physical attributes and appearance; hence, they are more likely to adopt disordered eating patterns (Voelker et al., 2015). Such body-consciousness can lead to a preoccupation with dieting, which may adversely affect eating behaviour, psychosocial development, and nutritional status (Mallick et al., 2014).

The next sub-section discusses emotional well-being and mental health for adolescents. This was included because it was believed that a consideration of the implications of emotional well-being would be beneficial due to its connection with the concept of emotional eating, as White (2018) pointed out that EE is a risk factor for physical and emotional well-being.

### ***3.2.3 Emotional Well-being and Mental Health for Adolescents***

Emotional well-being has been defined as a “positive state of mind and body, feeling safe and able to cope, with a sense of connection with people, communities and the wider environment” (Department of Health, 2011, p. 90). The emotional well-being of adolescents and young people is associated with their psychological health (Howard et al., 2017; Warwick et al., 2008). Emotional and behavioural problems, such as truanting, being violent, being withdrawn, indulging in self-harming behaviour, and not engaging with academic studies, have increasingly been reported in adolescent students. A key factor that may cause adolescents to be susceptible to such psychological disorders is their social and economic background (Warwick et al., 2008; Welsh et al., 2015). In the context of Saudi Arabia, this could indicate that the religious and cultural environment could have implications on the health, eating behaviour and well-being of adolescents in the country. Al-Hazzaa et al. (2013) noted that unhealthy lifestyle behaviours and dietary habits of Saudi adolescents are influenced by culture.

In this context, the concept of emotional well-being is significant, as it is a principal indication of mental health in the early stages of existence (childhood, teenage years) (Department of Health, 2015; World Health Organization [WHO], 2003a). In general, emotional well-being comprises the inclination of an individual to be content with and optimistically experience life; be self-assured; think positively; and to successfully deal with problems (Pickett & Wilkinson, 2015).

The World Health Organization (WHO, 2018d) has defined mental health as “a state of well-being enabling individuals to realise their abilities, cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their communities” (p. 4). Psychological well-being affects emotional mastery over day-to-day activities; hence, in addition to the psychopathology aspects, the definition of positive psychological health can be extended to include prosperity, positive beliefs, positive working approaches, and general well-being (Keyes, 2002). Therefore, adolescents need support in developing the emotional strength that can aid them in dealing with and recovering from adverse situations. Such strength can eventually help avert the occurrence of mental health issues in later life among adolescents because there are several emotional distress symptoms which are associated with the reasons and conditions of eating disorders (section 3.3.4 and 3.4.6.1) (Howard et al., 2017) and emotional eating (Hertz, 2019) (section 3.4.2 and 3.4.4).

In 2004, a survey was conducted in the UK regarding the various types of psychological disorders that were prevalent among children and adolescents aged between 11 and 16 years. It was found that psychological disorders were common among men, while emotional issues were more commonly found in women. Additionally, 10% of the girls and 13% of the boys were found to have some kind of psychological disorder, such as eating disorders (Green et al., 2005).

It is clear that emotional health is an essential part of mental health, emotional well-being, and overall health (Dawkins & Jennifer, 2020). Emotional health has been variously described as the capacity “to express emotions and feelings appropriately” (Greenberg, 2014, p. 4) and the ability “to respond affirmatively and cope with positive and adverse situations, to reflect on one's emotions and surroundings, and to engage in leisure and fun” (Huebner, 2003, p. 347). The National Institute of Health U.S. (2017) pointed out that emotionally healthy people could control their feelings, thoughts, and behaviours, and cope with the challenges of life. Additionally, they have a good feeling about themselves and have good relationships.

Since children and adolescents spend considerable time in the school environment, schools have been recognized to be the ideal environment to encourage robust emotional health and identify preliminary modifications in behaviour and hints of emotional troubles (YoungMinds, 2017). Therefore, emotional health means to have an awareness of emotions, besides the capability to express and manage feelings in an appropriate manner.

### **3.3 Eating Behaviours and Food Choices**

Human beings consume food for a number of reasons, such as satisfying hunger, staying healthy, catering to culinary tastes, and socialising. Eating habits, consequently, reflect individual as well as familial and cultural dietary habits. In the context of the present study, it is imperative to understand the eating behaviours of adolescents, as they are influenced by their environment and the people with whom they interact (Ranjana et al., 2013; Story et al., 2002). According to Anglé et al. (2009), ‘eating behaviours’ are characterised by the cognitive, emotional, and behavioural aspects of how and what people eat, and are primarily determined by either individual or environmental influences (section 3.4.6). Various psychological and biological characteristics determine the individual influences (section 3.4.6.1), whereas family members, friends, and peers determine the environmental influences. Furthermore, social norms and systems, coupled with external inputs such as marketing and advertising, also contribute significantly to people’s eating patterns (section 3.4.6.2) (Story et al., 2014). As discussed in Chapter 2, aspects of the religious and sociocultural environment in the KSA influence the eating behaviour of individuals.

Eating behaviours were defined by Viana and Sinde (2008, cited in Freitas et al., 2018) as “the attitudes and psychosocial factors related to the selection and decision of which foods to eat” (p. 20). Drawing on this definition, Póinhos et al. (2018) describe eating behaviour as “a multidimensional construct that refers to quantitative and qualitative features of the selection and decision of what foods to eat” (p. 33). For instance, as Grimm and Steinle (2011) indicate, eating behaviour is “a complex interplay of physiological, psychological, social, and genetic factors that influence meal timing, quantity of food intake, food preference, and food selection” (p. 52). Accordingly, inquiry into this topic encompasses various themes, including food-related preferences, compulsive behaviours and disorders associated with eating, meal proportions, and meal choices. There is some evidence of this in the fact that the term “eating behaviours” is vastly wide-ranging and is usually employed in association with more definite fields of inquiry, such as food

selection, healthy eating, dieting, obesity, or disordered eating. The term is used by Šmahel et al. (2018) in its obvious sense, to designate any form of eating-related behaviour or mental processes. Consequently, these authors place emphasis on certain practices, such as dieting methods, together with the outlooks or principles associated with various kinds of eating behaviours, including whether dieting is perceived to be “un/wanted or un/healthy”.

Overall, nutrients and energy are provided by food. Nutrients are vital for the *well-being* of humans. However, the identification of other compounds in foods continues and there is growing awareness of their health attributes (Jew et al., 2015). There are vital implications associated with the connection between foods, nutrients, and dietary patterns, particularly in the avoidance and occurrence of enduring conditions, such as cardiovascular diseases (e.g., heart attacks, stroke), cancers, chronic respiratory diseases (e.g., asthma, chronic obstructive pulmonary disease (COPD)) and diabetes (Bowen et al., 2018). Physical, societal, and environmental aspects influence the preferences for food, and thus, they keep varying through life (Ventura & Worobey, 2013). These preferences are the principal factors determining choices of food and consequently quality of diet (Birch, 1999; Russell & Worsley, 2013). As highlighted in the Introduction to this study, the present context of the KSA demonstrates the impact of the nutrition transition, over the past few decades, which has impacted the preferences and patterns associated with eating.

Overall, the preceding discussions indicate that eating behaviours can be considered to embrace various components. These are briefly described in the following sub-sections. In general, this section (3.3) focuses on an overview of eating behaviours and their types. In the next section (3.4), the focus is on emotional eating and discussing its aspects in particular. It must be noted that some of these discussions will be as a nutritionist rather than as an educator.

When discussing eating behaviours, it is imperative to shed light on the connection between eating and awareness to differentiate between mindless and mindful eating, which is presented in the next section.

### ***3.3.1 Eating Awareness (‘Mindful Eating’)***

The notion of eating awareness pertains to developing a greater consciousness of an individual’s association with food, as this can enhance one’s gratification in eating by discovering the sensory character of foods. Moreover, it pertains to observing ‘what’ and ‘how’ a person is eating (Balancedweightmanagement.com, 2019). In this context,

‘mindless’ eating indicates eating like an automaton, that is, eating without being aware of ‘why’, ‘when’, ‘what’, ‘how’, and ‘how much’ one eats. The tendency to eat mindlessly can be overcome by putting ‘mindful’ eating into practice. Mindful eating is a method which can be employed to develop eating habits which are healthier (see section 3.3.1). Further, it is a method that can help an individual master their eating habits. People’s awareness of their bodies and feelings increases when they eat mindfully, together with a finer appreciation of the taste and consistency of food. Also, they are more aware of the speed with which they are eating, the quantity they are consuming, and the sensation of fullness. Further, this helps to check overindulging, a happening that is extremely likely to occur when mindless eating takes place (Ministry of Health Singapore, 2019).

Mindful eating is awareness of the process of consuming food, as well as awareness about the quality and quantity of the food being consumed. Such consciousness whilst eating involves the regulation and control of the sensory organs (Albers, 2008). According to Albers (2008), three main steps are required to practise mindful eating. The first step involves regulating the sensory organs in cases where the aroma, visual appeal, taste and texture of the food being consumed may tempt a person to indulge in unhealthy eating. Regulating the sensory organs could be carried out by outlining the mindfulness and mindless thoughts and feelings, besides exploring the motivations of mindful eating. The second step is to avoid unconscious eating, i.e., focusing only on the actual process of eating and not work, the television, or other distractions. The third step is to identify the factors that cause a person to start and end the process of eating. In a survey conducted on participants at a preparatory school, a fitness centre, a non-profit company and another company, it was found that overeating was associated with a high Body Mass Index (BMI) but that this could be effectively combated by using mindful eating techniques (Framson et al., 2009). In the specific context of adolescents, a pilot study employing a small sample (n = 40) in Richmond County, Georgia, demonstrated that awareness trainings based on mindful eating inspired adolescents to practise healthy eating and to increase physical activity and reduced their inclination to put on weight (Medical College of Georgia at Augusta University, 2016). Thus, mindfulness of bodily feelings can assist emotional eaters in realizing signals of hunger and fullness, which help people to promptly recognize when they are about to eat for other reasons than physical hunger. A study by Katterman et al. (2014) found that the influence of mindfulness meditation interventions can effectively reduce emotional eating and binge eating. Another study by Pierson et al. (2016)

confirmed that there is a need to promote healthy eating and lower EE by using mindfulness interventions.

The differences between mindless and mindful eating are summarised in Table 3.1 (Kristeller, 2014), which highlights that the fundamental difference in the two behaviours is greater attention to more comprehensive/wide ranging well-being rather than a limited focus on food itself. Further, the behaviour described as mindless eating will be seen in the forthcoming discussions on emotional eating, indicating that there is a negative connection between emotional eating and eating awareness.

**Table 3.1**

*The Differences between Mindless Eating and Mindful Eating (Kristeller, 2014)*

No.	Mindless Eating	Mindful Eating
1	Eating even after one is full and paying no attention to the body's signals	Paying attention to the body's signals and stopping when satisfied
2	Eating as a response to emotions (e.g., sad, lonely bored)	Eating as a response to signs from the body (e.g., growling stomach, low energy)
3	Eating by oneself, at arbitrary times and locations	Eating in company, at fixed times and locations
4	Eating food that provides emotional bolstering	Eating foods that provide nutrients for health, self-care, and energy.
5	Eating while doing other activities	Eating as a standalone activity
6	Regarding a meal as an outcome	Thinking about the origins of food

A further aspect of eating awareness is the loss or retention of control when eating. The eating behaviour in which people tend to eat compulsively and recklessly without any form of control is known as 'uncontrolled eating' (Anglé et al., 2009). Thus, uncontrolled eating can be understood to be a combination of impulsivity, binge eating, and disinhibition (Vainik et al., 2015a). That is, it means being unable to regulate appetites and impulses, which is decreased self-control over eating (Costa & McCrae, 1992; Vainik et al., 2015b), regular incidents of overeating and feeling an absence of control (American Psychiatric Association, 2013; Colles et al., 2008), and an inclination for opportunistic consumption of food (Bryant et al., 2008). As pointed out in Chapter 2, Islamic traditions encourage the exercise of self-control, as seen in the Ramadan fasting (section 2.3.3). Consequently, it might seem that adolescents in the KSA, who are accountable for their actions in the

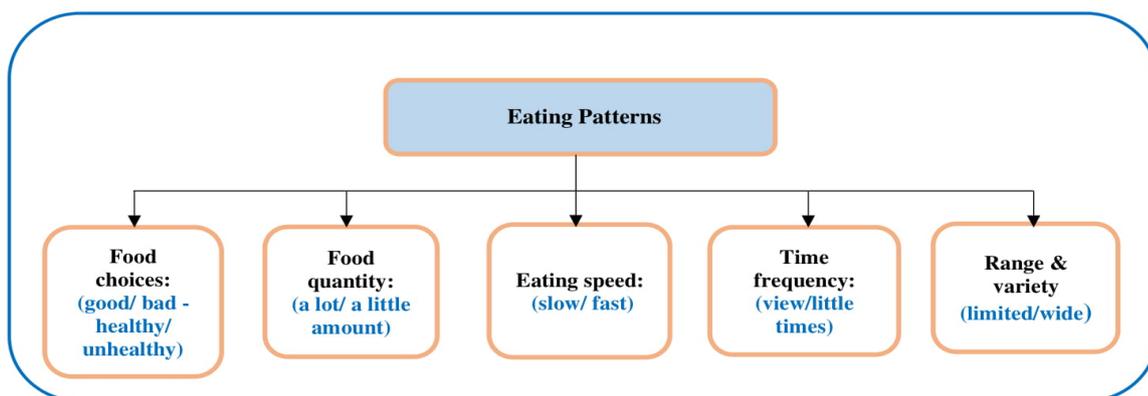
matter of religious activities, would not have any problems with eating control. However, it seems that there is an opposing factor at work, which may contribute to unhealthy eating and the prevalence of obesity in adolescents in the country.

### 3.3.2 Eating Patterns

Despite the mounting evidence supporting the significance of eating (dietary) patterns in determining the quality of diet, intakes of nutrients and energy, and cardiometabolic well-being (Leech et al., 2015a; Nicklas et al., 2014), this issue has not received much attention (Leech et al., 2015b). A position paper by the Academy of Nutrition and Dietetics (Freeland-Graves & Nitzke, 2013) seemed to provide support for this stance when it submitted that the pattern of food consumption, on the whole, was of more significance to a healthy diet than placing emphasis on specific foods or distinct nutrients.

Traditionally, dietary patterns have been defined as “the quantities, proportions, variety or combination of different foods, drinks, and nutrients in diets, and the frequency with which they are habitually consumed” (US Department of Agriculture, 2014, p. 9) (Figure 3.1). Nevertheless, it is acknowledged that dietary intake is both multifaceted (that is, an experience and behaviour that is intricate and profound) and dynamic (that is, fluctuates over time and stages of life) (Reedy et al., 2018). It is this understanding that the present study uses.

**Figure 3.1**  
*Eating Patterns*



The United States’ Office of Disease Prevention and Health Promotion (ODPHP, 2015) submitted that healthy patterns of eating are adjustable. That is, there are several ways in which an individual can achieve such a pattern. Moreover, any pattern of eating can be customised to suit the socio-cultural and respective partialities of an individual (ODPHP,

2015). The eating patterns in the KSA have traditionally revealed great emphasis on the consumption of food in social and familial contexts. Moreover, there is a predisposition, as a society, to consume foods of high caloric value. Consequently, it appears that the alterations in eating patterns, and even the type of food consumed, is more of a social phenomenon than an individual one.

The next sub-section discusses the first type of eating pattern, which is eating speed. In the context of this study, this has significance, as eating speed has been related to emotional eating and hence a person who admits to emotional eating and a high eating speed could be at risk of obesity (Macht, 2008).

### **3.3.2.1 Eating Speed.**

Eating speed or speed of eating, in general, indicates the time spent in consuming a meal (Wardle et al., 2001). Broadly, people can be divided based on their eating speed into three groups: slow, normal and fast eaters. Regarding eating speed, when people eat, it is very important to give sufficient time to chew food rather than just quick chewing to get a sense of satiety. Eating quickly is usually linked to gaining body weight, decreasing satiety, and resistance to insulin (Zhu et al., 2013) whereas eating slowly helps to lose weight (Galhardo et al., 2012). Slow eating patterns play a crucial role to reduce hunger and increase the feeling of fullness. Consequently, this simple behavioural modification could be a useful instrument to reduce the intake of calories among overweight people with T2DM, with the key aim of controlling the weight.

It was confirmed that eating food quickly could help in gaining weight and cause problems with the heart (Yamaji et al., 2017). Otherwise, it is less likely for slower eaters to gain weight, as well as less likely to increase *metabolic syndrome* – a group of disturbance which increases the risk of diabetes, heart disease, and strokes. This syndrome features a high level of both fasting blood sugar and blood pressure, and low level of HDL cholesterol. It is considered harmful in itself, but if diagnosed together, will increase the incidence of cardiovascular problems. In contrast, the study viewed that eating slowly could be a crucial behaviour to encourage preventing metabolic syndrome.

A systematic review by Ohkuma et al. (2015) revealed that excess body weight has a positive relationship with eating quickly. From 23 eligible studies, Ohkuma et al. (2015) found that the body mass indices (BMIs) of persons who consumed food quickly and those

who consumed food slowly differed, on average, by 1.78 kgm<sup>2</sup>. Further, Zhu et al. (2015) concluded that eating speed was related to the prevalence of metabolic syndrome.

### **3.3.2.2 Food Choices.**

How we choose and consume our food is a very intricate subject, involving analysing human behaviour and the various interconnected influences upon it. Although it is physiological need that makes a person eat in order to satisfy the hunger, a nutritional framework can suggest which foods will better serve human needs and which foods are best avoided or consumed only in small quantities (The European Food Information Council (EUFIC), 2005).

Other factors that may determine food choices are aroma, visual display, colour, and taste. A person's likes or dislikes, attitude towards food, health consciousness, dietary habits, and social contexts also determine food choices (Obeng-Gyasi et al., 2020). Furthermore, the specific food preferences of spouses and other family members residing in the household also determine food choices (Mahmoud & Grigoriou, 2019; Rageliene & Grønhøj, 2020). Health-related beliefs, for example around consuming organic and genetically modified food, also determine food habits. In some cases, religious doctrines, household income, and the cultural setting also determine the choice of food (Hammad & Berry, 2017). The availability and visibility of quality food and the access to such foods is also a consideration (EUFIC, 2005; Piqueras-Fiszman & Spence, 2016).

In their study of college students, Abraham et al. (2018) found that students understand that the consumption of fast foods, processed foods, and soda, is unhealthy and that these have additives. Moreover, the students strongly indicated their awareness of the need to be hydrated. Further, they indicated that their choice of food was driven by their individual tastes. Nevertheless, although the greater part of the students stated that they consumed fresh fruits, a considerable number reported that convenience drove them to eat processed foods, such as cookies, chips, and cereals. Overall, this study revealed that students have a reasonable awareness of the dietary requisites for well-being. Nevertheless, their choices of food were not routinely beneficial, as they placed emphasis on food that was accessible and tasty (Abraham et al., 2018).

Various studies have scrutinised the motivations and determining factors of the choices of food of individuals with the objective of gaining increased awareness and hence taking necessary action. Research has identified balanced factors of food choices among different

cultural groups, such as cost, fitness, limitations, control of weight and distinctive diets. Additionally, determining factors associated with feelings, such as palate, gratification, customs, longing, and expedience (section 3.4.2 and 3.4.6) (Deliens et al., 2016; Ducrot et al., 2015; Kourouniotis et al., 2016; Phan & Chambers, 2016). Furthermore, Blackman and Kvaska (2010) found that the type of food consumed is also determined by positive and negative mood (section 3.4.2)

These facets are of particular interest in the present study as they serve to highlight that the food choices specific to Saudi Arabia can impact a person's consumption of food. For instance, the specifications related to the food that can be consumed daily before the fast commences and to break the fast typically include foods high in calories. In other words, the post-pubescent population of the country (except for those exempted from the fast that year) is probably eating very rich food at regular intervals interspersed with rigorous fasting (see section 2.3.3).

### **3.3.2.3 Food Quantity.**

The position paper of the Academy of Nutrition and Dietetics (Freeland-Graves & Nitzke, 2013) states that what is most significant in the matter of healthy eating is the complete diet or general pattern of food consumed. Further, this pattern can encompass all foods if they are eaten in a balanced manner with suitable portion sizes and accompanied by physical exercise. Overall, the Academy's position seems to emphasise that healthy eating pertains to achieving a balance of food and beverages that fulfil the energy requirements of an individual instead of placing emphasis on a specific diet or meal. The size of portion denotes the quantity of food eaten in a single instance, regardless of whether the meal is from/in a restaurant, container, or is homemade (Marcus, 2014). Substantial portion sizes can result in enhanced eating. Research indicates that individuals are unconscious of the fact that they eat more when larger portions are served to them (Keenan et al., 2018). A study by Vartanian et al. (2017) found that participants had greater willingness to admit that the size of the portion influenced their intake of food when they thought they had overindulged than when they thought they had consumed a suitable quantity.

Early studies had already drawn attention to the keen inclination present in numerous persons to eat up the food given to them, that is, "clean the plate" (Krassner et al., 1979). As a result, there were indications that the influence of portion size on the quantity of food consumed could be expected, though there was minimal published support in this regard at

the time (Rolls, 1995). There is also evidence that there is a tacit connection between food portion size (FPS) and surplus weight through enhanced caloric consumption. This indicates that restricting FPS causes decreased caloric consumption, and consequently lowered weight gain (Ledikwe et al., 2005; Piernas & Popkin, 2011; WHO, 2014a). Large FPS has been linked, especially in the matter of calorie-rich foods, with increasing levels of adult obesity in America due to increased caloric consumption (Bhupathiraju & Hu, 2016; Ledikwe et al., 2005).

In the KSA, the traditional mode of eating meals together with family indicates large quantities of food being available at the table. Moreover, the presence of many people at the table could result in greater quantities of food being consumed at a single sitting, especially if the meal time is of extended duration. On the other hand, this could lead to controlled consumption of food in front of people and uncontrolled consumption when alone, at a later time.

As discussed in section 2.3.2, the Qur'an and Sunnah encourage Muslims to consume food in moderation, and to avoid extravagant drinking and eating. That will lead to a lean and light body, because eating full leads to heaviness, which makes one too lazy to do acts of worship and strive, so rather, taking care of the body and not causing any harm, whether by overeating or starving.

#### **3.3.2.4 Time and Frequency of Eating.**

Research has indicated the increasing change in eating patterns. In the present day, it is challenging to differentiate between conventional meals, such as breakfast, lunch, and dinner, as snacking and skipping of meals has become common. Such styles of eating can affect cardiometabolic indications of health, such as insulin resistance, obesity, lipid profile, and blood pressure in various ways (St-Onge et al., 2017).

Eating frequency is one of the dietary behaviours that can be modified. Typically, an instance in which intake of robust meals and snacks is reported by participants with a gap of at least 15 minutes between two instances of eating can be termed as an eating occasion (Aljuraiban et al., 2015). Eating frequency has nowadays become an essential element of most diets for weight loss (Leidy & Campbell, 2011). The historical nutritional advice to eat three sizeable meals daily has been replaced by a strategy endorsing more frequent eating in several present day nutritional plans. This strategy entails eating smaller quantities of food every two-three hours, four to six times a day. Eating frequency has been

hypothesised to enhance metabolism, lower cravings for foods and hunger, enhance insulin and glucose control, and lower both bodily weight and fat storage in the body, making it an attractive nutritional scheme for the loss of weight and/or upkeep of a beneficial body weight (Leidy & Campbell, 2011). On the other hand, more frequent eating could essentially result in enhanced contact with foods rich in energy and in large portion sizes. This aspect, in the present obesogenic atmosphere, could have an inverse effect, that is, enhanced appetite, inordinate intake of calories, and an unwholesome increase in body weight. This reasoning has resulted in the submission of various unorthodox nutritional plans which have recommended a decrease in the number of instances of eating, as well as proposing the non-inclusion of certain meals, such as breakfast or dinner, as probable strategies for weight loss (Leidy & Campbell, 2011).

It is essential to consider the link between emotions and eating frequency. For example, depression and loss of appetite can link with eating alone frequently (Nakata & Kawai, 2017) (section 3.4.6.1). Also, people may eat in the presence of people or in groups, called “social facilitation of eating”, which motives a positive mood (section 3.4.6.3). This may result in them enjoying the taste of food more and consuming much food (Herman et al., 2019). Such social facilitation while eating together offers social bonding, friendly communication, and allows people to feel comfortable, especially when the other people are family members or friends (section 3.4.6.3 and 3.5.1) (Nakata & Kawai, 2017).

Eating patterns are different among individuals depending on their eating behaviours. Therefore, the next section focuses on the types of eating behaviours to understand the differences and overlap between them.

### ***3.3.3 Types of Eating Behaviours***

As mentioned earlier, eating behaviour pertains to factors (viewpoints and psychosocial) associated with the choice and conclusion of which foods to consume (Viana & Sinde, 2008, cited in Freitas et al., 2018). In general, eating behaviour may be of different kinds. For instance, there is ‘typical eating’ behaviour, which is different from atypical eating. Moreover, some forms of eating behaviour can evolve into unhealthy eating because of the disorder of psychological stress (Klatzkin et al., 2018). The following sub-sections provide brief insights regarding typical and atypical eating. The purpose of doing so is to help the reader understand the distinction between emotional eating (section 3.4) and the other forms of disordered eating (section 3.3.3.2) and eating disorders (section

3.3.4), since emotional eating might prove to be the origin of one of these other disordered eating and eating disorders.

Consequently, if a person desires an improved association with food they need to drastically change course from a disordered viewpoint (feeling satisfaction) to a normal viewpoint (feeling satisfaction and fullness). It is likely that the belief system of a person can be reoriented by modifying their feelings or behaviours. However, while thinking can possibly be modified in this manner, the approach may not be systematic (Koenig, 2010).

### **3.3.3.1 Typical and Healthy Eating.**

While there is no formal definition of the term typical eating, it can be understood to regularise a broad range of eating behaviours. For instance, eating should be accommodating, adaptable, fulfilling, nutritious, and pleasurable. However, what it should not be is compulsive, disturbing, inflexible, overpowering, or troublesome (Fonnesbeck, 2019). Satter (2018), the creator of the Eating Competence Model, described typical eating behaviour as when a person eats only when hungry and only until they are satisfied. Moreover, she suggested that typical eating is the capacity of an individual to select food they enjoy and enjoy it fully, not having to stop eating it because the person believes it to be appropriate behaviour. Further, Satter (2018) submitted that typical eating includes the capacity to mindfully select food so that the food is nutritious, but not being so overcautious or limiting that enjoyable food is avoided. Additionally, she observed that typical eating can include a person allowing themselves to sometimes permit feelings to dictate what or when they eat, for instance, if they are happy, bored, sad, or just because they are tempted by some item of food. Also, typical eating could be three or more meals daily. It could be leaving some food to be eaten later or eating it all at the same time because it is tempting. However, it could also be eating less than usual and then wanting more. In short, the typical eater acts in response to a group of both deliberate and unintentional guidelines associated with food (Koenig, 2010).

Healthy eating is defined by NHS (2019) as “eating a wide variety of foods in the right proportions, and consuming the right amount of food and drink to achieve and maintain a healthy body weight”. Another definition describes it as “a diet low in fat, high in fibre, and high in fruit and vegetable consumption” (Russom & Fontenot, 2017, p. 5). Bruso (2018) clarified the difference between healthy and unhealthy eating as follows: healthy eating is eating foods that are made up fundamentally of foods which are rich in nutrients, such as whole grains, vegetable, fruits, low-fat dairy product, and legumes, while

unhealthy eating is often eating foods which are low in nutrients, rich in fat, trans fat, saturated fat, and sodium, besides added sugars. Moreover, healthy eating is consistent with maintaining and promoting health (Taylor et al., 2005; The NHS, 2019), unlike unhealthy eating. Healthy eating involves consuming the appropriate amounts for food from all groups of food to make sure that a person's body is suitably nurtured and able to function suitably, as related to way of life and levels of activity is healthy eating. Currently, Western governmental standards for healthy eating suggest the daily consumption of five servings of vegetables and fruits, lowering the amounts of sugar and salt, and limiting the consumption of alcohol (Cwerner & Gadsby, 2014).

### **3.3.3.2 Atypical Eating.**

As with the term typical eating, atypical eating also can be understood differently. For instance, in the case of a child with autism spectrum disorder, atypical eating behaviour could pertain to their restricted food preferences, hypersensitivity to certain textures, eating only a single brand of food, not swallowing food but holding it in the mouth, and so on (Mayes & Zickgraf, 2019). In the context of the present study, however, the understanding of the term pertains to eating behaviour that does not correspond to the eating behaviour described in the previous sub-section (that is, typical eating). Atypical eating includes three types of eating behaviours, which are unhealthy eating, disordered eating and eating disorders. There is often confusion when these perspectives are examined due to the similarity of the terms disordered eating and eating disorders. Nevertheless, they have very distinct implications and their consequences on persons that display indications of each are also very dissimilar (Larson, 2018). The association between EE and the different types of atypical eating is clarified in section 3.4 and Figures 3.4 and 3.5.

#### *Unhealthy eating.*

The health status of an individual can be greatly affected by their eating behaviour. There is an enhanced likelihood of enduring conditions, such as cardiovascular diseases, diabetes, cancer, and other obesity-related conditions in a person who partakes of an unhealthy diet (WHO, 2018a).

However, enhanced production of processed food, quick development of the society, and altered lifestyles have resulted in a greater consumption of foods that have elevated amounts of salt, sugars, energy, and fats (saturated, industry trans fats), and poorer consumption of vegetables and fruits (WHO, 2018c). Moreover, various other risk factors are part of diet, such as high cholesterol, high blood glucose, high blood pressure, physical

inactivity, and low consumption of fruits and vegetables (WHO, 2009). Thus, it can be seen that there is a significant need to develop interventions to deal with unhealthy consumption of food (Natrop, 2015).

Moreover, it would seem that there is a pressing need to deal with unhealthy patterns of diet on a broad scale. The obesity pandemic is driven principally by inadequate diets and lack of physical activity. Consequently, these have the dubious distinction of being, almost globally, among the foremost triggers of avoidable mortality and ill health. While countries struggle with the increasing commonness of obesity, several ground-breaking opportunities to lessen overeating and enhance the quality of diets continue to be unexplored for the most part (Gorsk & Roberto, 2015). Gorsk and Roberto (2015) suggested some methods for ground-breaking opportunities, such as establishing more rigorous and comprehensive approaches to assessing policies and programmes aimed to promote diet; connecting with feedback to develop the efficiency and effectiveness of policies' implementation; examining the effects of long-term policies in several locations and through different populations; and an urgent need for the fulfilment of best practices.

Across the globe, patterns of eating have altered in noteworthy ways over the past four decades or so. Diets have moved from consumption of unprocessed or minimally processed foods toward an enhanced intake of foods that are processed and ultra-processed. These latter are poor in nutrient content while being high in calories (Popkin et al., 2012). Moreover, there has been a surge in the intake of foods that are not home-made (for instance, fast food). Further, the portion sizes of a lot of these foods have become bigger, which encourages excessive consumption (Duffey & Popkin, 2011). Also, there has been a rise in foods of animal origin, together with a higher consumption of caloric sweeteners and oils (Popkin et al., 2012). The quantities of sodium, unhealthy fats, and supplementary sugars consumed by the typical population in several countries far exceed suggested amounts (Carriquiry et al., 2013; Ervin & Ogden, 2013; Wright et al., 2003). The excessive consumption of unhealthy foods and drinks has additionally been linked with a decreased consumption of beneficial dietary elements, such as coarse grains, legumes, and other vegetables which are high in nutrients and low in calories (Popkin et al., 2012). Consequently, there is a greater likelihood of food-related disorders, as the nature of food consumed has changed and to some extent also the behaviours associated with these. In the Saudi context, for instance, increased consumption of fast food has led to greater numbers of people eating alone, that is, individuals are moving away from the

traditional methods of eating together in extended family groups. Also, with the improved education of women and their entering the workforce, there is a dependence on housekeepers and maids to cook and serve food, which again may lead to a changed pattern of eating.

Additionally, a tremendous surge in the intake of sugar-sweetened beverages (SSBs) has been seen fairly recently (Malik et al., 2010). Consumption of these beverages (for instance, soda, fruit drinks, sports drinks, and energy drinks) tripled between 1970 and 2001 in merely the USA and nearly half of the American population (48%) report that they drink soda daily (Gallup, 2012; Nielsen & Popkin, 2004). More recently, there are indications that the intake of soda is reducing in the USA; however, the consumption of the other SSBs is mounting. Consequently, SSBs continue to be the most significant contributor to the consumption of supplementary sugar in the diet of Americans (Han & Powell, 2013; Malik et al., 2010; Reuters, 2014). However, the partiality for SSBs does not appear to be restricted to developed nations, such as the USA, as developing countries (for instance, India, China, Thailand, Vietnam, and other countries in Southeast Asia) have also been reported to experience a quick growth in the intake of SSBs (Ismail et al., 1997). The next sub-section provides insights into the various disordered eating and eating disorders, which are atypical styles of eating.

#### *Disordered eating.*

Disordered eating signifies unsettled and unhealthy eating behaviours accompanied by concerns regarding body image, and is a fairly common phenomenon. Behaviours included in disordered eating reflect some, but not all, of the indications of eating and feeding disorders, such as binge eating disorder, bulimia nervosa, anorexia nervosa, OSFED (other specified feeding and eating disorders), and ARFID (Avoidant/Restrictive Food Intake Disorder) (National Eating Disorders Collaboration [NEDC], n.d.). The most typical symptoms of the progress of an eating disorder are disordered eating behaviours, in general, and dieting, in particular. The lowered capacity to deal with stressful circumstances, along with an enhanced occurrence of morbid behaviours and feelings (specifically in adolescents) has been associated with disordered eating. Additional instances of disordered eating include abstaining from food or prolonged controlled eating; missing meals; binge eating; restrictive dieting; self-stimulated vomiting; unbalanced eating (for instance, limiting intake of a significant food group such as carbohydrates or 'fatty' foods); misuse of laxatives, diuretics, and enemas; usage of steroid and creatine

(supplements to enhance athletic performance and enhance muscle mass); and the usage of diet pills (NEDC, n.d.)

Again, disordered eating pertains to any pattern of eating that is unusual, varying from moderately extreme to excessively extreme behaviours. It encompasses a group of eating habits that are interconnected, such as practices related to managing weight; outlooks about diet, weight, and figure or stature; and imbalances of physiological origin (Boston College, 2015). A consequence of disordered eating behaviours (DEB) is eating disorders (ED), especially through adolescence and the initial years of adulthood (Jacobi et al., 2004). Moreover, DEBs meet the requirements to be deemed a communal health challenge due to their association with ill health, death, and disability (Fairburn & Harrison, 2003; Fandiño et al., 2007; Hoek, 2006; Striegel-Moore & Bulik, 2007); it may be inferred that disability is included because of the probable impact to a person's activities, senses, or abilities. It must be noted that while there are presently no integrated measures in the literature which can be utilised to define DEB, those available encompass all indications of ED in a comparable manner but with lower strength and incidence (Shisslak & Crago, 2001). Nevertheless, three categories of DEB are recognized: limiting behaviours, purging behaviours, and binge eating (León-Vázquez et al., 2017).

### ***3.3.4 Eating Disorders***

The United States' National Institute of Mental Health ([NIMH], 2018) submits that eating disorders (EDs) are acute medical conditions indicated by grave disruptions to the eating behaviour of an individual. Indications of an ED may include fixations with food, and body shape and weight. Moreover, EDs can impact the physical and emotional well-being of a person and can even be life-threatening in some cases. However, it must be noted that they are not a choice pertaining to a way of life (NIMH, 2018). An eating disorder involves a significant change in the choice, quality, and quantity of food to be consumed (Segura-Garcia et al., 2014). In the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-3; APA., 1980), both anorexia nervosa and bulimia nervosa (see Table 3.2) were diagnosed as psychiatric illnesses. Since then, eating disorders have been widely understood and extensively studied as severely devastating psychiatric illnesses with a high level of heterogeneity (McClelland, 2015). Eating disorders can range from poor eating habits to disorders such as anorexia nervosa, which may cause malnutrition and serious complications. The complications associated with some eating disorders have a high rate of morbidity and mortality (Carrard et al., 2011).

EDs, such as anorexia or bulimia nervosa, are the most extreme instances of disordered eating. A diagnosis of ED is made only if a person satisfies certain criteria associated with eating behaviour and body weight. Individuals may experience some form of disordered eating during some life stages or the other. Consequently, being able to identify indications of disordered eating and obtaining professional help before the problem escalates is very important, as this can prevent the development of an ED. In general, interventions for disordered eating and ED are most effective when they are commenced in the initial stages of the condition (Kelty Mental Health, 2019).

Fairburn and Harrison (2003) specified that an ED could be identified when there is a “definite disturbance of eating habits or weight-control behaviour.” This disturbance results in “a clinically significant impairment of physical health or psychosocial functioning.” Moreover, “the behavioural disturbance should not be secondary to any general medical disorder or to any other psychiatric condition” (p. 408). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) of the American Psychiatric Association ([APA], 2013) describes the following EDs: anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED), other specified feeding or eating disorder (for instance, purging disorder, atypical anorexia nervosa, night eating syndrome), and unspecified feeding or eating disorders (see Table 3.2). Reas (2017) pointed out that BED is more prevalent than either AN or BN.

On the whole, EDs signify a grave health concern with adverse consequences to health. For instance, the outcomes of anorexia and bulimia nervosa can include death (Arcelus et al., 2011); suicidal tendencies are intensified in persons with anorexia nervosa; and females aged between 15 and 34 years with a diagnosis of anorexia nervosa are also more likely to have an early death than females of comparable age in the general populace (Keshaviah et al., 2014; Šmahel et al., 2018).

Persons who are extremely anxious regarding their body shape and weight may fall prey to disturbed eating and unhealthy behaviour for weight control, such as going hungry, abstaining, skipping meals frequently, purging preceded by overindulging and binge-eating. Moreover, they may misuse diet pills, emetics or purgatives, and diuretics, and pursue disproportionate physical activity (Fallatah et al., 2015; Striegel-Moore & Bulik, 2007). Table 3.2 summarises the key terms associated with eating disorders.

**Table 3.2**  
*Key Terms Associated with Eating Disorders*

<b>Eating disorder</b>	<b>Definition</b>	<b>Resource</b>
Anorexia nervosa (AN)	Anorexia nervosa is an eating disorder where an individual tries to maintain a low body weight.	(Crow & Ecker, 2016;NIMH, 2018)
Bulimia nervosa (BN)	Bulimia nervosa is an eating disorder in which a person overeats and then induces vomiting or uses laxatives to get rid of the excess food consumed.	(Crow & Ecker, 2016;NIMH, 2018)
Binge eating disorder (BED)	Binge eating disorder is an eating disorder in which a person consumes large quantities of food within a short time.	(Wadden et al., 2016;NIMH, 2018)
Restrained eating	Restrained eating is also known as ‘cognitive restraint’ or ‘dietary restraint’, in which a person restricts his or her food intake.	(Angle et al., 2009;NIMH, 2018)
Food cravings	Food cravings are also known as ‘selective hunger’ and are characterized by a person wanting to eat certain foods repeatedly.	(Striepens et al., 2016;NIMH, 2018)
Night eating syndrome (NES)	Night eating syndrome (NES) is an eating disorder in which food is consumed at odd hours in the night.	(Allison et al., 2010)
Comfort eating	Comfort eating is practised to alleviate negative feelings, rather than to actually satisfy physical hunger.	(Hamburg et al., 2014)
Food addiction	Food addiction is where a person gets addicted to consuming food even if they are not hungry. Such food addicts find it difficult to avoid food even when they wish to stop eating.	(Cathelain et al., 2016)
EDNOS (Eating Disorder Not Otherwise Specified)	<p>As per DSM-IV, EDNOS is the category of eating disorders reserved for those of clinical severity that do not satisfy the diagnostic standards for AN or BN.</p> <p>Behaviour associated with EDNOS include</p> <ol style="list-style-type: none"> <li>a. all symptoms of AN excluding <ol style="list-style-type: none"> <li>a. amenorrhea (for females only);</li> <li>b. current weight is in the normal range;</li> </ol> </li> <li>b. all criteria for BN excluding <ol style="list-style-type: none"> <li>a. frequency of binges or compensatory behaviours, as these may not satisfy the criteria for frequency, or not endure for more than 3 months;</li> </ol> </li> <li>c. unsuitable compensatory behaviours by normal-weight individuals after consuming small amounts of food;</li> <li>d. repeated chewing and spitting out, not accompanied by swallowing large amounts of food; and</li> </ol>	(Machado et al., 2013; Schaumberg et al., 2019)

Eating disorder	Definition	Resource
Pica	<p>e. BED: repeated incidences of binge eating unaccompanied by other unsuitable customary compensatory behaviours, typical of BN.</p> <p>Persistent and compulsive intake of non-food substances that have no nutritional value. Further, the duration of this intake is at least for a month. Moreover, this eating behaviour does not correspond to the individual’s level of development and is not an element of a practice that is culturally endorsed.</p>	(APA, 2013)

The emotional well-being and health of many people is affected by binge-eating disorder (BED), which is also known as compulsive eating. People suffering from BED compulsively eat large amounts of food in one sitting and then feel guilty about their food consumption. According to Hilbert et al. (2012), people desperate to control their compulsion to eat often feel a lack of willpower over their eating habits and may not even realise that they need consultation and treatment for their disorder. BED impairs quality of life and can cause several health problems, such as becoming overweight or obese and associated health risks, serious mental illness, and psychopathological disorders (APA, 2013). The development of BED and its associated psychopathology (Hilbert et al., 2012) can be curbed by implementing recommended treatments, such as Cognitive Behavioural Therapy (CBT) and Interpersonal Psychotherapy (IPT) (AWMF, 2011).

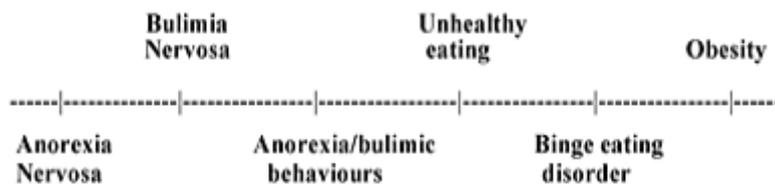
It can be inferred from the preceding sections that disordered eating and eating disorders are two distinct notions. Disordered eating is widespread and can impact different kinds of individuals. Also, it can be described as episodes where an individual avoids food, restricts the kind of food consumed, or overindulges. In contrast, an ED is a diagnosable psychiatric condition that is more recurrent and persistent, and also more dangerous than disordered eating. The principal aspects of differentiation between the two notions are thus the gravity and incidence of DEB (disordered eating behaviour) (U.S. Department of Veteran Affairs [USVDA], 2017).

The term “eating disorder” encompasses a broad spectrum of challenges associated with eating and weight (Eating Disorders Forum, 2019). As can be seen in Figures 3.2 and 3.3, recognized disorders, such as anorexia nervosa and bulimia nervosa, are at one extreme of the spectrum. At the other extreme is severe (morbid) obesity caused by disproportionate

eating or overindulging unaccompanied by purging. Spanning the two extremes are the more typical behaviours that encompass distortions of body image, yo-yo dieting (where the body weight fluctuates like a yo-yo), excessive or overly moderate exercising, and uneasy or humiliating outlooks concerning food and body dimensions (Eating Disorders Forum, 2019).

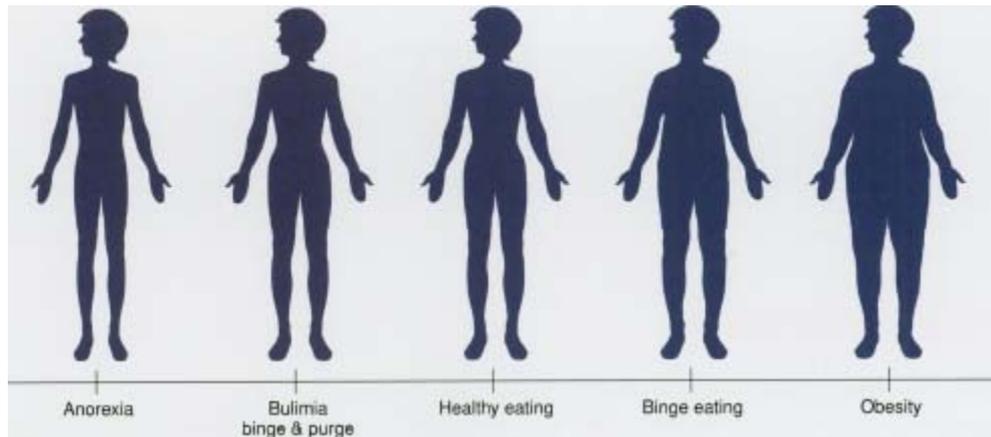
Although the different eating disorders can be distinguished by their triggers, foundations, and indications, behaviours may be comparable, and consequently, more extreme conditions may result from the less grave ones (Eating Disorders Forum, 2019). In the present day, there is continued exposure to conversations about food or diets or weight management. For instance, the media is frequently full of discussions of the diets of present pop culture personalities; entire bookshelves display books advocating rapid programmes for weight loss, strategies, and fashionable diets; and commercials for medication to aid in weight-loss, diet foods, supplements to burn fat, solutions, and programmes, are seen on television and in magazines.

**Figure 3.2**  
*The Spectrum of Weight-Related Disorders*



Source: Neumark-Sztainer (2003)

**Figure 3.3**  
*Spectrum of Eating Disorders*



Source: Eating Disorders Forum (2019)

Another perspective to scrutinise disorders associated with weight was provided by Neumark-Sztainer (2003) and later incorporated by The Eating Disorders Forum (2019). This spectrum (Figures 3.2 & 3.3) has anorexia and bulimia nervosa at one end and obesity at the other. In the middle are a series of other disorders associated with weight, such as anorexic or bulimic behaviours, and binge eating disorder. Obesity makes its appearance on this continuum due to acknowledgement of its elevated incidence and robust associations with an individual's unhappiness with their body, harmful dieting, and eating behaviour, which is disordered.

In a study of overeating among adolescents, Ackard et al. (2003) utilised the Project EAT (Eating Among Teens) and anthropometric dimensions in a sample of 4,746 school children in Minnesota, United States. Their study found that eating styles ranging from objective or subclinical binge eating to binge eating syndrome were reported by 17.3% of the females and 7.8% of the males. Objective eating indicates eating without losing control. On the other hand, subclinical binge eating indicates eating with loss of control; however, the frequency of binges is low and the binges are not accompanied by distress. Finally, binge eating syndrome pertains to frequent binges accompanied by loss of control and distress. Further, Ackard et al. (2003) found that undesirable behaviours and adverse emotional experiences were related to overeating among the students. Moreover, there was a greater likelihood that the students who ate too much were overweight or obese, had been on a diet, or were struggling to shed weight. Additionally, their body weight and shape was of considerable importance to their general notion of themselves. Furthermore, more than a

fourth of the students (28.4% males, 27.8% females) who had binged reported that they had tried to commit suicide (Ackard et al., 2003).

Human psychology plays an important role in causing people to behave in certain ways, including the development of eating disorders. Such disordered behaviours reflect emotional disturbances and disruptions in normal inner thought processes. In all eating disorders, no matter whether they are characterised by the restriction or overconsumption of food or even both, the health and potentially the lives of the affected individuals are at risk. Moreover, attempts made by sufferers to alleviate or reverse the ill-effects of their eating disorders may only further complicate and aggravate these risks (Schulherr, 2008). People who succumb to eating disorders are often conscious about their physical appearance; however, it is also possible to fall victim to such illnesses without this preoccupation with body image. These eating disorders generally start during adolescence and are aggravated during transitional stages of individual growth and development (WHO, 2018b; 2019 a). Females in the age group of 15-24 years have been found to be the group with the greatest susceptibility to anorexia nervosa (Cummins et al., 2005; Pinhas et al., 2011). Generally, there has been greater reporting of eating disorders in women (Kaplan Medical, 2004). Nevertheless, there is evidence that an increasing number of men are also affected by eating disorders (Dakanalis et al., 2015; Limbers et al., 2018; Strother et al., 2012), though they are often underreported or overlooked.

People suffering from eating disorders were asked to share their experiences in managing their negative emotions, such as boredom, sadness and anger, through a stimulus response questionnaire prepared by Macht (1999). In another study conducted by Weiland and Macht (2006), however, it was found that anorexics were not as susceptible to emotional eating as healthy people. From the above studies, it can thus be inferred that some eating disorders normally commence with eating unnecessary snacks to elevate or regulate the mood, which in some people can escalate into food binges, resulting in eating disorders such as BED and bulimia nervosa (Hertz, 2019; Macht & Simons, 2011), and external eating (Paans et al., 2019).

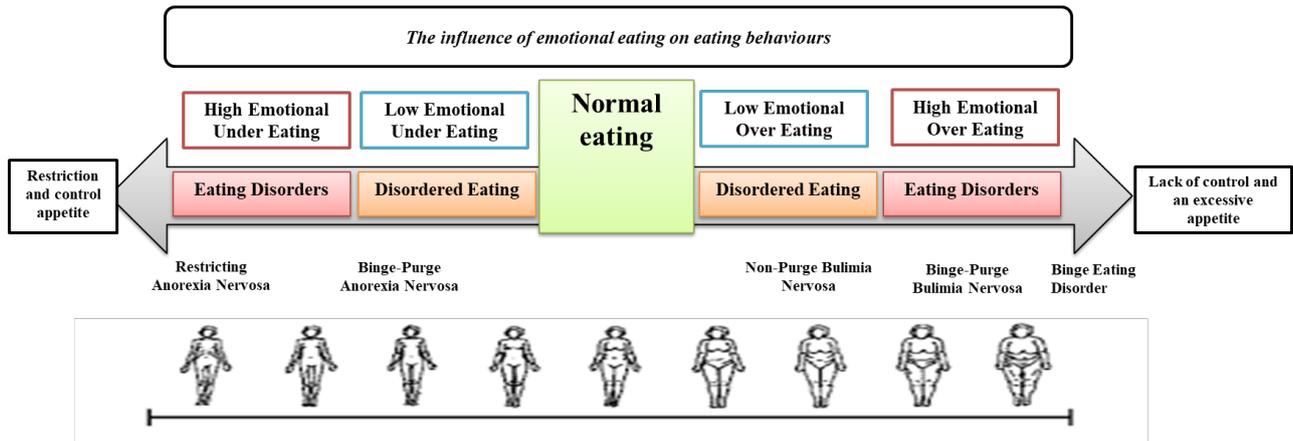
Early research (e.g., Bruch, 1973; Garner et al., 1983) endeavoured to explain the association between emotional eating and the psychopathological characteristics that trigger eating conditions, such as excessive perfectionism, and a numbing feeling of incompetence. Accordingly, certain studies of that period determined that emotional eating is definitely, although the extent is only moderate, related to the psychopathology of eating

disorders (van Strien, 1996; Waller & Osman, 1998; Waller & Matoba, 1999;) and poor emotional well-being, such as a sense of insufficiency and poor self-worth (van Strien et al., 1995). Since the typical emphasis of these studies has been some manner of overeating, these relationships have been attached to the psychological cause of bulimia or obesity. Nevertheless, if controlled eaters also respond to negative emotions by eating (e.g., Herman & Mack, 1975; Polivy et al., 1994), it can be queried if merely those controlled emotional eaters who concurrently participate in overeating display indications of eating disorder psychopathology, or if the blend of emotional and controlled eating by itself, regardless of leanings to overeat, is related to the pathology. In this regard, the study of Lindeman et al. (2001) found that only certain controlled eaters were emotional eaters. Moreover, they found that bulimic inclinations were possessed by only certain emotional eaters. Additionally, their findings indicate that emotional eating is not merely responsible for overeating but could, together with prolonged dieting, also be connected to the overall psychopathology underlying eating disorders.

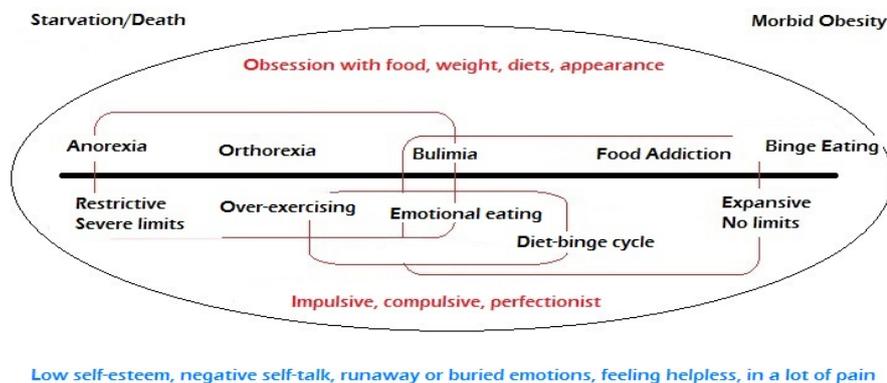
In a more recent study, Weinbach et al. (2017) investigated 98 adolescents with eating disorders (equal numbers with restrictive and with binge eating/purging eating disorders) using different questionnaires, including the Difficulties in Emotion Regulation Scale (DERS). They found that binge eating/purging kinds of eating conditions were related to pronounced problems in several dimensions of emotion control, such as controlling impulses, goal-oriented conduct, and access to successful strategies for emotion control. Mindfulness and clearness of emotions were also poorer in the binge eating/purging eating disorders. However, this variance did not persist when measures for co-occurring psychopathology were controlled (Figures 3.4 & 3.5).

Volkow et al. (2016) suggested that emotional eaters are in danger of frequently consuming food that is naturally rewarding. This in turn can modify the neurobiological systems that intervene in obsessive behaviours. Studies (e.g., Pursey et al., 2014) have determined that emotional eating (EE) and food addiction (FA) coexist and/or are favourably related, but only to a moderate extent. In particular, evidence of this is found in persons with clinically noteworthy obsessive overeating (e.g., binge eating disorder, bulimia nervosa), with various studies (e.g., Ahmed & Sayed, 2017, Granero et al., 2014, Meule et al., 2014), revealing that these behaviours affect certain (not all) cases.

**Figure 3.4**  
*The Influence of Emotional Eating on Eating Behaviours*



**Figure 3.5**  
*The Disordered Eating Continuum*



Source: Gold (2018)

**3.3.4.1 Eating Disorders in Western and Non-Western Countries.**

Although much of the research on eating disorders has been conducted in Western countries, they seem to occur regardless of racial, social, and economic characteristics (e.g., Chandra et al., 2012; Marques et al., 2011; Schaumberg et al., 2017). In the context of the present research, eating disorders have also been studied in the Middle East. For example, as the concept of maintaining a slim body has been popularised by the mass media,

teenagers living in the United Arab Emirates (UAE) have also been found to have adopted certain behaviours that may lead to eating disorders and other related health issues. This was due to the fact that such adolescents often perceive themselves to be overweight and aspire to be thinner (Eapen et al., 2006). A number of these adolescents also admitted to taking extreme measures to lose weight, such as exercising excessively, restricting food intake and practising self-induced vomiting.

Studies by Al-Subaie (1998) and Al-Adawi et al. (2002) confirmed that eating disorders were prevalent then among teenagers in the KSA and Oman, while studies by Apter et al. (1994) and Maor et al. (2006) reported instances of disordered eating behaviours among Israeli, Jewish, and Arab adolescents. More than two-thirds of students in 9<sup>th</sup> and 11<sup>th</sup> grades in southern Asia reported consuming junk food because they were affected by television advertisements (Sharma, 1998). It was also found that such students preferred to consume lesser quantities of more nutritional foods that are more beneficial for health.

Allihaibi (2015) used the EAT-26 in a sample of 180 female students aged between 15 and 19 years in the KSA, and found that the mean EAT-26 score for participants was  $16.01 \pm 8.88$ , with 26.1% of the students scoring above the cut-off of 20, indicating negative attitudes to eating. Nevertheless, there is a significant lack of reporting with regard to the incidence of eating disorders in Saudi Arabia. A recent study by Taha et al. (2018) endeavoured to fill this gap by scrutinising the incidence among 1,200 female undergraduate students (age 17-33 years; median age of 21 years) from Taif University, KSA. Using the EAT-26 questionnaire to obtain data, Taha et al. (2018) found that 35.4% of the students could be categorised as at risk for eating disorders. Moreover, the highest significant EAT scores were achieved by students from the medical college and those who were obese. Thus, this study has drawn attention to the issue of eating disorders in the KSA and its alarming finding highlights the need for a study like the present one to develop an intervention to increase awareness of healthy eating among adolescents before they grow old enough to study at university.

### **3.4 Emotional Eating**

#### ***3.4.1 Background of Emotional Eating***

Some teenagers may respond to positive and negative emotions by feeling the urge to eat (Anglé et al., 2009). 'Emotional eating' is viewed as a change in food consumption to

respond to emotional triggers, as the pattern of food consumption changes according to the person's mood (Economy, 2013) (section 3.4.6.1).

During these times there is a greater likelihood that sweets or other palatable foods will be consumed in contrast to vegetables and fruits (Nguyen-Michel et al., 2007; Wallis & Hetherington, 2009). Moreover, emotional eating behaviour has been associated in individuals with inadequate ability to cope, limited interoceptive awareness (that is, limited capacity to identify stimuli of physical origin), and elevated alexithymia (that is, they do not have the capacity to identify or label their own feelings – emotional or physical) (Ouwens et al., 2009; van Strien et al., 2012). Moreover, when a person eats emotionally, they may eat foods high in calories, fat, and energy dense, which are not beneficial to one's well-being (Aston University, 2016).

Care is required in using the term emotional eating. Some researchers have considered it to be a manner of disordered eating, since emotions have the capacity to affect eating behaviour and food choice (section 3.4.2) (Geliebter & Aversa, 2003; Goossens et al., 2009). And emotional eating is sometimes compared with comfort eating, as the two terms are sometimes utilised synonymously. People who eat 'comfort food' tend to consume food that has a connection to their positive memories of a specific time, stage, place, or person (Hamburg et al., 2014). In this thesis, however, emotional eating refers to any kind of eating behaviour that is affected by positive or negative emotions, and is therefore much broader than comfort eating and not necessarily a type of disordered eating.

The next section discusses the role of emotions in changing eating behaviour and determining people's diets to illustrate the interrelationship between emotions and eating behaviours, where each can affect the other.

### ***3.4.2 The Role of Emotions in Eating Behaviour***

Many researchers have stated that eating behaviours and emotions are interrelated and can affect one another. This was further corroborated by Blackman and Kvaska (2011), who stated that people's emotions determine their diets, and people's diets determine their emotions. Despite being aware that eating behaviours are determined by emotions, it is difficult to gauge how this actually works, as different individuals have different thought processes (Macht, 2008). Nonetheless, there are five significant emotion-based psychological tendencies: controlling choice of food; suppressing intake of food; impaired awareness of control when eating; eating to satisfy emotional needs; and emotion-

congruent modulation of eating. These were observed in a study conducted by Macht (2008). Changes in eating patterns happen as a consequence of the interaction between eating and a range of emotions. Just as eating habits and behaviours are governed by emotions, so emotions are also governed by eating behaviours (section 3.6.1). According to Levitan and Davis (2010), the connection between eating behaviours and emotions is a complicated subject and thorough study is needed to arrive at some understanding of it.

Various researchers have their own perceptions about the concepts of and reasons for emotional eating (Desmet & Schifferstein, 2008). "Emotion-congruent eating versus emotion-regulating eating" has been shown to determine the quantity and quality of food consumption. "Emotion-congruent eating" means that a person's chances of falling victim to emotion-based eating are increased by positive feelings and decreased by negative feelings (less likely to eat when feeling negative emotions) while "emotion-regulating eating" means that food is consumed to counter unpleasant feelings and to control mood; a person who is feeling sad may like to eat ice-cream, for example, as people experiencing negative emotions often consume 'comfort foods'. According to Levitan and Davis (2010) and Hertz (2019), comfort foods are often consumed to induce and maintain positive moods and pleasure. Levitan and Davis (2010) also claimed that men tend to consume comfort food to maintain their positive emotions, while women are more likely to consume comfort food in response to negative emotions. In addition, it has been observed that emotional eating is more likely to take place between meals (Turner et al., 2009). Furthermore, Blackman and Kvaska (2010) found that the type of food consumed is also determined by mood, as they found that negative moods trigger the consumption of sweet foods, and positive moods trigger the consumption of savoury foods.

In a non-clinical study surveying the daily activities of a sample of 23 women, Macht and Simons (2000) explored the associations between eating and emotions. The sample group was asked to eat at five different times in the day for six successive days to gauge the level of their emotions and motivation. Four kinds of emotional conditions were revealed by the scrutiny of the emotions, during which there was a greater likelihood that the participants would eat, such as tension/fear, anger-dominance, relaxation/joy, and emotionless (Macht & Simons, 2000). They found that negative emotions triggered most of the emotional eating compared to more positive or neutral emotional states. Also, for many people, the process of eating relaxes their state of mind, as it distracts them from their thoughts. However, emotional eating triggered by anger causes negative health

effects. Macht and Simons (2000) considered that more research is required to understand fully the effects of emotions on eating behaviours, which corresponds with what this study tried to achieve.

Macht (2008) suggested that high or positive emotions result in decreased food intake, and low emotions have the opposite effect. In contrast, it was noted above that Levitan and Davis (2010) claimed that men tend to increase their intake of comfort food to maintain their positive emotions. Both positive and negative emotions thus have particular effects on food consumption (section 3.4.6.1). Impulsive food consumption caters to the emotional requirements often triggered by negative emotions, such as sadness, fear, and anger. On the other hand, the pleasure of consuming healthy and satisfying food is augmented by positive emotions, such as happiness and joy (Macht, 2008).

In emotional eaters, it has been found that negative and positive moods affected their eating behaviours, such as eating speed and chewing (Macht, 2008) (section 3.3.2.1). In particular, eating during a negative mood can occur in great speed (D'Arrigo 2007). Hence, it is clear how emotional eating leads to engaging in exaggerated eating behaviours as a coping strategy with negative emotions (Kemp et al., 2011).

Moreover, EE plays a significant role in food choice because when emotional hunger is present, people's attention is moving towards a particular food, which is, in all probability, a comfort food, this being one of the distinguishing characteristics of emotional eating. Young (2016) suggested that emotional eating has the power to influence people's food choices. In the study of Ashurst (2018) on first-year college students, it was found that food choice is associated significantly with positive and negative emotions. The study reported that on the occasions of experiencing negative emotion participants were likely to consume proteins/meats as compared to positive occasions, when sweets were more likely to be consumed by participants.

Emotional eating has been used to explain the behaviour followed by persons who are overweight and obese and also those of normal weight (Frayn et al., 2018) and underweight (Dolgoplova et al., 2019). In some individuals, weight gain is promoted by emotional eating along with challenges in shedding weight. Nevertheless, a normal weight is also maintained by individuals who participate in emotional eating, and there is poor awareness regarding the methods utilised by these individuals to control their weight. Frayn et al. (2018) submitted that emotional eaters who strive to keep their weight under

healthful limits could be favourably influenced by programmes which endorse exercise, eating mindfully, management of emotions, and affirmative body image.

### ***3.4.3 The Difference between Emotional and Physical Hunger***

Emotional eaters cannot distinguish the hunger caused by a physiological need from that which is caused by emotional triggers. The concept of emotion-based eating behaviour is derived from Psychosomatic Theory (Adriaanse et al., 2011) (section 3.5.2).

Physiological changes affect emotions, which, in turn, can cause appetite loss in some people. On the other hand, negative emotions can cause emotional eaters to resort to unnecessary eating. It is important for people to identify whether their source of hunger is a physical need or an emotional desire (Blackman & Kvaska, 2011). Albers (2013) submitted that five circumstances generate an illusion which can cause a person to believe they are physically hungry when they are not, namely, being on a diet, self-indulgence, social eating, anxiety, and shock. Consequently, being aware of the connection between food and emotions can help a person stop overeating and reduce weight. The differences between emotional hunger and physical hunger are shown in Table 3.3 (Spangle, 2008).

**Table 3.3**

*Differences Between Emotional and Physical Hunger (Spangle, 2008)*

<b>No.</b>	<b>Emotional hunger</b>	<b>Physical hunger</b>
1.	Comes on suddenly.	Comes on gradually.
2.	Cannot wait.	Can wait.
3.	Craving to a specific food.	Open to any option of good food.
4.	Eating to satisfy an emotional need and not stopping to eat even when feeling full.	Eating to satisfy physical hunger and likely to stop when feeling full.
5.	Eating quickly, usually alone.	Taking time to eat in good company.
6.	May feel ashamed after eating.	Does not feel ashamed or bad after eating.

Pertaining to indications of appetite, hunger is the physical stimulus of appetite. This is commonly distinguished as physical signals from the body that it is time for a meal. For instance, a growling stomach is a sign that the body is asking for food. However, the longing to eat, in humans, is not driven solely by physiology but also by circumstances. For example, when an appealing cake is presented in the workplace for a celebration of some kind, a person may not be hungry at the time of the celebration or not have much of

an appetite. Regardless, they may still consume a slice of cake not to satisfy their hunger but merely because it is available and every other person in the vicinity is also eating (Monash University, 2019).

It must be noted, however, that the manner in which individuals respond to external indications to eat can greatly vary. For instance, some individuals may search for food when they are troubled or unhappy, whereas in others these same negative feelings could reduce their appetite or their longing to eat. Here it is clear the associations that exist among specific emotions and eating behaviours. Various cultural matters can also influence an individual's appetite. For example, a food that is extremely unappealing to one person might be greatly regarded and sought after by another. Thus, it could be inferred that a person's yearning or need to eat is influenced not only by physical indications that inform them to eat to maintain energy levels but also various other factors (Monash University, 2019). Moreover, appetite has a pronounced relationship with eating behaviour, as both are controlled by societal and environmental influences and by internal natural systems (de Graaf et al., 2004). In simple terms, however, appetite is the desire to satisfy a physical need and can be viewed as composed of three elements: hunger, fullness, and satisfaction (Pilgrim et al., 2015). Hunger indicates the feeling that stimulates intake of food whereas fullness is the sense of satiation encountered during eating which results in the end of eating. Satisfaction, on the other hand, pertains to the satiation that endures between instances of eating (Mattes et al., 2005). Nevertheless, appetite is a multifaceted notion. It can be described, from a biological standpoint, as "the internal driving force for search, choice, and ingestion of food" (de Graaf et al., 2004, p. 946). Then again, it can be understood, in a wider perspective, to signify a group of physical processes which together with emotional and environmental aspects, regulate the day-to-day pattern of eating (Halford & Blundell, 2000).

An extensive variety of influences can affect appetite, including physical pursuits, mental, societal, and cultural stimuli. As stated before, appetite is a multifaceted matter with no straightforward rationalisation for why people consume the food they do. Instead, the appetite of an individual and the factors that direct it are significant considerations when that individual is contemplating modifying their diet. Thus, it is imperative to recognize what specifically drives appetite and choices of food, as awareness of these can help individuals respond differently to these drivers if and as required (Monash University, 2019). Relatedly, Freitas et al. (2018) suggested that eating behaviours associated with

appetite could result from a blend of hereditary and biological influences. These influences are fashioned by aspects of the environment in which an individual finds himself, such as family situations, school, society/culture, and so on.

While many eating behaviours associated with appetite signalling (that is, mechanisms that indicate appetite) adversely affect the health of individuals, three types appear to additionally promote overweightness, namely, external eating, restraint, and emotional eating (van Strien et al., 1986). The notion that these behaviours are not autonomous but instead are interrelated has gained strength in recent times (Braet et al., 2008; Lluch et al., 2000; van Strien & Oosterveld, 2008). In particular, indications of fullness can be disregarded by emotional eating, which can result in overeating and cause problems with weight if the behaviour becomes customary. It would thus appear that while the longings of the body should not be ignored, it is prudent to be conscious regarding what is directing a longing for food (Konttinen et al., 2019).

#### ***3.4.4 Emotional Overeating (EOE) and Emotional Undereating (EUE)***

The inclination to respond to negative emotion by overeating or undereating seems to develop in the preschool years (Ashcroft et al., 2008; Herle et al., 2017 a-b). Recognizing the cause of these behaviours as early as possible is crucial since EOE and EUE have been theorised to be the respective underlying causes of overweight and underweight (Wardle et al., 2001). These theories have received some support since EOE has been related to higher weight in cross-sectional studies (Domoff et al., 2015; Konttinen et al., 2019; Sánchez et al., 2016; van Strien, 2018) and with weight gain in longitudinal studies from 5-6 years to 6-8 years (Parkinson et al., 2010) and from 4-8 years (Steinsbekk & Wichstrøm, 2015). In contrast, EUE has been found to have a negative relationship with weight (e.g., Domoff et al., 2015; Jansen et al., 2012; Viana et al., 2008). Nevertheless, insignificant outcomes have occasionally been reported for both EOE (Braden et al., 2014; McCarthy et al., 2015) and EUE (Domoff et al., 2015; McCarthy et al., 2015) in cross-sectional studies.

EOE and EUE are likely to be favourably associated, notwithstanding their conflicting relationships with weight (Domoff et al., 2015; Sleddens et al., 2008; Wardle et al., 2001). This means that certain children have a fundamental inclination, in response to adverse emotions, to both eat too much and eat too little. This leads to the query whether these two responses indicate distinctive facets of the same fundamental characteristic (that is, an inclination to both undereat and overeat in reaction to adverse emotion) (section 3.4.2) with a mutual cause, or are discrete characteristics with singular causes. Herle et al. (2017)

investigated this query through a study of 1,027 pairs of twins (i.e., 2,054 children) aged five years at the time. They found that genetic influence on EOE and EUE was low. Moreover, EOE and EUE were positively correlated and this relationship could be explained by mutual shared environmental stimuli. Also, several of the joint environmental stimuli triggering EUE and EOE were found to be the same. Thus, this study found that childhood EOE and EUE have distinct causes. Moreover, the inclination to overeat or undereat as an emotional response is acquired rather than inborn (Herle et al., 2017).

### ***3.4.5 Gender Differences between Emotional Eating***

The relationship between stress and emotional eating has been looked at more closely in females, who have been found to have more unhealthy weight control practices than males (Neumark-Sztainer et al., 2002). Regarding choice of food and gender, unhealthy and sweet foods rich in fat are more likely to be consumed by women under stress (Zellner et al., 2006). Likewise, female children and adolescents have reported higher levels of emotional eating in some studies (Braet et al., 2008; Tanofsky-Kraff et al., 2007). In a study by Nguyen-Rodriguez et al. (2008), they found 16.5% of adolescent males and 20.4% of adolescent females showed emotional eating on the Dutch Eating Behaviour Questionnaire. Compared with females, males experienced less benefit from eating food to increase mood (Kenardy et al., 2003). Further, many studies suggested strong cross-sectional and prospective associations between emotional eating and binge eating in non-clinical and eating-disordered adolescent females (Stice et al., 2002; Van Strien et al., 2005). For example, emotional eating was an important predictor for future binge eating episodes in adolescent females (Stice et al., 2002). A study by Lee (2018) examined the relationship between coping style for stress and emotional eating behaviour focused on gender difference. A total of 475 college students (males, 244; females, 231) participated. The female students reported significantly higher emotional eating behaviour than the males. In a sample of American middle school students, Nguyen-Rodriguez et al. (2009) found perceived stress, worries, and tension/anxiety were associated with emotional eating among females, but only confused mood was associated with emotional eating in males. Similarly, among a sample of American children and adolescents, Tanofsky-Kraff et al. (2007) reported females demonstrated a greater propensity to eat in response to depressive symptoms and feeling unsettled compared to males (Tanofsky-Kraff et al., 2007).

A quantitative study conducted by Zellner et al. (2006) in the USA found that more women than men reported overeating when stressed and that the percentage of restrained

eaters amongst those stressed was higher for women than men. These findings suggest that eating food does something to help them feel better by allowing them to escape an aversive task, remind them of something better, or enjoy the flavour of the food. Foran (2013) suggested that men may be less likely to report emotional eating as a problem, as they may not make the connection themselves or may see their emotions as something they should not pay attention to.

Conversely, other studies have failed to find sex differences in reports of emotional eating (Braet & Van Strien, 1997; Caccialanza et al., 2004; Hill et al., 1994). A cross-sectional analysis revealed no significant gender differences in emotional eating scores and found perceived stress and worries were associated with emotional eating for both males and females (Nguyen-Rodriguez et al., 2009). In another study, males were more likely to overeat in response to non-specific emotional factors and females were more likely to eat in response to depressive and unsettled feelings (Goossens et al., 2007).

#### ***3.4.6 Factors That Contribute to Emotional Eating and Eating Disorders***

Several models or perspectives have been proposed to describe the factors that influence people's selection of food, such as psychophysiological, cognitive, and developmental (Ogden, 2012). Four aspects influencing eating behaviours were described in a complex model proposed by Story et al. (2002). These are, first, personal influences encompassing psychosocial elements (outlooks, principles, and awareness), biological elements (hunger), and behavioural elements (patterns of snacking and meals); second, influences of the social environment (influence of family, academic environment, peer groups); third, influences of the physical environment on the availability and accessibility of food (nearness of shops, fast food outlets, restaurants, and other suppliers related to food); and fourth, influences of the macro society, which are significant though indirect, and include norms (societal and cultural) related to eating, influence of commercials and media, and laws (regional and national) related to food.

In general, as with health behaviour, several factors influence eating disorders. Keel (2016), for instance, submitted that eating disorders could be associated with risk factors which may be psychological, biological and hereditary, and sociocultural. The personality attributes of individuals, such as fastidiousness, undesirable outlooks regarding themselves and their bodies, and poor self-image, comprise psychological factors (Jacobi et al. 2004; Noordenbos, 2013; Sassaroli & Ruggiero, 2005). A greater tendency for the occurrence of eating disorders may be developed by hereditary aspects (Strober et al., 2000).

Sociocultural aspects include the effect of family and intimate associations, for instance, disparagement of an individual's appearance, the eating behaviour of mothers, and dieting practices of roommates in college (Cooley et al., 2008; Keel et al., 2013). They also encompass social standards regarding weight and appearance, for example, extreme behaviours related to weight regulation could be the outcome of an individual's failure or desire to meet the societal standards of slenderness (Keel & Forney, 2013).

Based on its research objectives, the present study will place emphasis on two principal factors that promote emotional eating, namely, individual and sociocultural factors (Figure 3.8). Emotional and personal factors will be the individual factors taken for consideration, whereas environmental factors (parents/siblings/friends/peers) and social factors (social media, food brands, religion, cultural pressure and norms, commercials/advertisements, social events) will be the sociocultural factors considered. Biological and hereditary factors will not be considered, as these require clinical observation.

#### **3.4.6.1 Emotional and Personal Factors.**

A number of personal factors can be associated with emotional eating. Unhappiness with appearance can contribute to it (Goossens et al., 2009; Musaiger et al., 2011). In the other direction, a person may experience negative emotions due to being overweight and due to the frequent consumption of calorie-rich foods. Poor diet and eating habits can thus often lead to the development of emotional eating. And many psychological factors are associated with emotional eating behaviour, including depression (see shortly), isolation, anger, stress, poor self-esteem (see shortly), limited emotional regulation (NEDA, 2012a, 2012b), psychopathology (Goossens et al., 2009), perceived hunger (Alexander & Siegel, 2013), and anxiety (Scott et al., 2012).

In addition, aspects related to using food to regulate emotions, emotional attachment and avoidance (escape) can also contribute to emotional eating (Buckroyd & Rother, 2008; Pace et al., 2012; Waters & Cummings, 2000). A further dimension is the influence of positive emotions (e.g., van Strien et al., 2016). Positive emotions could be joy and merriment due to meeting with friends, holidays, etc., whereas negative emotions include sadness, anxiety, ennui, isolation, and grief.

A person can possess either a positive or negative attitude towards themselves, leading to high or low self-esteem (Dweck, 2000). People with low self-esteem consider themselves worthless and usually behave in a pessimistic manner, whilst people with high self-esteem

demonstrate a confident and optimistic attitude (Rosenberg, 1965). Young people whose dissatisfaction with their body image causes them to feel distress and have low self-esteem are at higher risk of emotional eating, which can lead to binge eating disorder (BED) (Buckroyd, 2011), and affect their personal relationships. Additionally, these factors also trigger emotional eating among people who find stress difficult to handle. People who have low self-esteem may often isolate themselves from others and may find it difficult to connect with other people, even in social situations. This may result in loneliness, which may trigger emotional eating (Canter, 2011). As with positive emotions like happiness or other negative emotions, such as anger, anxiety and stress, boredom is also a major factor that induces emotional eating among adolescents.

The term ‘depression’ was defined by Beyondblue (2014) as experiencing feelings of low mood or sadness over a long period of time, spanning several weeks, months, or years. In the DSM-5, depression (major depressive disorder) is explained as “a common and serious medical illness that negatively affects how people feel, the way they think, and how they act”. (American Psychiatric Association, 2013). Goossens et al. (2009) submitted that a person who is extremely anxious or depressed is more likely to turn to emotional eating. Several physical problems, such as self-induced starvation, rapid loss or gain of body weight, and other such complications can also lead to emotional eating.

Timmerman and Acton (2001) studied the association between basic needs and satisfaction in relation to Maslow’s Hierarchy of Needs. They found that if a person does not have their certain basic needs met, they are likely to fall prey to emotional eating and find solace in food. It is important to note, however, that some adolescents can successfully cope with stress and are aware of the consequences of eating disorders, which ensures they stay healthy. This finding was confirmed by Zellner et al. (2006) and Taylor (2018).

#### **3.4.6.2 Sociocultural Factors.**

Social and cultural perceptions may alter individual eating habits and behaviours. Several societal and cultural beliefs may encourage the consumption of food with the intent to either gain or lose weight to achieve a specific body shape, for example. Cultural norms and expectations may mean people repress their emotions and do not talk about them, which is also a risk factor for emotional eating. Sources of discrimination, such as race, ethnicity, body size, or body weight may also influence emotional eating, and such influences may come from family members, peers, or other sources.

Sociocultural factors pertain to societal and cultural facets of a person's existence. In Saudi Arabia, the familial and social environment has a significant influence on a person's eating habits. This is also attributable to the strong Islamic impact on the functioning of Saudi society (section 2.3) and the power of globalization resulting from the discovery of oil on changing eating behaviours (section 2.4). Thus, it is not surprising that a person's immediate environment that includes parents, siblings, friends, peers and religion can have a significant impact on their eating habits. Moreover, aspects of the wider society can also influence eating behaviour, such as social media (e.g., Al-Jaaly, 2016; Becker et al., 2002), food brand (company), pressure due to culture and norms (e.g., Polivy & Herman, 2002), commercial ads and social events. Additionally, there are some other drivers of emotional eating, such as weekends and holidays, social and religious events, a menstrual period (in the case of girls), and meeting with friends or relatives.

Therefore, in the KSA, it is necessary to consider that a health belief system is based deeply on religion and culture during examining, and designing mental health services (Al Dhaifallah et al., 2015; Koenig et al., 2014). Further, it is important to prevent contradiction among health messages and sociocultural values. This is significant because sociocultural values have an essential role in the lifestyle of the Saudi population, and the outcome of its avoidance can lead to weak uptake of the healthy information provided by an intervention (Hefni, 2017).

#### **3.4.6.3 Environmental Factors.**

##### *Family influence.*

Parental and familial influences play a vital role in determining the dietary habits of individuals, including responses to emotions. Parents tend to control their children's food habits; therefore, they may indirectly contribute to the development of emotional eating. For example, some children may subconsciously learn from childhood that it is acceptable to eat in order to cater to their emotional needs. Familial and parental concerns towards other family members and children with regard to diet often result in the whole family adopting emotional eating habits (Engel et al., 2007). Children who spend their formative years with high levels of control from parents often feel helpless and lack independence. Such children often become emotional eaters.

This view is supported by Engel et al. (2007) and Gouveia et al. (2019), who claimed that rigid and overprotective parents may cause their children to adopt disordered eating behaviours and eventually develop eating disorders. Also, parents could be inadvertently

training their children to depend on food to cope with their emotions, for instance, when their feeding practices are excessively controlling, such as treating or rewarding their children utilising ‘bad’ food (high in sugar, fat, or salt). Children growing up in such circumstances may be at greater risk, in later childhood, to ‘emotionally eat’ (Aston University, 2016). Several societal and cultural beliefs may encourage the consumption of food with the intent to either gain or lose weight to achieve a specific body shape, for example.

A study in the UK by Herle et al. (2018) investigated a sample of twins (n = 398) aged 4-years and found that the home environment had a robust influence on emotional eating. Herle et al. (2018) found that environmental aspects (parents and family) influenced emotional eating, irrespective of the possibility of obesity for a particular child. Further, Herle et al. (2018) provide evidence to support the theory that emotional overeating and undereating in children is largely influenced by their environment, while genes have an insignificant role in childhood emotional overeating.

The relationship between mother and child provides the foundations for the notion “avoidant attachment” of limiting or utilising food to control emotions. For instance, if a mother always responds to her baby’s distress by offering food regardless of whether the infant requires food or comforting, this can lead to the child associating the mechanism used (i.e., food) with the feeling (i.e., being distracted or soothed or comforted) (Clinton, 2006); and can carry this association into its future existence: a pattern often seen in individuals who exhibit disordered eating patterns (see Attachment Theory in section 3.5.1).

It can be seen that emotional eating is used to control problematic emotions that have evolved due to the non-establishment, in childhood, of secure attachments. Buckroyd (2011) indicated that obesity can be the outcome of overeating by individuals having insecure attachments, submitting that attachment has a considerable role to play in the usage of food as a method of dealing with adverse emotions. For instance, food may be used to distract from negative emotions. Overall, the Attachment Theory submitted that emotional eating was the outcome of the lack of secure attachments.

The Family Systems Theory proposes that models in family associations can not only influence the advancement and continuance of obesity but also serve to preserve equilibrium in the system. One means by which this can take place is emotional eating, as

a bid to use eating to control the challenging emotional facets of family existence (Walfish, 2004). In general, people do relate food with their cultural characteristics and family unit. Thus, it could be inferred that food is significantly associated with the feeling of affection (Lupton, 1996). This can be enlarged by assimilating the Family Systems Theory with the Attachment Theory, which submits that affection is conveyed through actions, such as nursing an infant or partaking of a meal cooked by a partner.

Furthermore, several studies have confirmed that the food choices of adolescents are influenced positively or negatively by parents (Mahmoud & Grigoriou, 2019) and siblings (Rageliene & Grønhøj, 2020). However, there is a need for more studies to examine the influence of siblings and peers on the eating behaviour of children and adolescents (Rageliene & Grønhøj, 2020).

#### Friends and peer pressure.

Much like the influence of the media, peer pressure is also considered a major socio-cultural factor that affects emotional eating. This is because peers often encourage, inspire, persuade, or criticise people in order to influence them to adopt certain dietary habits that eventually may lead to the development of eating disorders (Polivy & Herman, 2002). Adolescent girls often change their attitudes and behaviours due to pressure to keep up with the latest fashions and trends adopted by their peers, which may include attempting to maintain a slim figure by dieting or purging. Mahmoud and Grigoriou (2019) found in their study a strong impact of friends in the food choices of children and adolescents. Peer pressure and influence thus play a significant role in the dietary habits of susceptible adolescent girls. Indeed, several studies have affirmed that peer pressure has stronger effects among girls than among boys (Franchina & Coco, 2018).

#### **3.4.6.4 Social Factors.**

##### The Media.

Developing and maintaining a slim body is promoted in the Western media and is increasingly being supported by other developed and developing countries. These body image ideals may cause people to change their dietary habits and subsequently fall prey to eating disorders. This statement is supported by a study showing that Japanese and Chinese students studying in the USA were influenced by the media to adopt different food habits (Stark-Wroblewski et al., 2005), as slim bodies were perceived to be the 'ideal'. Furthermore, the introduction of Western television programmes in Fiji promoted weight-reducing dietary habits among school girls (Becker et al., 2002). According to research

conducted by Unikel et al. (2005) on Mexican women (mean age  $19.1 \pm 3.8$ ), social and cultural pressure to stay slim caused people to develop dissatisfaction with their bodies and change their food habits. Such changes may eventually lead to the development of eating disorders.

The media are also considered to be responsible to a certain extent for the spread of eating disorders. Images of slim bodies advertised by the media promote a certain ideal, prompting people to want to lose weight in order to look more like that ideal. Similarly, reality is usually distorted by the media, for example, with the use of celebrity endorsements, as celebrities are often either unnaturally slim or aspiring to be thin (Rounsefell et al., 2020). Likewise, Calvert (2017) highlighted the vital role of the media character, which can play a significant function in enhancing social and educational improvement in young children.

According to Damiano et al. (2013), the powerful role of images and real characters could be used in education to make the concepts obvious and situated, besides facilitating concentrating on related elements, to promote the intervention process. Additionally, Aguiar et al. (2019) stated that the learning of children is affected by the relationships with individuals and media characters who they trust. Especially, young children have a feeling of trust and attachment towards educational content learning because the characters and adults could be more credible.

In a study set in Jeddah, KSA, Al-Jaaly (2016) investigated the influence of television advertisements on the eating behaviour of adolescent girls. Using a cross-sectional survey containing questions concerning media advertisements and their influence on eating behaviour, Al-Jaaly collected data from 1,519 girls from 20 Jeddah schools. A significant association was found between consumption of dessert and exposure to advertisements. Moreover, the study found that adolescent females exposed to media advertisements had a greater likelihood of eating dessert, shopping for food, and attempting to reduce weight. Consequently, Al-Jaaly (2016) recommended that decision-makers have a role and obligation to safeguard young consumers from media content (e.g., food advertisements) that target them through improved legislation and regulation.

Awareness, outlooks, partialities, and habits associated with food have been found to be influenced by the media environment, in general, and by commercials, in particular (Story & French, 2004). The underlying association between food-related advertising and the

diets of children is straightforward. Specifically, this manifests as a growth in the intake of snack foods and calories on the whole, accompanied by a reduction in the intake of vegetables and fruits (Kovács et al., 2015).

Robinson et al. (2017) claimed that there is a greater likelihood that individuals would eat too much when viewing television. Moreover, they could learn unhealthy food behaviours from commercials and television programmes. Additionally, fewer portions of healthy food and greater amounts of junk food and red or processed meat are consumed by children who eat at least two meals a day while viewing television, in contrast to families where television viewing is non-existent or restricted to during one meal daily (Fulkerson et al., 2014; Robinson et al., 2017). Elevated amounts of sugar and foods high in fat have been found to be consumed by school children with greater exposure to television. This is regardless of their actual partiality for such foods, indicating that passive intake of such foods may be related to their television viewing (Lissner et al., 2012). Households where family meals were consumed while watching television were found to be less likely to serve vegetables and fruits (FitzPatrick et al., 2007). Studies (Leit et al., 2002; Pope et al., 2000) have indicated that men have lower exposure to societal and media compulsion to diet than women.

The scrutiny of the influence of advertising on the food awareness and partialities of children (age 2-9.9 years) was performed as part of the “Identification and Prevention of Dietary and Lifestyle-induced Health Effects in Children and Infants” (IDEFICS) study (Kovács et al., 2015). Further, this study investigated the influence of advertising on children’s nutritional choices and status of weight. At baseline, the compliances to fundamental behaviours associated with childhood obesity, such as consumption of water, sweetened beverages, fruits and vegetables, regular television schedule, physical pursuits, family time, and sufficient duration of sleep, were measured. A composite score ranging between 0 (none) and 6 (complying with all recommendations) was computed using international recommendations for these behaviours. This study found that increasing the level of compliance reduced the likelihood of becoming overweight or obese. Moreover, compliance to the recommendations pertaining to physical pursuits, duration of television watching and sleep, were the principal influences to lessening the likelihood of overweightness. Overall, children who were overweight or obese were less likely to comply with even one of the recommended behaviours, in contrast to children who were thin or of normal weight (Kovács et al., 2015). On the whole, this study found that

increasing movement, decreasing time spent on television viewing, and getting sufficient sleep were possibly more beneficial to reducing the chances of overweightness in contrast to solely dietary behaviours.

Overall, it is evident that overexposure to media can impact the eating decisions and behaviours of children and consequently, parents and caregivers should endeavour to restrict such exposure and seek to encourage more healthy behaviours.

### Culture.

Different cultures have different food habits, which can cause specific eating disorders to develop over different timeframes (Polivy & Herman, 2002). Polivy and Herman (2002) and Rounsefell et al. (2020) stated that people tend to want to gain weight in cultures where food is scarce and to lose weight where food is abundantly available, as to a certain extent, it is human nature to strive for things that are difficult to achieve. Siegel (2002) drew attention to the emphasis placed by cultures on slender figures for women. This factor accompanied by the increase in body fat during puberty was proposed as a principal concern with regard to psychological distress throughout the period of a person's maturation.

Aspects of Saudi culture that may contribute to emotional eating have been discussed in Chapter 2, and especially section 2.3 and 2.4.

Since the aim of the previous sections is to review the theoretical framework of emotional eating of earlier studies, the next section discusses some different theories associated with emotional eating and usually invoked by the researchers to interpret the mechanism of emotional eating.

## **3.5 Theoretical Background of Emotional Eating**

Emotional eating may originate at earlier phases of a person's development. However, although the primary foundations of emotional eating are not presently recognized, numerous theories have been submitted in this regard. For instance, it has been submitted that emotional eating may develop from the reinforcement associated with recurrent occurrences of enjoyable consumption of food through episodes of adverse emotion (e.g., Gibson & Desmond, 1999; Mercer & Holder, 1997). On the other hand, other research evidence indicates that the character and disposition of an individual have a role to play in such eating behaviour (Levitan & Davis, 2010). This section examines the theoretical

background of emotional eating by exploring different theories that have explained emotional eating.

### 3.5.1 Overview of Theories of Emotional Eating

Numerous theories have been presented to account for overeating in response to emotions. Each of these offers dissimilar outlooks and reveals the intricacy of emotional eating behaviour. This section represents some of these theories, namely, the Psychosomatic Theories of Obesity (e.g., Bruch, 1973; Kaplan & Kaplan, 1957); the Learning Theory; the Affect Regulation Theory (Gross, 1999); the Attachment Theory (Bowlby, 1988; Siegel, 1999; Tasca et al., 2011); the Escape Theory (Heatherton & Baumeister, 1991); and the Restraint Theory (Herman & Polivy, 1980). In addition to these theories, some other perspectives (approaches) (e.g., biological model, sociocultural model and positive emotional eating) that endeavour to provide a rationale for emotional eating will be explored. These theories are summarised in Table 3.4.

**Table 3.4**  
*Theories Related to Emotional Eating*

Principal Theorists	Summary
<b>Psychosomatic Theories</b>	
Kaplan and Kaplan (1957)	<ul style="list-style-type: none"> <li>• Obesity caused by behavioural patterns where disproportionate intake of food is employed as an emotional shield when negative affect is experienced by an individual.</li> </ul>
Bruch (1973)	<ul style="list-style-type: none"> <li>• Emotional eating is the outcome of blurring between hunger and internal states of arousal, which may be fostered by early incidents of learning.</li> </ul>
Slochower (1983)	<ul style="list-style-type: none"> <li>• Eating can be utilised as a mechanism to cope with or regulate negative emotions.</li> </ul>
Lehman and Rodin (1989)	<ul style="list-style-type: none"> <li>• The yearning and attempt to enhance and sustain the occurrence of favourable emotional conditions is a psychological reasoning that triggers emotional eating.</li> <li>• This theory reinforces biological hypotheses which posited that the intake of comfort foods high in sugar and fat content lessen the activities of the hypothalamic-pituitary-adrenal</li> </ul>

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**Principal Theorists    Summary**

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axis, which are associated with reacting to stress by triggering the brain's reward centres.

### **Learning Theory**

#### *Learning Theory*

- Booth (1994)
- Negative emotions are viewed as “eliciting stimuli,” food consumption as “operant behaviour,” and its outcome as “negative reinforcement,” that is, the eating-induced lessening of negative emotions.

### **Affect Regulation Theories**

#### *Affect Regulation Theory*

- Gross (1999, 2007)
- Regulation of affect is critical for preserving the emotional and physical health of an individual.

### **Attachment Theory**

- Bowlby (1969, 1979); Siegel (1999)
- The *Attachment Theory* facilitates awareness of human associations.
  - In the context of emotional eating, individuals with “avoidant attachment” have been known to withdraw from emotional encounters by means of eating constraints.

### **Escape Theory**

- Heatherton and Baumeister (1991); Wicklund (1975)
- The *escape theory* suggests that food may be used to distract from negative emotions.
  - When a stressor is encountered, persons who blame themselves will eat greater amounts than persons who blame others.

### **Restraint Theory**

- Herman and Polivy (1980)
- The restraint theory suggests that overeating is triggered in restrained eaters, who can be termed chronic dieters, by negative affect in particular.

### **Biological Perspectives**

#### *Stress Induced Eating*

- Epel et al. (2004); Stone and Brownell (1994)
- Stress impacts eating in humans in two ways. That is, either, as in most cases, the food intake of individuals increases during stress, or a reduction in food consumption and

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Principal Theorists	Summary
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correspondingly a loss in weight before or following stress are seen, as found in approximately a third of the overall population.

#### *Addiction Model*

Adam and Epel (2007)

- Disproportionate intake of tasty calorie-rich food can result in an intense condition of “reward hyposensitivity” that is comparable with that of abuse of drugs, which can cause the progression of obsessive-like eating.

### **Sociocultural Perspectives**

#### *Social Facilitation*

Lupton (1996)

- Food has a greater role to play than merely offering nourishment and can permit individuals to direct their associations by means of their diet and intake.

Herman et al. (2019)

- When people are eating in the presence of people or in groups that motivates a positive mood (e.g., enjoying more the taste of food and consume much food).

#### *Parental Feeding Styles*

Birch and Deysher (1985, 1986); Birch and Fisher (1998)

- The existence in individuals of self-discipline and the capacity to self-adjust employing hunger signals and fulfilment can be involuntarily lessened by feeding styles of parents, such as regulating consumption, parental control or compulsion to eat.

#### *Family Systems Theory*

Lupton (1996); Walfish (2004)

- People relate food with their cultural characteristics and family unit.
- Food is significantly associated with the feeling of affection.

### **Happy Eating Model**

Evers et al. (2013); van Strien et al. (2016)

- Emotional eaters can eat in response to positive emotions as well as negative emotions. Being in a positive state of mind could enhance the enjoyment of eating and cause greater levels of eating (section 3.5.3).

These theories highlighted that the association of negative and positive emotions with food could have developed as:

- (i) a means to regulate negative emotions (Gross, 1999; Telch, 1997);
- (ii) the shattering of restraint (or disinhibition) in restrained eaters (Herman & Polivy, 1980);
- (iii) a means to avoid the effects of negative emotion (Wicklund, 1975), and a means of feeling joy (Evers and colleagues (2013, etc.); van Strien & colleagues (2016, etc.);
- (iv) an outcome of a person's style of attachment (Bowlby, 1969, 1979).

According to Bruch (1973), emotional eating is the outcome of blurring between hunger and internal states of arousal, which may be fostered by early incidents of learning. In contrast, it was submitted by Heatherton and Baumeister (1991) that emotional eating is an element of an effort to evade adverse self-perception. Individuals, in their theory, transfer emphasis from profound experiences of adverse internal states and awareness regarding food.

While these theories provided considerable insights with regard to the reasons why an individual would possibly indulge in overeating, the early biological perspective drew attention to the typical biological impulses caused by negative emotions in the body, which mimicked the fulfilment associated with food consumption (Schachter et al., 1968). In other words, it would appear that the biological reaction to negative emotions interacts with the psychosomatic response. However, stress, in particular, could cause biological impulse, which leads to an increase in food intake in emotional eaters (Dallman, 2010; Fries et al., 2005). One method of grasping personal internal understanding of hunger and fulfilment is through Attachment Theory. In simple terms, attachment indicates a permanent emotional connection between individuals (Bowlby, 1969) and is directed by the basic human necessity to belong (Leary & Baumeister, 2017) and the stimulus to pursue closeness to attachment figures in moments of hardship (Bowlby, 1979). It has been suggested that Attachment Theory can be utilised to inform the treatment of persons with various emotional challenges, eating disorders being one such challenge (Tasca et al., 2011).

Attachment Theory submits that people are born with a variety of inborn behaviours that expand their prospects of continued existence. Also, that while an infant is enabled by investigative behaviour to discover their societal universe, others are drawn towards them

by attachment behaviour in times of distress or need (Bowlby, 1988). The theory also contends that such behaviours impact the maturity of the emotional identity and the capacity of a person to recognize themselves with respect to others in the framework of their societal universe (Fonagy et al., 1995; Fonagy et al., 2002). According to Attachment Theory (Waters & Cummings, 2000), individuals attach to their caregivers in early life, and when those bonds are not properly formed, unhealthy coping strategies and behaviours may result. In the context of emotional eating, individuals with “avoidant attachment” have been known to withdraw from emotional encounters by means of eating constraints. On the other hand, persons with “attachment anxiety” who experience elevated emotions have been found to intensify their food consumption and exhibit behaviours such as overeating and purging as coping mechanisms (Tasca et al., 2011).

### ***3.5.2 Psychosomatic Theories***

The origins of the notion of emotional eating can be traced to the Psychosomatic Theory of Obesity proposed by Kaplan and Kaplan (1957). This theory posits that obesity is caused by behavioural patterns where disproportionate intake of food is employed as an emotional shield when negative affect is experienced by an individual. It accords with Bruch (1973), Kaplan and Kaplan (1957), and Slochower (1983), who also submitted that eating could be utilised as a mechanism to cope with or regulate negative emotions. The latter’s data indicated that persons who are obese truly cannot label their emotional states accurately, which may be extremely early signs for the connection between affect and eating described by Bruch (1973). Slochower (1983) also suggested that emotional eating was related to the usage of food as emotional protection, necessitated due to inadequate functioning of the ego functioning and a failure to endure emotional distress.

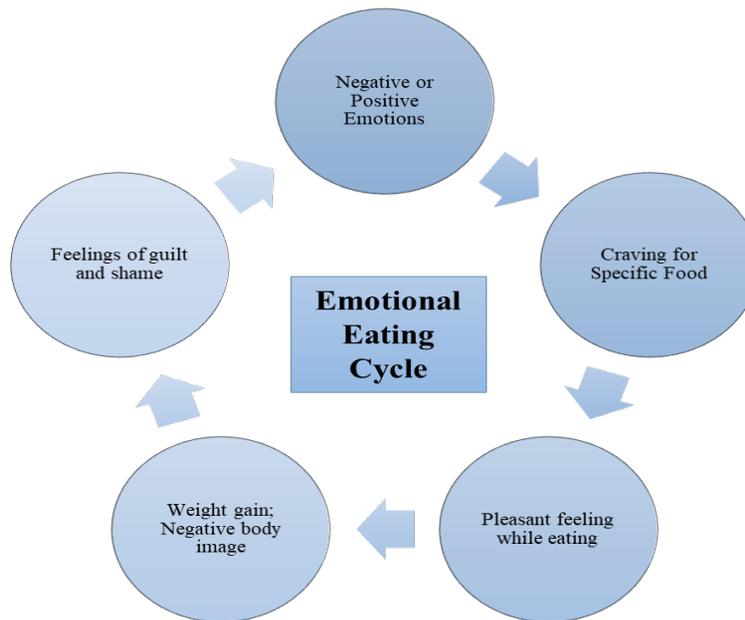
Bruch’s (1973) theory holds two principal assumptions with regard to the theory of emotional eating. Firstly, that the desire or craving to consume food is increased by negative emotions and hence people tend to eat while experiencing such emotions. Secondly, that eating helps to lessen the power of negative emotions. When these assumptions are viewed from the standpoint of the Learning Theory (Booth, 1994), negative emotions are seen as “eliciting stimuli,” food consumption as “operant behaviour,” and its outcome as “negative reinforcement,” that is, the eating-induced lessening of negative emotions (Macht, 2008, p. 6). In other words, eating is one of the many reactions of an individual encountering a negative emotion, depicts the manner in

which an emotional eater gets ensnared in the emotional eating cycle and finds it difficult to break out of it (Figure 3.6).

The Psychosomatic Theories of Obesity submit that overeating, in the case of some persons who are obese, is an endeavour on their part to lessen anxiety and stress (Bruch, 1973; Kaplan & Kaplan, 1957). As early as 1955, Bruch had claimed that the “role of emotions in relation to food can hardly be overrated” (p. 68). In addition, Bruch (1955) highlighted that two fundamental truths are related to the emotional facets of eating. These are the general dread of food shortage and the common occurrence in every person’s early existence that the assistance of another individual is necessitated in eating. Bruch also mentioned that sometimes, the activity of feeding children may become “overcharged with emotional significance” (p. 73) for some parents, creating a pattern in which food turns into the only major mode of emotional connection. This can inaugurate the adverse association formed by some individuals with food and can lead, in later life, to problematic eating behaviours owing to the perception that eating offers a reprieve from emotional stress and a feeling of satiation.

Overall, it can be seen that the Psychosomatic Theories of both Bruch (1973) and Kaplan and Kaplan (1957) (Figure 3.6) indicate that an emotional eater has learned that adverse emotional states can be reduced by overeating in reaction to their negative affect. Thus, early learning experiences would seem to have caused some individuals to inappropriately recognize the physical and mental sensations associated with hunger and fulfilment (Bruch, 1973). Such individuals hence would have to explore external indicators to understand what and how much to eat, as their personal internal understanding of hunger and fulfilment has not been accurately coded (Bruch, 1973). Lehman and Rodin (1989) explained that the yearning and attempt to enhance and sustain the occurrence of favourable emotional conditions is a psychological reasoning that triggers emotional eating. This theory reinforces biological hypotheses which posited that the intake of comfort foods high in sugar and fat content lessen the activities of the hypothalamic-pituitary-adrenal axis, which are associated with reacting to stress by triggering the brain’s reward centres.

**Figure 3.6**  
*The Cycle of Emotional Eating*



Source: "Psychometric Theory" (Bruch, 1973; Kaplan & Kaplan, 1957)

### ***3.5.3 Perspectives on Positive Emotions and Eating***

In addition, this study also considers perspectives on "happy eating," which is posited to be "eating in response to positive emotions" (van Strien et al., 2016) (Table 3.4). Happy eating has been looked at because it is crucial in this study, and because the literature reviews of some studies take it as a part of their theoretical background. So, positive EE is appearing to some extent in theories as a sort of background literature. Besides, eating in response to positive emotions can result after a while in gaining weight and a negative body image, which leads to negative emotions, and then engaging in the EE cycle of Psychosomatic Theory (Figure 3.6). Therefore, positive EE is considered as a part of the Psychosomatic approach. Wedig and Nock (2010) stated that emotional eaters respond to their negative emotions by overeating because it alleviates them from negative mood states and raises positive emotions. This theory is supported by the studies of Oliver et al. (2000) and Macht and Mueller (2007), as these studies showed an increase in eating among emotional eaters who had average weight and obesity, which is linked with raising positive emotions within the negative influence context.

In the notion of EE, the role of positive emotions could be used to examine the nature of food consumed during such emotional conditions. For instance, Mehrabian and Racioni (1986) found that healthier foods were consumed when positive emotional states were

experienced. Evers et al. (2013) investigated the part played by positive emotions in motivating consumption of food and presented several considerations to describe why positive moods could herald food consumption. Firstly, intake of food and positive moods are predisposed to be associated through a learning mechanism relating positive emotions to higher consumption of food (Patel & Schlundt, 2001). For instance, regardless of culture, food is undeniably utilised as the climax of festivities connected with special events such as birthdays and weddings that are typically associated with positive feelings (Rozin, 1999). Secondly, eating has a firm connection with mixing with people.

A further theory (Lehman & Rodin, 1989) submits that the yearning and attempt to enhance and sustain the occurrence of favourable emotional conditions is a psychological factor that triggers EE. This theory reinforces biological hypotheses which posited that the intake of comfort foods high in sugar and fat content lessen the activities of the hypothalamic-pituitary-adrenal axis, which are associated with reacting to stress by triggering the brain's reward centres. Researchers have developed this theory additionally by pursuing a psycho-biological hypothetical viewpoint of emotional eating which contends that rewards are the basis of this phenomenon. This outlook explains emotional eating's repetitive quality (Adam & Epel, 2007; Lehman & Rodin, 1989; Leow et al., 2018). Also, if a person became addicted to eating (Adam & Epel, 2007; Wilson, 2010), there could be an increased obsession to consume food to obtain the "rewarding effects", such as palatable foods in the cafeteria, which have high calories and can encourage reward function in the brain and subsequently induce addiction, which could lead to overeating and obesity (de Macedo et al., 2016).

Nevertheless, there are other theoretical perspectives that explain the association of positive emotions and food intake (Happy Eating Model). For instance, Frederickson's (2001) "Broaden-and-build" Theory submits that personal resources are enhanced by positive emotions, thus making it simpler to achieve later challenges (e.g., refusing tasty foods). Likewise, Andrade's (2005) "Mood Maintenance Theory" suggests that positive emotions inspire individuals to resist excess as they believe that giving in would weaken the positive mood. Moreover, eating can provide a means of feeling joy (Evers et al., 2013, etc.; van Strien et al., 2016, etc.). Such theories, accordingly, would support the notion that food intake is triggered by positive emotions.

#### ***3.5.4 Choice of Theoretical Framework for This Study with Justification***

The justification for using the Psychosomatic Theory for this study is that it is the principal theory associated with emotional eating, and most of the different theories of EE are based on it (Adriaanse et al., 2011). Also, this theory explains the primary process of EE and how people engage in the EE cycle (Figure 3.6). Additionally, positive emotional eating could be one of the emotional eating cycle stages (Psychosomatic theory) when the individual is eating their favourite food to improve their mood.

Besides, it could be inferred that contact with appealing food when in a positive state of mind could enhance the enjoyment of eating and cause greater levels of eating. Lastly, positive moods have been recognized to be a familiar justification for various indulgences, including overeating (De Witt et al., 2012; Kivetz & Zheng, 2006). Thus, it is evident that there is theoretical support towards the association of positive emotions and food intake, and this study considers perspectives on “happy eating,” which is posited to be “eating in response to positive emotions” (van Strien et al., 2016) (Figure 3.7).

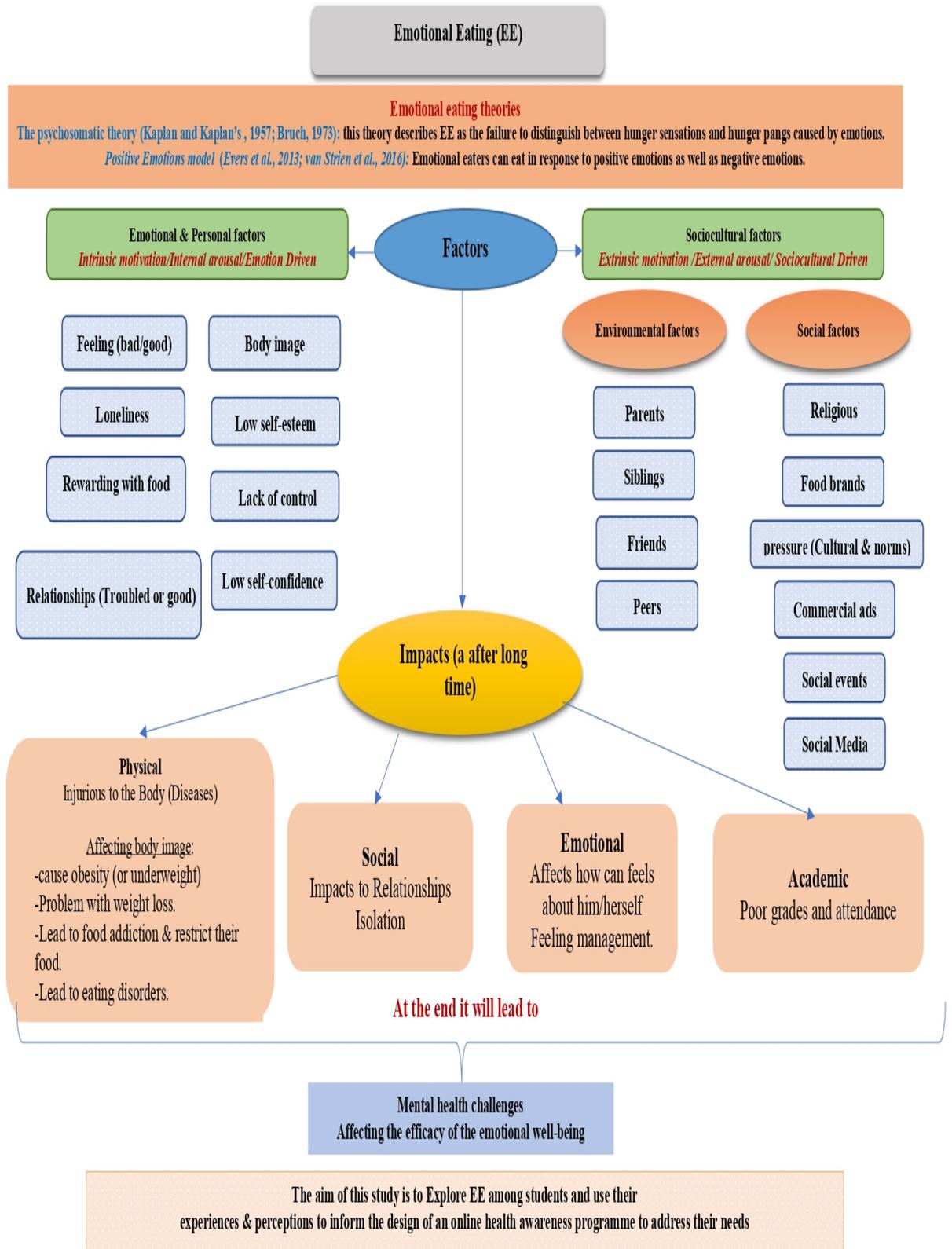
### **3.6 Conceptual Framework**

The conceptual framework for the present study developed by drawing from the extant literature related to emotional eating (sections 3.2, 3.4, 3.5, and 3.7) and the theories underlying emotional eating (section 3.5). The emphasis of the conceptual framework is to offer deeper awareness of the study and to highlight probable factors that can contribute to emotional eating among adolescent students in the KSA. Thus, the objective of the conceptual framework in this study is to separate the principal conceptual dimensions that necessitate identification and description to acquire more understanding of the predisposition of adolescents to emotional eating. It is hoped that the development of the framework will promote coherence in the scrutiny of the role of emotions in adolescent eating behaviour, which is the one of the principal objectives of this study and then to inform the design of a relevant intervention. Figure 3.7 summarises the key components of the conceptual framework and informs the structure of this section.

The theories and perspectives of emotional eating are first revisited to clarify the association between different emotions and eating, and how emotions play a role in guiding an individual’s eating behaviours. They are followed by discussion of the factors that affect EE. Finally, there is consideration about informing the design of an intervention and an online health awareness programme for adolescents.

**Figure 3.7**

*The Conceptual Framework of the Study: Theories, Factors, Impacts of Emotional Eating, and Aims.*



### ***3.6.1 Theories and Perspectives of Emotional Eating***

Several theories and perspectives have been proposed to account for overeating in individuals who are emotional eaters. They are summarised in Table 3.4 and briefly revisited here. The objective of providing an overview of theories and concepts of emotional eating is to understand the basics of building the conceptual framework and to contribute to understanding its mechanism (Figure 3.7).

The theoretical foundations of the study are derived from the Psychosomatic Theories of Obesity (Bruch, 1973; Kaplan & Kaplan, 1957; Slochower, 1983), which drew attention to the connection of emotions with individuals' eating behaviour (section 3.5.2). Moreover, Attachment Theory pointed out attachment indicates a permanent emotional connection between individuals and eating (Bowlby, 1969) (section 3.5.1). Additionally, the sociocultural perspective highlighted the impact of social relationships on eating behaviour (section 3.4.6.3), and family systems where affection was often conveyed through food (Charles & Kerr, 1988; Cheal, 1988; Walfish, 2004). Finally, it was evident that positive emotions could also trigger emotional eating (van Strien et al., 2016). The study emphasized the part played by positive emotions in eating (section 3.5.3) because this emerged as important in its findings (Figure 3.7 & 3.8).

### ***3.6.2 Factors Affecting Emotional Eating***

One focus of this study is exploring the different factors that contribute to emotional eating. These factors are categorised as intrinsic/internal and extrinsic/external (see Figure 3.7); these factors influenced the design of the questionnaire and interview. Some factors were associated with the individual whereas others were from outside the individual, that is, their immediate environment and the larger society. The intrinsic/internal contributors of emotional eating involve selections of emotional (positive and negative emotions) and personal factors (body image, low self-esteem, low self-confidence, lack of control and troubled or good relationships), which often interfere with each other (see section 3.4.6).

In regard to the second category of extrinsic/external contributors, which are called socio-cultural factors, these play a significant role in identifying eating behaviours (Zeeni et al., 2013). Socio-cultural factors involve the environmental factors (such as parents, siblings, friends, peers), and social factors (such as religion, social media, food brands, cultural pressure & norms, commercials/ advertisements, social events) (see Figure 3.7). Several societal and cultural beliefs may encourage the consumption of food with the

intent to either gain or lose weight to achieve a specific body shape (Aston University, 2016).

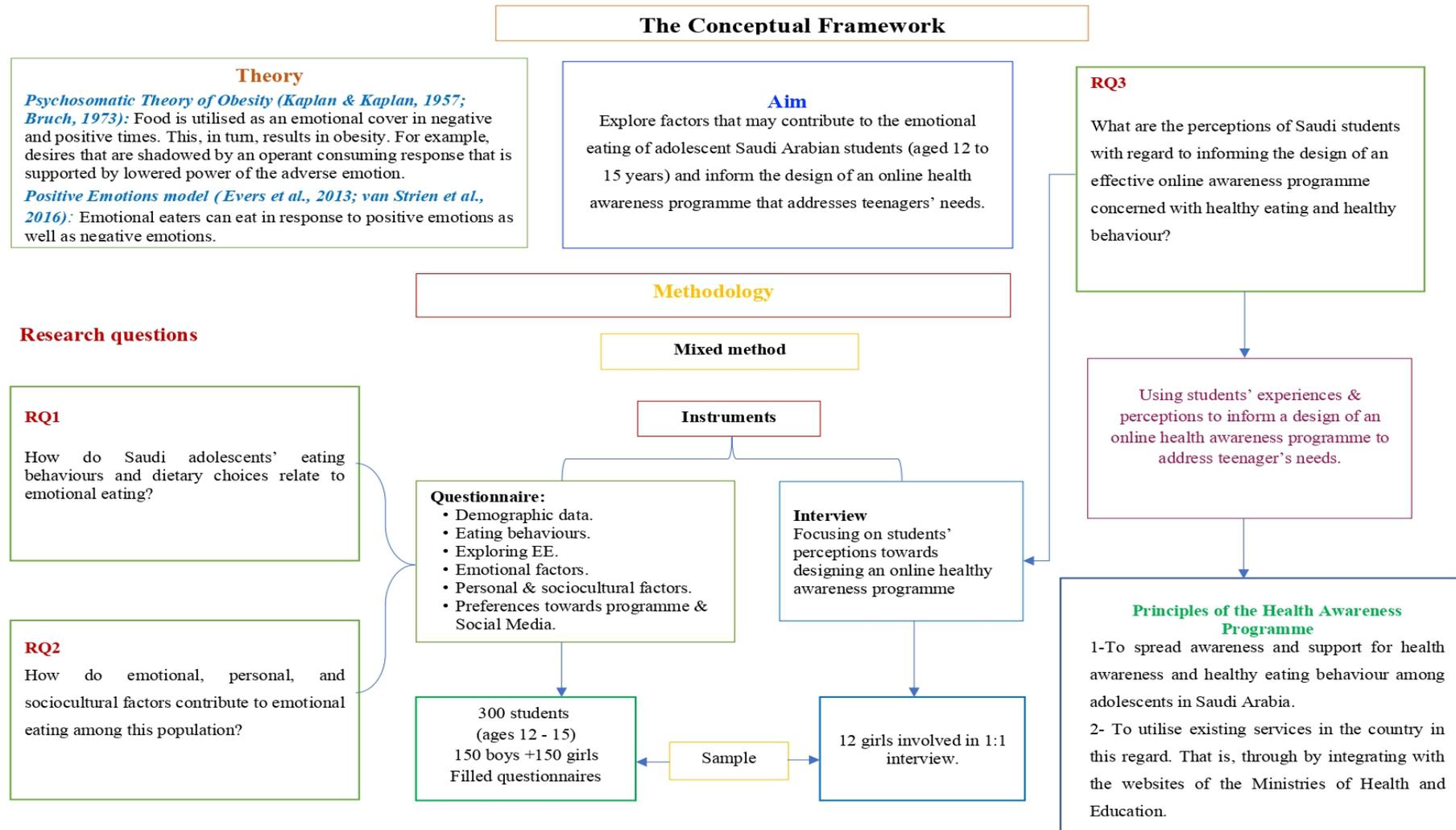
A final element of the conceptual framework is the proposed outcome of the study, that is, using the perceptions of the participating adolescents to inform the design of interventions and an online awareness programme for healthy eating behaviour.

### ***3.6.3 Informing the Design of an Intervention and an Online Health Awareness Programme for Adolescents.***

The principles of designing an online health awareness programme are formulated to support adolescent students by spreading awareness and support for health awareness and healthy eating behaviour, as well as to utilise existing services in the country, which calls for integration with the websites of the Ministries of Health and Education (Figure 3.7 & 3.8).

**Figure 3.8**

*The Principal Contents of the Conceptual Framework of the Study: Theories, Aim, Research Questions, Methodology, and Informing the Design of an Online Health Awareness Programme.*



The next section discusses the effectiveness of interventions and mindful eating techniques for emotional eating to draw attention to the potential of the Internet as a successful means by which to deliver programmes to adolescents to facilitate the adoption of healthy behaviours.

### **3.7 Interventions for Emotional Eating**

#### ***3.7.1 Mindful Eating Techniques***

Mindful eating techniques can help overcome some eating-related disorders, such as binge eating disorder (Kristeller & Hallett, 1999), Prader-Willi syndrome (Singh et al., 2008), and bulimia nervosa (Proulx, 2007). These eating disorders can be effectively treated with these techniques of mindful eating to alter eating behaviour, reduce and eventually stop binge-eating behaviours, and to increase awareness of the difference between hunger, satiety, and cravings (Proulx, 2007).

Methods based on mindfulness seem to have the most effectiveness in dealing with eating sprees, and eating in response to emotions (emotional eating) and external prompts (external eating) (Warren et al., 2017). In the recent past, several systematic reviews have been undertaken to examine the value of eating mindfully (Godfrey et al., 2015), and interventions based on mindfulness in binge eating, obesity and behaviours associated with obesity, and eating disorders (Godsey, 2013; Katterman et al., 2014; Olson & Emery, 2015; O'Reilly et al., 2014). The review by Katterman et al. (2014) found that mindfulness-based interventions resulted in a considerable reduction in binge eating before and after the interventions. The same review found that such interventions were also beneficial in the lessening of emotional eating, though this was in individuals who had reported high extents of this behaviour. Evidence supporting the efficacy of mindfulness-based interventions in emotional and external eating was also provided by Godsey (2013), Olson and Emery (2015), and O'Reilly et al. (2014). However, there was lower evidence of their value in weight management (Godsey, 2013; Katterman et al., 2014).

Further, it is submitted that healthy dietary patterns can be achieved through the adaptation of mindful eating. In general, being mindful about something is regarded as having the capacity to maintain one's alertness while various stimuli traverse one's consciousness. Assuredly, developing the mindfulness to decide on what to eat is a noteworthy matter. Further, improvement of dietary patterns and the enhancement of metabolic well-being could be facilitated by a distinct understanding of nutrient-dense foods. Moreover, there is merit in advice concerning beneficial eating activity, as in the

intake of a diet low in calories but including vital nutrients, such as omega fatty acids, first-rate proteins, carbohydrates, minerals, and natural bioactive components from fruits and vegetables. Furthermore, the adoption of mindful eating could help in enhancing and sustaining self-management of healthy dietary patterns (Youngwanichsetha, 2018).

The fundamental principles of mindful eating, as provided by Monroe (2015), are summarised in Table 3.5.

**Table 3.5**  
*Basic Principles and Practice of Mindful Eating*

<b>Principle</b>	<b>How to Implement</b>
1. Decrease rate of eating.	Chew well prior to swallowing, take littler bites, stop and/or drink water in the middle of bites.
2. Measure cues for hunger and fullness.	Evaluate motivation for eating (feelings vs. hunger). Utilise a hunger scale (see Appendices 2 and 3) to measure extent of hunger.
3. Decrease sizes of portions.	Serve smaller portions, utilise smaller tableware, ask for tinier servings at restaurants.
4. Lessen diversions while eating.	Switch off music and television; eat at a table; place emphasis on relishing food.
5. Enjoy food.	Make eating an enjoyable activity, utilise all sensations to relish food, and construct affirmative, enjoyable eating conditions.

In contrast, eating becomes mindless when food is consumed to satisfy requirements other than hunger, such as in response to a display of food, eating because family members and friends are eating, being attracted to packaging, succumbing to sensory temptations, and wanting to fit in with social groups. Nutritional and biological requirements do not play any role in mindless eating, but people who are unaware of this tendency will believe that they are eating to satisfy their hunger, even when this is not the case. This type of mindless eating behaviour may lead to serious health complications (Wansink, 2006). Many studies have shown that when people are less conscious of their food consumption, they often end up eating healthier foods (Bahl et al., 2013; Vartanian et al., 2008). Wansink and Sobal (2007) identified about 200 ‘mindless eating decisions’ made by individuals every day (such as whether or not to have food, quantity, type and place of food, etc.).

A study by Pierson et al. (2016) scrutinised the factors related to emotional and mindless eating among school students using the validated Eating in Emotional Situations Questionnaire (EESQ), which contains 11 emotional conditions, and the adults' Mindful Eating Questionnaire (MEQ). The first instrument was used to measure emotional eating whereas the second was to measure mindless eating. A third instrument utilised in this study was a validated survey to check food consumption, which was suitable for the participants' age group. The population of their study was a convenience sample of 287 Hispanic and non-Hispanic white students from the third to fifth grade of two low income schools in California. This study found that eating in three or more emotional conditions was reported by more than half (52.7%) of the participants whereas eating in six or more emotional conditions was reported by about a sixth (17%) of the participants. Further, mindless eating and emotional eating were found to have a significant correlation in the case of the participants. However, mindless eating behaviours were reported more significantly by third graders rather than fifth graders. Intake of sugar-sweetened foods and sweet snacks was significantly related to mindless eating. Pierson et al. (2016) concluded that the intake of pleasant foods could be influenced by mindless eating behaviour in children. Nevertheless, they agreed that more research is required to identify the causes for mindless and emotional eating, while also agreeing that interventions that place emphasis on mindful eating may promote healthy eating behaviour among children of elementary school age.

### ***3.7.2 Awareness Programmes on Healthy Eating***

The background paper published by the Food and Agriculture Organization of the United Nations (FAO) observes that public awareness campaigns are an effective method of communication, whose objective is to generate awareness and modify the behaviour of the general population (Hawkes, 2013). Frequently, these campaigns are described as mass media campaigns. In fact, the WHO (2011) has endorsed mass media campaigns as one of their "Best Buys" for the prevention and control of non-communicable diseases (NCDs). Such awareness campaigns also use various other channels to provide information to the general public (Hawkes, 2013). These include: health and education-related settings; public relations events, such as talks, demonstrations and tours; social media; and mass media.

Different techniques for raising awareness are used by public awareness campaigns through these channels. These range from information resources to more refined strategies, such as social marketing, or employing elements acquired from the psychological sciences,

such as Social Cognitive Theory (Hawkes, 2013). The focuses of public awareness campaigns over the past few decades have typically been oriented towards food-based dietary guidelines; generic healthy eating; fruits and vegetables; other “eat more” foods (wholegrain, low-fat milk; salt); other “eat less” foods (e.g. sugar-sweetened beverages, fats); and food labelling (Hawkes, 2013). Generic public awareness campaigns, in the form of “social marketing,” have also been led by governments working together with the private sector (Evans et al., 2010). For example, the Change4Life campaign in the UK, which aims to create awareness around obesity, is a social marketing campaign that has been in progress since 2008 (NHS-UK, 2012). Other examples of awareness programmes include Get Set 4 Life (Australia), Eat Move Live (New Zealand), VERB (US), Live Long Kids (Canada), Push Play (New Zealand), and ‘Get a Life, Get Active’ and ‘It all adds up’ (Northern Ireland) (Best et al., 2017; Wiltshire et al., 2017).

Previous research demonstrated the significance of public awareness campaigns for health communication by using various other channels to provide information to the general public. Different techniques and focuses can be used through these channels for raising the efficiency of the public awareness campaigns, besides working with the private sectors to create awareness around health problems. Due to the lack of health awareness campaigns in Saudi schools (see Chapter 2), more considerable efforts are needed toward these campaigns targeting raising awareness in healthy eating and healthy behaviours among Saudi adolescent students.

### ***3.7.3 Online Programmes on Healthy Eating***

Substantial research has pointed out that diet and eating behaviour are considered as a fundamental cause of obesity and chronic diseases. Nutrition has been identified as a key determinant of chronic diseases (Story et al., 2008). In childhood and adulthood, people are heavier than ever before. Overweightness can endure to adulthood and later cause chronic health problems, which are attributable to sedentary lifestyle, unhealthy eating, and overweight, that can be prevented by creating healthy habits in young people (Hamel & Robbins, 2012).

In the KSA, most technology and Internet users are young children, implying that young people face challenges as a result of the information and technology revolution (Almogbel et al., 2015). On average, the time spent surfing the Internet and watching television has been reported to be 5 hours, 3.5 hours and 4 hours, in the US, Europe, and Australia, respectively (Kak et al., 2013). In the KSA, adolescents spend on average approximately 2 hours per weekday and close to 3 hours per weekend day playing

computer games and surfing the Internet (Ramirez et al., 2011). Based on the study by Almogbel et al. (2015), 44.3% of young children use the Internet for less than 2 hours, 26.6% use it for 2-4 hours, 14% for more than 6 hours, and 11.9% for about 4-6 hours during the day. Furthermore, 59.7% of the children owned a computer and 37.7% did not own a computer (whilst 2.6% of the children did not mention it). As a result, the Internet has become more significant and is considered as a centre ground for when a young person develops a concept of self (Almogbel et al., 2015). Regarding Internet use, Van et al. (2013) stated that during leisure time, the amount of time consumed in using a computer and watching television has increased from 26% in 1975 to 43% in 2005. Moreover, several studies (Casazza & Ciccazzo, 2007; Cullen et al., 2005; Long & Stevens, 2004) have reported that adolescents also have shown a preference for receiving information related to health through the computer and the Internet rather than via traditional ways, such as printed materials. Likewise, several lines of evidence have suggested that these types of programmes can encourage children and adolescents to increase their levels of effective physical activity (Hamel et al., 2011). Consequently, online programmes are a promising method of educating this population regarding healthful behaviours due to the technological capacities of children and adolescents and their predilection for information introduced in this manner (Casazza & Ciccazzo, 2007; Crutzen et al., 2011).

The next section describes recent studies which have designed Web-based awareness systems.

### **3.7.3.1 Design of Online Awareness Systems.**

The level of the effectiveness of electronic health interventions could be impacted by their design, that is, the manner of delivery of the content (Morrison et al., 2012). Morrison et al.'s (2012) systematic review of 52 published reports from diverse and representative samples identified four essential interactive design features. These features, they posited, could serve to mediate the influences of intervention design on consequences. The four features are "social context and support; contacts with intervention; tailoring; and self-management" (p. 137). This section therefore scrutinises existing literature related to the design and development of online awareness/intervention programmes in general. The objective of this review is giving a brief overview of the successful themes used in various programmes that can be considered when designing health programmes. The themes are as follows:

### *a. User-centred Design (UCD)*

User-centred Design (UCD) is a design for behaviour change concerning how design can impact people's behaviour to address the challenges that face society (Won & Tang, 2017). Regarding health and healthy eating, UCD can be used in the primary care services and an intervention that could be associated with better health outcomes. Furthermore, educational tools must be adapted to individuals and caregivers in terms of health literacy and usability (Gagnon et al., 2019). Therefore, UCD demands better comprehension of the context and the users, in particular the factors which influence behaviour (Zachrisson & Boks, 2012). Moreover, UCD provides considerable methods to combine this kind of insight from participants. It is essential to understand the factors influencing children's food choices and consumption to support the development of appropriate interventions facilitating healthy eating (Won & Tang, 2017).

Further, Ludden and Hekkert (2014) stated that UCD has been recognized as an approach that could promote healthier behaviour. Designers shape the services and development of products which aid people to improve their behaviour and foster healthier lifestyles. However, they show little recognition of how to combine such insights from children. Children users have different interests, needs, and preferences (Druin, 2002), as well as developmental needs (Fails et al., 2012), which are different from adults. In this regard, UCD is an essential method that can be applied for a better understanding of children's behaviours, besides enhancing their involvement in creating suitable design solutions to promote healthy eating. Applying different ways can assist designers in inspecting settings and determinants regarding healthy eating from several angles, providing verbal, visual, as well as written outputs that can be useful design for healthy behaviour among adolescents. Furthermore, the developmental needs of adolescents should be taken into consideration, as they are included in the design process of healthy eating interventions (Won & Tang, 2017). Therefore, this study involved adolescents in the design of the objectives and the contents of an online health awareness programme to identify suitable methods for investigating and supporting the needs of adolescents towards healthy eating and healthy behaviour (see section 8.3).

### *b. Supporting long-term maintenance*

Stevens et al. (2008) described the design and implementation of an interactive website to support long-term maintenance of weight loss. The intended audience for this website were persons who had lost weight recently and wanted to maintain their weight loss. The

development of the website took place over a year and involved an interdisciplinary team encompassing health experts (e.g., public health researchers and experts in behaviour change interventions) and website development experts (e.g., application developers and interface designers). Principal features of the developed website included interactive societal support, self-supervising, written recommendations for diet and physical activity, links to suitable websites, empathetic tools for modification of behaviour, accountability for check-in, individualised messages for reinforcement, and training for problem-solving and prevention of relapses. The programme for weight loss maintenance included a system of reminders (pre-set telephone and email messages) that encouraged participants who had missed a check-in deadline to visit the website. The participants would be called by a staff member if the pre-set messages did not encourage a response. Stevens et al. (2008) evaluated the implementation of this website through an on-going randomized control trial (RCT) with 348 participants and average age of 56 years. Preliminary findings from the trial indicated that the prompts (telephone and email) seemed to be successful in enabling the participants to maintain continual use of the website.

*c. A community-based participatory research*

A study by Kattelman et al. (2014a) described the development of a customised, Web-delivered, theory-based intervention (YEAH-Young Adults Eating and Active for Health) which used a community-based participatory research model to inhibit undue weight gain in young adults. The four phases of the PRECEDE model (PRECEDE-PROCEED process) were utilised by researchers from 14 US universities to develop the YEAH portal and the supporting portal for administration. Steering committees for the development of YEAH included the intended audience (age 19-24 years) and critical personnel associated with health/wellness. These were established in each institution and offered information to inform the development across phases. Outcomes of a pilot were utilised to polish the curriculum and to recognize and prevent obstacles to delivery. The information obtained during the first three PRECEDE phases included identification of factors of greatest significance to young adults; clarification of the environmental supports necessitated for healthful existence; and identification of significant and variable behavioural and environmental modifications. Development of the 10-week, theory-based, stage-tailored, interactive-learning intervention with a 10-month reinforcement period took place in the fourth phase. Kattelman et al. (2014a) reported that the use, with fidelity, of the PRECEDE model led to an intervention that was found useful and relevant by participants of the pilot study, gained their attention, imparted confidence in their capacity to use the

information, and offered a feeling of satisfaction. However, a study by Bridges et al. (2018) drew attention to a limitation of the PRECEDE-PROCEED model in that it is an extremely wide-ranging planning model. Consequently, precise support for influencing behaviours is not provided. That is, there is no guidance regarding which exact prompting, facilitating, and supporting factors require to be prioritised.

*d. Making the system respond to the individuals' requirement by collecting their information to inform the design (structure and content)*

A study by Thompson et al. (2012) drew attention to the potential of the Internet as a successful approach to deliver programmes to adolescents to facilitate the adoption of healthy behaviours. Their study attempted to collect information to inform the design (structure and content) of a teen-friendly website encouraging behaviours related to healthy eating and physical activity from 113 participants aged between 12 and 17 years. The participating adolescents provided ideas to conquer typical obstacles to healthy eating and physical activity which were then utilised to develop “Teen Choice: Food & Fitness”, which is a 12-week online programme for behaviour change. Cartoon characters were utilised to depict role models in the programme. Overall, this study emphasised the need to include members of the intended audience in the formative research to create programmes for behaviour modification that are applicable, attractive, and deal with their interests and needs.

Relatedly, Cullen et al. (2013), in their study to evaluate the effect of this online programme, described the capabilities/features of the programme. These included the capability for unique and secure user credentials. Moreover, at the initial sign in, adolescents were requested to examine the resources related to diet and physical activity, and utilise the healthy eating calculator to identify recommendations pertaining to food groups and physical activities. Consequently, they could set weekly targets to improve on behaviour related to diet and/or physical activity. Further, 12 brief video stories (six each on healthy eating and physical activity) are provided which address barriers and feature adolescent role models. A Teen Kitchen provides recipes. Moreover, a ‘Did you know?’ section provides information related to nutrition and physical activity. Further, a refereed blog can be accessed by website users, and they can formulate strategies to help them achieve their goals, monitor their progress, describe achievement of goals, take part in problem solving, and print a copy of their goal sheet. Cullen et al. (2013) observed that the stories using role models, setting of goals, problem solving, and self-supervision were the critical elements related to behaviour change.

A study conducted by Im et al. (2016) highlighted the need to take practical issues into consideration when developing and implementing a Web-based system oriented towards participants of a specific ethnicity. Taking the instance of an Internet Cancer Support Group, they explored the practical concerns associated when the target audience were Asian American cancer patients. The principal issues identified in creating a culturally tailored support group included the complexities of utilising multiple languages; association with the IT department and technological concerns; complexities in recruitment and retention of participants; ideal timing; and features of the users.

*e. Cooperating with stakeholders and agree with them for the content industry.*

Cousineau et al. (2008) interacted with stakeholders to obtain agreement on the most crucial areas of content for a nutrition Web education and prevention programme for the workplace. This method entailed obtaining key viewpoints and attributes from stakeholders in the gaming industry as part of a process of “concept mapping” (CM). CM comprises various steps performed in sequence. The first, elicitation research, generates precise viewpoints in response to an inducement question and is typically achieved through stakeholder interviews. The second, consensus building, pertains to participants sifting their own inputs into reasonable thematic groups and then assessing the comparative significance of each statement. In the third step, analysis, a specialised software programme is utilised to create conceptual maps. Finally, in the fourth step, the results are interpreted and this is translated to the educational programme.

The insights gained from previous research lay the groundwork for future research to develop the design of online health awareness programmes by taking into account their various approaches which had been used successfully.

### **3.7.3.2 Effectiveness of Online Awareness/Intervention Programmes.**

This section scrutinises existing literature related to the effectiveness of online awareness/intervention programmes. Overall, in the context of the present study, it could be seen that there was a lack of research attention and evidence concerning online interventions in the case of adolescents. Moreover, while there seemed to be a greater emphasis on populations of mixed ethnicities as found in universities or workplaces, there seemed to be limited attention to this matter in the Middle East, in general, and in the KSA, in particular, perhaps due to the recent attention to this matter in this region. The next section reviews the effectiveness of online awareness/intervention programmes based on the key idea of each programme.

### *1. Investment in innovative technology and evaluation of the outcomes.*

More than a decade ago, Cousineau et al. (2008) highlighted that personalised nutrition programmes on the Internet were an evolving trend associated with the prevention of obesity. They also highlighted that the target population for such programmes be well understood prior to investment in innovative technology. Accordingly, they attempted to assess the viability of a nutrition Web programme in a workplace through a study set in the gaming industry with 104 participants. The participants were exposed to a prototype Web programme to ascertain its viability. Outcome measures utilised were concept mapping, a nutrition knowledge test comprising 16 items, and user satisfaction. Cousineau et al. (2008) found that moderate consensus was displayed by the participants regarding the prioritisation of content for the programme. For example, participating employees and managers disagreed on the priority of content related to Physical Activity and Employee Participation and Support. Nevertheless, the nutrition knowledge of the employees considerably increased post the intervention. Overall, this study drew attention to the need for programmes to consider the needs of different stakeholders. Furthermore, the use of computer-based approaches could deal with the health concerns of different stakeholders through personalised, adapted programming. Recently, Yang et al. (2019) undertook a meta-analysis to scrutinise the impacts of Web-based interactive interventions for health. The outcomes of the included studies indicated the effectiveness, in general, of such interventions. However, the health matter under consideration, theoretical framework, and study design, were found to moderate the outcomes.

Cullen et al. (2013) reported the outcomes of an RCT that evaluated the effect of the “Teen Choice: Food and Fitness” programme (Thompson et al., 2012). Using online surveys at baseline, this trial measured the physical activity, diet, sedentary behaviour, and enablers of diet/physical activity of 408 participants aged between 12 and 17 years. The participants were randomly requested to log onto either the control condition or intervention website for eight weeks to study the content and establish targets to enhance behaviour associated with nutritional and physical activity. At the post-test, which took place after eight weeks, consumption of three or greater daily servings of vegetables were reported more for participants in the intervention group than the control group. However, significant surges in physical activity and considerable reductions in TV viewing were reported by both groups. Over the eight weeks, the mean rate of logging on was 75% and this did not vary by condition. Overall, Cullen et al. (2013) found that the adolescents were

enabled by the website to enhance consumption of vegetables, increase regular physical activity, and decrease inactivity.

Observing the failure of dietary programmes, in general, to produce enduring results due to the tendency of participants to lapse into their erstwhile habits, Kaipainen et al. (2012) suggested that slight modifications based on straightforward guidelines to behaviour and environment may be the most effective in the persistent maintenance of changes to habit. In this regard, they evaluated the retention of participants, outcomes related to weight, and obstacles for changes in the National Mindless Eating Challenge (NMEC), a Web-based healthy eating and weight loss programme that was publicly available. The sample for the study comprised 2,053 participants (principally female/white/Caucasian with an average age of 39.8 years, average BMI of 28.14). After completing a preliminary profiling scrutiny, participants were assigned tips/recommendations concerning changes to three specific habits. Participants were required to complete a follow-up survey at the end of each month and obtain fresh suggestions for the following month. Overall, 75% of the participants who had participated in the preliminary scrutiny did not complete the programme. On average, participants who remained in the programme lost 0.4% of their weight at the start of the programme. Participants who remained in the programme for three consecutive months at a minimum and also completed no less than two follow-up surveys lost, on average, 1% of their initial weight. Moreover, participants who reported adherence to the recommended changes for 25 or more days in a month reported weight loss of 2 lbs per month on average. Lower weight loss was reported by participants who withdrew from the programme after 1 or 2 months, or those who did not comply with the recommended changes. Greater monthly compliance to recommendations was reported by participants who lost weight during the programme. Barriers for change typically reported included incompatible or inapt recommendations, changes not implemented because they were overlooked or the participants were otherwise engaged, uncommon conditions, and emotional eating. Kaipainen et al. (2012) concluded that online interventions centred on small modifications could probably result in clinically significant loss of weight, and could benefit further by incorporating individualisations suited to personal conditions and psychological requirements.

## *2. Evaluating the effectiveness of interventions in relation to maintenance of eating behaviour and good health habits.*

Another study by Jones et al. (2008) evaluated the effectiveness of a 16-week intervention related to maintenance of weight and binge eating in 105 adolescents that was Internet-facilitated. The participants were randomly assigned to an online intervention (StudentBodies2-BED) or a control group (wait-list). The outcomes of the study indicated that the BMI z-scores, from baseline to follow-up assessments, of the participants assigned to the StudentBodies2-BED group were significantly lower than the participants from the control group. Moreover, there was a considerable reduction, from baseline to post-treatment evaluation, in objective and subjective binge episodes of the participants assigned to the StudentBodies2-BED group, along with considerable decreases in concerns related to weight and figure, from post-treatment to follow-up evaluations and from baseline to follow-up evaluations. Furthermore, at follow-up assessment, a greater decrease in BMI was seen in participants assigned to the intervention group who participated in binge eating episodes or objective overeating in contrast to those in the wait-list control group. Overall, Jones et al. (2008) found that an intervention that was Internet-facilitated was moderately successful in temporary weight reduction and maintenance and produced a considerable decrease in binge eating. Further, simultaneous achievement of weight management and decrease of the psychopathological aspects of eating disorders was possible through the use of an Internet-facilitated intervention that could be distributed effortlessly.

Alexander et al. (2010) evaluated the change in consumption of fruits and vegetables in a population-based sample by randomly assigning participants to one of three experimental arms, namely: an online non-customised programme, a customised behavioural intervention, and a customised behaviour intervention incorporating motivational interviewing-based counselling using email. The 2,540 participants (age 21-65 years) were members of five different health plans. The fruit and vegetable consumption of the participants was measured at baseline and then at three-monthly intervals for a year. The average change in daily fruit and vegetable servings were measured twelve months after baseline. Overall, Alexander et al. (2010) found that only 80% of the participants received follow-up at the end of the interventions. Across all study arms, there was an increase in the average servings of fruits and vegetables, with the highest increase being seen with the third experimental arm. Alexander et al. (2010) therefore concluded that online nutritional interventions have potential as dietary interventions for a population, as they are

convenient, straightforward to distribute, and would seem to support maintenance of dietary modifications.

Lieffers (2016) evaluated the MyGoals feature of eaTracker (<http://www.eaTracker.ca/>), a Web-based tool from Dietitians of Canada, and EatRight Ontario (ERO, <http://www.eatrightontario.ca/>). Moreover, she scrutinised the experiences and perceptions of adults who access publicly available mobile nutrition behaviour modification apps for weight control and the usage of mobile apps in dietetic practice in Canada. Overall, this study found that goals set using eaTracker® were typically of poor quality and unrealistic, and consequently were not tracked to completion. In the case of ERO, participants believed that goal setting for behavioural changes associated with nutrition and physical activity was beneficial. However, following through with goals was difficult. Moreover, no participants of the study had utilised the ERO's dietitian services. Apps such as MyFitnessPal® (MyFitnessPal, San Francisco, California) that are related to modifications in nutrition behaviour were popular but were typically utilised without seeking the assistance of a professional. Lieffers (2016) identified five categories of aspects regarding the users' experiences with these apps, namely, data entry; liability, response, and improvement; technology and app-associated; individual; and fixation. For instance, most participants performed data entry through the course of the day whereas some did so at the end of the day. The remaining few pre-arranged their food consumption using the apps. However, while usage of apps was affected by technical issues or individual factors, such as privacy, self-motivation, and awareness, some female participants highlighted the apps could encourage a fixation with recording of dietary consumption and calories consumed. Finally, Lieffers (2016) found that more than half of the participating dietitians reported the use of mobile apps in their practice. Again, more than half the participants reported that they had had clients who inquired about or utilised an app related to food/nutrition. Relatedly, about two-fifths of the participating dietitians had recommended apps related to food/nutrition to their clients. However, they also drew attention to factors which could influence the dietitians' recommendation of apps to clients and their own usage of such apps. These included factors related to the mobile device and app (e.g., quality of content, ease of use, cost, etc.), individual factors (e.g., awareness, appropriateness, capacity/readiness to pay, etc.), and workplace factors (e.g., being permitted to utilise mobile phones in the workplace, poor mobile infrastructure, etc.) (Lieffers, 2016; Lieffers et al., 2014).

The objective of another study by Schweitzer (2014) was to evaluate the efficacy of an electronic health intervention in enhancing the health habits of college students. This population was investigated since the health habits of college students are considerably challenged, as they move from adolescence to early adulthood. In this study, a programme for diet and physical activity spanning 24 weeks was sent via email to 99 college students (age 18-20 years) from a diverse college campus. The intervention (“A Lifestyle Intervention Via Email” (ALIVE), NutritionQuest (Berkeley, CA)) contained individualised, collaborative goals for diet and physical activity that were changed every week based on each participant’s stage of change. Exercise-related health fact sheets containing no diet information were sent to a control group of participants (49 students). Surveys were conducted at baseline, end of the 12<sup>th</sup> week, and end of the intervention (24<sup>th</sup> week) to assess diet and physical activity. Overall, Schweitzer et al. (2016) found that electronic health interventions were practical to increase the consumption of healthy food and decrease unhealthy eating among the intervention group in comparison to the control group.

### **3.7.3.3 Discussing the Key Ideas and Findings.**

Overall, it could be seen that the prevalence of programmes for weight loss on the Internet is growing. Moreover, there has been significant academic attention to the matter, as evident from the reviews of Arem and Irwin (2011), Goode et al. (2015), Hageman et al., (2017), Kodama et al. (2012), Sorgente et al. (2017), and Wieland et al. (2012), among others. However, it could be seen that the principal emphasis of most interventions and studies was loss or maintenance of weight in different populations, such as women from rural communities (e.g., Hageman et al., 2017), cancer survivors (e.g., Goode et al., 2015), persons who are overweight and obese (e.g., Sorgente et al., 2017; Wieland et al., 2012), persons with type 2 diabetes (Christian et al., 2008) or metabolic syndrome (Christian et al., 2011). Moreover, loss or maintenance of weight (e.g., Arem & Irwin, 2011; Binks & van Mierlo, 2010; Carter-Edwards et al., 2009; Hageman et al., 2017; Kaipainen et al., 2012; Neve et al., 2010, 2011; Sorgente et al., 2017; Wieland et al., 2012) and/or associated behaviour modifications were stressed (e.g., Verheijden et al., 2007).

Additionally, attrition or retention of participants seemed to be an overarching concern. For instance, it has been reported that while the retention of participants in such programmes is typically high (70-83%), this can fluctuate considerably based on the design of the study. Lowest rates of retention were seen in programmes with irregular individual contact or an extended duration (Carter-Edwards et al., 2009; Kaipainen et al., 2012; Neve

et al., 2010). Also, Verheijden et al. (2007) found that a module-based website intervention for healthy weight and behaviours had been utilised multiple times by only about 10% of users, indicating perhaps a lack of interest in behaviour change counselling. On the other hand, higher rates of retention (88-94%) were seen in programmes where participants had been enrolled from clinics. In this case, follow-up contact was performed at the usual visits for physician care (Christian et al., 2008, 2011). On the other hand, weight loss has not been reported to be significant or medically appropriate in programmes constrained by poor design, although the rate of retention may be high (Schweitzer, 2014).

Moreover, a systematic review by Neve et al. (2011) reported that the effectiveness of Web-based interventions in successful weight loss or maintenance of weight could not be determined. Nevertheless, while greater use of the features of such websites may be related to favourable modifications to weight, the specific features which enhance this outcome could not be determined. Moreover, only about a third of the individuals who subscribed to weight loss websites continued to be active through to the end of their subscriptions. This finding was corroborated by another study by Binks and van Mierlo (2010), who found that very few users had utilised the various elements (e.g., meal planner, nutritional data lookup tool, activity log, support group message board, etc.) of such websites, indicating that the website usage could be limited. Further, these studies have found that website usage can reduce over time (Binks & van Mierlo, 2010; Neve et al., 2010; Neve et al., 2011; Verheijden et al., 2007).

The predictors of website usage have also been scrutinised by researchers. For instance, Verheijden et al. (2007) found obesity, adequate baseline moderate physical activity, adequate levels of vegetable intake, age >40 years, and non-smokers and past smokers could independently predict repeated usage of websites. On the other hand, gender, intake of fruits and alcohol, and level of education were not independent predictors. Further, Neve et al. (2010) determined that higher age groups (45-65 years) and higher baseline levels of exercise and eating breakfast were safeguards against non-usage attrition. In contrast, emotional eating, skipping of meals and usage of sugar in tea or coffee predicted non-usage attrition. It has also been found that there was a greater likelihood that male users and older users would adhere to the physical activity interventions contained in a website (Wanner et al., 2010).

Further, different study designs have been utilised encompassing placing emphasis on maintenance of weight over weight loss (Cussler et al., 2008; Rothert et al., 2006; Stevens et al., 2008; Thomas et al., 2011), cohort studies (without controls) (Carter-Edwards et al.,

2009; Krukowskil et al., 2008; Neve et al., 2010), assessing various Web-based programmes (Appel et al., 2011; Booth et al., 2008; Gold et al., 2007; Tate et al., 2001), comparing Web-based programmes with various control conditions (e.g., usual care, no care, and paper information only) (Christian et al., 2008, 2011; Hunter et al., 2008; Lubans et al., 2009; McConnon et al., 2007; Patrick et al., 2011; Tate et al., 2006). Higher loss of weight rather than control is achieved by personalised electronic interventions which have active goals for weight loss and features for self-reporting. In contrast, weight loss is even higher in interventions which involve personal interaction (Arem & Irwin, 211; Kodama et al., 2012; Wieland et al., 2012). Overall, it could be inferred that weight loss programmes in adults should place emphasis on customising behavioural interventions for diet and physical activity. Moreover, they should include live interaction with qualified experts accompanied by a maintenance follow-up programme delivered on the Internet (Schweitzer et al., 2016).

As mentioned previously, college students are in a state of transition as they progress from adolescence to early adulthood. Thus, interventions targeted to this population must be designed taking into consideration this state to improve their effectiveness (Schweitzer et al., 2016). Across the world, electronic interventions have been effectively utilised to enhance various health behaviours, such as abuse of substances, stopping smoking, management of stress, diet and exercise (Brown, 2013; Carey et al., 2009; Hager et al., 2012; Hebden et al., 2014; Huang et al., 2009).

A comparison of interventions targeted towards adults and persons of college age revealed that volunteer bias was common. For instance, female participants made up the majority in most interventions associated with diet and exercise regardless of targeted age group (Schweitzer et al., 2016). Nevertheless, rates of retention ranged between 64% and 96% in college studies (Hebden et al., 2014; Napolitano et al., 2013), indicating that college students were more likely to remain in a programme once they had enrolled for it. Nevertheless, it must be noted that the number of electronic intervention studies scrutinising college students is lower than those scrutinising adults (Schweitzer et al., 2016).

Physical activity programmes utilising electronic technology have been found to be effective in the case of college students. For instance, Huang et al. (2009) found that the levels of physical activity in female college students in Taiwan were enhanced after a Web-based intervention of three-month duration. The participants of this pre-post-test control group design study were assigned to one of three groups: an experimental group, a

generic group, and a control group. The first group received messages on the website that were stage-matched, whereas the second received messages on the website that were non-stage-matched. The control group was not given access to the website and received only lectures. The outcomes indicated that the greatest improvement was seen in participants in the stage-matched group followed by the generic group with regard to stage-of-exercise and quantum of exercise. On the other hand, the control group seemed inclined to a decline. However, while the effects of the intervention did not persist in the experimental and generic groups, the level of exercise self-efficacy was significantly higher in the experimental group compared to the other groups immediately following the intervention. Overall, the outcomes of this study indicate that the use of theory-based messages (albeit the website was highly interactive and included high level graphics and virtual technology) could effectively improve the levels of physical activity and exercise self-efficacy in young females.

A study by Cavallo et al. (2012) assessed the effectiveness of a physical activity intervention that blended education, monitoring of physical activity, and online social networking (through a Facebook group) to enhance societal support for physical activity, in contrast to a control that used only education. Emails, website instructions, and moderator interactions were used to encourage intervention participants over a 12-week period. These were intended to invite and offer societal support to enhancing physical activity by means of a Facebook group with a physical activity theme. Moreover, participants were given access to a dedicated website which contained educational materials and tools to self-monitor physical activity. Cavallo et al. (2012) found that over time increases in societal support and physical activity were experienced by the participants. However, over time, the perceived societal support and physical activity did not differ between the groups. Cavallo et al. (2012) therefore concluded that while the combination of social networking and self-monitoring had not fared as well as education-only controls in improving perceptions of societal support or physical activity, the use of online social networks in health promotion required greater investigation.

Another study by Magoc et al. (2011) scrutinised a population of college students primarily of Hispanic origin in a six-week long intervention. This study reported enhanced periods of moderate and vigorous physical activity following a Web-based intervention using the WebCT course technology programme. In contrast, only information regarding physical education was provided to the control group and these participants were encouraged to utilise activity logs. The results showed no changes among the control group

towards PA. A study by Hager et al. (2012) required volunteer participants to use either classroom lecture or an online course with similar curriculum content to complete a general education health and wellness course. On the whole, the level of physical activity of the students and their consumption of fruits/vegetables, bran/whole grain cereal, and brown rice/whole wheat bread improved. Interestingly, more robust improvements were yielded by the classroom lecture than the online course.

A large study using an RCT design by Greene et al. (2012) utilised an online curriculum to enhance nutrition and physical activity of college students. The participants for this study (n = 1,869, age 18-24 years) were from eight US universities. The intervention comprised a 10-lesson (one lesson a week) curriculum which placed emphasis on healthful eating and physical activity. In particular, non-dieting guidelines, such as eating competence and size acceptance, were highlighted. The online curriculum was developed using software from Rainstorm, Inc. (Orono, Maine, USA). Greene et al. (2012) found that the curriculum completion rate for the intervention group was 84%. Moreover, over a period of 15 months, this group, in contrast to the control group, demonstrated considerably higher intake of fruits/vegetables and participation in physical activity. Further, this behaviour was still present at the follow-up after 15 months. Overall, this study indicated that an online intervention encouraged competent decisions related to healthful food and eating, had an enduring effect on the consumption of fruits and vegetables, and sustained physical activity at baseline levels.

Another RCT study by Franko et al. (2008) reported the outcomes of the use of MyStudentBody.com-Nutrition (MSB-N), an Internet-based education programme for nutrition and physical activity. Students from six US universities were randomly assigned to three groups: two experimental (MBS-N, MBS-N plus Booster) and one attention placebo control. Consumption of fruits and vegetables was found to have increased in the participants in the experimental groups. Also, the motivation to modify eating behaviours was improved in members of the same groups, along with the likelihood to enhance their societal support and self-efficacy for dietary modification. Moreover, the attitude of these participants improved towards exercise. On the whole, MSB-N was found to be an effective Internet-based programme that could be widely used for nutrition education and motivating alteration in health behaviours on college campuses.

Online programmes for weight loss have also been scrutinised in the context of college students. For instance, a cohort study by Harvey-Berino et al. (2012) explored the feasibility of an online programme for behavioural weight management for college

students. The programme placed emphasis on behavioural strategies to alter students' eating and exercise behaviours. Tools such as weekly chat meetings with a facilitator, recommendations for calorie and fat gram, everyday food logs, and guidance for exercise, were included in the programme. On the whole, 23% of the students (total participants = 336) lost more than 5% of their baseline weight after the intervention. In a pilot RCT, Hebden et al. (2013) provided printed diet booklets with a dietitian's instructions to intervention and control groups. Additionally, the intervention group received four SMS text messages per week, four emails per week, and could access smartphone applications and Internet forums. Overall, this piloted mHealth programme offered some temporary and favourable modifications in weight, diet, and physical activity. However, these alterations did not differ from those seen in the controls.

Kattelman et al. (2014b) evaluated the effectiveness of the YEAH intervention (Kattelman et al., 2014a). Using an RCT study design, the study was conducted over 15 months commencing with a ten-week intensive intervention and a subsequent follow-up after 12 months. Email and the Internet were utilised to deliver the intervention to 1,639 college students across 13 college campuses. Using the WebHealth (that is, a non-diet method) and placing emphasis on eating behaviour, physical activity, management of stress, and healthy management of weight, mini-educational lessons and email messages (or nudges) were developed. The purpose of the nudges was to reinforce curriculum content; they were brief, regular, engaging, and customised to every behaviour by stage. At post-intervention, trifling improvements in fruit and vegetable consumption, brisk physical activity (in females), intake of fat, self-instruction, and control for mealtime behaviour, and sleep hours, were observed for both experimental and control participants; however, these had not been maintained at follow-up. Moreover, a larger number of participants from the experimental group were in the action/maintenance phase for fruit and vegetable consumption in comparison to the control group. Overall, the intervention facilitated favourable modifications in behaviours that may mitigate undue gaining of weight, such as enhanced consumption of fruit and vegetable intake and healthier self-regulation behaviours at mealtimes, directly after post-intervention. Nevertheless, the need to explore further strategies to sustain changes to behaviour was indicated.

Mobile apps have also been scrutinised for their effectiveness in developing awareness of healthy eating behaviour. For instance, a study by Helander et al. (2014) scrutinised the usage of a diet self-monitoring app (The Eatery), which permits users to rank their food (and the food consumed by others) on the basis of healthiness by inspecting photographs of

their food. The study found that the majority of the persons who had downloaded the app either never utilised the app or used it merely to take one picture. Moreover, persons with a greater likelihood to become active users were those who had self-reported that they were adhering to a strict diet. Further, this app did not contain techniques to facilitate behaviour modifications, such as the setting of goals, which could offer a more targeted reason to utilise the app and potentially increase its usage. A systematic review by Coughlin et al. (2015) scrutinised 193 articles and found that the preferences of participants were oriented towards applications that were fast and easily administered, and those that enhanced mindfulness of food consumption and weight control. Moreover, the usage of smartphone apps was related to higher adherence to diet for foods low in calories and fat, and high in fibre, and higher levels of physical activity levels which led to greater weight loss.

#### **3.7.3.4 The Role of Social Media in Awareness Programmes.**

A systematic review by Chang et al. (2013) examined social media's role in online weight management. Their premise was that social media applications could be likely assistants to online interventions for weight management by supporting education, involvement, and support of peers. The most common social media application utilised in the reviewed studies were found to be message boards and chat rooms. However, Chang et al. (2013) found that most studies did not quantify the effect of social media on online weight management interventions despite their widespread usage. In fact, only one of the included studies had evaluated the unique influence of social media and had found no difference in outcomes related to weight, though the participants displayed greater involvement.

Another study by Hales et al. (2014) scrutinised different kinds of posts to assess whether they influence the engagement of participants differently and if weight loss is enhanced by social media engagement. Hales et al. (2014) have sub-analysed from a randomised weight-loss study involving a follow-up support period of four-months using monthly meetings and private Facebook groups. Based on Social Cognitive Theory, five different types of posts were posted weekly by counsellors, namely, weight-associated, recipes, diet information, votes for polls, or appeals for recommendations. This was followed by assessment of the kinds of participant engagement, namely, likes, poll votes/comments, and views. Hales et al. (2014) found that the most engagement was seen in poll votes, suggestions, and weight-related posts. Moreover, during the four-month maintenance period, weight loss was found to be significantly related to Facebook engagement.

Dahl et al. (2016) found that social media was typically utilised together with, or as an optional extra to, other methods of intervention delivery. This was despite social media's potential to eliminate obstacles, such as expenditure, material delivery schedules, and availability to inaccessible populations, and to provide health information, societal support, and motivation. In general, YouTube, Instagram, and Snapchat are the most common social media applications that attract teenagers (Ahmed & Hassan, 2017; Anderson & Jiang, 2018).

A systematic review by Willis et al. (2017) attempted to assess the effectiveness of interventions for weight management which were delivered using online social networks (OSN). Of the five articles finally included in the review, Willis et al. (2017) found that all five reported a decrease in baseline weight. Moreover, significant reductions in body weight were reported when OSN was combined with support from a health educator, as evident in three of the studies. However, a clinically significant loss of weight was reported only by one study. On the whole, this review revealed that the use of OSN for management of weight was in its nascent stages.

Pagoto et al. (2015) also scrutinised the use of OSN in weight loss, positing that these may replace in-person visits and increase prospects for societal support. Using an iterative series of pilot studies, Pagoto et al. (2015) assessed the viability and suitability of OSNs to deliver lifestyle interventions. The first study entailed lifestyle counselling for ten obese participants with depression through 12 weekly group visits and a Twitter private group. The average weight loss of these participants was 1.2% of baseline weight. Moreover, two-thirds of them found the assistance of the Twitter group to be fairly beneficial. The 11 participants of the second study were not depressed and had to regularly use social media. The average weight loss of these participants was 3.0% of baseline weight and all of them reported that they found the assistance of the Twitter group to be fairly beneficial. In the third study, the 12 participants received a 12-week lifestyle intervention almost completely through Twitter and restricted the group visits to a single visit. The inclusion criteria for this pilot were the same as the second study. The average weight loss of these participants was also 3.0% of baseline weight. Further, 90% of them reported that they found the assistance of the Twitter group to be fairly beneficial. Overall, this study indicated the viability and suitability of a private weight-loss group on Twitter, in general, and among customary users of social media, in particular.

A study by Merchant et al. (2017) attempted to gain awareness concerning how college students tried to lose weight by involving their social networks and utilising social and

mobile technologies. The study's participants (n = 20 treatment, n = 18 control) were part of a larger 2-year RCT (Project SMART: Social and Mobile Approach to Reduce Weight, n = 404). The participants in the treatment group were pleased with the appropriate support offered by the study and the incorporation of content among various technologies. In both groups, participants reported that they were aided in weight loss by non-study-designed apps. Moreover, the participants were acquainted with each other. Face-to-face conversations regarding weight-loss goals between friends increased their accountability to bring their goals to completion. Further, while many participants were motivated by seeing the success of others online, there were varied opinions regarding the appropriateness of using social media to discussing personal health. Other studies which scrutinised aspects of Project SMART (e.g., Godino et al., 2016; Gupta et al., 2015; Patrick et al., 2014) reported no difference in weight loss at the end of two years between treatment and control groups. However, there was significantly greater loss of weight in the treatment group at 6 and 12 months in comparison with the control group.

A cross-sectional study by Alhaddad (2018) attempted to evaluate the usage of social media applications among citizens of the KSA for health information. The most commonly utilised application was found to be WhatsApp, as its use was reported by 83.8% of the respondents. Moreover, the use of social media was found to be both to search for and to receive information related to medicines. The principal source of this information was friends, followed by health specialists. Nevertheless, the majority of the respondents indicated that they preferred medicine-related information from trustworthy official sources. Alhaddad (2018) highlighted that the health information content available on social media required frequent review by health authorities. Moreover, health authorities also had the responsibility of educating patients on the significance of confirming the information they obtained via social media.

A study by El Tantawi et al. (2019) attempted to evaluate the partiality of adolescents to utilise social media to obtain oral health information (OHI) and the factors related to this partiality. The questionnaire utilised in the survey sought information related to the background of the adolescents, earlier practices of seeking OHI, their purposes in using the Internet, the convenience associated with utilising social media for OHI, and their opinion on the usefulness of the OHI obtained through social media. The authors concluded that most adolescents had a decided partiality to receive OHI using social media.

### **3.8 Summary**

This chapter reviewed and analysed the current literature associated with the research topic under consideration. Accordingly, adolescence, eating behaviour, and emotional eating were examined in detail. Then some theories and perspectives of emotional eating were presented, followed by the conceptual framework of the study. Finally some interventions for emotional eating were discussed, including online programmes designed to promote healthy eating.

Section 3.1 provided an initial introduction. Section 3.2 examined the notion of adolescence and drew attention to the vulnerability or susceptibility of this age group to influences which could inform their way forward into adulthood. The alarming trends of obesity and eating disorders in this age group drew attention to the imperative need for suitable pre-emptive action to manage these problems.

Section 3.3 examined various aspects of eating behaviour, including eating awareness and different types of eating patterns, such as eating speed and food choices, food quantity and frequency of eating. A distinction was drawn between typical and atypical eating to assist in understanding the relationships between emotional eating and the other forms of disordered eating and eating disorders. Then in section 3.4 a number of topics associated with emotional eating were discussed, including the difference between emotional and physical hunger. The concepts of emotional overeating and undereating were examined, followed by gender differences in emotional eating, where some studies have found that adolescent females are more likely to show emotional eating than males, while others have found no difference. After that, the relationship between emotional eating and different types of eating behaviours was reviewed. Next, a number of factors related to emotional eating and eating disorders were discussed.

Section 3.5 set out a theoretical background of emotional eating by exploring different theories relevant to this issue. These included the Psychosomatic Theory of Obesity and Attachment Theory, along with others. Perspectives on eating in relation to positive emotions were also presented, including the Positive Emotions Model. Section 3.6 put forward the conceptual framework for the present study, which was developed by drawing from the existing literature and the theories underlying emotional eating in relation to the aims and research questions of the study.

Finally, Section 3.7 discussed interventions for emotional eating. It focused on the examination of awareness programmes on healthy eating, including online programmes for

promoting good health and healthy eating, and their effectiveness. The section concluded with a discussion of the key ideas and findings in this field, and considered the role of social media in awareness programmes.

## Chapter 4 Research Methodology

### 4.1 Introduction

This chapter explains the methodology of the study and the reasons behind adopting the sequential mixed methods approach to collect and analyse the data. It then presents in detail the sampling approach, the techniques used in the analysis, and discusses the validity, reliability and ethical aspects of the study.

The next section considers the rationale for the chosen research methodology, including the research paradigm, ontology and epistemology, and justifies the use of a sequential mixed method approach. Section 4.3 discusses the sampling for the research. Sections 4.4 presents the instruments used in the data collection and discusses the data analysis. Section 4.5 summarizes the steps taken in the pilot study and the main study. Section 4.6 presents the data organization and analysis. Sections 4.7 and 4.8 deal, in turn, with the issues of ensuring research quality and the ethical considerations that underpin the study. Section 4.9 presents the summary of this chapter.

#### *4.1.1 Study Aims and Research Questions*

The aim of this study is to contribute to raising awareness about the prevalence of emotional eating among Saudi Arabian adolescents aged 12-15 years and to use this information to inform the design of an online health awareness programme that supports healthy eating and healthy behaviour for this population (see Chapter 8). Moreover, the study will contribute to the broader literature on emotional eating among adolescents.

The following research questions were formulated in line with the objectives of the study:

1. How do Saudi adolescents' eating behaviours and dietary choices relate to emotional eating?
2. How do emotional, personal, and sociocultural factors contribute to emotional eating among this population?
3. What are the perceptions of Saudi adolescents with regard to informing the design of an effective online awareness programme concerned with healthy eating and healthy behaviour?

## **4.2 Rationale for the Chosen Research Methodology**

### **4.2.1 Introduction**

This section explains the use of the tools in this study in collecting the data and the methodology adopted to conduct the analysis. It will be concluded that both quantitative and qualitative methods are the most appropriate for gathering and analysing the data and hence a sequential mixed methods approach is required (O'Cathain, 2020). Denscombe (2008) pointed out that mixed methods research can increase data accuracy, provide an integrated and more precise picture of the studied phenomenon, and overcome the biases and weaknesses of a single method. The questionnaire (yielding quantitative data) can help with examining eating behaviours and emotional eating, along with the factors that could affect these. Subsequently, the semi-structured interviews (yielding qualitative data) enable the phenomenon to be investigated in more depth by obtaining the perceptions of the adolescent students who presented a high level of EE, which will allow more in-depth insight regarding the design of an online health awareness programme to address their needs.

The following sub-sections discuss the paradigm adopted, along with ontological, epistemological and methodological considerations.

### **4.2.2 Research Paradigm**

Choosing an appropriate theoretical perspective or paradigm as a framework is considered as a fundamental step in research. This provides a philosophical grounding that shapes the kind of knowledge that could be obtained and ensure its validity and suitability (Morrison, 2012). Punch (2009, p. 358) defines a paradigm as “a set of assumptions about the social world, and about what constitutes proper teaching and topics for inquiring into that world; a set of basic beliefs, a world-view, a view of how science should be done (ontology, epistemology, methodology)”. MacNaughton et al. (2007) point out that a paradigm appears like a picture frame, as all the elements are included within one painted picture, and so integrated in one artwork. The literature looks at the philosophy of conducting research from three perspectives, the ontological, the epistemological, and the methodological, which will now be considered in turn.

#### **4.2.2.1 Ontology.**

Ontology can be defined as “a kind of philosophy interested in explaining the nature of the world besides its structure “reality” (Wand & Weber, 1993) It can be viewed as the style of

how the researchers look at the world in their understanding of reality (Cornford, 2014). It is noteworthy that Ontological Theory includes the objectivism and constructivism paradigms. Objectivism requires that the social structure in question abides by an outward (external) objective reality that is independent of the awareness of the researcher. Conversely, constructionism suggests that social structures can and should be taken into account; and that social constructions rely on the conceptions and behaviours of social actors.

In brief, the ontological stance of the researcher was that emotional eating (the reality under scrutiny) among adolescent students could be affected by several factors (emotional, personal, and sociocultural), and that their emotional eating behaviour is driven by their interpretations of such factors and their daily interactions.

#### **4.2.2.2 Epistemology.**

Epistemology is a type of philosophy that analyses human knowledge intricacies, which play a significant role in explorative studies (Guba & Lincoln, 2005; Halaweh et al., 2008). It is one of the theoretical bases for choosing a research methodology, and can be regarded as the theory of knowledge (Crotty, 1998; Henn et al., 2006, p. 18). As such, it considers the methods by which researchers obtain knowledge and their theories toward getting knowledge (Bryman, 2012; Morrison, 2012). Epistemological standpoints differ as to the relation of knowledge to assumptions, beliefs and values. Epistemological Theory focuses on four approaches, which are positivism, interpretivism, social constructionism, and pragmatism.

##### **a. Positivism**

Positivism views knowledge as realistic and objective, and underlies the approaches of the natural sciences. It holds that knowledge can only be obtained through the senses, using tools, and that the findings from such methods are trustworthy and reliable, and can be repeatedly confirmed (Bryman, 2012). As adolescent students' eating behaviours can be observed or measured objectively, they can produce reliable numerical data in this regard. Thus, positivism was considered as an appropriate paradigm to analyse such behaviours.

##### **b. Interpretivism**

However, an interpretative method was also adopted by this study in order to reveal and interpret the effect of potential factors (Bryman, 2012). It could be argued that the qualitative explanations and interpretations obtainable from the interviews enable us to

avoid the limitations of the knowledge that we could get as a result of only using the quantitative method (Bryman, 2004; Irene, 2014). Therefore, interpretivism is taken to be an additional valuable perspective for collecting and analysing in depth the students' perceptions about informing the design of an online health awareness programme to address their needs towards healthy eating healthy behaviours (see Chapter 8).

#### c. Social constructionism

Social constructionism views learning as a social collaborative activity that is created through people's social interactions. The researcher's epistemological standpoint in this study was that the meaning and truth about people's experience has been created and constructed by the participants themselves through their daily interactions. This standpoint is in line with Paul's (2005) point of view about the constructivist definition of knowledge as a 'dynamic product of the interactive work of the mind made manifest in social practices and institutions' (p.47). This views learning is an interactive process, which cannot happen in an isolated environment. It should be noted that a social constructionism paradigm is compatible with an interpretive epistemology (Crotty, 2005); thus, a social constructionism paradigm is adequate for this study, since the study focuses on the perceptions and experiences (knowledge) that the students have of their own eating behaviour and how this relates to their emotions. It includes an interpretive, real-life approach to the world (Crotty, 2005). For that reason, the adolescent students' perceptions (what they believe to be true) served as the core theme that this study tried to reveal and explain.

#### d. Pragmatism

The positivist and interpretivist paradigms have been merged into another paradigm called "pragmatism", which takes features from both of them (Teddlie & Tashakkori, 2009). The pragmatism paradigm is concerned with what can be achieved and what works, rather than the nature of absolute truth or reality. Pragmatism provides a ground for employing mixed methods research as a third approach that allows social researchers who desire to carry out both quantitative and qualitative research to obtain relevant findings (Creswell, 2014). The researcher felt that using only a single research method would not be sufficient to yield data appropriate to the research questions. This study employed mixed methods as it was felt that by combining more than one method would enable the researcher to minimise the weaknesses of each and draw on their strengths, which has been widely used (Denscombe, 2014).

The researcher recognized that to answer the research questions necessitates a mixture of qualitative and quantitative paradigms, as the paradigm relevant to this study as it encompasses the data collected from interviews and surveys. Hesse-Biber (2010) lists the following five main reasons that make researchers choose to combine different methodologies:

- **Triangulation:** Triangulation is frequently referred to in a mixed methods approach as a means to broaden the credibility of a study and its outcomes (Cohen et al., 2007). The researcher achieved triangulation in the present study via two separate processes sequentially, namely questionnaires and interviews analysis, to reinforce this study's quality and trustworthiness (Creswell, 2014).
- **Complementarity:** This highlights that both quantitative and qualitative methods are used simultaneously to understand the research question from a different point of view (Creswell, 2009), which allowed the researcher to accomplish the complementarity by bringing a comprehensive elaboration and enhancing the quantitative method results with the qualitative method results.
- **Development:** The outcomes obtained from mixed method enable one to use them in order to improve or amend other research tools (Creswell, 2014). In this study, the researcher aimed to employ the findings from the quantitative method (questionnaire) to inform the qualitative method (interview).
- **Initiation:** The conflicts between qualitative and quantitative methods can be used to improve or freshly initiate a research analysis (Creswell, 2014). Initiation helped the researcher explore the new perspectives of the structure of questions and findings in the quantitative and qualitative approaches.
- **Expansion:** Significant results that are obtained from a specific study sometimes encourage other researchers to use the same method or to adopt a mixed method (Creswell, 2014). It is hoped that other researchers will build on the present research by improving and expanding the research methods and inquiry scope using different methods components to adopt the current study tools.

This paradigm aids the researcher in gaining awareness of the prevalence of EE among adolescent students and exploring the emotional, personal, and sociocultural factors that could contribute to EE in Saudi Arabia from the perspective of adolescent students. Thus, the researcher decided to use a sequential mixed-methods approach in this study, which will be explained in more detail in the next section.

#### **4.2.2.3 Methodological Perspectives (Sequential Mixed Methods).**

Mixed methods is a process that combines both quantitative and qualitative approaches in collecting and analysing data as a best strategy to achieve the research objectives (Plano Clark & Ivankova, 2016). After consideration of the advantages of the mixed methods approach, it has been decided to utilise both quantitative and qualitative measures subsequently to obtain a better understanding of the present issue. The sequential mixed methods is the process whereby the researcher seeks to extend the findings of a single method following it up with another method (Ivankova et al., 2006). The study started by using a quantitative approach to examine a concept or theory with a large sample, which allowed the researcher to generalize results on a population, followed by a qualitative method, including a description in detail with a few cases or individuals (Creswell, 2014). The purpose of combining both quantitative and qualitative data in a sequential mixed methods was to obtain a better understanding of a research matter through converging (or triangulating) broad numerical information from the quantitative method and the detail and depth of the qualitative method (O’Cathain et al., 2007).

Sequential mixed methods can serve the study in two forms: (1) linking quantitative and qualitative methods of the study via choosing the participants for the second stage and improving the qualitative data collection procedure based on the findings of the quantitative tests, and (2) merging the findings of the quantitative and qualitative methods while discussing the results of the entire study and designing implications. Integrating quantitative and qualitative approaches leads to higher inference quality (Tashakkori & Teddlie, 2003).

### **4.3 The Research Sample**

This research involved two samples. In the first quantitative phase, the researcher collected data by asking the participants to fill in a questionnaire that yielded numerical data (quantitative approach, positivist paradigm) to examine eating behaviours, EE, factors that contribute to EE, and the suggestions of adolescent students regarding the design of an online health programme. In the second qualitative phase, the researcher conducted semi-structured interviews with adolescents who had high emotional eating (qualitative approach, interpretivist paradigm) to obtain an in-depth comprehension of their perceptions towards EE.

### ***4.1.2 Sampling Strategy***

There are different ways to select a sample. For instance, probability sampling or random sampling can be used to gather a sample of participants for the purpose of quantitative analysis, while purpose-driven sampling can be used to get appropriate information for qualitative analysis. In some cases a mixture of both methods can be used to obtain the relevant information, which is known as a mixed approach (Cohen et al., 2011; Teddlie & Tashakkori, 2009). The selection of the schools was purposive, then the selection of the students was pseudo-random (systematic sampling) for answering the questionnaire. After that, a purposive sample of students who had a high level of EE was taken for participation in the interviews. In the purposive method, the observations are not randomly selected, which means some of them are more likely to be chosen (Yin, 2014). In contrast, probability sampling selects a random sample of observations from a statistical population, where every population unit has an equal chance of being chosen (Berg, 2016). This process leads to the selection of a representative sample of the population and will minimise the sampling error (Creswell, 2014).

Both methods of sampling were found to be appropriate for this study because the first method (purposive sample) allowed the researcher to identify the potential schools and participants for interviews, who met the required criteria while the second method (random sample) provides the same opportunity for every unit to be selected in the sample. The details of the sampling follow.

### ***4.1.3 Sampling of Schools***

After consulting the MoE, five intermediate schools for girls and five for boys were chosen in different areas in Riyadh (purposive sample). These ten intermediate schools [grades 7, 8, 9] were selected by the Research Development Department because they are responsible for guiding researchers and selecting schools, according to their authority and the nature of the research. This department selected these schools by following a purposive sampling strategy to achieve the maximum possible variation between participants by taking into account their socio-economic level. After obtaining ethical approval from the MoE and the Local Education Authority in Riyadh (see section 4.8), the researcher arranged meetings with the head teachers to explain the nature of the research. All ten schools agreed to be included in the study. These schools have been chosen for two main reasons:

- 1- Each school has the largest population in its area, which implies that there will potentially be a good response rate.
- 2- These schools are distributed over various locations (North, South, East, West, and Middle) of Riyadh city, which allows the samples to be taken from different areas and promote further representativeness of the city.

#### ***4.1.4 Sampling of Participants***

##### **a. Questionnaire**

This study uses a systematic random method to select a representative sample of the adolescent population (see shortly). It is known that the sample size is determined by a number of factors, such as the purpose and nature of the study and data collection method (Cohen et al., 2007; Gay & Airasian, 2003). It has been statistically proved that the bigger the sample size, the more representative it is of the statistical population and the more credible are the obtained results (Bryman, 2008). However, Crowl (1996) claims that having a large sample size is not essential, as more consideration should be given in selecting the samples. As such, Crowl (1996) and Bryman (2008) suggest that getting a smaller sample size with a higher level of responses is better than getting a larger sample size with a lower level of responses. Gay and Airasian (2003) suggest that selecting a sample size which ranges between 10% and 20% of the population is a relevant size to carry out a descriptive research. However, we found it difficult to apply this recommendation for this study to cover the whole of Riyadh city with its huge population and large number of schools.

Thus, a sample of 360 students (180 males and 180 females) was selected randomly (systematic sample) from ten intermediate schools. The distributions of the sample by type and students' grade are shown in Table 4.1.

**Table 4.1**  
*The Distribution of Sample by School Type and Student Grade*

School type	Number of schools	Grades	The total number of students in each grade	The total number of students who completed more than 80% of their questionnaires	Total
Males' schools	5	7	60	51	151 males
		8	60	50	
		9	60	50	
Females' schools	5	7	60	52	153 females
		8	60	50	
		9	60	51	
Total			360	304	304

The sample was chosen randomly by a systematic approach as follows: First, the researcher received the lists of all students in the different grades for each school. Then, the researcher chose a random start on the list and selected every X numbered student on the list until 12 from each grade in each school were selected. The X number was based on a fraction determined by the number of students on a list and the number that are to be selected on the list (e.g., 1 out of every 20th student). The X number differed from school to school, depending on the number of students in each grade. Then the researcher communicated with the schools to organize with them the process of contacting the selected students under the supervision and assistance from the school administration.

### **b. Interviews**

Sampling for interviews has some disadvantages, as in most cases its outcome cannot be generalised to the whole population because the sample used as the source of the information cannot be regarded as being representative of the entire population (Cohen et al., 2011). Researchers that follow qualitative methodology select specific participants as they believe this is the appropriate technique to get sufficient information to answer the main enquiries of the research. This kind of sampling enables one to effectively obtain information from participants based of definite criteria that have been set by the researcher (Silverman, 2005). Thus, it is believed that using only information from a purposive sampling among the students within the schools might not enough to explore properly the emotional eating behaviour and perceptions of the students. Therefore, in this study, a more targeted technique was seen to be necessary to obtain a complete picture about this phenomenon.

In the purposive sampling for this study, only female students were available to participate in a one-to-one interview, as the female researcher was not allowed to enter boys' schools. Fifteen were chosen who were willing to take part (Figure 4.1). A high level of emotional eating (those who got a high score between 22-28) was identified through their answers to the questionnaires (see section 4.6.1). 12.5% of the female participants showed a high level of EE, from whom fifteen were chosen randomly to participate in a 1:1 semi-structured interview, with the constraint that three students were selected from each school and one student from each year group (Table 4.2). Twelve females completed their interviews, while three pulled out.

**Table 4.2**  
*The Distribution of Female Students by Year Grades for the Interviews*

School type	Number of schools	Grades	The total number of students in each grade	The total number of students who completed their Interviews
Females' schools	5	7	5	4
		8	5	4
		9	5	4
Total			15	12

**Figure 4.1**

*Diagram of the Sampling Technique Followed by the Study*



#### **4.4 Data Collection Instruments**

Adopting an appropriate method to collect data is affected by different factors, such as the research questions and objectives, time, cost and the size of the population, and the type of the data (Rea & Parker, 2014). Often, researchers adopt one or more instruments that are suggested by previous literature, taking into account the research ethics (Fraenkel & Wallen, 2008). The data of the study were collected in three steps, which were conducting a pilot study in October 2017, preparing an appropriate questionnaire (Appendix 1), and organizing semi-structured interviews (Appendix 2). The last step was collecting data by using questionnaires and semi-structured interview, which was conducted in January 2017. The researcher conducted the questionnaires in the classroom and interviewed each girl in a private room at school at appropriate times, such as during a break, activities classes, or in free classes of absent teachers. The room was located near to

the classes, which helped the researcher to bring the girls easily to the interview. The researcher presented herself as a teacher, so the participant didn't feel vulnerable. Both the questionnaire and the interview took 30 minutes to complete. Each girl was informed that she could withdraw at any time during or after the interview (Appendix 4). Permission from the MoE in Saudi Arabia was obtained much earlier in order to make sure everything was ready before starting the data collection process (Appendix 5).

#### **4.4.1 Questionnaire**

A questionnaire was defined by Gass and Mackey (2007, p.148) as “written instruments that present all participants with the same series of questions or statements, which the participants then react to either through providing written answers, marking Likert-style judgments or selecting options from a series of statements”. The questionnaire is one of the most effective instruments of collecting data as it allows the opportunity to ask all respondents clearly the similar questions (Cohen et al., 2007; Gass & Mackey, 2007; Wilkinson & Birmingham, 2003). The questionnaire can be carried out via many ways; for instance, through traditional mail, email or even personal interviews (Gay & Airasian, 2003; Wilkinson & Birmingham, 2003; Cohen et al., 2007; Tymms, 2012). In this study, the researcher (personally) attended the girls' schools in order to make sure of delivering the questionnaire appropriately and within the time frame. For boys' schools, a volunteer man was trained adequately on providing the questionnaire and collecting data within the specified time for applying the questionnaire. He completed the task as required. A letter was attached to the questionnaire to explain the purpose of the process (Cohen et al., 2007) (Appendix 4).

Levin et al. (1989) state that using questionnaires in data collection can have the following advantages:

- They can be conducted at low cost and save considerable time, as they can be circulated widely.
- Using the same questions that are fixed for all participants will give a high degree of unification.
- They can be accomplished quickly within the time limit.
- Participants have a great degree of freedom in expressing their views, particularly on sensitive issues because they cannot be identified easily.
- Using questionnaires enables one to obtain large samples.

In contrast, Alassaf (2010) and Obaydat et al. (2011) claim that questionnaires also have the following disadvantages:

- Some participants could avoid answering the entire questions.
- Some participants cannot give thoughtful attention to answer some questions, sometimes due to the questionnaire being too long.
- Sometimes, questions can be unclear or misunderstood by the participant, which will affect their answers and may be inaccurate.

To overcome these disadvantages, the researcher distributed a large number of questionnaires to obtain a greater number of completed and valid questionnaires (section 4.3.3). Moreover, the researcher reviewed the questionnaire through academic arbitrators (section 4.4.1.1), as well as testing the questionnaire by a sample of boys and girls in the same age group (section 4.5).

#### **4.4.1.1 Construction of the Questionnaire.**

Nevertheless, the questionnaire method remains as one of the effective tools in data collecting, especially from a large number of participants. This is the main reason that it was used as a major method in collecting the primary data for this study. The questionnaire was carefully designed following literature in the field of eating behaviours among adolescents (see section 4.4.1.1). The study aimed to involve as large a number of participants as possible. Additionally, this was the best way to obtain useful data and minimise the time needed by the participants to answer the questions, as well as to offer them more freedom to express their opinion. Bryman (2008) states that designing any questionnaire should be based on the study questions. The questions can vary from close-ended to open-ended, which basically depend on the nature of information to be obtained (Bryman, 2008; Cohen et al., 2007; Gay & Airasian, 2003; Wilkinson & Birmingham, 2003). Questionnaires could contain different questions based on their answers, such as dichotomous (yes/no), multiple choices, rank order, rating scale (known as Likert scales), constant sum, ratio, and open-ended (Cohen et al., 2011).

The questionnaire that was adopted in this study contained both close-ended and open-ended questions, multiple choices, and rank scales. To answer the rank scale questions, four-point Likert scales were provided to get a general picture on eating behaviours and emotional eating behaviour, which can give a good opportunity to discover the differences between the participants.

During the designing of a proper questionnaire for this study, the researcher focused on four main important issues, which are the eating behaviours; emotional eating; factors that could affect this phenomenon; and informing the design of an online health awareness programme among adolescents (Table 4.3). The questionnaire was developed from several questionnaires related to emotional eating and its factors, which are: the Emotional Eater Questionnaire (EEQ), which was developed by Garaulet et al. (2012) (Appendix 6); also, a similar set of questions mentioned by the Help Guide International Organization on their website to explore EE (Help Guide International Organization, 2019); the EADES (Eating and Appraisal Due to Emotions and Stress) Questionnaire, and the Emotional Eating Questionnaire (Arnouk et al., 1995) (Appendix 7). As mentioned before, the questionnaire was designed to serve the aim of this study in an educational context, and not for clinical or psychological purposes. For this reason, the researcher developed and adapted her questionnaire to be used ethically with adolescents. The design and development of the questionnaire went through several stages until it reached the final form. After designing the first draft of the questionnaire, it was presented to the supervisor, and academic arbitrators from Saudi universities in the field of food and nutrition, as well as academics in psychology. It was developed in accordance with the nature of the research and served its aims by changing the design, deleting some questions, and adding some. For example, the Likert scale in the questionnaire has been changed from standard attitude scales, which were "Strongly agree, Agree, Disagree, Strongly disagree" to behaviours' scales, "Usually, Sometimes, Little, and Never". Moreover, some questions were deleted, such as "Do you feel guilty when eating sweet or snacks?" because it is unethical to use the word "guilty" with adolescents, as well as adding new questions, such as "Who has influenced my interest in my body shape...., etc.). Since, the questionnaire was designed to be completed by Arabic people, it was important that the questions had to be constructed very carefully in order to avoid any complexity and vagueness. Later, a pilot study was carried out to assess the questionnaire's appropriateness and then the questions were revised according to the feedbacks that were given (section 4.5).

The questionnaire included four main parts, which contain 51 statements in total for boys and 52 statements for girls (the extra question is for the onset of period) (Appendix 1), as follows:

### ***1. Demographic data:***

This section consisted of fourteen statements (multiple-choice; four-point Likert scales) which cover a general background on the participants, which are:

School grade; Age; Weight; Height; Age of the first period (for girls); Parents who live with; Position among brother and sisters; Number of siblings who live with; Number of individuals living at house; Educational level of father and mother; Kind of house; Ownership of house; and Number of house staff in the home.

## **2. *Eating behaviours:***

This section included sixteen statements which were divided in two parts, designed to understand:

1) Eating behaviours of adolescent students (in general) and related aspects, such as eating slowly, tasting, eating quickly, and doing exercise regularly. This part was also designed to get information on how participants are avoiding eating unhealthy food, paying attention to food ingredients before eating them, noticing the flavours in the food, reading food calories, eating large quantities of food in a short time, and parents' favoured food.

2) EE behaviours, which contained seven statements to explore emotional eating among adolescents, for instance, eating more with pressure or anxiety, eating when not hungry, eating to feel better, self-rewarding with food, eating to feel happy, eating to feel safe, cannot resist food, and eating continuously.

## **3. *Factors that could contribute to emotional eating:***

This section was designed to collect information about the potential factors that could contribute to emotional eating, as follows:

### **a. *Emotional factors:***

This part consisted of twelve statements which used multiple-choice (four-point Likert scales) about several emotions, as follows:

Feeling down; Pressure / Stress; Irritation / Angry; Boredom, Loneliness; Around people and Feeling happy.

### **b. *Personal and sociocultural factors:***

This part included seven statements which used multiple choices, as follows:

- Influencing the interest of the body shape.
- Influencing food choices.
- Time more prone to eating.
- Food more appealing.
- Drinks more appealing.

- Emotions related to food, and
- Emotional drinking.

#### 4. Informing the design of an online health awareness programme:

This section focused on collecting students’ opinion towards informing the design of an online health awareness programme, which involved three parts:

- Social media: this part involved three statements, with multiple-choices.
- Criteria of the design of an online programme to raise health awareness: this question included seven multiple-choices.
- Type of app/website that students prefer in designing an online health awareness programme. This statement has four multiple-choices.

**Table 4.3**  
*The Contents of the Questionnaires*

N o.	Section	No of questions	Order of questions in the Questionnaire	Type of Questions
1.	Demographic data.	14	1 – 14	Multiple-choice
	Eating behaviours:			
2.	<i>a. General eating behaviours.</i>	9	15 – 23	Multiple-choice (Four-point Likert scales):  (Never-little-sometimes-usually)
	<i>b. Focus on emotional eating.</i>	7	24 – 30	
	Factors of EE			
3.	<i>a. Emotional factors.</i>	12	31 – 42	Multiple-choice
		7		
	<i>b. Sociocultural factors.</i>	(28 Optional)	43 - 49	
4.	Designing a programme.	3 (20 Optional)	50 -52	Multiple-choice

##### 4.4.1.2 Translation of the Questionnaire.

The questionnaire was originally written in English and then translated carefully into Arabic. It was translated by five other native Arabic speakers to check for any possibility of unclear wording and for checking accuracy. Then, the translated version was read by six Arabic adolescent students in order to make sure that all the questions were presented clearly, and for more reliability.

#### ***4.4.2 Semi-structured Interviews***

Semi-structured interviews were carried out to obtain a more profound comprehension about the significant issues that featured from the questionnaires. This, however, was applied only to those participants who showed an interest and offered their consent to be interviewed and who displayed high tendencies towards emotional eating from their answers on the questionnaire. It was also used to explore adolescent students' perceptions towards EE to inform the design of a relevant online health awareness programme that addresses teenage needs (Appendix 2).

##### **4.4.2.1 Advantages and Disadvantages of Semi-structured Interviews**

Using semi-structured interviews to collect information has a number of advantages and disadvantages over structured interviews. This method is more flexible than the structured interview, as it is usually followed by quantitative studies and often has definite answer(s); yes or no. However, the semi-structured interview has more restrictions than a fully unstructured interview, as the latter seeks more general issues and the participant has more freedom to change the direction of the conversation (Bryman, 2012). For this study, it is considered that neither structured nor unstructured interviews are suitable to obtain the relevant information, because the former restricts the interviewees' answers and the latter gives the interviewer the freedom to redirect the discussion beyond the scope of the study. Thus, a semi-structured interview was seen to be more relevant because it keeps the participant more focused and allows them to answer the questions in detail. This method also allows more opportunity to give justifications and clarifications about any possible assumptions as well as to investigate and expand the interviewees' responses in depth (Hitchcock & Hughes, 1995, p.83). This flexibility enables the researcher to obtain extra data and gives more opportunity to ask in detail about any points that are not clear or have been misunderstood. In addition, it allows other new issues of interest to be discussed that could come up during the interviews and ensure that all the questions are understood by the participants through asking them the same questions. Therefore, this kind of interview enables the obtaining of detailed information in a flexible manner, which is relevant for both parties (researcher and participants) and this information is extremely important, as it is given in the participant's own voice.

The dialogue of the participants was recorded by using a digital recorder, which would offer more analysis or review, as demand needed. During the interview extra attention was paid to record any other aspects related to the participants, such as her body

language, hesitations and changes of voice tone. All of these might have certain meanings, which can be used to understand and explain participants' perceptions.

However, semi-structured interviews have some disadvantages that have led some researchers to recommend not using them as an instrument to collect data. Firstly, they focus only on a communication between two parties, the researcher and the respondents, and sometimes they are effort-consuming during conducting, transcribing and analysing the interview (Bryman, 2012). Sometimes it is difficult to conduct this kind of interview in terms of arranging, sticking to the time limit, rescheduling it in some circumstances, and it is even sometimes more costly compared to other methods (Gray, 2013; Kvale, 2008). Analysis of open-ended questions can be more difficult because some participants' answers are complex and getting honest answers from participants is not guaranteed (Hesse-Biber & Leavy, 2010; Hitchcock & Hughes, 1995). It is very difficult to interview a large number of participants because of time and budget limitations. This, these factors made the researcher use and analyse a much smaller sample size, which might lead such analysis to be biased (Gray, 2013). In some cases, participants can give unnecessary information during answering all the direct and indirect questions, or even misunderstanding could happen during the interview, especially when the interviewee feels anxious and uncomfortable (Berg, 2016; Kvale, 2008).

#### **4.5 The Pilot Study and the Main Study**

##### ***a. For the pilot study:***

A pilot study was conducted before launching the main study to assess the appropriateness and validity of the instruments (section 4.7). The following steps were taken:

*Step 1:* Initially, the researcher obtained consent from the participants, who had previously received a printed copy of the information sheet. Questionnaires were distributed in October 2017 among sixty adolescent students (30 males and 30 females) from one boys' school and one girls' school. These schools were chosen (purposive sample) because they are located in the centre of Riyadh city, and students attend them from different areas of the city. Then detailed interviews were conducted with four female students who showed high emotional eating in their answers on the pilot questionnaires. The time taken to implement both the pilot questionnaire and the pilot interview was 30 minutes, and both were conducted during activities classes or in free classes of absent

teachers. The pilot questionnaire was administered in the classrooms while the pilot interviews were conducted in the guest room.

*Step 2:* The questionnaire responses were analysed carefully to determine whether we obtained the right information that could help to answer the main research questions and whether any other possible feedback could be added to the given options. The time needed to complete the questionnaire was also measured to make sure it did not exceed 30 minutes. Additionally, participants' feedback was considered to assess their understanding of the questions and comments on the questions' suitability (in regard to the wording and their ability to answer them), any additional information that they needed to ask about and any areas of ambiguity. Consequently, ambiguous and difficult questions were removed and any questions that were not answered as expected were rewritten. Eventually, the questionnaire was revised and finalised. The questions used in the interviews were also piloted, refined and modified by taking into account the outcome of the analysis of the pilot study (see section 4.5 for more details).

*Step 3:* The questions used in the pilot interviews were modified to improve the structure of the interview via paraphrasing unclear questions and ambiguous words. Moreover, questions that produced similar or unhelpful answers were removed or replaced (see section 4.6 for more details). The pilot interview enabled the researcher to familiarise herself with the procedure and improve her interviewing skills. Consequently, it allowed the researcher to prepare and to adapt the questions in a way that assisted participants to speak honestly about the topic without feeling judged. At the start, the researcher clarified the aim of the study and the interview, and highlighted the confidentiality.

***b. For the main study:***

*Step 3:* The modified questionnaire (see Appendix 1) was distributed in January 2017 to 360 students (180 males and 180 females) from ten selected schools (purposive sample) (5 schools of each gender) in different regions of Riyadh city. Participants were asked if they wished to be involved in the study, and all 360 students showed an interest in volunteering to join it. Most of the participants (304, 84%) returned their questionnaire completed more than 80%, and most of the female participants showed an extra interest in the subsequent pilot interview.

*Step 4:* The interviews were conducted with 15 female students, who had shown high emotional eating behaviours in their answers on the questionnaire (purposive sample).

Twelve of them completed the interviews while three pulled out. The consent was obtained from the participants and their parents before conducting the interview (Appendix 2).

*Step 5:* For the data analysis (see section 4.6), the quantitative results were displayed using descriptive analysis, mainly percentages, frequencies, means and standards deviations, using the SPSS programme. Moreover, Shapiro-Wilk's test of normality and Levene's test of homogeneity of variance were used. Field (2013) mentioned that to determine what statistical model is suitable, it is significant to investigate if the distribution of the collected data violates or conforms to the two hypothesis: "normality of something or other" and "homoscedasticity/homogeneity of variance" (p. 165), by looking at the outcome of a Shapiro-Wilk's test for normality and Levene's test, which is used to assess the variance ratio (Hartley's  $F_{max}$ ). Furthermore, Pearson correlation coefficients were used for calculating the internal consistency of the questionnaire. Alpha-Cronbach stability coefficients were used to calculate the structural integrity. Additionally, non-parametric statistical analyses (Mann-Whitney, Kruskal-Wallis, Chi-square, and effect size tests) were performed to test these hypotheses and to check whether differences among groups were statistically significant. The qualitative information was transcribed and translated by the researcher from Arabic to English. The transcription was revised by two bilingual academic experts to make sure of the accuracy of the translation. Then the information was organized and then coded using the thematic analysis (Appendix 3).

#### **4.6 Data Organization and Analysis**

Because this study was both quantitative and qualitative research, it used mixed data collection methods. Most of the obtained data was quantitative with a relatively small part of the questionnaire answers being qualitative data. The quantitative data were based on multiple-choice and four-point Likert scales (Table 4.3). The qualitative data of the questionnaire were based on thematic analysis.

The study focused on adolescent students' eating behaviours and their experience in emotional eating by examining both quantitative and qualitative data. All 360 adolescent students involved in the data collection returned the questionnaires; 304 answered more than 80% of the questionnaire, leaving 56 who answered less than 80%.

The questionnaire papers were allocated identification numbers [1 to 180 for males' questionnaires and 181 to 360 for females' questionnaires], in preparation for data

analysis; a unique reference code helped the researcher to select a number of students (15) for follow-up 1:1 interviews (section 4.6.1 and Figure 4.1).

Tools were provided to measure height and weight (a wall ruler and a weight scale) for male and female participants who did not know their weights or were unsure of them. This step was optional. The researcher took the girls' height and weight measurements; for the boys, the measurements were taken by the assistant man. The findings were recorded accurately.

#### ***4.6.1 Analysis of the Quantitative Data***

A total of 304 respondents (84%) answered more than 80% of open-ended questions in the questionnaire and their data were analysed. The responses that have relatively short answers were stored in Arabic in a MS Word document. The answers were read carefully and initial codes were assigned for them. Further investigation of the answers was conducted and each fact was put under a specific code. These codes were then grouped under main themes that were shared among the participants. Later, these were arranged in more meaningful ways using graphs and tables that drew useful and relevant connections among the data (Huberman & Miles, 2002) and helped in understanding the main themes.

Every completed questionnaire was stored in an SPSS file, separately. Each statement of the questionnaire was represented by a variable and allocated a specific name. The name was reflecting the number of the question and the order of the statement. Each choice of the answers was given a number from 1-3 or 1-4 based on the number of options. For example, in Qa.1, the answers were coded as 1= grade 7, 2= grade 8 and 3= grade 9. Missing data were coded '99', which was also used where more than one answer had been selected. Then the whole SPSS files were revised to identify any mistakes during the entering process by producing tables of frequency, searching for any outlier data outside the coding range. The descriptive statistics were generated, such as tables of frequency and percentages for both the background information and the responses for all questions (see section 4.7). Alongside, for quantitative variables (e.g., age and BMI), the mean and standard deviation were used. For a qualitative variable, a 4-point Likert scale was used.

The aim was to provide a detailed picture about the trends of the responses and to identify the main issues. To specify the statistical test appropriate for analysis, it is essential to investigate the distribution of data, if normal or non-normal, by using the Shapiro-Wilk Test of normality. It was also necessary to examine the homogeneity of the

variance (see Table 5.34 & Figures 5.4, 5.5, & 5.6). This was followed by comparing the responses across groups and applying some non-parametric tests (Mann-Whitney and Kruskal-Wallis tests, Chi-square, and effect size), in order to achieve the following:

- To compare the responses of two or more groups searching for any statistically significant differences.
- Producing a histogram to assess the distribution of the sample, some of which were found not to be normally distributed.
- To compare some groups of small samples (less than 30).
- Discover the outliers.

The homogeneity of variance of the present study data was measured by using Levene's test that functions through examining the null hypothesis, which states that variances are equal in a given dataset to measure the different sizes between them. In the case of the test result indicating significance ( $p < 0.05$ ), the null hypothesis is rejected because it is assumed that there is no equality between the variances (Larson-Hall, 2010). Also, post-hoc effect sizes were used for comparing every two assessment (variables) outcomes to understand how basically different they are. In the findings, the interpretations of the post-hoc effect sizes are as follows: "d – small = .20, medium = .50, large = .80; r – small = .10, medium = .30, large = .50" (Field, 2013).

To specify the level of EE of the students from the questionnaire, there is Part 2-B in the questionnaire (see Appendix 1) which includes a set of seven questions that was developed (adapted) to assess (specify) the level of emotional eating. To assess the level of EE, this study followed the method of a questionnaire called the Emotional Eater Questionnaire (EEQ) which was developed by Garaulet et al. (2012) (Appendix 6), but with a difference, as their EEQ consists of ten questions to measure EE. At the same time, the questionnaire of this study involves a set of seven questions to measure EE level (Appendix 1, Part 2-B). Also, a similar set of questions was mentioned by the Help Guide International Organization on their website to explore EE (Help Guide International Organization, 2019). The researcher, as an educator, adapted and used this questionnaire to serve the aim of this study, and not for clinical or psychological purposes. All the questions involved four possible answers: 1) Never; 2) Little; 3) Sometimes and 4) Usually. A score of 1 to 4 was given for each answer, and the higher the score, the higher the level of emotional eating. A score between 0/1-7: non-emotional eater; a score between 8-14: low emotional

eater; a score between 15-21: middle emotional eater; and a score between 22-28: high emotional eater. These values came from dividing the total scores (28) into four quarters.

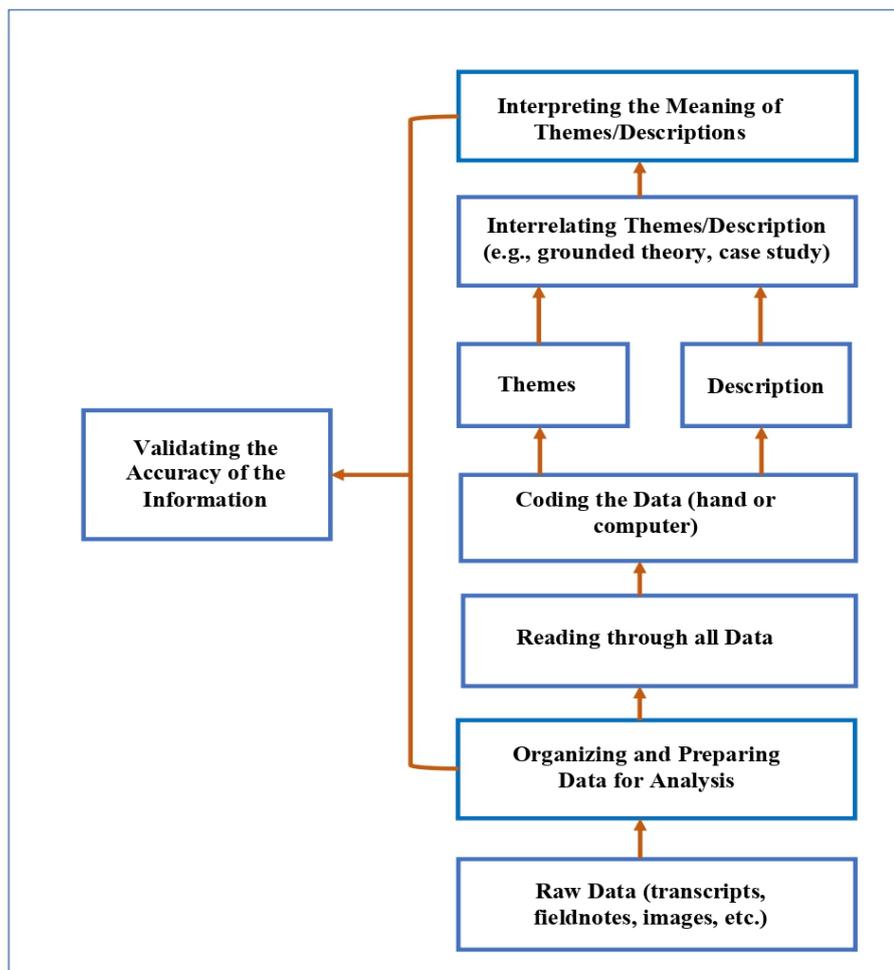
Note that only significant differences are presented in Chapters 5 and 6. Then they were used as a guideline for the next stage: the interviews.

#### ***4.6.2 Data of the Interviews***

Qualitative data were analysed by breaking them into meaningful pieces of information that made them easy to be analysed and obtain reliable outcomes. Following a step-by-step procedure enabled the researcher to answer the main study's questions (Savin-Baden & Major, 2013, p. 434 and Merriam, 2009, p. 203). In order to explore the relationships between the variables and support the clarifications, the study categorised the pieces of information in a way (themes and sub-themes) to facilitate this. This was considered as an important step toward answering critiques and making new theories (Hatch, 2000). In this regard, Nvivo software is one of the available tools that are recommended by literature to analyse qualitative data (Bazeley & Jackson, 2013; Walsh, 2003). However, this study uses the manual method to analyse the current qualitative data. The main reason for using the manual analysis was because the raw data were written in Arabic language, which made it necessary to translate it into English. Regarding the translation process, firstly, the original Arabic transcripts were checked by the researcher and two bilingual academic experts. Instead of translating the whole information, the researcher selected appropriate parts of the information which were then translated by the researcher and then they were revised and verified by the two academics, as it seemed some parts were irrelevant. This was a step-by-step procedure of using the coding technique of thematic analysis (Creswell, 2009); see Figure 4.2, and see Appendix 3 for examples of original coding of interview transcripts and interviews' themes.

**Figure 4.2**

*Data Analysis in Qualitative Research (Creswell, 2014, p. 197)*



The study followed Creswell's technique to put together all the ideas obtained from the transcripts of the interviews. This means that the current study uses thematic analysis in order to identify the main patterns by following the procedure Braun and Clarke (2006). However, it is worthy to know that we cannot always directly relate an obtained pattern to a definite philosophical structure (Savin-Baden & Major, 2013).

For this study, this kind of thematic analysis calls for systematic techniques and careful consideration of how to identify the codes and themes (Boyask et al., 2004; Bryman, 2012). Braun and Clarke (2006) claim that there are six main steps that are necessary to be followed by a research to analyse a qualitative data using thematic analysis, as shown below:

**Step No. Step description.**

- 1 Become familiar with the data.
- 2 Generate initial codes.
- 3 Search for common themes.
- 4 Review the themes.
- 5 Define and name the themes.
- 6 Produce a report.

This method makes it easy to identify specific notions of the interviews before starting on the analysis process. These notions are used later as entry codes for research and interview questions. Therefore, this study applied the method of template on the interviews of the 12 female students.

First step, the data was translated into English with the assistance of professional translators, who could speak and write both languages fluently.

Next step, during the coding process, a range of new themes were noted, which were gradually integrated into the template. The codes used in the final template were combined with the basic themes and included those obtained from the data. Hence, the current analysis contains both codes and sub-codes (Appendix 3). However, it was found very hard to develop a template that could be applied to the whole set of the transcripts by following the above steps. Thus, when any new theme emerged and was found to have a particular importance, it was reviewed again to make sure that it was properly placed and then it was integrated into the template (see Appendix 3: Examples of original coding of interview and interviews' themes).

## **4.7 Research Quality**

### ***4.7.1 Ensuring Data Quality and Verifiable Conclusions***

Validity and reliability of data are two main factors that support the quality of any research (Cohen et al., 2011; Yin, 2014). However, Hammersley (2007) states that these two factors are more applicable to quantitative researches rather than qualitative studies. It has been suggested that the quality of qualitative studies can be assessed more by their credibility, transferability, and dependability (Savin-Baden & Major, 2013).

In this mixed method approach (see section 4.2.2.3), however, the researcher considers that validity and reliability on the one hand and credibility, transferability and

dependability on the other hand can be seen as two sides of a coin. These concepts can be used as criteria to evaluate the reliability of the data and the validity of the findings as well as inferences. For example, quantitative research uses internal validity while qualitative research uses credibility; likewise, external validity in quantitative approach corresponds to transferability in qualitative research, and reliability to dependability, respectively. This means both approaches use the same criteria to evaluate the quality and reliability of a research, but they are using different measures (section 4.7).

It could be said that the reliability of this study was improved and its dependability increased because it used two data collection tools, questionnaires (male and female students) and semi-structured interviews (only with females). These tools supported each other and showed a high level of accuracy of the interpretations (Berg, 2016). Furthermore, the study followed carefully the steps of the data collection and prepared a questionnaire with a high level of validity and credibility to obtain the qualitative data. For example, it was made sure that the participants were fully informed about the topic and aims of the study in advance (Yin, 2014), by providing an information (consent) sheet that clarified these subjects (Appendix 4). Additionally, the research questions were clearly defined to give a clear indication of the purpose of the research. The data collection tools were reviewed several times by the researcher, professionals, and fellow academics, who provided valuable feedback on the suitability of the survey and the questions of the interview. Both sets of questions were sent to a number of adolescent students and experts in the educational area to ensure the clarity of the questions. Later they were piloted to validate them and to check that they measured what they were supposed to do and were unbiased (Neuman, 2014). Then, based on the obtained information, more necessary modifications were made. The dependability of the findings was increased by providing clearly details and documenting all the steps of this process (Yin, 2014) (section 4.5).

The study follows certain measures to ensure that the data collection and analysis led to accurate research outcomes (David & Sutton, 2011). A mixture of closed and open-ended questions was used to ensure the internal validity of the questionnaires, which permitted participants to express and justify their opinions, freely. A particular attention was paid to the process of designing the questionnaire in order to maximise its reliability. For example, some questions were effectively repeated twice but in slightly differently phrases. Then, the whole questionnaire was piloted (see section 4.5) to check the clearness of the statements and any vague wording was changed, accordingly. Here, Cronbach's alpha ( $\alpha$ ), which measures the internal consistency, has shown a good level of reliability (Pallant,

2005) (see section 5.2). The  $\alpha$  coefficient of the entire emotional eating of adolescents and emotional factors of eating of the questionnaire was calculated to be  $\alpha = 0.821$  (Table 5.3). The correlation coefficients between the total score of axis II “exploring emotional eating among students and their stages” was ranged .913\*\*, and axis III “emotional (psychological) factors for eating” was ranged .882\*\* (Table 5.2). This indicates that these reliability coefficients were sufficiently large (Cohen et al., 2011).

For the qualitative phase, the researcher worked to build a connection with the respondents by visiting the schools, which enabled a good level of credibility of the interviews to be achieved and led to more interactions and participations. Member checking was used to enhance the credibility of the qualitative data, as the transcribed interviews were returned to the respondents to allow them to confirm their agreement or record additional comments or concerns (Harper & Cole, 2012).

Several processes were used to promote a high level of reliability of data in the semi-structured interviews, such as following the same steps with all interviewees using the same questions. Moreover, the interviewer ensured creating a safe and non-judgmental environment and encouraged the participant to be expressing herself honestly (Berg, 2016).

Furthermore, the researcher checked the transcripts for apparent errors, and she was constantly checking if there was a drift in definitions of the codes over the process of the theming and coding. She frequently referred to two academic colleagues for assistance in evaluating the themes and coding (Creswell, 2009).

It is worth pointing out that the interviews in this study were somewhat different from many other interviews in that the researcher was gathering views on the design of the online health awareness programme rather than seeking the personal experiences of the participants, and so such views could not be checked for consistency with the questionnaire responses.

#### **4.8 Ethical Considerations**

Ethical considerations should be taken into account when dealing with human interactions. Therefore, it is expected that each stage of the research could encounter ethical problems (Cohen et al., 2007, p. 51). In this section I am going to discuss the ethical considerations that were followed in order to promote the safeguarding of all the

participants and support the collection of the data in an ethical way. Therefore, the ethical considerations of this study will take into account several processes, which follow.

#### ***4.8.1 Permission and Approval***

This research study has been reviewed following the procedures of the University of Reading Research Ethics Committee and has been given a favourable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request (Appendix 8).

Further, this study strictly follows the ethical guidelines of the British Education Research Association (2003). This involved applying important measures, including completing a required document, which is called “Application Form for Research Ethics Approval”, and getting approval from the UoR Research Ethics Committee before starting the study and a detailed information sheet was provided to the students, head teachers, administrators, and parents. The information sheets were distributed. They included information of how to contact the researcher, and participants were invited to discuss any questions, concerns, or queries that they had about the aims and nature of the study.

#### ***4.8.2 Informed Consent***

As an important part of this process, a consent form was distributed to participants before their involvement in the data collection, and they had an option to return this form and ask any further questions (Anderson, 2003). They were given the right to withdraw at any stage of the project. The researcher made this clear before the interview started. Respecting the privacy and confidentiality of participants, which is requested by the British Sociological Association (2004), was followed carefully. Also, the consent was obtained from the MoE, head teachers and parents. Consent forms were distributed and obtained before data was collected from the participants (Appendix 4).

The following official steps were implemented:

Step one: A request letter issued by the Institute of Education at the University of Reading was sent to the Saudi Culture Office in London requesting an approval from the MoE in Saudi Arabia to conduct the research and field work.

Step two: A confirmation paper from the Local Education Authority in Riyadh was obtained, which permitted the researcher to enter the schools (Appendix 5). A list of selected intermediate schools for boys and girls in Riyadh was prepared and the researcher arranged appointments with the schools’ head teachers.

Step three: The researcher visited each girls' school to introduce herself to the head teacher and explained the purpose of the visit, the procedures, and the expected time of the research.

### ***4.8.3 Confidentiality***

Regarding confidentiality, there were some ethical considerations raised in the study related to aspects that were quite personal and extremely sensitive to culture, such as asking questions about EE or eating disorders, measuring weight and height, and asking girls when their first period was (Appendix 1).

The researcher is a teacher and nutritionist who recognized the power relationships that may have existed in her interactions with students and who followed procedures to minimise any risk for students as vulnerable participants. The researcher also acknowledges that the topic introduces personal and what can be regarded as sensitive data (e.g. asking female participants about their first period). For such questions female students were informed in advance that it is optional to answer them and they will be kept confidential (section 4.4.1.1 and Appendix 4).

Fifteen female students who showed a high level of EE were chosen (who were willing to take part) (Figure 4.1). They were identified through their answers to the questionnaires (see section 4.6.1). During the interviews, the researcher introduced herself as a nutritionist, explained the aims of her study and her interest in healthy eating. She also explained that she is an outsider and that the conversation will not influence grades.

The participants and their parents were fully informed that the study's environment is confidential, and nobody will know the identity of the participants, as the researcher coded the questionnaires with pseudonyms to make the participants feel confident. They were assured that all data would be maintained securely and every participant's identity would be kept confidential (section 4.6 and Appendix 4).

The computer's stored data were protected by a strong password that could only be accessed by the researcher. The questionnaires were kept in a locked cupboard that only the researcher could open. This data will be destroyed one year after the research (for more see Appendix 4: Research information sheets and consent forms).

All the questions were revised and modified to have positive and appropriate words and statements suitable to the educational context, such as "healthy eating" and "eating behaviours". At the same time, clinical and sensitive words were avoided, as were statements regarding eating behaviour such as "emotional eating" and "eating disorders" (section 4.4.1.1).

Sensitive words and statements regarding body image such as "feeling shame" and "feeling guilty after eating high caloric food" were avoided (section 4.4.1.1).

In regard to measuring weight and height, it was optional to the participants to either record their weight and height if they knew them; or measure themselves by using the provided weight and height measuring tools; or get help from the researcher for the female participants and the researcher's assistant for the male students (section 4.4.1.1). The participants were initially informed that all of the information is confidential and private.

## **4.9 Summary**

The main goal of this chapter was to clarify the methodology that is used by the current study and to explain the procedures that followed in the data collection. A basic literature review was carried out in order to clarify the tools and the reasons behind using specific procedures in data collection. Then, the rationale behind the adopted methodology for this mixed method study was provided, as it relies on the questionnaire method that was followed by semi-structured interviews, which aimed to understand the respondents' perceptions. In addition, it explains the processes of the sampling and data collection, the strategies used in the analysis, and the measures that were followed to ensure obtaining reliable and valid data. The fieldwork was conducted in Saudi Arabia, within ten different intermediate schools in Riyadh, which took approximately one month for collecting data. The sample was based on those students who completed 80% of their questionnaires, consisting of 304 participants from the ten selected schools in different regions of Riyadh. Then, 15 female students took part in a one-to-one interview, with 12 of them providing useful information. Finally, the key ethical considerations that support the study are discussed.

The next chapter presents the results that were obtained from the first steps of the research, the quantitative survey.

## **Chapter 5 First Phase Findings: Quantitative Survey**

### **5.1 Introduction**

This is the first of two chapters that present the research findings. As part of its aim is to recognize students who have an emotional eating disorder through a set of customized questions for identifying emotional eaters (Appendix 2), it focuses on the quantitative data from the first part of the study. Section 5.2 presents the procedures utilised for the content validity and internal consistency of the questionnaire. Section 5.3 discusses findings pertaining to the students' demographics. Section 5.4 describes the factors the students associated with eating behaviours and emotional eating. Then section 5.5 reviews the elements of an online healthy eating awareness programme. Section 5.6 presents the findings associated with eating behaviour and emotional eating. Next, the testing of some hypotheses concerning are carried out in section 5.7. The study used a modified version of the Emotional Eating Questionnaire that was developed for use in the study (see section 4.4.1 and Appendix 1). Finally, section 5.8 presents the summary.

### **5.2 Content Validity and Internal Consistency of the Questionnaire**

#### ***5.2.1 Content Validity***

To achieve content validity, the questionnaire was modified from the established published questionnaires related to emotional eating and eating behaviour, and then presented in its initial form to a group of professors and specialists in nutrition and psychology. They critically reviewed the relevance of its statements, including the extent of the affiliation of the statements to the second axis "Exploring emotional eaters and their stages" and the third axis "Emotional (psychological) factors for eating", which are related to EE, as well as the clarity of its linguistic form. In the final questionnaire, a group of 18 statements representing the different opinions associated with emotional eating was divided into these two main axes.

#### ***5.2.2 Internal Consistency of the Questionnaire***

The internal consistency was assessed by calculating the Pearson correlation coefficient between the scores of each statement and the total score of the axis to which the statement belongs, and are presented in Table 5.1. It can be seen that all were high positive correlations, except for two statements (41 and 42), which only exhibited moderate positive correlations ( $r=0.47^{**}$  -  $0.541^{**}$ ) with all the other statements. These statements

are: “If I’m feeling really good, I don’t worry about the type or quantity of food I eat” and “When I’m happy, having a favourite snack makes me feel even better” (Appendix 1). Overall, these high positive correlations show the questionnaire has high internal consistency.

**Table 5.1**  
*Pearson Correlation Coefficients for Perceptions of Emotional Eating*

<b>Axis II: Exploring emotional eating among students and their stages</b>					
24	.704**	27	.752**	30	.791**
25	.638**	28	.769**		
26	.702**	29	.670**		
<b>Axis III: Emotional (psychological) factors for eating</b>					
31	.674**	35	.732**	39	.626**
32	.712**	36	.765**	41	.471**
33	.630**	37	.660**	42	.541**
34	.616**	38	.707**		

\*\*D is statistically significant at p<0.01

\*D is statistically significant at p<0.05

### 5.2.3 Structural Integrity of the Questionnaire

The structural integrity of the two axes was verified by finding the correlation coefficients between the total score of each axis and the total number of statements in the questionnaire, which are presented in Table 5.2, and both were statistically significant.

**Table 5.2**  
*Correlation Coefficients between the Total Score of Axis Two and Three*

N	The hub	Coefficient of correlation
2	Axis II: "exploring emotional eating among students and their stages".	.913**
3	Axis III "emotional (psychological factors for eating)".	.882**

\* D is statistically significant, p<0.01

The values of the Cronbach-alpha stability coefficients for axes II and III are presented in Table 5.3 and are acceptably high.

**Table 5.3**  
*Cronbach-Alpha Stability Coefficients for the Resolution Axes*

The hub	Number of statements	Cronbach Alpha coefficient
Axis II: exploring emotional eating	7	.820
Axis III: emotional/psychological factors for eating	11	.821

### 5.3 Section 1: Student Demographics

This section presents general demographic data gathered about the students, including gender, year of study, and age. Data regarding their weight and height were collected to compute their body mass index (BMI). The participants were asked to write down their height and weight if they were sure of it; otherwise their height and weight were measured for them. Girls were moreover required to provide details about the timing of their first period. Other details obtained concerned the persons the students were living with, their siblings, education levels of parents, nature of residence, and house staff (see Appendix 1).

#### 5.3.1 Year of Study and Age

Table 5.4 summarises the distribution of the students by their year of study and gender, showing a very even distribution.

**Table 5.4**  
*Distribution of Sample by Year of Study and Gender*

Year of Study	Boys		Girls	
	N	%	N	%
Year 7	50	33.11	52	33.98
Year 8	51	33.77	50	32.67
Year 9	50	33.11	51	33.33
Total	151	100	153	100

The ages of the students are presented in Table 5.5, showing them to be in the early stage of adolescence.

**Table 5.5**  
*Distribution of Sample by Age*

Age (in years)	Males		Females		Total	
	n	%	n	%	n	%
12	8	5.3	22	14.4	30	20.27
13	50	33.1	47	30.7	96	63.17
14	53	35.1	51	33.33	104	68.42
15	40	26.5	33	21.56	73	24.03
Total	151	100.0	153	100.0	304	100.0

### 5.3.2 Weight, Height, and BMI

The distributions of weights of the boys and girls by their year of study are presented in Table 5.6. Details of the means and standard deviations of the weights are presented in Table 5.7.

**Table 5.6**  
*Distribution of Sample's Weight by Gender and Year of Study*

Boys	Weight (kg)							
	Year 7		Year 8		Year 9		Total	
	N	%	N	%	N	%	N	%
I do not know	2	4.0	4	7.8	1	2.0	7	4.6
36-45	13	26.0	5	9.8	3	6.0	21	13.9
46-55	11	22.0	12	23.5	15	30.0	38	25.2
56-65	11	22.0	13	25.5	15	30.0	39	25.8
66 and more	13	26.0	17	33.3	16	32.0	46	30.5
<b>Total N</b>	50	100	51	100	50	100	151	100
Girls	Year 7		Year 8		Year 9		Total	
	N	%	N	%	N	%	N	%
	I do not know	6	11.5	2	4.0	3	5.9	11
36-45	19	36.5	13	26.0	12	23.5	44	28.8
46-55	20	38.5	16	32.0	10	19.6	46	30.1
56-65	5	9.6	13	26.0	12	23.5	30	19.6
66 and more	2	3.8	6	12.0	14	27.5	22	14.4
<b>Total N</b>	52	52	50	100	51	100	153	100

**Table 5.7**  
*Distribution of Sample's Mean of Weight by Gender and Year of Study*

School grade	Boys				Girls				Total			
	N	%	Mean weight (kg)	Std. Deviation	N	%	Mean weight (kg)	Std. Deviation	N	%	Mean weight (kg)	Std. Deviation
7	50	33.1	54.80	16.899	52	34	43.21	17.592	102	33.6	48.89	18.130
8	51	33.8	56.27	20.152	50	32.7	51.52	14.283	101	33.2	53.92	17.571
9	50	33.1	60.86	14.779	51	33.3	54.47	18.431	101	33.2	57.63	16.946
Total	151	100	57.30	17.512	153	100	49.68	17.449	304	100	53.47	17.865

The heights of the boys and girls are presented in Table 5.8.

**Table 5.8**  
*Distribution of Sample by Height*

Height (cm)	Boys		Girls		Total		Valid percent
	N	%	N	%	N	%	
I do not know	7	4.6	13	8.4	20	6.57	6.57
140-149	4	2.6	11	7.2	15	4.9	4.9
150-159	48	31.8	77	50.3	125	41.1	41.1
160-169	73	48.3	47	30.7	120	39.5	39.5
170 and more	19	12.6	5	3.3	24	7.9	7.9
Total	151	100	153	100	304	100	100

The distributions of the heights of the students by year of study are presented in Table 5.9.

**Table 5.9**  
*Distribution of Sample's Height by Gender and Year of Study*

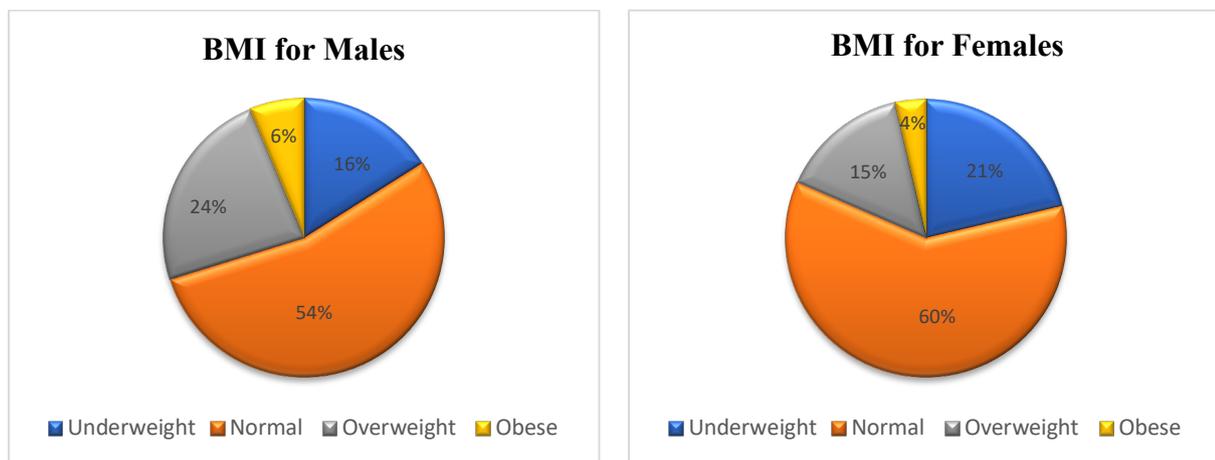
School grade	Males				Females				Total			
	N	%	Mean height (cm)	Std. Deviation	N	%	Mean height (cm)	Std. Deviation	N	%	Mean height (cm)	Std. Deviation
7	50	33.11	152.18	31.743	52	33.98	136.27	49.889	102	33.6	144.07	42.538
8	51	33.77	149.59	44.467	50	32.67	151.80	31.712	101	33.2	150.68	38.505
9	50	33.11	160.80	23.984	51	33.33	147.08	43.681	101	33.2	153.87	35.825
Total	151	100	154.16	34.630	153	100	144.95	42.774	304	100	149.52	39.151

The weight and height data obtained allowed computation of the body mass index (BMI) of the participating students, which is a measure of body fat: BMI is a person's weight in kilograms divided by the square of their height in metres. The different BMI categories are: Underweight = (<18.5), Normal weight = (18.5–24.9), Overweight = (25–29.9), and Obesity = (>=30) (CDC, 2018). See Table 5.10 and Table 5.11 and Figure 5.1.

**Table 5.10**  
*Distribution of Sample's BMI by Gender*

Gender	School grade	N	BMI			Mean	Std. Deviation	Missing data
			%	% total N				
Males	Didn't mentioned	7	6.4	2.3	.00	.000		
	Underweight = <18.5	23	15.2	7.6	17.26	.864		
	Normal = 18.5–24.9	78	51.7	25.7	21.88	1.900		
	Overweight = 25–29.9	34	22.5	11.2	26.80	1.989		
	Obese = 30 or greater	9	6	3.0	31.71	1.897		
	<b>Total</b>	<b>151</b>	<b>100</b>	<b>49.7</b>	<b>21.85</b>	<b>6.318</b>	<b>7</b>	
Females	Didn't mentioned	12	7.8	3.9	.00	.000		
	Underweight = <18.5	30	19.6	9.9	17.43	.750		
	Normal = 18.5–24.9	85	55.6	28.0	21.14	1.968		
	Overweight = 25–29.9	21	13.7	6.9	26.97	1.259		
	Obese = 30 or greater	5	3.3	1.6	31.57	2.202		
	<b>Total</b>	<b>153</b>	<b>100</b>	<b>50.3</b>	<b>19.90</b>	<b>6.877</b>	<b>12</b>	
Total	Didn't mentioned	19	6.3	6.3	.00	.000		
	Underweight = <18.5	53	17.4	17.4	17.36	.798		
	Normal = 18.5–24.9	163	53.6	53.6	21.49	1.964		
	Overweight = 25–29.9	55	18.1	18.1	26.86	1.735		
	Obese = 30 or greater	14	4.6	4.6	31.66	1.927		
	<b>Total</b>	<b>304</b>	<b>100</b>	<b>100.0</b>	<b>20.87</b>	<b>6.667</b>	<b>19</b>	

**Figure 5.1**  
*Distribution of Sample by BMI (Males N=144, Females N=141)*



**Table 5.11***Means and Standard Deviations of the Sample's BMI by Gender and Year of Study*

Gender	School grade	BMI		Mean	Std. Deviation
		N	%		
Boys	7	50	33.1	21.74	6.337
	8	51	33.8	21.27	7.244
	9	50	33.1	22.57	5.253
	Total	151	100	21.85	6.318
Girls	7	52	34	18.19	7.273
	8	50	32.7	20.58	5.506
	9	51	33.3	20.97	7.447
	Total	153	100	19.90	6.877
Total	7	102	33.6	19.93	7.026
	8	101	33.2	20.93	6.420
	9	101	33.2	21.79	6.473
	Total	304	100	20.87	6.667

A Mann-Whitney test was performed to determine whether the BMI of the participants differed by gender. It showed that the male students (Mdn= 22.41) had significantly higher BMI than the female students (Mdn=20.20),  $U = 9819.500$ ,  $z = -2.475$ ,  $p < .013$ . The effect size was small in the difference of the BMI according to the gender: Eta squared ( $\eta^2$ )  $r = 0.017$ ,  $d = 0.261$ . This finding was expected, as adolescent males generally have higher BMI than adolescent females (CDC, 2018).

Interestingly, overweight and obesity in this study was lower comparatively than what was found between 2009 and 2010 in the Al-Khobar, Jeddah, and Riyadh regions of Saudi Arabia among secondary school students aged between 14 and 19 years by Al-Hazzaa et al. (2014). This study found that across the age groups, the majority of the study population were overweight or obese (respectively, 39.9% to 45.6% in males, and 30.4% to 38.7% in females). By comparison, the present study found that only 22.7% of all the students were overweight or obese (Table 5.10). Moreover, this figure is lower than for other Arabian Gulf countries, such as the United Arab Emirates, where 35.7% were overweight /obese (Musaiger et al., 2003); Kuwait, where 28.4% were overweight/obese (Papandreou et al., 2015); and Oman, where 28.2% were overweight/obese (Al-Kilani et al., 2012). Further, the present study's finding of 22.7% being overweight/obese is lower than what was reported by the British National Foundation (2018) for 2013, when 34% of teenage males and 39% of teenage females aged 13-15 years in England were obese or overweight. These high values of BMI highlight the importance of raising the awareness of healthy eating and behaviours for reducing weight to a normal value.

### 5.3.3 Age at First Period (Females Only)

The age at which the girls had their first period is presented in Table 5.12. The findings correspond to those of Al Harbi et al. (2018), who found that Saudi girls had experienced menarche with a mean age of  $12.46 \pm 1.57$ .

**Table 5.12**  
*Distribution of Girls by Age at First Period*

Age	N	%	Valid Percentage	Cumulative Percentage
Not yet	21	13.8	6.9	56.4
10	4	2.6	1.3	100
11	31	20.39	10.2	66.7
12	56	36.8	18.4	85.1
13	29	19.1	9.5	94.7
14	10	6.6	3.3	98.0
15	2	1.32	0.7	98.7
Total	152	100.0	100.0	
Missing data	1			

### 5.3.4 Family and Household

A significant majority, 97.3% of the males and 94.1% of the females, were found to reside with both parents (Table 5.13). This is not surprising, as in Riyadh, the majority (68%) of the population aged 22 or greater are married couples (High Commission for the Development of ARRIyadh, 2017).

**Table 5.13**  
*Distribution of Sample by Persons They Live With*

Persons Living with	Boys		Girls		Total	
	N	%	N	%	N	%
Parents	146	97.3	144	94.1	290	95.7
Mother	4	2.7	5	3.3	9	3.0
Father	0	-	2	1.3	2	0.7
Others	0	-	2	1.3	2	0.7
Total	150	100.0	153	100.0	303	100.0
Missing data	1					

The distribution of the sample by birth order is presented in Table 5.14. A study in Japan by Ochiai et al. (2012) found that childhood overweightness was related to being an only or youngest child. However, while their study did not find a statistically significant

association between overweightness and a larger number of older siblings, it did find a negative association between having a larger number of younger siblings and overweightness. Nevertheless, given the childhood obesity statistics in Saudi Arabia, it is highly probable that the siblings are of the same BMI as the participating students.

**Table 5.14**  
*Distribution of Sample by Birth Order*

Birth Order	Boys		Girls		Total	
	N	%	N	%	N	%
<b>Eldest</b>	39	25.8	42	27.3	81	26.6
<b>Middle</b>	77	51	79	52.0	156	51.3
<b>Youngest</b>	35	23.2	32	20.7	67	22.0
<b>Total</b>	151	100.0	153	100.0	304	100.0

Table 5.15 shows the distribution of the sample by the number of siblings. Households with more than one child have been found to have siblings with different weight statuses (e.g., healthy weight, overweight, underweight). Thus, parents may use different practices to restrict or encourage the eating of the siblings, for example, using restrictive feeding practices with an overweight child or pressurising an underweight child to eat (Berge et al., 2016). Further, adolescent siblings, regardless of their weight category, may influence the eating behaviour of their siblings, as will be seen later.

**Table 5.15**  
*Distribution of Sample by Number of Siblings*

Number of siblings in the family	Boys		Girls		Total	
	N	%	N	%	N	%
<b>None</b>	3	1.32	5	3.3	8	2.7
<b>1-3</b>	43	28.5	44	28.8	87	28.7
<b>4 or more</b>	104	68.9	104	68	208	68.7
<b>Total</b>	150	100.0	153	100.0	303	100.0
<b>Missing data</b>	1				1	

The distribution of the number of persons living in the household is presented in Table 5.16. These findings show that most Saudi families are either medium or large.

The family types of the participants were either a single family, which consisted of their parents, father's other spouses, and siblings, or extended families, which consisted of their

father's spouses, children, and other relatives (High Commission for the Development of ARRIyadh, 2017).

**Table 5.16**

*Distribution of Sample by Number of Persons Living in the Household*

Number of Persons Living in the Household	Boys		Girls		Total	
	N	%	N	%	N	%
1-3	7	4.7	11	7.2	18	6.0
4-7	76	51	82	53.6	158	52.3
8 or more	66	44.3	60	39.2	126	41.7
<b>Total</b>	149	100.0	153	100.0	302	100.0
<b>Missing data</b>	2				2	

Since Saudi families reflect the collectivistic nature of their society (Hammad, 2017), the findings in this section were in line with the social context of Saudi families and the influence of various persons in the existence of a family. This is particularly of significance in the context of the current study, as the type of food consumed by children can be affected by the persons living in close proximity with them, for instance, parents, siblings, grandparents, uncles and aunts (Hughes et al., 2013). Further, the study's sample reflected the average size of families in Riyadh city, which is 5-7 people (High Commission for the Development of ARRIyadh, 2017). Family members could influence eating behaviours, as Walfish (2004) pointed out that the system by which the family expresses affection is often conveyed through food. Also, people relate food with their cultural characteristics and family unit. In Saudi Arabia, the familial and social environment has a significant influence on the eating habits of a person. This is also attributable to the strong Islamic influence on the functioning of Saudi society (section 2.3). Thus, it is not surprising that a person's immediate environment, which includes parents and siblings, can have a significant impact on their eating habits (Al-Jaaly, 2016) (section 3.4.6.3).

### **5.3.5 Educational Level of Parents**

The distribution of the father's educational level is presented in Table 5.17.

**Table 5.17***Distribution of Sample by Father's Educational Level*

Father's educational level	Boys		Girls		Total	
	N	%	N	%	N	%
No education	1	0.7	5	3.3	6	2.0
Secondary or less	30	19.9	48	31.6	78	25.7
Bachelor or more	119	78.8	99	65.1	218	71.9
Total	150	99.3	152	99.3	302	99.3
Missing data	1		1		2	

The distribution of the mother's educational level is presented in Table 5.18.

**Table 5.18***Distribution of Sample by Mother's Educational Level*

Mother's educational level	Boys		Girls		Total	
	N	%	N	%	N	%
No education.	9	6.0	9	5.9	18	5.9
Secondary or less.	52	34.4	61	40.1	113	37.3
Bachelor or more.	89	58.9	82	53.9	171	56.4
Total	150	100.0	152	100.0	302	100.0
Missing data	1		1		2	

Further, women are encouraged to pursue higher education both within the country and overseas, which led to an increase in the number of working women. The implication of women's dependence on work is the limited parental supervision of children, which may lead to them developing unhealthy food-related behaviours, such as the intake of large quantities of unhealthy foods or depending on maids without supervision or instruction (Benajiba, 2016).

### **5.3.6 Ownership and Type of Residence**

The distribution of the ownership of residence is presented in Table 5.19. Overall, 56% of Saudi families living in Riyadh own their homes, 40% live in rented homes, and 3% live in homes provided by their employers (High Commission for the Development of ARRIyadh, 2017). Thus, the study's participants were representative of the families in Riyadh, as they lived in similarly owned residence.

**Table 5.19**  
*Distribution of Sample by Ownership of Residence*

Type of Residence	Boys		Girls		Total	
	N	%	N	%	N	%
<b>Owned</b>	99	66	65	42.5	164	54.1
<b>Rented</b>	41	27.3	59	38.6	100	33.0
<b>Sharing house with relatives</b>	1	0.7	17	11.1	18	5.9
<b>Work-provided</b>	9	6.0	12	7.8	21	6.9
<b>Total</b>	150	100	153	100	303	100
<b>Missing data</b>	1				1	

The distribution of the type of residence is presented in Table 5.20. These findings are in line with the findings of the survey performed by the High Commission for the Development of Arriyadh (2017), which revealed that 52% of the population in Riyadh lived in villas, while 42% lived in apartments, and 2.5% lived in popular houses (old houses).

**Table 5.20**  
*Distribution of Sample by Type of Residence*

Type of Residence	Boys		Girls		Total	
	N	%	N	%	N	%
Villa	104	68.9	76	49.7	180	59.2
Flat	24	15.9	41	26.8	65	21.4
Floor	23	15.2	36	23.5	56	19.4
<b>Total</b>	151	100.0	153	100.0	304	100.0

### **5.3.7 Number of House Staff**

The distribution of the sample by the number of house staff is shown in Table 5.21, which shows the pattern for an average household. In Saudi Arabia house staff usually involves the maid, who is in charge of cleaning and cooking, or the driver, who is responsible for driving and the garden.

**Table 5.21**  
*Distribution of Sample by Number of House Staff*

House staff	Boys		Girls		Total	
	N	%	N	%	N	%
No house staff	59	39.1	64	41.8	123	40.5
1 staff	42	27.8	49	32.0	91	29.9
2 staffs	42	27.8	33	21.6	75	24.7
3 or more	8	5.3	7	4.6	15	4.9
<b>Total</b>	151	100	153	100	304	100

## 5.4 Section 2: Factors Associated with Emotional Eating

The intent of the second section of the questionnaire was to obtain insights regarding the different factors associated with emotional eating (personal and sociocultural factors), such as influence on body shape, food choices, etc.

### 5.4.1 Influence on Body Shape

The people who influence body shape are presented in Table 5.22. The results indicated that the males were highly affected by friends while the females were highly affected by social media. Also, it could be seen that mothers had a slightly stronger influence on the body shape of both boys and girls in contrast to the fathers, although as expected, fathers were reported to have a greater influence on the body shape of the boys rather than the girls. Surprisingly, celebrities were ranked relatively low by both boys and girls.

Several societal and cultural beliefs may encourage the consumption of food with the intent, for example, to either gain or lose weight to achieve a specific body shape. Parents tend to control their children's food habits; therefore, they may indirectly contribute to the development of emotional eating (Aston University, 2016). Moreover, the study of Unikel et al. (2005) on Mexican women (mean age 19.1±3.8) found that social and cultural pressure to stay slim caused people to develop dissatisfaction with their bodies and change their food habits. Such changes may eventually lead to the development of eating disorders.

**Table 5.22**  
*People's Influence on Body Shape*

Influence on body shape	Boys		Girls		Total	
	N	%	N	%	N	%
Father	77	51.0	42	27.5	119	39.1
Mother	77	51.0	95	62.1	172	56.6
Siblings	63	41.7	66	43.1	129	42.4
Friends	92	60.9	89	58.2	181	59.5
Famous people	37	24.5	40	26.1	77	25.3
Social media	71	47	108	70.6	179	58.9
None of these	11	7.3	11	7.3	22	7.2

#### 5.4.2 Influence on Food Choices

The influences on food choice are presented in Table 5.23. The results indicated that the males were highly influenced by their parents while the females were highly influenced by both parents and food brand. Friends and social media were also significant influences.

**Table 5.23**  
*Influences on Food Choices*

Influence on food choices	Boys		Girls		Total	
	N	%	N	%	N	%
Parents	106	70.2	118	77.1	224	73.4
Siblings	55	36.4	92	60.1	147	48.4
Friends	65	43.0	78	51.0	143	47.0
Social media	56	37.1	79	51.6	135	44.4
Food brand	52	34.4	114	74.5	166	54.6
None of these	11	7.3	10	6.5	21	6.9

#### 5.4.3 Predisposition to Eating

The times and people who increased predisposition to eating are presented in Table 5.24; note that participants could list more than one option here. It is noteworthy that the females were more inclined to eat during meetings with friends and relatives, weekend holidays, and social and religious events, possibly suggesting that the females felt more inclined to eat during social interactions, where possibly greater quantities of food were also available.

**Table 5.24**  
*Increased Predisposition to Eating*

Increased predisposition to eating	Boys		Girls		Total	
	N	%	N	%	N	%
Period days	0	0.0	35	22.9	35	11.5
Fasting days	89	58.9	55	35.9	144	47.4
Weekend holidays	93	61.6	117	77.0	210	69.3
Social and religious events	65	43.3	76	49.7	141	46.5
Friends and relatives meeting	89	58.9	126	82.4	215	70.7
None of these	5	3.3	5	3.3	10	3.3

#### 5.4.4 Food and Drink That Appeals

The students provided insights about the food and drink that appealed to them, which are presented in Table 5.25. It is not perhaps surprising that they preferred fast food and snacks over healthy food choices, as these may be in line with what they see on the different media and advertisements.

**Table 5.25**  
*Food That Appeals*

Food that appeals	Boys		Girls		Total	
	N	%	N	%	N	%
Healthy food	89	58.9	71	46.4	160	52.6
Fast food	107	70.9	132	86.3	239	78.6
Snack	100	66.2	138	90.2	238	78.3
None of these	4	2.6	5	3.3	9	3.0

The types of drinks that appeal are presented in Table 5.26.

**Table 5.26**  
*Drinks That Appeal*

Drinks that appeal	Boys		Girls		Total	
	N	%	N	%	N	%
Water	80	53.0	62	40.5	142	46.7
Soft drinks	84	55.6	92	60.1	176	57.9
Juices	88	58.3	106	69.3	194	63.8
Energy drinks	53	35.1	37	24.2	90	29.6
None of these	2	1.3	3	2.0	5	1.6

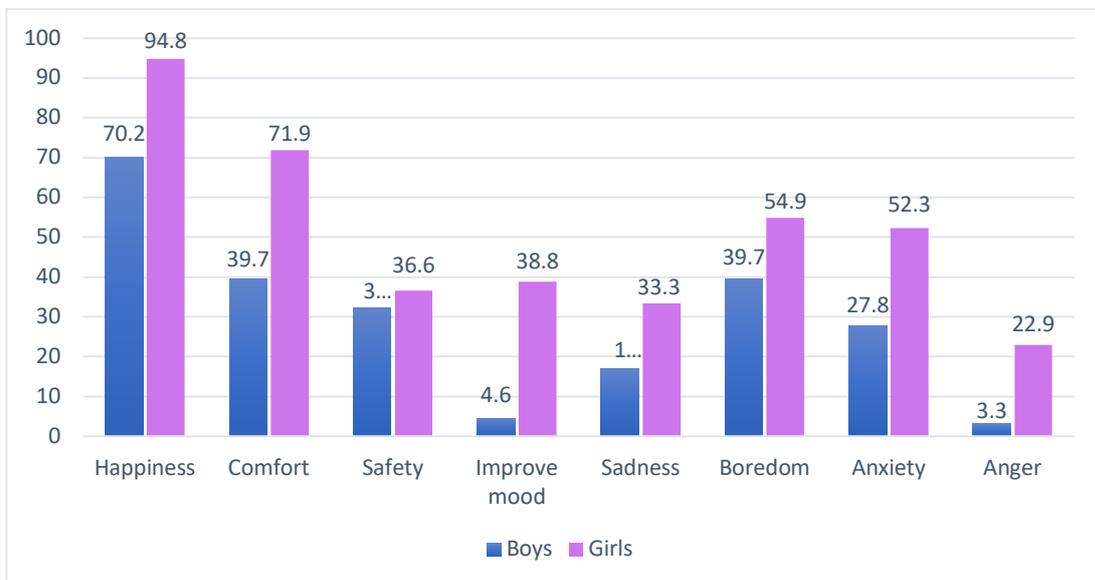
### 5.4.5 Emotions Associated with Eating

The students were asked to indicate the emotions they associated with eating, with the main ones presented in Table 5.27 and Figure 5.2. It is interesting that happiness came out top for both sexes, and comfort was reported by 72% of the females. The Chi-square tests (applying Yates' correction) indicated that a significantly higher proportion of the females compared with the males associated happiness, comfort, improving mood, sadness, boredom, anxiety and anger with eating.

**Table 5.27**  
*Emotions Associated with Eating*

Emotions associated with eating	Boy		Girl		Total		Chi-square	p
	N	%	N	%	N	%		
Happiness	106	70.2	145	94.8	251	82.6	30.194	0.00001
Comfort	60	39.7	110	71.9	170	55.9	30.5968	0.00001
Safety	49	32.5	56	36.6	105	34.5	0.4101	.521909
Improve mood	7	4.6	59	38.8	66	21.8	49.4863	0.00001
Enjoyment	19	12.6	27	17.6	46	15.1	1.149	0.283757
Sadness	26	17.2	51	33.3	77	25.3	9.5999	.001946
Boredom	60	39.7	84	54.9	144	47.4	6.417	.011303
Anxiety	42	27.8	80	52.3	122	40.1	17.9397	.000023
Anger	5	3.3	35	22.9	40	13.2	23.7742	0.00001
Hunger	17	11.3	9	5.9	26	8.6	2.1629	0.141376
Laziness	1	0.7	1	0.7	2	0.7	0.4902	0.483849

**Figure 5.2**  
*Emotions Associated with Eating*



#### 5.4.6 Is Healthy Eating a Problem for Young People in Saudi Arabia?

The students were asked if they were aware that healthy eating was a problem for the youth in their country. The majority (82.8% of males and 79.7% of females) agreed that healthy eating was indeed a problem in the country (see Table 5.28).

**Table 5.28**

*Is Healthy Eating Viewed As a Problem for Young People in Saudi Arabia?*

Healthy eating is a problem for young people in Saudi Arabia	Boy		Girl		Total	
	N	%	N	%	N	%
Disagree	26	17.2	31	20.3	57	18.8
Agree	125	82.8	122	79.7	247	81.3

### 5.5 Section 3: Elements of an Online Healthy Eating Awareness Programme

The purpose of the third section of the questionnaire was to obtain insights regarding the perceptions of the participants regarding the elements of an online awareness programme for healthy eating.

#### 5.5.1 Preference of Social Networking Apps

Table 5.29 summarises the preferences of the participating students with regard to social networking apps.

**Table 5.29**

*Preference of Social Networking Apps*

Preference of social networking apps	Boy		Girl		Total	
	n	%	n	%	n	%
Facebook	6	4	12	7.8	18	5.9
Instagram	86	57.0	134	87.6	220	72.4
Twitter	38	25.2	21	13.7	59	19.4
Snapchat	108	71.5	131	85.6	239	78.6
WhatsApp	89	58.9	56	6.8	145	47.9
YouTube	128	84.8	131	85.6	259	85.2

#### 5.5.2 Preferred Features of an Online Healthy Eating Programme

The preferred features of an online healthy eating programme in the opinion of the participating boys are presented in Table 5.30.

**Table 5.30**  
*Features of an Online Healthy Eating Programme*

Features of an online healthy eating programme	Boy		Girl		Total	
	N	%	N	%	N	%
Video Clips	95	62.9	118	77.6	213	70.3
Lecture presentations	15	9.9	13	8.6	28	9.03
Activities	41	27.2	67	44.1	108	35.6
Games	78	51.7	102	67.1	180	59.4
Healthy eating information	84	55.6	121	79.6	205	67.7
Talking (discussing) with young	66	43.7	103	67.8	169	55.8
Advice	68	45.0	121	79.6	189	62.4
Meal plans	52	34.4	81	53.3	133	43.9

### 5.5.3 Applications/Websites to Prompt Healthy Eating

The findings for applications/websites that prompt healthy eating are presented in Table 5.31.

**Table 5.31**  
*Applications/ Websites that Prompt Healthy Eating*

Applications/ websites that prompt healthy eating	Boy		Girl		Total	
	N	%	N	%	N	%
App/Website that helps me monitor what I eat	83	55.0	82	53.9	165	54.5
App/Website that gives me advice about healthy eating	62	41.4	62	40.8	124	40.9
App/Website that shows me to exercise to stay fit	100	66.2	89	58.6	189	62.4
App/Website that helps me discuss healthy eating with other young people	25	16.6	41	27.0	66	21.8

## 5.6 Section 4: Eating Behaviour and Emotional Eating

The fourth section of the questionnaire pertained to different aspects of the eating behaviour of the participants. This section was organized into three axes related to emotional eating. That is, (1) the eating behaviours of adolescents, (2) exploring emotional eating among students and the stages, and (3) emotional (psychological), personal, social, and cultural factors and how all these related to eating.

Appendix 9 summarises the statistical results of the students' responses to the first axis of the questionnaire, i.e., eating behaviours of adolescents.

### 5.6.1 Emotional Eating

Appendix 10 summarises the statistical results of the students' responses to the second axis of the questionnaire, i.e., emotional factors of eating. The highest means were found for the items “*I reward myself by eating*” and “*I eat food to feel better when I’m sad, worried, bored ... etc.*”.

### 5.6.2 Emotional (Psychological), Personal, Social and Cultural Factors for Eating

Appendix 11 summarises the statistical results of the students' responses to the third axis of the questionnaire, i.e., emotional (psychological), personal, social and cultural factors for eating. The highest means were found for the items “*When I’m happy, having a favourite snack makes me feel even better*” and “*I eat less when other people are around.*”

### 5.6.3 Level of Emotional Eating

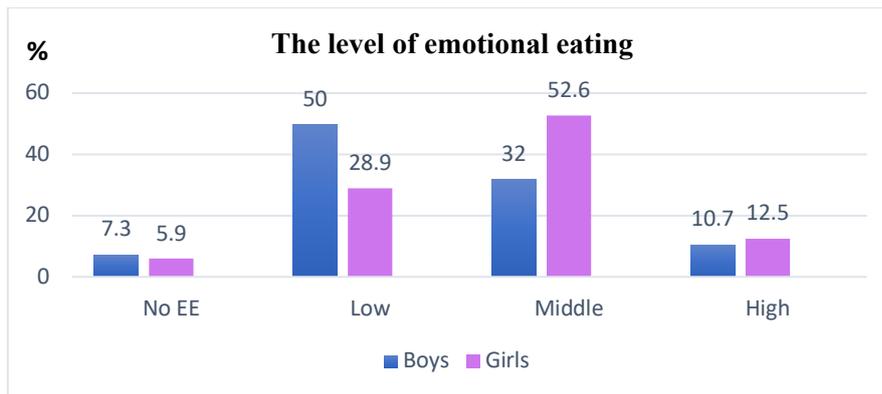
The level of EE among participants was computed to determine the extent of EE of the students (No EE, Low, Middle, or High). To assess the level of EE, this study followed the method of a questionnaire called the Emotional Eater Questionnaire (EEQ), which developed by Garaulet et al. (2012) (Appendix 6) and modified this method in line with this research. All the questions have four possible answers: 1) Never; 2) Little; 3) Sometimes and 4) Usually. A score of 1 to 4 was given for each answer, and the higher the score, the higher the level of emotional eating. The classes were: score between 0-7=non-emotional eater; 8-14= low emotional eater; 15-21= middle emotional eater; and 22-28= high emotional eater (see section 4.6.1). The findings are presented in Table 5.32 and Figure 5.3.

**Table 5.32**  
*Level of Emotional Eating*

Gender	School grade	No EE		Low		Middle		High		Mean	N	Std. Deviation	Missing data
		N	%	N	%	N	%	N	%				
Boys	7	3	6.0	32	64.0	9	18.0	6	12.0	2.36	50	.776	
	8	3	5.9	24	47.1	20	39.2	4	7.8	2.49	51	.731	
	9	5	10.2	19	38.8	19	38.8	6	12.2	2.53	49	.844	
	Total	11	7.3	75	50.0	48	32.0	16	10.7	2.46	150	.783	1
Girls	7	7	13.5	12	23.1	27	51.9	6	11.5	2.62	52	.867	
	8	1	2.0	13	26.0	25	50.0	11	22.0	2.92	50	.752	
	9	1	2.0	19	38.0	28	56.0	2	4.0	2.62	50	.602	
	Total	9	5.9	44	28.9	80	52.6	19	12.5	2.72	152	.758	1
Total	7	10	9.8	44	43.1	36	35.3	12	11.8	2.49	102	.829	
	8	4	4.0	37	36.6	45	44.6	15	14.9	2.70	101	.769	
	9	6	6.1	38	38.4	47	47.5	8	8.1	2.58	99	.730	
	Total	20	6.6	119	39.4	128	42.4	35	11.6	2.59	302	.780	

**Figure 5.3**

*Level of Emotional Eating of Boys and Girls*



To facilitate comparing the males and females, the classes were subjected to a further stage of analysis. “No EE” was assigned a score of 0, “Low” a score of 1, “Middle” a score of 2 and “High” a score of 3. The means of these scores were then calculated. The males had a mean of 1.46 (between Low and Middle) and the females a mean of 1.72 (also between Low and Middle). A Kolmogorov-Smirnov 2-sample test was conducted to look for any differences between the distributions of the males and females and yielded a value of  $D = 0.224$ , which is above the critical value of 0.157 for the  $p=0.05$  (2-tailed) level of significance and a sample size of  $n_1=150$  and  $n_2=152$  (Siegel, 1956). It can be concluded that the males showed a significantly lower level of emotional eating than the females.

### **5.7 Hypotheses Testing**

The following hypotheses were formulated for statistical testing, based on an examination of the findings.

- 1 Gender has an effect on the opinions of the students with regard to their eating behaviours.
2. Gender has an effect on the opinions of the students with regard to their EE.
3. Year of study (grade) has an effect on the opinions of the students with regard to their EE.
4. Level of mothers’ education has an effect on the opinions of the students with regard to their emotional eating.

5. Level of fathers' education has an effect on the opinions of the students with regard to their emotional eating.
6. The number of individuals at home has an effect on the opinions of the students with regard to their emotional eating.
7. The level of emotional eating is related to the BMI of the student.

Table 5.33 sets out the themes (Axes I, II, and III) and their related items in the questionnaire, which have been tested to examine the hypothesis.

**Table 5.33**  
*The Questionnaire Themes*

Theme	No. of Items	Survey Items	Questionnaire question
Axis I: "eating behaviours of adolescents"	8	15, 16, 18, 19, 20, 21, 22, 23	2 <sup>nd</sup> question-part A
Axis II: "exploring emotional eating among students and their stages"	7	24, 25, 26, 27, 28, 29, 30	2 <sup>nd</sup> question-part B
Axis III: "emotional factors to eat"	11	31, 32, 33, 34, 35, 36, 37,38, 39, 41, 42	3 <sup>rd</sup> question-part A

Note: For an explanation of each survey item, see Appendix 1

### **5.7.1 Tests of Normality Homogeneity**

In order to determine whether parametric tests are appropriate, it is essential to investigate if the collected data distribution is normal or non-normal, as well as examining the homogeneity of the variances. The Shapiro-Wilk test of normality displayed that the distribution of the boys' and girls' sample was not normal. Hence, nonparametric tests would be appropriate (see Table 5.34 and Figures 5.4, 5.5, & 5.6).

Furthermore, the results of the Levene's test of variances' homogeneity indicated that the assumption of variance's homogeneity ( $p < .05$ ) was not met. Therefore, non-parametric statistical analyses (Mann-Whitney and Kruskal-Wallis tests, and effect size) were performed to test these hypotheses. These are described in the following sub-sections.

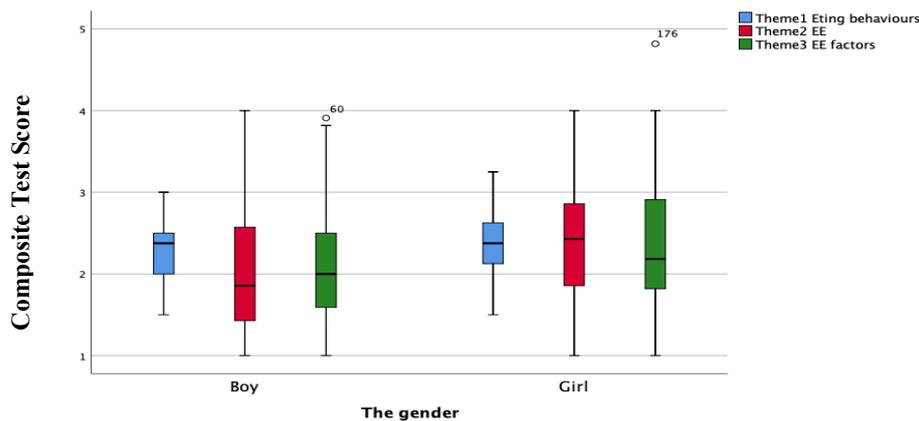
**Table 5.34**

*Shapiro-Wilk's Test of Normality and Levene's Test of Homogeneity of Variance for the Three Themes: Eating Behaviours of Adolescents, EE and Factors of EE*

Theme	Gender	Shapiro-Wilk Test			Levene's Test
		Statistic	df	P-value	P-value
Axis I: "eating behaviours of adolescents"	Boys	.978	151	.018	.009
	Girls	.984	153	.067	
Axis II: "exploring emotional eating among students and their stages"	Boys	.951	151	.000	.000
	Girls	.975	153	.006	
Axis III: "emotional factors to eat"	Boys	.970	151	.002	.001
	Girls	.979	153	.021	

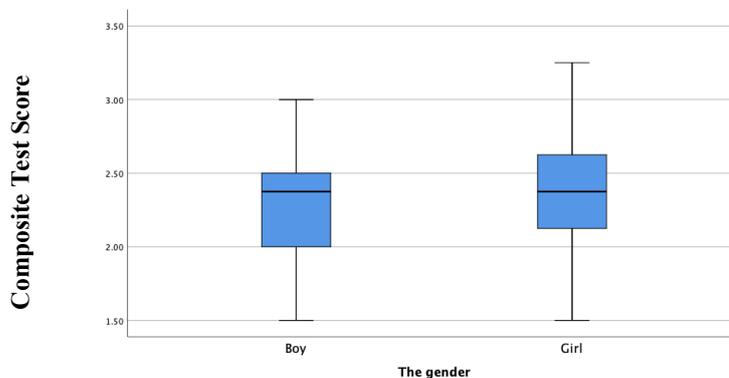
**Figure 5.4**

*Boxplot for the Composite Test Score for Each Theme (Axis)*



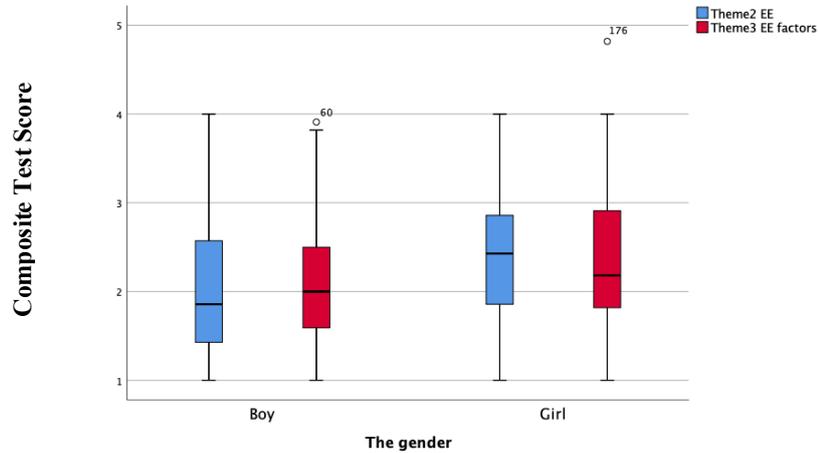
**Figure 5.5**

*Boxplot for the Composite Test Score for Gender in Theme 1 (Axis I)*



**Figure 5.6**

*Boxplot for the Composite Test Score for Gender in Theme 2 & Theme 3 (Axis II and III)*



### **5.7.2 Differences in Eating Behaviours by Gender**

A series of Mann-Whitney tests were performed to determine whether the eating behaviour of the participants differed by gender (Table 5.35). There were statistically significant differences with regard to half of the statements of the first axis: “I eat slowly and taste every piece of food which I eat”, “I avoid eating unhealthy food”, “Before eating, I spend a moment to pay attention to food's shape and colour and smell its fragrance”, and “When I do a good job, my parents reward me with food.” The effect sizes were small in Axis I: Eta squared ( $\eta^2$ )  $r = 0.02$  ,  $d = 0.284$ .

**Table 5.35***Outcomes of Mann-Whitney Tests for Differences in Eating Behaviour by Gender*

Axis 1: "eating behaviours of adolescents"									
The hub	Gender	N	Mean	Sum of Rank	Mann Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	
1	1. I eat slowly and taste every piece of food which I eat.	Males	151	2.62	21012.50	9536.500	21012.500	-2.830	.005
	Females	153	2.90	25347.50					
	Total	304	2.76	23.180					
2	I eat quickly.	Males	151	2.30	24404.50	10174.500	21955.500	-1.879	.060
	Females	153	2.08	21955.50					
	Total	304	2.19	23.180					
3	I avoid eating unhealthy food.	Males	151	2.30	24836.00	9743.000	21524.000	-2.495	.013
	Females	153	2.05	21524.00					
	Total	304	2.18	23.180					
4	Before eating, I spend a moment to pay attention to food's shape and colour and smell its fragrance.	Males	151	2.54	20501.50	9025.500	20501.500	-3.432	.001
	Females	153	2.00	25858.50					
	Total	304	2.77	23.180					
5	I notice the flavours in the food while eating it.	Males	151	2.91	22442.50	10966.500	22442.500	-.802	.423
	Females	153	3.00	23917.50					
	Total	304	2.96	23.180					
6	I read the food calories when I choose food.	Males	151	1.62	23225.00	11354.000	23135.000	-.303	.762
	Females	153	1.58	23135.00					
	Total	304	1.60	23.180					
7	I consume large quantities of food in a short period of time.	Males	151	2.07	22653.50	11177.500	22653.500	-.512	.609
	Females	153	2.13	23706.50					
	Total	304	2.10	23.180					
8	When I do a good job, my parents reward me with food	Males	151	1.91	20233.00	8757.000	20233.000	-3.843	.000
	Females	153	2.35	26127.00					
	Total	304	2.13	23.180					

As four of the eight statements showed gender differences, the first hypothesis was partially accepted.

### 5.7.3 Differences in Emotional Eating by Gender

Mann-Whitney tests were conducted to explore gender differences in the responses to the second and third axes (see Table 5.36). It was found that the female students were significantly more in agreement with the statements than the males for both axes. Thus, the second hypothesis was accepted.

**Table 5.36***Outcomes of Mann-Whitney Tests for Differences in the Emotional Eating by the Gender*

The hub	Gender	N	Mean	Sum of Rank	Mann Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: “exploring emotional eating among students and their stages”	Males	151	2.0296	20950.2857	8383.000	19859.000	-4.142	.000	0.056	0.488
	Females	153	2.3641	25322.92						
	Total	304	2.1980	23136.5714						
Axis III: “emotional factors to eat”	Males	151	2.0783	21382.9091	9036.000	20512.000	-3.286	.001	0.035	0.383
	Females	153	2.3559	24977.0909						
	Total	304	2.2180	23.180						

**5.7.4 Differences in Emotional Eating by Year of Study**

Kruskal-Wallis tests were conducted to investigate whether emotional eating varied by the year of study but revealed no statistically significant effects for either axis (see Table 5.37). Thus, the third hypothesis was rejected.

**Table 5.37***Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Year of Study*

The hub	Year of Study	Number	Mean (by Year of Study)	Kruskal- Wallis H	Degrees of freedom	Level of significance	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: exploring emotional eaters and their stages.	Year 7	102	2.1078	2.968	2	.227	0.004	0.121
	Year 8	101	2.2419					
	Year 9	101	2.2452					
	<b>Total</b>	304						
Axis III: emotional (psychological), factors to eat.	Year 7	102	2.2193	.814	2	.666	0.002	0.082
	Year 8	101	2.2610					
	Year 9	101	2.1737					
	<b>Total</b>	304						

**5.7.5 Differences in Emotional Eating by Mothers' Education**

The Kruskal-Wallis test also was performed to determine whether the emotional eating of the participants differed by the mothers' education (see Table 5.38). There were no statistically significant effects for either axis. Thus, the fourth hypothesis was also rejected.

**Table 5.38**

*Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Mothers' Education*

The hub	Year of Study	Number	Mean (by Year of Study)	Kruskal-Wallis H	Degrees of freedom	Level of significance	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: exploring emotional eaters and their stages.	No education	18	2.1984	.404	2	.817	0.002	0.094
	Secondary or less	113	2.1656					
	Bachelor or more	171	2.2250					
	<b>Total</b>	302						
Axis III: emotional (psychological), factors to eat.	No education	18	2.1111	1.034	2	.596	0.001	0.076
	Secondary or less	113	2.1802					
	Bachelor or more	171	2.2568					
	<b>Total</b>	302						

### **5.7.6 Differences in Emotional Eating by Fathers' Education**

Similarly, the Kruskal-Wallis test was applied to determine whether the emotional eating of the participants differed by the fathers' education (see Table 5.39). There were no statistically significant effects for either axis. Thus, the fifth hypothesis was also rejected.

**Table 5.39**

*Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Fathers' Education*

The hub	Year of Study	Number	Mean (by Year of Study)	Kruskal-Wallis H	Degrees of freedom	Level of significance	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: exploring emotional eaters and their stages	No education	6	2.7381	3.982	2	.137	0.001	0.054
	Secondary or less	78	2.1740					
	Bachelor or more	218	2.1962					
	Total	302						
Axis III: emotional (psychological), factors to eat	No education	6	2.4545	.802	2	.670	0.003	0.118
	Secondary or less	78	2.2366					
	Bachelor or more	218	2.2068					
	Total	302						

### ***5.7.7 Differences in Emotional Eating by the Number of Individuals at Home***

Kruskal-Wallis tests were further performed to determine whether the emotional eating of the participants differed by the number of individual at home (see Table 5.40). There were no statistically significant effects for either axis. Thus, the sixth hypothesis was also rejected.

**Table 5.40**

*Outcomes of Kruskal-Wallis Tests for Differences in Emotional Eating by the Number of Individuals at Home*

The hub	Year of Study	Number	Mean (by Year of Study)	Kruskal-Wallis H	Degrees of freedom	Level of significance	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: exploring emotional eaters and their stages	1 - 3	18	2.4841	3.057	2	.217	0.003	0.106
	4 - 7	158	2.1474					
	8 or more	126	2.2203					
	Total	302						
Axis III: emotional (psychological), factors to eat	1 - 3	18	2.3737	1.531	2	.465	0.000	0.028
	4 - 7	158	2.1910					
	8 or more	126	2.2330					
	Total	304						

### 5.7.8 The BMI Is Related to the Emotional Eating of the Students

The Kruskal-Wallis test was applied to determine whether the level of emotional eating differed according to their BMI class (see Table 5.41). Importantly, it was found that there was a statistically significant difference in their levels of emotional eating (axis II). Inspection of the means indicates that the obese students reported higher levels of emotional eating. Thus, the seventh hypothesis was accepted.

**Table 5.41**

*Outcome of Kruskal-Wallis Test for Differences in Emotional Eating by the BMI*

The hub	BMI class	Number	Mean	Kruskal-Wallis H	Degrees of freedom	Level of significance	Eta squared ( $\eta^2$ ) <i>r</i>	<i>d</i>
Axis II: exploring emotional eaters and their stages.	Underweight	53	2.1644	5.041	3	0.169	0.007	0.166
	Normal weight	163	2.2176					
	Overweight	55	2.1169					
	Obese	14	2.6224					
	<b>Total</b>	302						

## 5.8 Summary

This chapter presented the analysis of the findings of the study's quantitative phase. The first section described the procedures utilised for data analysis, and ensuring the integrity and consistency of the questionnaire. The next section presented some of the students' demographics. The third examined the factors the students associated with emotional eating. The fourth section reviewed the elements of an online healthy eating awareness programme, while the fifth section presented the findings associated with eating behaviour. The students' grade did not influence their eating behaviour, but gender was found to have some influence. Their parents' education and the number of individuals at home did not affect their emotional eating. An important finding was that their BMI was related to their emotional eating, with obese students reporting higher levels of emotional eating.

## Chapter 6 Second Phase Findings: Qualitative Data (Interviews)

### 6.1 Introduction

This chapter describes the findings from the semi-structured interviews conducted with 12 adolescent females who had high EE. The process of analysis of the interview data described in section 4.6 was employed to derive themes from the data (Lacey & Luff, 2007) (see Appendix 3 for examples of thematic analysis). The qualitative phase of the study was primarily oriented towards obtaining information to answer the third research question, that is, “What are the perceptions of Saudi adolescents with regard to informing the design of an effective online awareness programme concerned with healthy eating and healthy behaviour?” Accordingly, the themes and associated sub-themes are listed in Table 6.1.

**Table 6.1**

*Themes Derived from the Interview Data*

Theme	Sub-theme(s)	Question number in the interview
Online resources on healthy eating.	Nil	Q 1
Popular online resources.	Nil	Q 2
Criteria of an online healthy eating programme.	- Functions and features of an online healthy eating programme.	Q 3
	- Frequency of content update.	Q 4
	- Format (type) of information.	Q 5
	- Imagery to be used.	Q 7
Applications on healthy eating.	Nil	Q 6
Online content that influences eating habits and healthy eating.	Nil	Q 8
Suggestions for the design of a healthy eating programme.	Nil	Q 9

The following sections present the students' insights and perceptions, categorised by theme and associated sub-theme. Representative quotes have been included where appropriate. The names of the interviewees are masked for the purposes of confidentiality. Table 6.2 provides the details of the female students who were interviewed because they showed a high level of EE in their responses to the questionnaire.

**Table 6.2**  
*Details of the Interviewed Female Students*

SI #	Interviewee Code	School Year	BMI	Weight
1	P1	9	28	Overweight
2	P2	7	17	Underweight
3	P3	8	22	Normal
4	P4	8	24	Normal
5	P5	8	35	Obese
6	P6	9	24	Normal
7	P7	9	27	Normal
8	P8	8	21	Normal
9	P9	7	29	Overweight
10	P10	7	22	Normal
11	P11	7	23	Normal
12	P12	9	19	Normal

As shown in Table 6.2, the participants were coded by colours according to their academic year to make distinguishing their answers easier, as follows: Year 7 (Yellow), Year 8 (Fuchsia), and Year 9 (Blue).

## 6.2 Theme 1: Online Resources on Healthy Eating

The first theme deals with the students' insights regarding online resources on healthy eating, that is, whether they would be more effective than resources on any other form of media (for example, leaflets, booklets, etc.) and their reasons for believing thus, or otherwise.

The comments of P1 indicated that she believed that Internet programmes and apps were appropriate in the modern era and moreover were “*more attractive to young people.*” P2 drew attention to the “*prevalence*” of Internet programmes over “*traditional methods such as brochures*” to indicate their suitability. She also suggested that such programmes are “*more attractive*” and would be “*useful in different age groups especially the youth group.*” It can be seen from these insights that the students believed that the Internet was a tool for the modern age and thus an online resource utilising it would have a wide reach, especially among the youth.

P3’s perspective showed that she believed that the efficacy of Internet programmes was because they were “*enjoyable and encourage healthy eating and practising exercise.*” P4 provided three reasons to demonstrate her belief that online resources on social media and Internet programmes would be more effective. First, she submitted that they are “*easier to deliver information.*” Second, they are “*more enjoyable and help to spend a long time without boredom.*” And, third, they introduce “*a lot of good information in a short time.*” P4’s opinion was seconded by P5, who believed online resources were “*enjoyable and allow for communicating with others.*”

P4 also observed that an online healthy eating programme would help to deliver “*useful information and advice related to health, losing weight and how to keep health.*” Moreover, P5 believed that an online programme would help young people to “*turn to healthy eating.*”

In P6’s opinion, social media and modern programmes were primary influencers of young people because “*they are funny and attractive which make youth spend a long time to watch them.*” Consequently, she believed that they were important to “*promote health and raise awareness among young people.*” Similarly, P7 indicated that she believed that Internet programmes and applications were more effective in raising awareness of health and healthy eating since they were used significantly by the youth to “*search for fun and suspense.*” Accordingly, she believed that “*any healthy information obtained from these programmes will be accepted significantly.*”

Further attention was drawn to the attractiveness of online resources by P8, who also highlighted the availability of information through these. She stated regarding online resources “*they help people looking for answers and solutions for any inquiry quickly and directly.*” She

added that traditional methods were limited, as they permitted only the reading of *“existent information without any opportunity to inquire or get additional information.”*

P9 drew attention to the continual provision of information that was possible through Internet resources. She observed that Internet programmes were *“more enjoyable”* and *“the devices are available to youth most of the time which give them useful and variety information continuously.”* P10 also was in agreement regarding the usefulness of online resources, as they *“can stimulate the enthusiasm and enables displaying electronic images and video clips which are more attractive.”* Moreover, P10 highlighted the persuasiveness and influence of online resources since they could use pictures, videos, and cartoons, to make the content more exciting to watch. Moreover, the final output and content would be better than *“traditional methods which are inherently boring and unattractive”* because the resources allow viewable contents, such as pictures and video clips. This view was supported by P11, who observed that using programmes, such as Snapchat, Instagram, and nutrition sites, could help in improving health. Moreover, information and videos obtained from Google and YouTube could be beneficial. Further, P11 emphasised the suitability of online resources for young people, as she believed that they find these resources enjoyable to use and moreover *“they prefer to read and search for information through the Internet instead of reading books or publications.”* This opinion was supported by P12, who highlighted the attractiveness of online resources in contrast to the traditional methods which she believed were found *“boring”* by young people.

Overall, it could be seen from the responses under this theme that the students were agreed that an online resource on healthy eating would be more effective in comparison to resources on traditional media. They placed particular emphasis on the attractiveness of Internet resources and the contrasting monotony of traditional resources.

### **6.3 Theme 2: Popular Online Resources**

The second theme identified draws attention to the opinions of the students regarding the various existing online resources “media sharing apps” that could eventually be utilised for an online resource on healthy eating.

P1 listed YouTube, Snapchat, and Instagram as her preferences. YouTube because *“videos clips and movies are more attractive and fun, they contain animated images, whether real or cartoon, but the realistic sections more influential”*; Snapchat because *“it exists all the times*

and it is highly interactive among people. Also, it makes the user connected and follows with the outside world”; and Instagram “because it allows looking at people’s posts and sharing their thoughts.” P2 shared the same preferences. However, her preferred order was Snapchat and YouTube, followed by Instagram.

P3 indicated that she preferred using mobile apps. Interestingly, her choice of applications mimicked those of P1 and P2, namely Snapchat, YouTube, and Instagram. She stated that she typically used YouTube for her exercises while she liked Instagram because it gave her the opportunity “to communicate with friends...” P4’s list added Facebook to the three applications already discussed. P5’s list of suitable applications was Instagram, Snapchat, Facebook, BBM and WhatsApp. Similarly, Snapchat, YouTube, and Instagram were P6’s applications of choice. She observed that mobile applications were “fast, easy and can be used at any time.” Moreover, she drew attention to the availability of short clips in Snapchat and YouTube, a feature which could possibly be used for a programme on healthy eating.

Twitter was the additional application introduced by P7’s narrative, although it was her lowest preference. Her other preferences included YouTube, Snapchat, and Instagram, in that order. P8’s narrative highlighted that she preferred using a mobile app, as all the applications she needed could be together on a mobile. Her preference of applications was YouTube, Snapchat, Instagram, and Twitter, in that order. It was her opinion that these applications were “the most attractive to young people aged 15 years.”

The applications “media sharing apps” preferred by P9 were Snapchat, Twitter, Instagram, and YouTube. P10’s choices were Instagram, Google, Snapchat, and YouTube. Similarly, P11’s choices were Instagram, Snapchat, Twitter, and YouTube, whereas P12’s preferences were Instagram, Snap Chat, and YouTube.

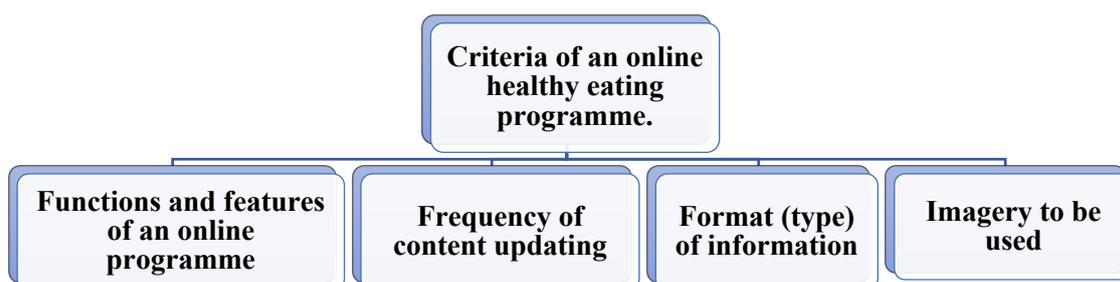
Overall, it could be seen that the most popular applications “media sharing apps” among the female students were YouTube (11), Snapchat (12), Instagram (11), and Twitter (6). Further evaluation would be required to determine which of these would be most suitable for an online resource on healthy eating.

## 6.4 Theme 3: Functions and Features of an Online Healthy Eating Programme

This theme deals with the students' perceptions of the functions and features of an online healthy eating programme. Four sub-themes were identified under this theme and will be discussed in the following sections. Figure 6.1 depicts the sub-themes arising from the present theme.

**Figure 6.1**

*Sub-themes Associated with Functions and Features of an Online Programme*



### 6.4.1 Sub-theme 1: Functions and Features of an Online Healthy Eating Programme

The students had different opinions about the functions and features of an online programme. For instance, P1 placed emphasis on the usefulness of programmes that educated young people about the importance of health *“through dialogue programmes between people also with specialists.”* P1 also commented on the style of the programme. She said it would be helpful to base the style on the *“interaction, challenge and competition between friends, and design it to be clear and flexible at the time.”*

On the other hand, P2 drew attention to the features of online programmes stating that their usefulness stemmed from the fact that their use was *“simple, easy, affordable and inexpensive and often free price.”* P3 highlighted the usefulness of technology programmes in providing advice, emphasising the benefits of healthy behaviour, and demonstrating the adverse impacts of unhealthy behaviour. She also mentioned that an online programme is *“a tool for mobile learning which is easy to use....”* P4 emphasised that a most important point was *“advertising these programmes, so that will make people know about them and get benefit.”* She highlighted the need for such resources to be *“compatible with the modern programmes which attract people.”* P5 explained that such programmes are *“sophisticated and useful for health because it allows calculation [of] calorie intake.”*

P6's perspective showed that using technology programmes is useful to promote health and healthy eating because they allow for individuals to communicate with other people who share similar hobbies or interested in the same field, and in addition, to recognize the sites which are related to the areas of users' preferences and interests.

P7 felt that the programmes should be designed "*in a modern way which is compatible with mobile applications, this way is more effective on young people.*" The narrative of P8 showed that she was aware of the usefulness of online resources in different areas, for example, to encourage "*young people to practise the right sport.*" Thus, she observed that such resources would also help "*to regulate time and encourage healthy eating behaviour because when young people practise sport continuously, they will have a greater desire to increase the health level of body and maintain it by practising healthy eating.*" On the other hand, P9 suggested that online resources could "*benefit from doctors, health experts and celebrities to give tips about health and losing weight.*" Moreover, the resources could use an "*advertising style and interactive Apps which allow to experts and individuals to answer various questions from their experiences.*"

P10 indicated that using technology programme will be more influential and more persuasive because it displays pictures, videos and cartoons, which makes it exciting to watch, and the final output and content will be better than traditional methods which are inherently boring and unattractive because they have a view contents of pictures and video clips.

P11 emphasised that the "*most important thing is to make the information interesting and enjoyable to facilitate the delivery of ideas, raise the awareness of health and improve healthy practices and behaviours among young people.*" P12 added one more dimension when she suggested that the health information "*should be renewable and easily accessible for people.*"

In summary, it could be seen that the students believed that an online programme for healthy eating should be interactive and support interaction among people and also with specialists. Moreover, the programme could incorporate tips and advice on healthy eating from doctors, health experts, celebrities. An additional feature was the calculation of calorific intake. Furthermore, the students' narratives revealed that they believed that the programme should emphasise the benefits of healthy behaviour, demonstrate the adverse impacts of unhealthy behaviour, and provide useful information and advice related to health, losing weight, and how to remain healthy. Additionally, the students suggested that the programme

be simple, easy, affordable (i.e., inexpensive or free); be compatible with mobile applications; be kept up-to-date; and be easily accessible.

#### **6.4.2 Sub-theme 2: Frequency of Content Updating**

This sub-theme relates to the students' perceptions regarding the frequency of updating of the content of the online resource for healthy eating. It could be seen that the students were agreed that the content requires constant updating. For instance, P1 mentioned that the content must be continually updated and developed to be *“more attractive and fun for young people, adults and children, which make these programmes distinctive and compatible with the requirements of youth and modern society.”* P2 stated that the content must be kept current to remain up-to-date in the social context. As she observed, *“it must be updated because the society is constantly developing and renewing in its culture. There is also increasing awareness and changing in thinking. Therefore, programmes must be developed in line with the progress of the society.”*

P3 explained that the resources should be constantly updated to *“avoid the boredom that makes people obviate these programmes. Also, there must be change and diversity in the content and people.”* P4 also emphasised the need for constant development and updating to make the resources more useful. The narrative of P5 further supported the opinions of the previous interviewees with regard to constant updating. She provided some additional reasons to support her opinion: *“to modify some of the flaws that may appear in the programme during the time. Also, individuals can change their interest in the type of programme because they tend to more modern programme and leave the old ones.”* P6 mentioned that constant updating was needed to achieve required objectives and to be successful. P7 was also in agreement and stated that constant updating was important to keep the programmes *“updated with the interests of young people, also to avoid negative aspects or weakness[es] that appear in the programme over the time.”*

P8 highlighted incomplete design and user feedback as two reasons for regularly updating content. She mentioned that continual updating would help attract people because *“maybe the first design is incomplete and there are some important things that have not been included.”* She also highlighted that *“other competing applications”* could become available, hence it was necessary for programmes to be developed to *“be ranked in a high quality level and to have*

*more usage by youth.*" P9 highlighted the availability of new programmes and the use of new healthy food systems as reasons for constant updating. A similar observation was made by P10. P11 and P12 emphasised the need to update the programme to be compatible with current trends and technology, as these would serve to attract the youth.

Overall, the students agreed that content in an online resource required continual updating. The primary reasons provided by them were to make the resource more attractive, keep it up-to-date in a social/cultural context, make it engaging so as to avoid boredom, to correct errors/overcome flaws, and to keep ahead of the competition.

### **6.4.3 Sub-theme 3: Format (Type) of Information**

This sub-theme relates to the students' perceptions regarding their beliefs concerning the format (type) of information in an online resource to encourage its use by young people. P1 suggested that information be presented in a "*fun*" manner since this would appeal more to young people. P2 thought of involving famous people who take good care of their body and appearance "*because they can influence and convince me more.*" She believed that the kinds of information which attract youth are "*mostly are related to entertainment, health and personal care.*"

Exotic information, celebrity news and information that helps towards self-realisation were the interests of young people in the opinion of P3. She believed that they would not be very interested in cultural information. P4 observed that challenging programmes which contain competitive games and stories were the most attractive for young people. Other content that could be appealing was useful tips in health, healthy eating and cooking methods. P5 drew attention to the sparseness of information related to healthy eating in school books, observing that information such as, "*the amount of calories which need to burn, the amount of water they need to drink and what kind of food is good for their health and proper for body,*" needed to be provided in online programmes to compensate for this lack.

"*Awareness information about healthy eating and harmful eating.*" This was P6's comment on what was required in an online resource. She also suggested that information related to "*damage caused by wrong eating behaviours on the body and weight*" and "*body health and losing weight*" be included.

P7 believed that information attractive to young people is mostly associated with “*sport exercises, losing weight and body shape. In addition to fashion and following up celebrities.*” P8 referred to how the youth often follow celebrities’ lives and try to imitate them, and their interest about fashion and the home, which affects their manner of food and dress.

The suggestion from P9 was to design the programme to take the different needs of persons into account. For example, “*some look for fun and entertainment and some look for the latest developments and events in the society or in the world.*” P10 held that information related to sport and drinking water and topics posted by celebrities would be appealing.

P11 suggested that it is “*very important for information to be varied and entertaining, and interested in social, scientific and health issues. Also, focus on topics that are concerned with fitness and sports.* She also drew attention to the need to include information regarding “*the basics of healthy nutrition, meals distribution and the food quantities. It is important that the information be small and concise.*” P12’s suggestions for appealing information included “*entertainment and games as well as useful topics, which are brief and contain images or videos. Also, which contain new or strange information. Likewise, renewable and cultural themes in general and which linked with daily lifestyle.*”

Overall, the students believed that information about healthy eating behaviour (e.g., exercise, drinking water, unhealthy eating behaviour, etc.) should be presented in an appealing and attractive manner in the online resource. Use of celebrity news and information and games, among others, were recommended. One student suggested that the resource contain adequate information to overcome the sparseness of information in school books.

#### **6.4.4 Sub-theme 4: Imagery To Be Used**

This sub-theme examines whether the students preferred the use of avatars (cartoon characters) or real people to communicate the information in the online resource. P1 suggested that real characters would be more effective than cartoon characters because this “*is closer to reality and people can interact with it more. It is also preferred for representative characters to be in close age to the target group age because the impact will be greater.*” P2 suggested the use of cartoon characters in the online programme, as she believed that these are more appropriate for young people. Furthermore, cartoon characters are “*cute and funny and have sound effects.*”

Similar to P1, P3 preferred the use of real persons in the programmes as “*they are more attractive.*” However, she did mention that she liked “*cartoon characters when they are close to the reality because they will be interesting and exciting.*” P4 preferred the use of real characters “*because they are realistic and more attractive.*” P5’s preference was for animated characters because they were more attractive and fun. P6 proposed the use of real persons as this would be realistic and be more effective. P7 suggested the use of real characters as she believed they are more attractive. P8 also preferred real characters “*because their influence and interaction are greater and their experiences are real. It is possible to communicate with them and ask any enquiry. In my opinion, cartoon characters are suitable for people aged 10 years or less.*”

In contrast to the last two interviewees, P9 preferred cartoon characters which are “*near to the reality because they are more fun, attractive and exciting.*” P10 also preferred the use of cartoon characters. P11 observed that both cartoon and real characters could be used, “*but real characters are more attractive.*” P12 preferred real characters and cartoon characters which are close to reality, that is, “*three-dimensional.*”

Overall, the majority of the students believed that using real persons would be more appropriate in the online resource. However, some were alright with using cartoon characters if they were realistic enough.

## **6.5 Theme 4: Applications on Healthy Eating**

This theme deals with existing apps on healthy eating and the students’ perceptions on whether they would be useful in helping young people acquire healthy eating behaviour. P1 responded that she knew of an application named “*500 steps to burn calories.*” She believed that this programme encouraged young people to walk and burn calories and thus resulted in healthy eating. P2 remarked that she had a “*simple experience in a programme related to the body and how to do exercise, and another experience for a programme that calculates the amount of water that I need to drink daily. Also, a programme calculates the distance which I walked and how many calories I burned.*” It could be inferred that both of these students were interested in healthy eating behaviour and consequently had looked for applications that would support them.

P8 had much to say in this matter. Her lengthy narrative drew attention to the influence of celebrities on young people, as she reported that she gained awareness of an application through a celebrity she followed in Snapchat. This application was *“related to sport that sends alerts in times that I specified (my leisure time). It requires body shape, weight and gender...and I have used it for a while.”* P8 also was aware of another application related to drinking water, where hourly alerts were sent to remind her to drink water. This application required *“knowing length, weight, gender and whether is there an exercises or not. This application encourages me to have water with me continuously to drink it when receiving a reminder.”* Another aspect highlighted by P8 was that friends on Facebook or Instagram could share this application. Consequently, each one knew the amount of water drunk by the others. This could be advantageous as a competition was created between them in terms of water drunk and could result in increased enthusiasm to drink water. However, in P8’s opinion, *“most of the applications are not in the desired form and they still lack important things.”*

P3 reported that she was not aware of any programmes that help in promoting healthy eating because she was *“not interested in healthy eating”* and was not willing to do exercise. Similarly, P4 did not have any prior experience with such programmes. However, she reported that *“there are some pictures, videos and people’s experiences in health in Snapchat and Instagram that may benefit their followers.”* P5 could not recollect the name of an application but reported that *“it calculates the amount of water in the body and how much needs from water. Also, it calculates the amount of weight that should be loosed from the body. I often follow this healthy programme for a short time then I leave it when I feel bored because I do not find encourage to follow it up.”* P5’s narrative illustrates the need for the use of appealing information that would help the users to remain engaged in the programme.

P6 was not aware of any application or programme to promote healthy eating among young people because she had not heard about them before and she was not encouraged to search for these programmes. Also, she said, *“there is no interest from my family or friends about them.”* P12 explained that she lacked awareness of such programmes *“because I did not hear about them before and I have not found any encouragement to look for them.”* The narratives of P6 and P12 place emphasis on the involvement of other people (e.g., family and friends) in encouraging young people into healthy eating behaviours.

Like P3, P7 also was not aware of any application or programme that promotes health or healthy eating. This was because she did “*not look for healthy programmes*” and did not care about them. P9 and P10 were also unaware of programmes to promote health and healthy eating. P9’s reason was that “*it does not attract me and I do not care about it*” whereas P10’s reason was “*because of the attraction to games and other unhealthy programmes which distract me from healthy and useful programmes.*” Similarly, P11 also reported that she was unaware of applications on healthy eating. According to her, this was “*because there are no topics that concern health and are attractive for young people in the same time, and there are no sites which are concerned with health and directed to young people or students.*” This indicates that the programmes available were too generic to appeal to young people or students and special attention was hence required.

The narratives under this theme revealed that some of the students were not aware of applications on healthy eating and in most of these cases, this was because they were not interested in healthy eating. Another important aspect pointed to was the potential role of the school, family, and friends in students’ healthy eating. Further, it could be seen that existing applications had shortcomings which prevented their continual use by the students.

## **6.6 Theme 5: Online Content That Influences Eating Habits and Healthy Eating**

This theme deals with content on social media or online that influences young people’s eating habits or helps young people with healthy eating.

P1 emphasised that it is good to make the style of programme based on the interaction, challenge and competition between friends, and design it to be clear and flexible in the time.

P2’s narrative drew attention to the influence of celebrities. She said that it was “*helpful to follow celebrities who are interested in the health field. Also, using challenge between a famous person and a follower.* However, she provided a word of caution: “*It depends on who the people they are following are because they can explain what is appropriate food and healthy behaviour of an age group and what sport can be followed. Otherwise, incorrect using of social media devices makes it unsafe for youth.*” P7 also said she was influenced by friends and celebrities. However, in most cases, the persons she followed had unhealthy interests.

P3 drew attention to the paucity of online content that promotes health. She said that there was “no encouragement for youth to use them, and people who are interested in these kinds of programmes are few.” P4 also reported a similar situation when she said that there “are not programmes and applications which are dedicated to health but there are some video clips and pictures which are produced by individuals.” P10, P11 and P12 also noted a lack of programmes and lack of encouragement to use them. As P10 observed, “there are no programmes that help to promote health or it may be present but very few.” Likewise, P11 mentioned that she did not know programmes that help in promoting health and that she did not “have any (encouragement) or help from school or parents to use or look for them.” P12 highlighted that “often topics which are available for young people are not healthy but related to entertainment and social topics.” These narratives serve to emphasise the significance of the present study.

The narrative of P5 illustrated that most of the content on the majority of social media and Internet sites were propaganda tools for restaurants and fast food “which make young people be attracted to unhealthy eating.” P6 suggested that video clips were highly effective in delivering information. She said that they are “clear, influential and may be easily followed by individuals. Also, it is always used by celebrities and youth.” P8 drew attention to the benefits of using mobiles in promoting health, as it was possible to “download various applications and programmes.” Also, she noted that these modern programmes enabled young people to look for answers to any question related to health at any time and to get quick answers instead of relying on traditional publications and methods. Moreover, she observed that “Blogs and personal pages are also useful because they allow to people to benefit from others' experiences, comments and different answers in these sites.” P9 highlighted the usefulness of social media and Internet programmes in facilitating “following people who are concerned on health and sport and receiving their advice which are very important, concise, useful and accessible through video programmes and applications.”

To conclude, the students found limited online content that influenced favourable eating behaviour. Celebrities were frequently detrimental influences. Overall, it could be inferred that there was a significant need for an online resource that provided suitable content and activity to motivate students to adopt healthy eating behaviour.

## 6.7 Theme 6: Suggestions for the Design of a Healthy Eating Programme

Various suggestions were provided with regard to the design of a healthy eating programme. Some of these were related to the programme content. For instance, P1 suggested that the programme contains challenging content, and to be clear in the time and the manner in which healthy eating can be achieved.

P2's suggestion was to educate parents and students as well as the persons responsible for school canteens on healthy eating. She also suggested an emphasis on how calories are calculated. P3 suggested the *“design [of] attractive healthy applications for people and being published among the target groups, comparing the results before and after using the programme and also introducing the results.”*

P4's suggestion was to design a mobile application, because *“it will be easy to use, flexible in the time and is not expensive, mostly free.”* P7, on the other hand, suggested the design of an enjoyable programme *“to reduce the sense of loneliness by providing the opportunity to communicate with others and providing social interaction.”* She additionally suggested allowing the participation of parents, teachers and school administration. From the content perspective, she suggested that information about the school canteen, healthy eating behaviours and food choices be included. She further proposed using *“a special account and a secret number for each student in this programme, so this can help the student to access and interact from any device or from a mobile phone. Moreover, activating the topic through hash tag in Twitter.”*

P8 suggested that the programme *“can be designed [as] a healthy application that cares about healthy eating, drinking water and exercising in one application...because using one application will be easier to use.* She also indicated that it would be useful to incorporate some amount of education regarding healthy eating behaviour in the school through *“one class weekly to educate students about healthy behaviour, healthy eating and maintaining weight. In addition, reading and learning from such programmes.* Another suggestion from P8 was that the schools could allot a personal account for each student which could be accessed using a user name and secret code. This would provide *“a direct interaction between school and students by recording a student's report during a week. Students can report their inquiries in the site, whether for sports, eating, health and other, so alerts will arrive to the teachers to answer on the students' inquiries.”* Further, P8 proposed several suggestions for content.

These included variety in the programme and availability of offline content (i.e., without an Internet connection) for anytime access.

P9 proposed that the application be “*comprehensive for several areas, such as an icon for proper nutrition, an icon for drinking water and an icon for healthy sports.*” She also highlighted the changes in topics that occur over time and the need to educate students on these changes. She also observed that the application “*offer a variety [of] healthy topics continuously, and informing students about these topics by sending alerts.*” P10 suggested the design of a varied programme that contains several sections, for example, “*an entertainment section, such as games about health. Also contains scientific films and cartoons to raise healthy awareness, for instant, encouraging healthy eating.*” Also, she highlighted the importance of alerts: “*messages for alerting, reminders for exercise, drinking water and eating fruits and vegetables.* She moreover suggested that there should be some mechanism to allow communication (e.g., chatting) among the users, as this would “*stimulate enthusiasm and competition. In addition, allowing to share diverse ideas, exchanging opinions, focusing on the special points of distinction.*”

P11’s suggestions included “*Designing a programme on the App Store to explain the behaviour of healthy eating and promote healthy exercise....Providing schedules for exercises and healthy food...The programme should be realistic and close to the concerns of young people in all aspects.*” She indicated the importance of involving family members (especially parents) in raising healthy awareness. Moreover, she considered that the canteen programmes in schools required attention. Other suggestions were to design a varied programme which includes information and educational videos and provides easy access to information. Finally, she suggested the use of influential people in the community to “*give advice in the programmes.*”

P12’s suggestions were related to the curriculum and content of the programme. For instance, she suggested the inclusion of health topics and programmes in the curriculum which placed emphasis on the importance of physical fitness, exercise, healthy eating and basic preventive information. From the content perspective, she suggested the use of “*sentences and phrases which are easy, concise and stimulating...Explained the meaning of calories and the required quantities of food.*” She moreover proposed that there should be a diagnosis for the health situation of each student and that health information should be provided to students

every day. Finally, she suggested that the programme be realistic and could include information and video clips.

In general, the students' suggestions placed emphasis on the content and manner of delivery of information in the programme. An interesting suggestion was that the programme incorporates features to track the "before" and "after" state of the student and the current progress. The students also suggested the involvement of school administration and relevant personnel in inculcating healthy eating behaviour and proposed the provision of classroom sessions on healthy eating for the students. Moreover, the enabling and involvement of family members in healthy eating programmes was suggested.

## **6.8 Summary**

This chapter described the findings from the interviews conducted with 12 female students who were chosen because they had high emotional eating, as shown in their responses on the questionnaire (section 4.6.1). A total of six themes and associated four sub-themes were recognized from the students' responses to obtain information in depth to answer the third research question, "What are the perceptions of Saudi students aged between 12 and 15 years with regard to an effective online awareness programme concerned with healthy eating and healthy behaviour?"

Several suggestions were put forward to address this issue. The students were agreed that an online resource on healthy eating would be more effective in comparison to resources on traditional media. The most popular "media sharing apps" among the female students were YouTube, Snapchat, Instagram, and Twitter. They believed that an online programme for healthy eating should be interactive and support interaction among people and also with specialists. Besides, it should stimulate enthusiasm and competition concerning healthy eating. A further suggestion was that the programme be published for use not only among the target groups, but also to permit the participation of parents, teachers, and the school administration, and it was proposed to provide classroom sessions on healthy eating for the students. Moreover, the programme could incorporate tips and advice on healthy eating from doctors, health experts, and celebrities. The students specifically highlighted the importance of involving family members (especially parents) in raising healthy awareness. An additional feature was the calculation of calorific intake. Furthermore, the students' narratives revealed

that they believed that the programme should emphasise the benefits of healthy behaviour, demonstrate the adverse impacts of unhealthy behaviour, and provide useful information and advice related to health, losing weight, and how to remain healthy. Additionally, the students suggested that the programme be simple, easy, affordable (i.e., inexpensive or free); be compatible with mobile applications; be kept up-to-date; and be easily accessible.

## Chapter 7 Discussion of Quantitative Findings

### 7.1 Introduction

The present study is framed within the context of the emotional eating theory (Adriaanse et al., 2011), which is derived from the Psychosomatic Theory of Obesity by Bruch (1973) and Kaplan and Kaplan (1957). The theoretical framework for the study was hypothesised on the supposition that recognizing the eating behaviour of adolescent students could facilitate the development of an awareness programme for healthy eating that will promote healthy eating habits among adolescents in Saudi Arabia.

The purpose of this chapter is to discuss the findings from the quantitative phase of the study in the light of existing literature. This chapter is organized in the following themes informed by the conceptual framework. It starts with Theme 1: Eating Behaviour, Dietary Choices, and Emotional Eating in Adolescents, which refers to section 7.2.1 Eating Behaviour in Adolescents and section 7.2.2 Exploring Emotional Eating in Adolescents. It follows with Theme 2: Factors That Contribute to Emotional Eating in Adolescents, which refers to section 7.3.1 Emotional Factors, and section 7.3.2 Personal and Sociocultural Factors. Both themes are based on the conceptual framework.

### 7.2 Theme 1: Eating Behaviour, Dietary Choices and Emotional Eating in Adolescents

#### 7.2.1 *Eating Behaviour in Adolescents*

As identified in the conceptual framework (section 3.6), EE is associated with several factors that influence eating emotionally, including psychological factors (features) related to the speed of eating, mindfulness in eating (choice of what to eat) and exercise, as well as environmental factors, such as being rewarded by parents, which are discussed in this section.

##### 7.2.1.1 **Speed of Eating.**

The majority of both the males (63%) and females (74%) indicated “sometimes” or “usually” to the statement “*I eat slowly and taste every piece of food which I eat*” (Appendix 9), and the females showed a significantly higher level of agreement with it than the males (Table 5.35). This agrees with the results of some previous studies, such as Ochiai et al.

(2013). Research indicates that eating slowly is not associated with weight gain (Galhardo et al., 2012) but instead reduces hunger and increases the feeling of fullness (Angelopoulos et al., 2014). Thus, it would appear that some students were showing some indications of healthy eating. Moreover, in contrast to the findings of Canterini (2018), the reported eating speed of these students suggested that they did not seem to be indulging in emotional eating.

#### **7.2.1.2 Mindfulness in Eating and Exercise.**

Regarding mindfulness in eating, several interesting differences were found between the genders (see section 5.7.2). For example, Table 5.35 shows that in response to the statement “*I avoid eating unhealthy food,*” 43.1% of the males but only 22.2% of females indicated “sometimes” or “usually”. Conversely, in response to the statement “*Before eating, I spend a moment to pay attention to food's shape and colour and smell its fragrance,*” 71% of the females but only 50% of the males indicated “sometimes” or “usually” (Appendix 9).

A notable issue was that a relatively high proportion of both the males (63%) and females (65.4%) admitted they *never* “read the food calories” when they chose food. Reading food calories is a part of good nutrition and essential for promoting overall health, which can help to maintain and reach a healthy weight, besides reducing the risk of chronic diseases.

However, it must be noted that some of the food choices may be made for the students as they reside in their homes with their parents (95.7% of the population) (Table 5.13) and other grown-ups who may be taking overall food-related decisions. Wansink and Sobal (2007) identified about 200 ‘mindless eating decisions’ made by individuals every day (such as whether or not to have food, quantity, type and place of food, etc.). Also, the students could be expected to have limited control over the food provided in the schools. Nevertheless, it is conceded that many adolescents may be purchasing some food for themselves, and consequently, their food choices probably are affected by their lack of mindfulness.

Regarding exercising regularly, 42% of the males and 75% of the females reported “never” or “little”. This finding suggests that females have less inclination than males to exercise. This is not helped by the lack of PE classes at school, especially in girls’ schools. PE classes have not been adequately provided because of the shortage of suitable places in schools, as well as the lack of awareness of their importance (Al-Hazzaa, 2018). This finding highlights the importance of educators making decisions to raise the awareness of physical exercise for students, and providing adequate classes in schools.

The findings that many students appeared to avoid regular exercise and did not read the calorific value of the foods they selected for consumption suggest they are at risk of gaining weight for both reasons. Moreover, Sung (2010) and Jalo et al. (2019) suggested that people who do not exercise regularly and eat high-calorie foods are inclined to develop emotional eating habits. The present study supports this, in that it showed the obese students showed a higher level of emotional eating than the rest.

### **7.2.1.3 Being Rewarded by Parents.**

The study's conceptual framework points to the role of the parents in contributing to emotional eating (see conceptual framework in section 3.6 and Figure 3.7). It was discussed in section 3.4.6.3 how parents play a vital role in determining the dietary habits of their children, including their responses to emotions. The students were asked to respond to the statement, *"When I do a good job, my parents reward me with food."* Appendix 9 reveals a considerable difference in their responses: about 34% of the male students and 50% of the females indicated "sometimes" or "usually", while 51% of the males and 25% of the females responded "never". This is of concern because the use of 'bad foods' by parents as a method to reward their children when they are feeling negative or doing a good thing can create a deeply unhealthy relationship between emotions and food. This is because parents could be training their children to consume food to cope with their emotions, for instance, rewarding their children utilising 'bad' food (high in sugar, fat, or salt). Such circumstances could lead children to be growing up at higher risk, in later childhood, to 'emotionally eat' (Aston University, 2016) (see Attachment Theory in section 3.5.1).

Gouveia et al. (2019) found that mindful parenting associated negatively with emotional eating among children and adolescents because mindful (aware) parents are less frequently rewarding their children with food, which consequently leads to their less overeating in early adolescence. Additionally, Gouveia et al. (2019) confirmed that mindful parenting practices have a significant role in enhancing healthy eating behaviours, engaging less in disordered eating, and emotional eating between children/adolescents. Hence, it is essential to consider the crucial role of parents in the design of an online health awareness programme.

### **7.2.2 Exploring Emotional Eating in Adolescents**

In section 5.6.1, it was shown that the students engaged in a wide range of levels of emotional eating, with the females engaging more overall than the males. As specific

examples, 56.3% of the males “Never” to “*Pressure or anxiety makes me eat more food*”, while only 28.8% of the females did so; and 44.4% of the males responded “never” to “*I eat food to feel better when I’m sad, worried, bored, etc.*” but only 23.5% of the females did so. Combining the genders, about 38% responded “sometimes” or “usually” to the first statement and 47% responded “sometimes” or “Usually” to the second statement. Similarly, the remaining findings reported in Appendix 10 show that over a third of the students were “sometimes” or “usually” engaging in eating to satisfy a variety of emotions (Macht & Simon, 2011). In general, the higher the level of emotional eating, the lesser the healthy eating and associated characteristics (Paans et al., 2018; Waller & Osman, 1998). It is noteworthy to clarify that it is not a problem to have EE eating when it under the individual’s control.

About 50% of the students responded that they “sometimes” or “usually” eat to reward themselves. This is of concern because the research presented in section 3.4.6.3 suggests that parents who reward their children by using ‘bad food’ (high in sugar, fat or salt) may put their children at greater risk of becoming emotional eaters later in life (Aston University, 2016). There could then be an increased obsession to consume food to obtain the “rewarding effects”, such as palatable foods in the cafeteria, which have high calories. As a result, this can encourage reward function in the brain and subsequently induce addiction, which could lead to overeating and obesity (de Macedo et al. 2016).

Although over the past decades, the majority of emotional eating research focused on negative emotions (section 3.5.1 and Table 3.4), more recently, several studies have indicated the role of positive emotions (Evers et al., 2013; Herman et al., 2019; van Strien et al., 2016). These studies found that emotional eaters consumed more food in a positive mood in comparison to the feeling of negative emotions. The findings of this study (section 5.6.1) support these studies, as the participants responded to positive emotions as well as negative emotions. For instance, 50.3% of the males responded “little”, “sometimes”, or “usually” to “*I eat constantly to feel happy, even when I am not hungry*”, as did a (statistically) significantly higher proportion of the females, 71.1%. The association of positive emotions and food intake is explained in the theoretical perspectives (Happy Eating Model, see section 3.5.3). For instance, eating can provide a means of feeling joy (Evers et al. (2013); van Strain et al. (2016). Such theories, accordingly, would support the notion that food intake is triggered by positive emotions (de Macedo et al., 2016).

### **7.2.2.1 Emotional Eating and BMI.**

This study found that 28.5% of the male students and 17% of the female students were overweight or obese (Table 5.10). These figures are lower than those found by a study by Al-Hazzaa et al (2014), which was carried out between 2009 and 2010 in the Al-Khobar, Jeddah, and Riyadh regions of Saudi Arabia on students aged between 14 and 19 years and which found that across the age groups, 39.9% to 45.6% of the males and 30.4% to 38.7% of the females were overweight or obese. In total, 22.7% of both the males and females were overweight (Table 5.10), which is also lower than that found in other Arabian Gulf countries, such as the United Arab Emirates (35.7%) (Musaiger et al., 2003), Kuwait (28.4%) (Papandreou et al., 2015), and Oman (28.2%) (Al-Kilani et al., 2012). Further, the present figures of 28.5% males and 17% females are lower than those reported by the British National Foundation (2018) for the year 2013 in England, when 34% of the males and 39% of the females aged 13-15 years were obese or overweight. It is not clear why the present Saudi sample, especially the females, were less overweight or obese.

In section 5.7.7, it was found that the obese students ( $BMI \geq 30$ ) reported a significantly higher level of emotional eating than the others, including the overweight. Extremes of weight have been related to emotional overeating (EOE) (Konttinen et al., 2019; van Strien, 2018), and emotional undereating (EUE) (Domoff et al., 2015; Jansen et al., 2012), as was discussed in section 3.4.4. Croker et al. (2011) and Geliebter and Aversa (2003) recognized an “obesogenic” characteristic that promotes an increase in weight, and eventually obesity, both in children and adults. Moreover, Péneau et al. (2013) observed that regular incidences of emotional eating were reported by the majority (57%) of overweight adults. In general, emotional eating is connected with greater rates of snacking, eating in reaction to everyday pressures, and higher intake of foods with greater calorific and fat levels, as assessed in the laboratory or through self-report (Camilleri et al., 2014). Wardle et al. (2001) noted that EOE and EUE have been theorised to be the respective underlying causes of overweight and underweight.

On the other hand, being overweight or underweight needs more attention because it is considered a public health issue, as several studies have indicated the prevalence of overweight and underweight among Saudi adolescents (Althayidi et al., 2018; Hijji et al., 2020). Childhood underweight, overweightness and obesity can contribute to significant health hazards in children, such as asthma, hyperlipidaemia, hypertension, sleep apnoea, fatty liver

disease, prediabetes, type 2 diabetes, and orthopaedic and emotional issues (Ornelas et al., 2014; Paulis et al., 2014). Emotional issues include poor self-worth, depression, and weak societal dealings (Kelsey et al., 2014; Shivpuri et al., 2012). Therefore, it would seem that the early recognition of emotional eating can facilitate significantly the prevention and treatment of issues related to weight control and disturbed patterns of eating.

### **7.3 Theme 2: Factors That Contribute to Emotional Eating in Adolescents**

In general, as with eating behaviour, research has acknowledged that various factors contribute to emotional eating. Some of these are emotions (Konttinen et al., 2019; van Strien, 2018), while others are personal or sociocultural factors (Rounsefell et al., 2020). These factors were categorised in this study's conceptual framework as intrinsic /internal factors and extrinsic/external factors. These factors are considered in the questionnaire and interview (see conceptual framework in section 3.6 and Figure 3.7).

Based on the research objectives, the present study will place emphasis on two principal factors that promote emotional eating, namely, individual and sociocultural factors, as clarified in the conceptual framework (Figure 3.7). Emotional and personal factors will be the individual factors taken for consideration, whereas environmental factors (parents/siblings/friends/peers) and social factors (social media, food brands, religion, cultural pressure and norms, commercials/ advertisements, social events) will be the sociocultural factors considered. Biological and hereditary factors will not be considered, as these require clinical observation.

#### ***7.3.1 Emotional Factors***

Emotional eating can happen as a response to emotional states, including both negative and positive emotions, which is captured by the theoretical framework of this study (section 3.5 and Table 3.4) and considered by the conceptual framework, which aims to clarify the association between different emotions and eating, and how emotions play a role in guiding an individual's eating behaviours, especially EE (section 3.6 and Figure 3.7).

Studies have identified that emotional factors that can affect eating behaviour include anger, depression, loneliness, stress, psychopathology (Goossens et al., 2009), perceived hunger (Alexander & Siegel, 2013), and anxiety (Scott et al., 2012). The present study investigated the perceptions of the participating students regarding these factors. It was noted

by Brown et al. (2009) and Frayn and Knauper (2018) that different emotions can trigger eating conditions and vary from person to person.

In this study, the students were asked to indicate the emotions they associated with eating. Interestingly, the top two emotions they linked with eating were both positive: happiness and comfort (see Table 5.27). Bongers et al. (2013b) and Hertz (2019) posited that positive feelings can increase a person's desire to eat because they may associate food with happiness. It can thus be suggested that some students in the present study were driven by positive emotions to eat.

The Chi-square tests revealed that significantly more females than males associated several emotions with eating, which were "Happiness", "Comfort", "Improve mood", "Sadness", "Boredom", "Anxiety", and "Anger". In contrast, there were no significant gender differences in respect of "Safety", "Hunger", "Laziness", and "Enjoyment". These findings correspond with others which have found a significant gender difference in emotional eating behaviour (for example, Lee, 2018; Nguyen-Rodriguez et al., 2009; Tanofsky-Kraff et al., 2007).

The discussion will first consider some positive emotions in relation to eating, followed by some negative emotions. Table 5.27 shows that 71.9% of the female students and 39.7% of the males associated "Comfort" with eating. This is not surprising, given the previous research in this area. Comfort eating, especially in women, can be undertaken to reduce negative emotions (Hertz, 2019; Levitan & Davis, 2010), and hence increase feeling better. Comfort is classed as an emotion and the eating of comfort foods has been considered to be a distinguishing characteristic of emotional eating, according to Young (2016). Keeling (2013) observed that people who eat 'comfort food' tend to consume food that has a connection to their positive memories of a specific time, stage, place, or person (Hamburg et al., 2014). Perez (2012) pointed out that comfort food is generally associated with home-cooked food consumed during childhood and provides consolation and a feeling of well-being. Such comfort foods are often high in carbohydrates and sugar, which can have negative health effects when consumed in excess (Finch & Tomiyama, 2015).

The majority of both the males (69.5%) and females (68.6%) responded "sometimes" or "usually" to the statement "*When I'm happy, having a favourite snack makes me feel even better*" (see Appendix 11). This suggests that many participating students were likely to

indulge in happy eating, that is, they may believe that eating would increase their happiness or that their happiness would not be complete without food (Bongers et al., 2013b; Hertz, 2019).

Turning now to negative emotions, those identified by the students participating in the present study were, in descending order of being mentioned, Boredom, Anxiety, Sadness, Anger, Improve mood, Hunger and Laziness. This finding is consistent with that of Deliens et al. (2014), who indicated that the eating behaviour of university students (i.e., late adolescence, early adulthood) was affected by stress and negative emotions. For instance, students reported eating more during the examinations or when they were not feeling well (especially emotionally).

The students were asked to respond to the statement, “*When I am feeling “down” a little snack will lift my mood.*” Appendix 11 shows that 54.2% of the females responded “sometimes” or “usually” to it, compared with 34.5% of the males, a statistically significant lower proportion. A similar statement was given to the students, “*When I’m down I have more desire to eat*”, which gave a similar pattern of responses: 45.7% of the females indicated “sometimes” or “usually” as against 23.9% of the males. Again, these differences are consistent with the studies of Hertz (2019) and Levitan and Davis (2010), cited above.

### **7.3.2 Personal and Sociocultural Factors**

This study revealed that certain personal and sociocultural factors could lead to emotional eating in the students, such as the influence on the body shape and food choices of the students. The study’s conceptual framework points to the role of the body shape and food choices on EE (see conceptual framework in section 3.6 and Figure 3.7) and how these factors play a role in guiding an individual’s eating behaviours (section 3.4.6). Moreover, their predisposition to eat and food and drink that appealed to them. These items are discussed briefly in the following sub-sections.

#### **7.3.2.1 Influences on Body Shape.**

As discussed in section 3.2.2, and in the conceptual framework in section 3.6 (Figure 3.7) several factors can influence the body shape of adolescents, including family, friends, culture, and the media. Over two-thirds (70.6%) of the female students reported that social media influenced their ideas about body shape, compared with 47% of the male students (see Table 5.22). This supports taking account of social media in the design of the online health awareness programme, especially in relation to dieting. However, in this connection, only

about 25% of both the males and females said that they were influenced by celebrities. Stark-Wroblewski et al. (2005) drew attention to the negative influence that the media can have in promoting the idea of an 'ideal' body shape.

About 60% of both the males and females indicated that their friends were an influence on their body shape. A lower proportion pointed to the influence of family members, except that 62% of the females mentioned their mother to be an influence. Fallatah et al. (2015) drew attention to the social pressure encountered by female adolescents, in particular, in Saudi Arabia, especially after puberty and as they approached marriageable age. They highlighted that parents were an especial source of pressure due to their tendency to comment on the girls' body weight and shape. In regard to the influence of friends, peer pressure has been considered a significant influence, as girls often modify their outlooks and behaviour to keep up with current fashion and other trends embraced by their peers (Polivy & Herman, 2002), which could be assumed to extend to their body shape.

#### **7.3.2.2 Influence on Food Choices.**

The majority of both the male students (70%) and females (77%) mentioned their parents to be an influence on their food choices (see Table 5.23). Less influential were friends, reported by 43% of the males and 51% of the females. These findings are consistent with several studies that confirmed that the food choices of adolescents are influenced positively or negatively by parents (Mahmoud & Grigoriou, 2019) and siblings and friends (Rageliene & Grønhøj, 2020). Interestingly, 75% of the females reported "Food brands" to influence their food choices, much higher than the corresponding figure of 34% for the males.

#### **7.3.2.3 Appealing Food.**

The study found that only 59% of the male students and 46% of the females found healthy food appealing (see Table 5.25). However, about 78% of all the students found both fast food and snacks appealing. These findings correspond with what was assessed in the laboratory or through self-report of the Camilleri et al. (2014) study, as he found that EE is connected strongly with snacking, eating in reaction to everyday pressures, and higher intake of foods with greater calorific and fat levels. The excessive consumption of unhealthy foods and drinks has additionally been linked with a decreased consumption of beneficial dietary elements, such as coarse grains, legumes, and other vegetables, which are high in nutrients and low in

calories (Popkin et al., 2012). Consequently, there is a higher likelihood of food-related disorders.

#### **7.3.2.4 Appealing Drinks and Emotional Drinking.**

Muslims are prohibited from consuming intoxicants (specifically alcoholic beverages), as mentioned in Chapter 2. Consequently, emotional drinking in its conventional use of the term is not something that can be anticipated in Saudi Arabia. Accordingly, the questionnaire used in the study did not include wine (or other alcoholic beverages) in the options provided for drinks that appealed to the participating adolescents. Nevertheless, drinks (particularly soft drinks, juices, energy drinks, etc.) were also consumed in response to emotions, as could be seen from the preceding discussions.

Table 5.26 shows that 64% of the students found juices appealing and 58% found soft drinks appealing, with more females reporting them to be appealing. This is as expected but is of concern. Benajiba and Mahboub (2019) noted that, in the Middle East, Saudi people are one of the highest consumers of soft drinks. Studies have reported a significant positive relationship between the intake of sugar-sweetened beverages and poor dietary habits in Saudi children in the age group of 10-19 years (Collison et al., 2010) and 15 years and older (Moradi-Lakeh et al., 2017).

#### **7.3.2.5 Predisposition to Eating.**

The participants were asked to report when they had an increased predisposition to eat, and were allowed to give more than one response. The findings are presented in Table 5.24. About 70% reported both “*weekend holidays*” and “*social and religious events*” to be such occasions. Further, 82% of the females and 59% of the males added “*friends and relatives meeting*”.

These findings are not surprising. Wansink (2004) pointed out that social factors such as eating in-group versus alone could play a role in eating, especially with friends and familiar people, because it makes eating more enjoyable, which leads to an increase in the consumption of food as clarified in the conceptual framework in section 3.6 and Figure 3.7. Moreover, this study's theoretical background (section 3.5) points out that when people are eating in the presence of people or groups, this motivates a positive mood. It is evident that the study data confirmed that eating in-group enhances enjoying more the taste of food and consuming much

food). In the context of Saudi Arabia, in particular, communal eating practices could also be understood to increase the inclination to eat.

For instance, due to the Islamic teachings that food be consumed with family, relatives, and friends, without any distinctions between rich and poor (Muslim, 2059), meals are often shared with family members, relatives, and friends, and people partake of food from a single plate. Consequently, the adolescents may be feeling the pressure or temptation to eat more to keep up with the rest of the family. Also, eating in the presence of people or in groups can motivate a positive mood. For example, enjoying more the taste of food and consuming much food (Herman et al., 2019). Such eating together offers social bonding, friendly communication, and allows people to feel comfortable, especially when the other people are family members or friends (Nakata & Kawai, 2017).

Since the participating students were aged between 12 and 15 years of age, most of them had reached puberty and could participate in fasting. It was found that more males (58.9%) reported an increased predisposition to eating during fasting days than females (35.9%). Moreover, the changes to daily life during the fasting month of Ramadan could have resulted in the adolescents eating more foods high in calories before the fast commences and after the break at sunset (Hammad, 2017) (section 2.3.3).

## **7.4 Summary**

This chapter has discussed the quantitative findings in the light of the extant literature. First, it discussed some findings in relation to the students' speed of eating and their mindfulness in eating, when it was noted that many never read the calorific values of food and did little or no exercise. Next, the students showed a wide range of levels of emotional eating, with the females showing a higher level than the males. Various emotions were associated with the students' eating. Interestingly, the emotions mostly strongly linked with their eating patterns were positive emotions, notably happiness and comfort. They also tended to eat when they had negative emotions, such as boredom, anxiety, or sadness. The sociocultural environment of Saudi Arabia appeared to contribute to the students' eating behaviour, mainly in respect of positive emotions and "Happy eating", for example, during meetings with friends and relatives, weekend holidays, social and religious events, and fasting days. The students seemed to be more predisposed to emotional overeating than emotional undereating. A final

point is that a majority of the students reported that unhealthy foods and drinks appealed to them.

The next chapter will present the discussion and inform the design of an online health awareness programme by using the personal accounts and experiences of adolescents to facilitate awareness about healthy eating habits for adolescents and to seek and provide a suitable intervention to reduce unhealthy eating and unhealthy behaviour.

## **Chapter 8 Discussion of Qualitative Findings and Informing the Design of an Online Health Awareness Programme**

### **8.1 Introduction**

The present study aims to gather information about the emotional eating of Saudi Arabian adolescents aged 12-15 years and to use this information to inform the design of an online health awareness programme that supports healthy eating and healthy behaviour. This chapter focuses on the third research question, which is, “What are the perceptions of Saudi adolescents with regard to informing the design of an effective online awareness programme concerned with healthy eating and healthy behaviour?” This was pursued by interviewing the students, with the findings being presented in Chapter 6. They considered online or digital resources as an appropriate medium for an awareness programme on healthy eating. Moreover, they provided insights regarding the design of an online awareness programme, such as the functions and features, frequency of content updating, format (type) of information, and imagery to be utilised. This chapter discusses these findings and their implications for the design of the online health awareness programme.

### **8.2 Discussion of Theme 3: Intervention for Emotional Eating**

The discussion of the findings in this section will be organized into six themes, which are: Suitability of online resources for programmes on healthy eating (section 8.2.1); Existing applications on healthy eating (section 8.2.2); Criteria of design of an online awareness programme (section 8.2.3); Preference of social networking apps (section 8.2.4); Suggestions for the design of a healthy eating programme (section 8.2.5); and Changes to the school curriculum (section 8.2.6). The relevant themes and associated sub-themes are listed in Table 6.1.

#### ***8.2.1 Suitability of Online Resources for Programmes on Healthy Eating***

The interviews confirmed that the female adolescents view online resources as suitable for an awareness programme on healthy eating. They all categorically emphasised that they believed that online resources would be more effective than any other form of media (for example, leaflets, booklets, etc.). They considered that online resources would be useful and appropriate for the modern age due to their “prevalence” and “attractiveness”, in contrast to

“boring” traditional methods, such as posters and pamphlets. Further, programmes on the Internet were “enjoyable”. These findings are supported by several studies (Casazza & Ciccazzo, 2007; Cullen et al., 2005; Long & Stevens, 2004) that have reported that adolescents have shown a preference for receiving information related to health through the computer and the Internet rather than via traditional ways, such as printed materials. In addition, the students indicated that online resources on social media and the Internet would be more effective due to the ease and speed with which they deliver information. Thus, the suitability of online resources to encourage healthy eating and exercise seemed to be implied. The merits of online resources in facilitating communication were also indicated, as were their usefulness in providing direct and quick solutions and answers for any inquiry or question. Consequently, online programmes are a promising method of educating this population regarding healthful behaviours due to the technological capacities of children and adolescents and their predilection for information introduced in this manner (Casazza & Ciccazzo, 2007; Crutzen et al., 2011). Furthermore, a study by Thompson et al. (2012) drew attention to the potential of the Internet as a successful approach to deliver programmes to adolescents to facilitate the adoption of healthy behaviours. Overall, this study emphasised the need to include members of the intended audience in the formative research to create programmes for behaviour modification that are applicable, attractive, and deal with their interests and needs.

Furthermore, the interviewed students believed that online resources could be useful in different areas, for example, to encourage participation in sports, regulate time, and encourage healthy eating behaviour. They also believed that technology programmes could be useful in promoting health and healthy eating, as they permit the interaction of individuals with other persons with mutual interests or hobbies.

In contrast, this study found that traditional methods, such as posters and pamphlets, were limited to extant information without the provision for further inquiry or probing. Also, they were perceived to be “inherently boring and unattractive” since viewable content (video clips, images) could not be used in them and hence online resources were better when it came to the final output and content, which is confirmed by several studies (Casazza & Ciccazzo, 2007; Cullen et al., 2005; Long & Stevens, 2004).

### **8.2.2 Existing Applications on Healthy Eating**

This study (qualitative phase) found that there was awareness of existing online applications on healthy eating among the students. However, it was also evident that online content that influenced favourable eating behaviour was limited. Overall, the study found that eight out of 12 students who were interested in healthy eating behaviour had looked for applications that would support them. On the other hand, the four students who were not interested in healthy eating or in exercise were found to be unaware of applications on healthy eating. It is therefore important that the design of such an application should take into account reaching and appealing to this group of students. Further, existing applications had shortcomings that prevented their continual use by the students, which is discussed shortly.

Awareness of such applications was found to be through celebrities the adolescents followed on Snapchat, for instance. Snapchat and other social networking applications, such as Instagram, were sometimes found to serve as an alternative to applications on healthy eating as the pictures, videos and people's experiences related to health that were available on them could be beneficial to the persons, including adolescents, who followed these people. Nevertheless, eight students recognized that celebrities were a significant influence on them, as they believed that following a celebrity who was interested in health would be beneficial to them, or not so if the celebrity was not interested in health.

Eight students reported that they started using an online programme but then stopped its usage when they did not receive encouragement to continue using it. The female participants emphasised the importance of encouraging adolescents to continue using health awareness programme to gain benefits. This receives support from Stevens et al. (2008), who described the design and implementation of an interactive website to support long-term maintenance of weight loss. This programme included a system of reminders (pre-set telephone and email messages) that encouraged participants who had missed a check-in deadline to visit the website. The participants would be called by a staff member if the pre-set messages did not encourage a response. Preliminary findings from the trial indicated that the prompts (telephone and email) seemed to be successful in enabling the participants to maintain continual use of the website.

Relatedly, the development of the programme as a mobile application was also suggested, as mobile applications are characterised by ease of use, flexibility, and inexpensiveness, the

last as they are typically free of cost. The programme could be made available on an AppStore and include features such as explaining healthy eating behaviour, promoting healthy exercise, providing schedules for exercise, and healthy food. Moreover, the students suggested that the application provide uninterrupted access to a variety of health topics and send alerts to notify students about new information. Alerts could also be provided to remind users to exercise, drink water, and eat fruits and vegetables. Accordingly, mobile apps have been scrutinised for their effectiveness in developing awareness of healthy eating behaviour. For instance, a systematic review by Coughlin et al. (2015) scrutinised 193 articles and found that the usage of smartphone apps was related to higher adherence to diet for foods low in calories and fat, and high in fibre, and higher levels of physical activity levels, which led to greater weight loss. Likewise, Lieffers (2016) scrutinised the experiences and perceptions of adults who access publicly available mobile nutrition behaviour modification apps for weight control and the usage of mobile apps in dietetic practice in Canada. Overall, the participants believed that goal setting for behavioural changes associated with nutrition and physical activity was beneficial. Moreover, Lieffers (2016) found that more than half of the participating dietitians reported the use of mobile apps in their practice.

### ***8.2.3 Criteria of Design of an Online Awareness Programme***

Various insights were provided by the students regarding the design of an online awareness programme during the two phases of the study. These are organized into several sub-themes, which are discussed in the following sub-sections.

#### ***8.2.3.1 Functions and Features of an Online Healthy Eating Programme.***

Overall, the students believed that an online programme for healthy eating should be interactive and support interaction among people and also with specialists. Yang et al. (2019) emphasized the effectiveness, in general, of such interventions for health, as well for healthy eating (Cullen et al., 2013). Moreover, the programme could incorporate tips and advice on healthy eating from doctors, health experts, celebrities, which is consistent with research showing that such features encourage the continual use of the website (Stevens et al., 2008). An additional feature was the calculation of calorific intake. Furthermore, the students' narratives revealed that they believed that the programme should emphasise the benefits of healthy behaviour, demonstrate the adverse impacts of unhealthy behaviour, and provide useful information and advice related to health, losing weight, and how to remain healthy.

Additionally, the students suggested that the programme should be simple, affordable (i.e., inexpensive or free); be compatible with mobile applications; be kept up-to-date; and be easily accessible. These views correspond with the findings of Coughlin et al. (2015), as the preferences of participants were oriented towards mobile applications that were fast and easily administered, and those that enhanced mindfulness of food consumption and weight control. The suggestion to use mobile apps has mixed support from the literature. As noted in section 3.7.3, Helander et al. (2014) scrutinised the usage of a diet self-monitoring app and found that the majority of the persons who had downloaded the app either never utilised the app or used it merely to take one picture. However, the systematic review by Coughlin et al. (2015) found that the usage of smartphone apps was related to higher adherence to diet for foods low in calories and fat, and high in fibre, and higher levels of physical activity levels, which led to greater weight loss.

Moreover, the students placed emphasis on the usefulness of programmes that educated young people about the importance of health through dialogues between people and specialists. They also perceived that it would be helpful to base the style of the programme on the “interaction, beneficial challenge and competition between friends, co-operation and supporting each other” and design it to be clear and flexible. Other features that were suggested were tips from doctors, health experts, and celebrities about health and losing weight. They also suggested the use of pictures, videos, and cartoons to make the online resource exciting to watch. Schweitzer et al. (2016) highlighted that interventions incorporating these would benefit by including live interaction with qualified experts accompanied by a maintenance follow-up programme delivered on the Internet.

### **8.2.3.2 Frequency of Content Updating.**

In general, the study found that the students agreed that the content of an online health awareness programme requires constant updating. The several reasons they provided for constant updating are presented in section 6.4.2. Their views are in agreement with Alhaddad (2018), who highlighted that the health information content available on social media required frequent updating and review by health authorities.

### **8.2.3.3 Format (Type) of Information.**

The features the students suggested should be included in an online awareness programme are presented in Table 5.30 and their suggestions for various applications are presented in Table 5.31.

Suggestions for content from the interviewed students included information which attracts youth such as, entertainment, health, and personal care; exotic information, celebrity news and information that aids self-realisation; programmes that challenged them through competitive games and stories; health tips; healthy eating and cooking methods; information to aid awareness about healthy and harmful eating; information regarding the adverse effects of incorrect eating behaviour on the body and weight; information on body health and weight loss, *through healthy means* (implied); exercises, weight loss, body shape, fashion, celebrity health updates; games, basics of healthy nutrition, food quantities to be consumed, distribution of meals, etc. (Table 8.1). Ybarra and Eaton (2005) have advocated the use of computer and online programmes to promote health-related behaviours through the use of computers or an Internet platform to deliver information. Additionally, Livingstone (2019) found that online tools are suitable for use with children and adolescents who already have access to it in their daily lives.

The female students also suggested that online programmes be customisable to take the different needs of persons into account. Additionally, they indicated that it was essential for the information to be varied and entertaining, and related to social, scientific, and health issues. Also, that emphasis should be placed on topics associated with fitness and sports. New or unfamiliar information should be provided where possible along with renewable and cultural themes, both in general and related to daily existence. In the context of children and adolescents, Hamel and Robbins (2012) submitted that computer- and web-based interventions, when conducted in schools and individualised, can enhance their eating behaviour and physical outcomes associated with food.

The study found that the students perceived video clips to be effective in delivering information as they are clear, persuasive, and could be easily followed. Also, they are frequently used by celebrities and youth. The students appeared to find mobile applications beneficial as they believed it was possible to download various applications and programmes. Further, they believed that such modern programmes helped young people to look for answers

to any health-related questions at any time and obtain quick answers instead of having to depend on conventional publications and approaches. Other online content reported to be useful were blogs and personal pages as they permit people to benefit from the experiences, comments, and responses of other individuals. The students also perceived that social media applications and Internet programmes facilitated the following of persons who are concerned about health and exercise and receiving their advice. Moreover, video programmes and applications ensured that important, concise, and useful advice was accessible. The students suggested that online resources could use an advertising style and interactive apps, which allowed experts and other individuals to answer questions based on their experience. The students' narratives drew attention to the involvement of other people (e.g., family and friends) in encouraging young people into healthy eating behaviours. This accords with Schweitzer et al. (2016), who suggested that weight loss programmes should include live interaction with qualified experts accompanied by a maintenance follow-up programme delivered on the Internet.

Another suggestion for online content was the use of competitions between a famous person and their follower(s), as this could influence healthy eating behaviour. It must be noted, however, that the students were aware of the detrimental influences of following the wrong kind of persons since they recognized the importance of receiving the right kind of inputs regarding food, healthy behaviour, and sport as pertained to their age group. In this regard, a study by Merchant et al. (2017) sought to gain awareness concerning how college students tried to lose weight by involving their social networks and utilising social and mobile technologies; the participants were acquainted with each other. It was found that many participants were motivated by seeing the success of others online, which shows the appropriateness of using social media to discussing personal health and increasing motivation for healthy eating and behaviour. Moreover, they seemed to be aware that media could distort reality, particularly in the case of celebrity endorsements, as celebrities are often seen to be either unnaturally slim or aspiring to be thin (Polivy & Herman, 2002; Rounsefell et al., 2020). Consequently, it could be seen that the students displayed an awareness of the adverse effects of the incorrect usage of social media applications in the context of health. Likewise, the study of Merchant et al. (2017) found that the participants in the treatment group were pleased with the appropriate support offered by the study and the incorporation of content among various technologies, such as social media.

The scarcity of information associated with healthy eating in school books was highlighted by the interviewed students. Accordingly, they indicated that information such as the amount of calories to be burned, the amount of water to be drunk, and the kind of food appropriate for adolescent health and bodies be provided in online programmes to compensate for this lack. On the other hand, the students indicated that adolescents would not be interested in activities and lectures (quantitative study) and cultural information (qualitative study) to be included in an online awareness programme. Overall, the developmental needs of adolescents should be taken into consideration, as they are included in the design process of healthy eating interventions (Won & Tang, 2017), which has been one of the aims of this research (see section 8.3). Such awareness campaigns also use various other channels to provide information to the general public (Hawkes, 2013). These include: health and education-related settings; public relations events, such as talks, demonstrations and tours; social media; and mass media.

#### **8.2.3.4 Imagery To Be Used.**

The qualitative study found that the students believed that using real persons would be more appropriate in an online resource. However, some of these were alright with using cartoon characters if they were realistic enough. Another perspective expressed supported the use of real persons or “*three-dimensional*” cartoon characters, which are realistic. It was suggested that the real persons used should be in the same age group as the target age group for greater impact. Supporters of the use of cartoon characters believed them to be more appropriate for young people up to the age of ten, as they were cute and funny and had sound effects. Moreover, cartoon characters, realistic or otherwise, could be interesting, exciting, fun, and attractive.

The students’ views are supported by several studies. According to Damiano et al. (2013), the powerful role of images and real characters could be used in education to make the concepts obvious and situated, besides facilitating concentrating on related elements to promote the mediation process. Likewise, Calvert (2017) highlighted the vital role of the media character that can play a significant function in enhancing social and educational improvement in young children. Additionally, Aguiar et al. (2019) stated that the learning of children is affected by the relationships with individuals and media characters whom they trust. Especially, young children have a feeling of trust and attachment towards educational content learning because the characters and adults could be more credible. These results have

significant educational implications because the findings suggested that the characters of the educational media are exchanged by characters that have more entertainment focus. Therefore, it is significant to take into account using pictures or real characters according to their high values in promoting the design of the online health awareness programme because these tools help adolescents learning by grasping their attention, explaining unclear concepts, and inspiring.

#### ***8.2.4 Preference of Social Networking Apps***

In the quantitative study, the students' preferences for social networking applications for an online programme related to awareness of healthy eating are presented in Table 5.29, which were, YouTube, Snapchat, WhatsApp, Instagram, Twitter, and Facebook. This was attributed to the fact that these applications were "the most attractive to young people aged 15 years" (Ahmed & Hassan, 2017; Anderson & Jiang, 2018). YouTube was ranked the highest, and Facebook was ranked the lowest by both the males and females. Hefni (2017) confirmed the significant role of mass media in promoting healthy behaviours, such as increasing physical activity and preventing obesity among Saudi adolescents.

The students also suggested that the design of an online programme for a specific audience required recognition of the sites which were suited to the group's preferences and interests. Furthermore, it should include educational videos and provide easy access to information. Also, the programme could be designed to consolidate aspects of healthy eating, drinking water, and exercising, as a single application would be easier to use.

These results are consistent with the results of the systematic review by Chang et al. (2013), as this study examined social media's role in online weight management. Their premise was that social media applications could be likely assistants to online interventions for weight management by supporting education, involvement, and support of peers. Additionally, the most common social media application utilised in the reviewed studies were found to be message boards and chat rooms.

#### ***8.2.5 Suggestions for the Design of a Healthy Eating Programme***

Several suggestions were forthcoming from the participating female students (qualitative phase) regarding the design of a healthy eating programme (see Table 8.2).

One suggestion was that the design of the application is attractive and that the capability for users to compare their health status before and after its use be provided. Besides, the design should be enjoyable for use to lower the sense of loneliness by facilitating social interaction that is, giving adolescents the opportunity to interact with others. Thus, it could be seen that the students believed that they would be encouraged into healthy eating through interaction with others in the same boat rather than in isolation (Arem & Irwin, 2011; Kodama et al., 2012; Wieland et al., 2012). Also, it appeared that the students were in favour of interaction between users as they suggested that the application include a mechanism to permit interaction (e.g., chatting). This, the students believed, would stimulate enthusiasm and competition concerning healthy eating. Moreover, the users of the application would be allowed to share diverse ideas and exchange opinions.

Another suggestion gleaned by the study was that the programme be published for use not only among the target groups, but also to permit the participation of parents, teachers, and the school administration. This accords with the findings of Schweitzer et al. (2016) in section 3.7.3, who confirmed the benefit of interaction with qualified experts accompanied by a maintenance follow-up programme delivered on the Internet. Likewise, the students specifically highlighted the importance of involving family members (especially parents) in raising healthy awareness. Thus, it could be seen that they believed that education on healthy eating was required for parents and students. In this regard, several studies have confirmed that the food choices and eating behaviours of adolescents are influenced positively or negatively by parents (Mahmoud & Grigoriou, 2019) and siblings (Rageliene & Grønhøj, 2020), as was discussed in section 3.4.6.3.

Furthermore, the interviewed girls specifically highlighted the importance of involving the persons responsible for school canteens, the last because they perceived that the canteen programmes in schools required attention. This fits with the view of Al-Jaaly et al. (2016), who pointed out that schools have a vital role in promoting and contributing to the healthy status and behaviours of students as compared with other institutions in society because through their canteens, healthy options of meals and snacks can be offered. Hence, many health policies and decisions could be implemented in education regarding healthcare and healthy lifestyles. Similarly, the school environment plays an important role in nurturing and sustaining good eating habits because most students consume at least one snack or one meal in their school canteen on most days of the week for several years (Ministry of Health Singapore,

2018). This means school meals could offer an essential contribution to the nutrient and energy intake of adolescents (British Nutrition Foundation, 2018a).

Another aspect suggested was to activate the topic using Twitter's hashtag feature. A related suggestion was that schools could allot a personal account for each student, which could be accessed using a user name and secret code. This would provide a direct interaction between school and students by recording a student's report during a week. Students could report their inquiries related to sports, eating, health, etc., on the application. Consequently, teachers could be sent alerts to respond to the students' inquiries. Such features of interaction seemed to be successful in enabling the participants to maintain continual use of the website (Stevens et al., 2008).

### ***8.2.6 Changes to the School Curriculum***

The students (qualitative phase) believed that it would be useful to incorporate some amount of education regarding healthy eating behaviour in the school through, for instance, a weekly class to educate students about healthy behaviour, healthy eating and maintaining a healthy weight, and the reading and learning associated with such programmes. It was clear that the adolescents were aware of the shortcomings in the communication at the school level with regard to healthy eating and wanted the situation to change. This confirmed the findings of earlier studies based in Saudi Arabia which drew attention to the absence, in the Saudi educational system, of an ideal curriculum, and supporting resources and physical activities had resulted in unhealthy habits being cultivated by many students, which resulted in many becoming overweight or obese (Alturki et al. 2018; Bajamal et al., 2017). Furthermore, it is necessary to allocate a healthy educational supervisor who has a role in supervising and educating the students. Franko et al. (2008) found that Internet-based programmes could be widely and effectively used for nutrition education and motivating alteration in health behaviours on college campuses. Greene et al. (2012) indicated that an online intervention encouraged competent decisions related to healthful food and eating, had an enduring effect on the consumption of fruits and vegetables, and sustained physical activity at baseline levels.

## 8.3 Informing the Design of the Online Health Awareness Programme

### 8.3.1 Background

The outcomes of the quantitative and qualitative phases of the study provided insights that are now utilised to guide the design of an online health awareness programme. The conceptual framework clarified the framework formulated to support adolescent students by spreading health awareness and healthy eating behaviour and utilising the existing services in the country (section 3.6 and Figure 3.7). Six themes and four sub-themes were derived concerning various aspects of online programmes for healthy eating and healthy behaviours, as follows (Table 6.1):

Theme 1: Online resources for healthy eating

Theme 2: Popular online resources

Theme 3: Criteria of an online healthy eating programme.

- Sub-theme 1- Functions and Features of an online healthy eating programme
- Sub-theme 2- Frequency of content update
- Sub-theme 3- Format (type) of information
- Sub-theme 4- Imagery to be used

Theme 4: Applications on healthy eating

Theme 5: Online content that influences eating habits and healthy eating

Theme 6: Suggestions for the design of a healthy eating programme.

The students indicated their preferences regarding the functions and features to be supported in an online programme (Table 8.1). They suggested the programme style should be based on interaction, challenge, and competition between friends; that is, the programme should be interactive and facilitate interaction between users (individuals, experts, etc.). In this regards, Almogbel et al. (2015) mentioned that most technology and Internet users in the KSA are young, which makes them face challenges as a result of the information and technology revolution. Schweitzer (2016) confirmed in his study the effectiveness of the electronic health interventions. Moreover, a study by Thompson et al. (2012) drew attention to the potential of the Internet as a successful approach to deliver programmes to adolescents to facilitate the adoption of healthy behaviours. Stevens et al. (2008) described the design and implementation

of an interactive website to support long-term maintenance of weight loss. Furthermore, Thompson et al. (2012) emphasised the need to include members of the intended audience in the formative research to create programmes for behaviour modification that are applicable, attractive, and deal with their interests and needs.

The students suggested that the programme should emphasise the benefits of healthy behaviour, demonstrate the adverse impacts of unhealthy behaviour, and provide useful information and advice related to health, losing weight, and how to remain healthy. Kaipainen et al. (2012) mentioned that online interventions centred on small modifications could probably result in clinically significant loss of weight, and could benefit further by incorporating individualisations suited to personal conditions and psychological requirements. Moreover, they could raise the awareness of the individuals to identify whether their source of hunger is a physical need or an emotional desire (Blackman & Kvaska, 2011).

The students suggested the programme be up-to-date; be easy to access; be clear; be flexible; and use pictures, videos, and cartoons. Coughlin et al. (2015) found that the preferences of participants were oriented towards applications that were fast and easily administered, and those that enhanced mindfulness of food consumption and weight control. Moreover, the usage of smartphone apps was related to higher adherence to diet for foods low in calories and fat, and high in fibre, and higher levels of physical activity levels, which led to greater weight loss.

Other features the students suggested were:

a. **Tips and Advice on Healthy Eating.** The programme should include tips and advice related to health, healthy eating, and losing weight, from persons likely to be able to influence adolescents, such as doctors, health experts, and celebrities. Lieffers (2016) found that more than half of the participating dietitians reported the use of mobile apps in their practice, and more than half reported that they had had clients who inquired about or utilised an app related to food/nutrition. Relatedly, about two-fifths of the participating dietitians had recommended apps related to food/nutrition to their clients. However, they also drew attention to factors which could influence the dietitians' recommendation of apps to clients and their own usage of such apps. These included factors related to the mobile device and app (e.g., quality of content, ease of use, cost, etc.), individual factors (e.g., awareness, appropriateness, capacity/readiness to pay, etc.), and workplace factors (e.g., being permitted to utilise mobile

phones in the workplace, poor mobile infrastructure, etc.) (Lieffers, 2016; Lieffers et al., 2014).

b. Calorie calculator. The programme should be able to calculate calories consumed. Harvey-Berino et al. (2012) found in their study an efficacy of tools such as weekly chat meetings with a facilitator, recommendations for calorie and fat gram, everyday food logs, and guidance for exercise, which were included in the programme. Overall, 23% of the participants lost weight after the intervention. Frayn et al. (2018) submitted that emotional eaters who strive to keep their weight under healthful limits could be favourably influenced by programmes which endorse exercise, eating mindfully, the management of emotions, and having an affirmative body image.

Table 8.1 presents the keywords related to the format (type) of the information.

**Table 8.1**  
*Keywords Related to the Format (Type) of the Information*

Video clips	Healthy eating	Meal plans	Games	Forums for advice
Talking with young people	Exercises to stay fit	Monitor food intake	Advice about healthy eating	Discuss healthy eating with other young people
Presentation	‘Fun’	Famous personalities	Interesting and enjoyable	Up-to-date, brief, easily accessible
Images or videos	Experts	Curriculum	Personal care	Celebrity news
Information that aids self-realisation	Challenge through competitive games and stories	Health /Health tip	Healthy eating and cooking methods	Awareness about healthy and harmful eating

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Adverse effects of incorrect eating behaviour on the body and weight	Healthy means for body health and weight loss	Exercises	Weight loss	Body shape
Celebrity health updates	Fashion	Games/ Varied and entertaining	Basics of healthy nutrition	Quantities of food
Meals distribution	Customisable	Co-operation Supporting	Related to social, scientific, and health issues	Fitness and sports
New or unfamiliar information	Renewable and cultural themes	Associated with daily existence	Mobile applications	Blogs and personal pages
Social media applications	Internet programmes “Web-based apps”	Video Games/clips and applications	Online resources	Advertising style for healthy awareness
Interactive apps	Beneficial & positive challenge Competitions	Amount of calories to be burned	Amount of water to be drunk	Food appropriate for adolescent health and bodies
No lectures	No cultural information			

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The students’ suggestions (the most common and repeated keywords of the suggestions in the interviews) for the design of a healthy eating programme are summarised in Table 8.2.

**Table 8.2**  
*Keywords Related to Programme Design*

<i>Challenging content</i>	<i>Clear</i>	<i>Focused</i>	<i>Informative</i>	<i>Available offline</i>
<i>Simple in language</i>	<i>Instructive</i>	<i>Diagnostic</i>	<i>Realistic</i>	<i>Video clips</i>
<i>Icons</i>	<i>Reminders</i>	<i>Sections</i>	<i>Audience</i>	<i>Up-to-date</i>
<i>Mobile app,</i> <i>Compatible with mobile apps</i>	<i>Involve influential people</i>	<i>Advice</i>	<i>Variety</i>	<i>Consolidated</i>
<i>Attractive</i>	<i>Capabilities</i>	<i>Enjoyable</i>	<i>Social interaction</i>	<i>Target groups</i>
<i>Parents, Family members</i> <i>teachers, school administration</i>	<i>Resemble other attractive programmes</i>	<i>User account</i>	<i>Twitter's hashtag feature</i>	<i>School-moderated / administered</i>
<i>Advertised</i>	<i>Alerts</i>	<i>Chatting</i>	<i>Exchange opinions</i>	<i>Share ideas</i>

### **8.3.2 Rationale and Principles for the Programme**

Emotional eating is a significant facet that could impact the emotional health and well-being of adolescents. Stirling and Emery (2016) observed that several emotional challenges could not be scientifically explained, and consequently, expert interventions are not beneficial. However, social models, such as social, environmental, and cultural factors, provide wide-ranging methods that take preventive action (see conceptual framework in section 3.6 and Figure 3.7).

In the present day, children and adolescents mature in a setting that progressively endorses adverse thrill-seeking behaviours as a result of various factors such as, undesirable role models, the influence of contemporaries, unclear outlooks for their role, and influence of the society/media (Keane, 2018). These thrill-seeking behaviours are developed by children and adolescents in differing extents, which may hinder their advancement in education.

Schools are in a unique position to respond to the fundamental needs of children with regard to health education. Indeed, the school, after the home, has the highest capacity to assist

each student beneficially. Investigations suggest that students in good health are more proficient (Barron & Osher, 2019; Darling-Hammond et al., 2019). Thus, it would appear that school-based intervention approaches are successful in eliminating several risk behaviours while also strengthening and supporting favourable health behaviours, in general (International Union for Health Promotion and Education [IUHPE], 2009).

*Interventions in schools related to health and nutrition have been proven to enhance not only the health and nutrition of children but also their potential to learn and their preferences in life, immediate and enduring. (Schools and Health, 2019).*

Apart from the school environment, online awareness and intervention programmes have been seen to be beneficial in aiding the development of healthy behaviour in populations of different ages. For example, the recent meta-analysis by Yang et al. (2019) revealed that the outcomes of web-based interactive interventions for health were generally effective, albeit they were moderated by the health matter under consideration, theoretical framework, and study design. Cullen et al. (2013) evaluated the effect of the “Teen Choice: Food and Fitness” programme and found that the adolescents were enabled by the website to enhance the consumption of vegetables, increase regular physical activity, and decrease inactivity. Moreover, it was concluded by Kaipainen et al. (2012) that online interventions could be effective in the matter of weight loss by placing emphasis on small modifications. For example, “*using smaller plates at meals, never eating directly from a package, or drinking water with every meal and snack*”. Furthermore, the capacity to individualise interventions enhanced their effectiveness. Jones et al. (2008) found that an Internet-facilitated intervention was moderately successful in temporary weight reduction and maintenance and produced a considerable decrease in binge eating. Another study by Schweitzer (2014) suggested that electronic health interventions could be effective in decreasing the consumption of saturated fat in students. On the whole, there is considerable research support for the effectiveness of Internet-facilitated programmes for weight-related awareness and interventions, as can be seen in the studies of Arem and Irwin (2011), Goode et al. (2015), Hageman et al. (2017), Kodama et al. (2012), Sorgente et al. (2017), and Wieland et al. (2012), among others (for more details, refer to Chapter 2). Thus, the present study informs the design of an online programme for health awareness, which will be of especial use to adolescents in the KSA where there is a dearth of programmes suitable for use in the context (religious and social) of the country.

The following principles are formulated for the health awareness programme (Figure 3.8):

1. To spread awareness and support for health awareness and healthy eating behaviour among adolescents in Saudi Arabia.
2. To utilise existing services in the country in this regard. That is, through integrating with the websites of the Ministries of Health and Education.

### ***8.3.3 Framework of the Proposed Health Awareness Programme***

The design of an online health awareness programme to deal with the needs of adolescents and to regulate the issue of emotional eating necessitates the highlighting of emotional and mental well-being, emotional health, wholesome behaviours, and healthy eating, as these are strongly associated with emotional eating. The framework of the proposed programme comprises three axes, namely: Objectives, Components and Strategies. These are described in the following sub-sections.

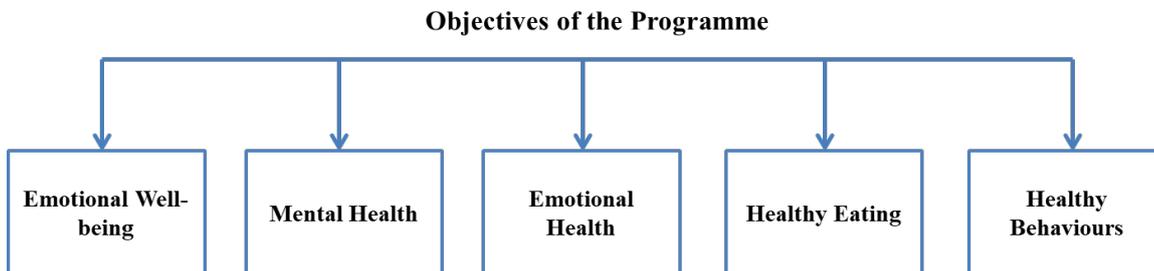
#### ***8.3.3.1 Objectives of the Health Awareness Programme.***

The outcomes of a study by Cassola (2013) indicated that the planning of an intervention directed towards reducing emotional eating required considering the following: reducing experienced stress, enhancing self-efficacy of exercise, improving overall self-efficacy, boosting identified social support, and reducing unsound strategies for coping (such as avoidant/avoidance and exercising unwarranted self-control), along with fostering sound strategies (such as planful problem solving and requesting social support). Similarly, the design of the study's proposed programme considers the objectives the programme endeavours to accomplish according to their important role regarding healthy eating and healthy behaviours, namely, emotional well-being (White, 2018), mental health (Polivy & Herman, 2005), emotional health (Dawkins & Jennifer, 2020) (section 3.2.3), and healthy eating and healthy behaviours (section 3.3.3.1) (Figure 8.1).

National Health Programme (2005) stated that there are strong mutual relations between healthy eating, healthy behaviour, mental health, and well-being. Furthermore, emotional health is considered as an essential state of well-being (Dawkins & Jennifer, 2020). Therefore, these objectives are essential to take into account to implement a health awareness programme to achieve healthy eating and behaviours; besides, they are efficient barriers to prevent EE behaviour and achieving healthy eating and behaviours.

**Figure 8.1**

*Objectives of the Proposed Programme*



### **Healthy Eating.**

In the context of healthy eating and healthy behaviours, it should take into account the development of school canteens and the school curriculum.

Drawing on the findings and the literature review of the study, the following objectives were derived with regard to the design of the online health awareness programme to deal with the needs of adolescents with regard to beneficial eating and behaviours associated with eating:

- To provide advice on supporting the health and well-being of school-going children and adolescents;
- To provide guidance regarding mental well-being and behaviour in schools to students;
- To offer guidance on school-based counselling;
- To offer resources to the online health awareness programme to develop emotional resilience in children and adolescents through collaboration with external agencies to obtain supplementary support as required;
- To confirm that primary healthcare is accessible;
- To offer a system to address emergency medical states;
- To provide methods to identify and solve health and educational challenges encountered by students;

- To offer wide-ranging and suitable health instruction.

### **8.3.3.2 Components of the Health Awareness Programme.**

It is essential in a health-promoting programme to take into consideration three fundamental channels based on the participants' views and the related literature reviews, which are:

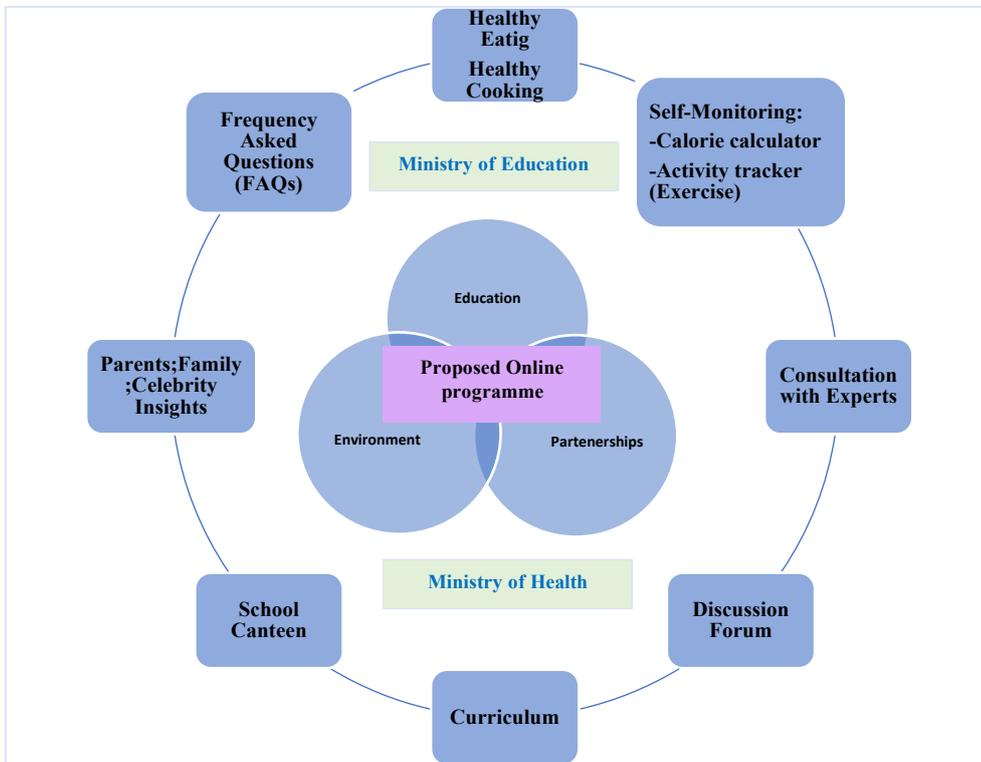
- *Education*: such as curriculum, learning, and teaching;
- *Environment*: organization, physical environment and ethos; and
- *Partnerships*: parents, the whole community, and services.

All of these channels are crucial to support the participants in healthy eating, physical activity, well-being, and mental health (WAHPSA, 2019).

Previous research has demonstrated the significance of public awareness campaigns for health communication by using the various channels to provide information to the school students. Various techniques, focuses, and components can be used through these channels for raising the efficiency of public awareness programmes (Hawkes, 2013). Due to the lack of health awareness programmes in Saudi schools (see Chapter 2), there is a considerable need for more to target raising awareness in healthy eating and healthy behaviours among the adolescent students. Along with this, there is a need to create a healthy and ideal food environment, and provide and improve a range of services and strategies that support the students' health and nutritional behaviour both inside and outside the school, which will require cooperation between the MoE and MoH.

This section reviews the key (critical) viewpoints and attributes obtained from the participants and the literature review, and puts forward various components pertaining to designing an online health awareness programme. These are Healthy Eating; Exercise, Self-monitoring; School Canteen; Parents, Family, and Celebrity Insight; Consultation with Experts; Discussion Forum; Frequently Asked Questions (FAQs); Blogs; and Curriculum. The components of the proposed programme are depicted in Figure 8.2 and the functions of the different parts are tabulated in Table 8.3.

**Figure 8.2**  
*Components of the Health Awareness Programme*



**Table 8.3**  
*Components of the Health Awareness Programme*

<b>Component</b>	<b>Description</b>
Healthy Eating	Content related to healthy eating behaviour (Cullen et al., 2013).
Exercise	Content related to suitable physical activity (& Physical Education) (Cullen et al., 2013).
Self-Monitoring	Tools for self-monitoring (Cullen et al, 2013).
School canteen	Implementing quality standards in school canteens and their related policies.
Parents and family	Parents and family can have a significant impact on their children's eating habits by encouraging their children to adopt healthy eating and healthy food choices (Mahmoud & Grigoriou, 2019; Rageliene & Grønhøj, 2020).
Celebrity Insights	Articles and news related to the healthy behaviours of celebrities, weight-loss approaches, etc. (Rounsefell et al., 2020).
Consultation with Experts	Forum for discussion with experts (Gagnon et al., 2019).
Discussion Forum	Forum for discussion with users of the website (Won & Tang, 2017).
FAQs	Frequently asked questions related to health (Schweitzer et al., 2016; Stevens et al., 2008).
Blogs	Blogs from registered users (Cullen et al., 2013).
Curriculum	Use the curriculum as an effective tool in promoting students to develop healthy eating besides the behaviours of physical activity (Elyas, 2018).

Since children and adolescents spend considerable time in the school environment, an online health awareness programme that is directed to school students has been recognized to be the ideal environment to encourage robust emotional health and identify preliminary modifications in behaviour and hints of emotional troubles (YoungMinds, 2017).

The interviewed believed that the programme should emphasise the benefits of healthy behaviour, demonstrate the adverse impacts of unhealthy behaviour, and provide useful information and advice related to health, losing weight, and how to remain healthy. Cullen et

al. (2013) found that adolescents were enabled by the website to enhance the consumption of vegetables, increase regular physical activity, and decrease inactivity. Likewise, several lines of evidence have suggested that these types of programmes can encourage children and adolescents to increase their levels of sufficient physical activity (Hamel et al., 2011). Moreover, the participants referred to the feature of self-monitoring, such as the calculation of calorific intake and using activity tracker (Exercise).

Additionally, adopting a suitable curriculum is a useful tool that could help students to improve healthy eating and behaviours. The participants believed that it would be helpful to incorporate some amount of education regarding healthy eating behaviour in the school through, for instance, a weekly class to educate students about healthy behaviour, healthy eating and maintaining a healthy weight, necessary preventive information, and the reading and learning associated with such programmes. Furthermore, it is necessary to allocate a healthy educational supervisor who has a role in supervising and educating the students. According to Franko et al. (2008), an Internet-based programme could be widely effective in being used for nutrition education and motivating alteration in health behaviours. Greene et al. (2012) indicated that an online intervention encouraged competent decisions related to healthful food and eating, had an enduring effect on the consumption of fruits and vegetables, and sustained physical activity at baseline levels. There is evidence (e.g., Al-Bakr et al., 2016; Elyas, 2018) that the Saudi school curriculum is inadequate from the perspective of the required provision of necessary resources and physical activities in Saudi schools. Therefore, community culture and tradition play a considerable role in designing and developing the school curriculum (Quennerstedt & Larsson, 2015). Likewise, it is essential to ensure that all foods and drinks sold in school canteens are appealing and nutritious to comply with the health standards of school canteens. The Saudi policy specifies what is not allowed to be provided in school canteens. In contrast, it fails in delivering and directing what should be served to promote the nutritional value of the catered meals (Aldubayan & Murimi, 2019). Also, the nutritional situation in schools was weak because the foods provided in schools were unhealthy (Bushara et al., 2017). Hence, it is crucial to make changes in policy and practice regarding school breaks and meals, besides applying regulations and rules to boost healthy food.

Additionally, the students suggested that the programme should be simple, easy, affordable (i.e., inexpensive or free); be compatible with mobile applications; be kept up-to-date; and be

easily accessible. Consequently, online programmes are a promising method of educating this population regarding healthful behaviours due to the technological capacities of children and adolescents and their predilection for information introduced in this manner (Casazza & Ciccazzo, 2007; Crutzen et al., 2011). Further, Crutzen et al. (2011) confirmed that blogs on healthy eating and physical activity are provided which address barriers and feature adolescent role models. Moreover, they provide information related to nutrition and physical activity. Further, blogs can be accessed by website users, and they can formulate strategies to help them achieve their goals, monitor their progress, describe the achievement of goals, take part in problem-solving, and print a copy of their goal sheet. Cullen et al. (2013) observed that the stories using role models, a setting of goals, problem-solving, and self-supervision were the critical elements related to behaviour change.

Furthermore, the development of the website could include an interdisciplinary team encompassing health experts (e.g., public health researchers and experts in behaviour change interventions) and website development experts (e.g., application developers and interface designers). Principal features of the developed website include interactive societal support, self-supervising, written recommendations for diet, and physical activity (Stevens et al., 2008).

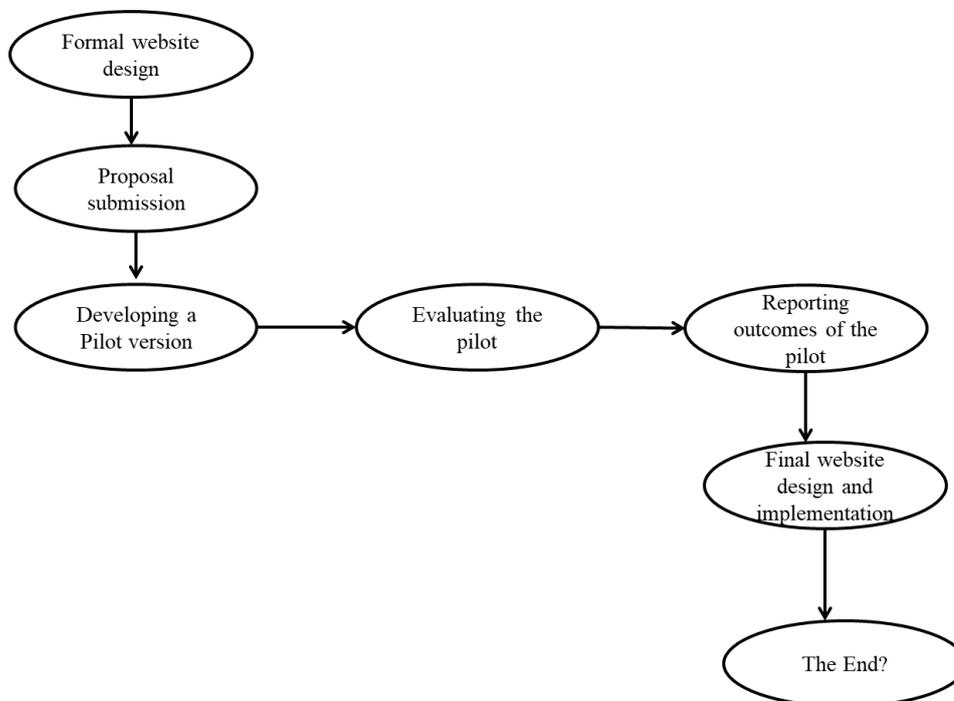
#### **8.3.3.3 Strategies: ‘Next Steps’**

At this time the design of the awareness programme remains at a nascent stage. The researcher is aware that there are several steps (Figure 8.3) that must be undertaken before the programme can become a reality. These next steps are as follows:

1. The formal design of the website involving experts for content and theory, and interface designers.
2. Development of key messages.
3. Submitting the website proposal to the Ministries of Health and Education for approval.
4. Working with authorised Ministry personnel to implement a pilot version of the website.

5. Assessment of the pilot website through a randomised controlled trial of at least 12 months duration involving 25-50 Saudi adolescents aged 12-15 years. This will serve to obtain preliminary information regarding the impacts and outcomes of the website.
6. Reporting of impacts and outcomes of the pilot website for scrutiny to the Ministries of Health and Education.
7. Progressing to the final website design and implementation based on the outcomes of the previous steps.

**Figure 8.3**  
*Next Steps*



## 8.4 Summary

This chapter discussed the findings from the qualitative phases of the study in the light of extant literature, as applicable. The female students provided valuable insights regarding the design of an online health awareness programme. Their support for an online programme over conventional forms of the intervention was clearly articulated. Besides, they provided essential inputs with regard to the social networking apps that could be used, functions and features, and overall design of such a programme, the frequency of content updating, the format (type)

of information, imagery, and so on. Furthermore, this chapter informed the design of an online health awareness programme based on the findings of the study and the literature review. Accordingly, the background of the design was provided, followed by rationale and principles for the programme, framework of the programme, objectives of the health awareness programme, components of the health awareness programme, strategies “Next steps”, and finally the conclusion.

## Chapter 9 Conclusions and Recommendations

### 9.1 Introduction

This chapter offers a final overview and evaluation of the study's aims, objectives, and contributions to the field of study. It includes a summary of the main findings (section 9.2); as sub-section 9.2.1 answers the first research question, sub-section 9.2.2 answers the second research question and sub-question 9.2.3 answers the third research question; then the study's contributions to knowledge (section 9.3), limitations of the study (section 9.4), recommendations (section 9.5), dissemination of the research findings (section 9.6), and summary (section 9.6).

This study sought to fulfil the following objectives by implementing a mixed-method research methodology as a means to explore the factors that may contribute to emotional eating:

The objectives of the research are as follows:

1. To identify the awareness and prevalence of emotional eating in adolescents aged 12-15 years in the KSA;
2. To understand the emotional, personal and sociocultural factors influencing the eating habits of (and contributing to emotional eating in) this population;
3. To identify potential components for informing the design of an online health awareness programme; and
4. To provide recommendations based on the study findings to government and administrative authorities in the KSA to improve programmes related to the emotional and physical health status of adolescents in the country.

The following research questions were formulated in line with these objectives:

1. How do Saudi adolescents' eating behaviours and dietary choices relate to emotional eating?
2. How do emotional, personal, and sociocultural factors contribute to emotional eating among this population?

3. What are the perceptions of Saudi adolescents with regard to informing the design of an effective online awareness programme concerned with healthy eating and healthy behaviour?

Overall, the study was able to obtain answers for the three research questions and thus fulfil its aims and objectives (Section 3.4.6 & Figure 3.8). Thus, the study was able to gain awareness of the experiences of adolescent students in Saudi Arabia with emotional eating. Moreover, insights could be obtained regarding the emotional, personal, and sociocultural factors that can contribute to eating behaviours (emotional eating) among Saudi males and females aged between 12-15 years (see conceptual framework in section 3.6 and Figure 3.7). These insights were also utilised to inform the design of an effective online awareness programme concerned with healthy eating and healthy behaviour (see Chapter 8 for details).

## **9.2 Summary of the Findings**

### ***9.2.1 Theme 1: Eating Behaviour and Emotional Eating in Adolescents***

The findings from the quantitative study concern demographic data, eating behaviours, emotional eating, different factors that could contribute to EE, and the students' preferences (Figure 3.7). Overall, the study found inconsistencies in the reported eating behaviour of the students, as their accounts varied from question to question. For instance, the study found some indications both of healthy eating behaviour and of unhealthy eating. In general, the males ate faster than the females. However, their speed of eating was not found to be indicative of emotional eating behaviour. Their responses suggested an apparent avoidance of exercise. Around 65% of both the males and females reported they did not read the calorific content of food. Regarding mindfulness in eating, the females reported more desire for unhealthy eating than the males, although both genders showed some awareness of the flavours, smells and colours of foods. Mindfulness is recommended as the best treatment for emotional eating because it helps to moderate emotional eating, as well as raise self-compassion (Bailey 2014; Pidgeon et al., 2012).

The females reported being rewarded with food by their parents more than the males after doing an excellent job. Hence, parents could be training their children (especially girls) to consume food to cope with their emotions, which might lead to issues with overeating. However, conflicting perceptions were seen in the matter of rewarding oneself with food, which leads the researcher to conclude that the participating students had an inclination for emotional eating. Just over half of both the males and females stated that

they rewarded themselves by eating “sometimes” or “usually”. It could be inferred that the students were unconsciously indulging in emotional eating, despite being mindful to some extent in their eating.

Additionally, the males and females revealed having different temptations to eat constantly to feel happy. About three-quarters (74%) of the males reported that they “never” or “sometimes” ate constantly to feel happy, even when they were not hungry, compared with only 57% of the females. Moreover, the highest percentage of the males (36.4%) and females (30.7%) indicated that they “never” could not resist food and eat continuously, and 26.5% of the males and 36.4% of the females chose “little”. This suggestion of conflicting perceptions regarding their association of emotions with eating does indicate an inclination towards emotional eating in the participating students.

The study revealed that both the male and female students were emotional eaters, as there were indications that the majority ate when they had positive emotions, as the majority seemed to eat to feel happy, when they were not hungry, or to feel comfortable. Nevertheless, a high majority of the males (92.7%) and females (94%) in the quantitative study had emotional eating at different levels, which are “High”, “Medium”, “Low”, and “None”, which were more noticeable among the females. It could be seen that the level of emotional eating of the majority of the female participants (52.6%) was in a “middle level” of EE, while the majority of males (50%) had EE at the low level (Table 5.32; Figure 5.3). This was an unexpected finding, and the current theories have focused on negative emotions. The association of positive emotions and food intake is explained in the theoretical perspectives (Happy Eating Model) (see section 3.5). The students also tended to eat when they had negative emotions, such as “boredom”, “anxiety” or “sadness”. The females showed higher levels of emotional eating than the males. In general, studies have indicated the higher the level of emotional eating, the less the healthy eating and associated characteristics (Jalo et al., 2019; Paans et al., 2018; Waller & Osman, 1998).

Moreover, the participants of the present study were found to have the normal range of weight and height for adolescents of the same age groups in Saudi Arabia (El Mouzan et al., 2016). About half of both the males (51.7%) and females (55.6%) showed BMIs in the “normal” weight range. This suggests that it is not necessary for the emotional eater to be overweight or obese, which is consistent with the study of Jalo et al. (2019), who found no association between EE and BMI. However, it is worth noting that over time EE could be a significant factor associated with increasing body weight (Keller & Siegrist, 2015). Moreover, the study also found that there was a tendency towards consuming drinks that

appealed to them as emotional drinking, though not of alcoholic beverages, as the students did have a tendency to drink soft drinks, juices, energy drinks, etc., in response to emotions, which agrees with the results of Aljaaly's study (2015) on the eating behaviours of Saudi adolescent girls.

### ***9.2.2 Theme 2: Factors That Contribute to Emotional Eating in Adolescents***

This study has acknowledged various factors that could contribute to emotional eating. Some of these are emotional factors while others are personal or sociocultural factors. This study found that around 50% of both the males and females "sometimes" or "usually" ate less when other people were around. Interestingly, 44% of the males and 53% of the females responded that "usually" "having a favourite snack made them feel *even* better when they were happy." In other words, the students were eating to satisfy emotions and were also indulging in eating by themselves. They reported the emotions associated with eating to be both positive and negative, including happiness, comfort, safety, anxiety, hunger, anger, enjoyment, and laziness, while recognizing to some extent that their eating behaviour was inappropriate, but they were unable to control themselves, especially with positive emotions.

The study found that the students were influenced regarding their body shape not only by various persons (parents, siblings, friends) in their day-to-day existence but also by persons or external factors in their daily life. Social media was also found to be a significant influence on the students, especially the females (70.6%) more than the males (47%). However, only about one-quarter of both the males and females reported being influenced by famous people, lower than might be expected. Parents were the greatest influence, as it was interestingly mentioned by the majority of the males.

A variety of influences affected their food choices, with parents having the greatest influence, as it was interestingly mentioned by the majority of both the males and females. Also, they were more influential than siblings or friends. Moreover, siblings, friends, social media, and food brands influenced the females more than the males.

Additionally, the study found that the students were more predisposed to eat during meetings with friends and relatives (males 59% females 82%), weekend holidays (males 62% and females 77%), social and religious events (males 43% and females 49.7%), fasting days (males 59% and females 35.9%), and period days (22.9%, females only). It was inferred that the students were experiencing greater inclination to eat due to

sociocultural factors and certain elements of stress, such as meeting with large groups of people or participating in social and religious events.

It was also found that their food choices appeared to be rather poor, as fast foods and snacks were high on their list, as were juices and soft drinks, all of which typically are high in calories. This corresponded with earlier findings that poor food choices (along with lack of physical activities) were the principal causes of overweight and obesity in Saudi Arabia.

### ***9.2.3 Theme 3: Adolescents' Perceptions towards Online Health Awareness Programmes***

The students believed that an online resource on healthy eating would have greater effectiveness than resources on conventional. Their insights revealed that YouTube, Snapchat, Instagram, and Twitter were popular among young people. The students had strong perceptions regarding the functions and features of an online healthy eating programme, including frequency of content updating, nature of information, and imagery to be used. They suggested in regard to imagery that they would be more receptive to the use of real persons or realistic cartoon characters. Some students were aware of existing applications related to healthy eating; however, the female students found limited online content that influenced favourable eating behaviour. Moreover, the female students drew attention to the influence of celebrities on young people. So, it is helpful to use celebrities as a tool to influence adolescents and direct them to send beneficial messages on healthy behaviours, as the female students mentioned that information related to promoting health, such as about sport and drinking water and topics posted by celebrities, would be appealing. The study found, on the whole, that there was a significant need for an online resource that provided suitable content and activity to motivate students to adopt healthy eating behaviour in Saudi Arabia.

### ***9.2.4 Informing the Design of an Online Awareness Programme***

The study also obtained various suggestions from the female students with regard to the design of a healthy eating programme. They suggested that the programme be interactive, informative, simple, easy to use, affordable, compatible with mobile applications, up-to-date, easy to access, clear, flexible, and use pictures, videos and cartoons. Other features suggested by the students pertained to the content of the programme, such as tips and advice on healthy eating, calorie calculator, and frequency of content updating.

It was recommended the framework of the proposed programme comprise four axes, namely: Targets, Components, Principles, and Strategies. In other words, the design of the

study's proposed programme considered the objectives the programme endeavours to accomplish, namely, emotional well-being, mental health, emotional health, and healthy eating and healthy behaviours. The components of the programme include healthy eating, exercise, self-monitoring, celebrity insights, expert consultations, discussion forums, FAQs, and blogs. The students believed that for such an intervention to succeed, it would be useful to involve the school administration and other relevant personnel. They also proposed the provision of classroom sessions on healthy eating for the students. Further, the students believed that family members be encouraged to contribute and be involved in healthy eating programmes pertaining to themselves.

### **9.3 Contributions to Knowledge**

First, the present study is the first of its kind in Saudi Arabia and the second study in other Arab countries, as only one previous research has investigated the process of emotional eating in Middle Eastern adolescents (Bahrain), but in a different age group, namely undergraduates ( $20 \pm 3$  years) (Alalwan et al., 2019).

Second, to the best of the researcher's knowledge, this is the first study that focuses on the perceptions of adolescent students regarding their eating behaviour and informing the design of an online health awareness programme for this population in Saudi Arabia, in particular, and in the Arab world, in general. This follows the study of Hefni (2017) in the KSA, which recommended that there is a need for a school-based intervention to enhance healthy eating as well promotes physical activity among school students. Moreover, several studies across the past two decades have confirmed that unhealthy eating behaviours were prevalent among Saudi teenagers (Al-Adawi et al., 2002; Al-Subaie, 1998; Moradi-Lakeh et al., 2017).

Third, the findings of the study serve to enhance existing literature related to the study of emotional eating and its determinants. Moreover, it has drawn attention to the various factors that may cause emotional eating. Further, the study serves to facilitate understanding of the different relationships between adolescents and food and thus furthers awareness of the process of emotional eating in adolescents. It also offers insights regarding the experiences of adolescents with emotional eating and their capacity to evaluate their relationship with food. Nevertheless, it was found that there was an indication of negative attitudes to eating, and also there was a significant lack of reporting with regard to the incidence of eating disorders among Saudi adolescents (Allihaibi, 2015). Moreover, the study of Taha et al. (2018) found that 35.4% of the students could be

categorised as at risk for eating disorders. Thus, this study has drawn attention to the issue of eating disorders in the KSA and its alarming finding highlights the need for a study like the present one to develop an intervention to increase awareness of healthy eating among adolescents before they grow old enough to study at university.

Fourth, this study draws attention to the significance and need for emotional well-being, emotional health, mental health, and obesity prevention for adolescents in Saudi Arabia. It was found that while previous studies set in Saudi Arabia had placed emphasis on obesity or eating habits, the significance of emotional well-being and the connection between emotions, eating behaviours and body had been overlooked. Consequently, this study contributes to a matter that has received limited research attention despite its broad applicability in the region. The researcher believes that there is a great likelihood that awareness of a person's association with food will offer insights regarding their physical and mental health, which can help teachers to offer timely support in the school environment. Moreover, in previous studies there was no focus on this specific age group (12-15 years) related to emotional eating (section 1.4), so the study contributes to awareness related to this complex age group.

Fifth, this study attempted to understand the link between emotions, eating behaviours, and body, which has a substantial impact on mental health and emotional well-being. Moreover, considerable attention and consideration were given to emotional health, mental health, and emotional well-being. According to Levitan and Davis (2010), the connection between eating behaviours and emotions is a complicated subject and thorough study is needed to arrive at some understanding of it.

Further, this study contributes to international awareness of the prevalence of emotional eating in response to positive emotions (happy eating) among Saudi adolescents. In Saudi Arabia, as in other countries, there is a great association of food with social occasions, especially birthdays, weddings, and festivals. This study thus provided evidence that adolescents do have a tendency to overeat in response to happy emotions as well as negative emotions. Most of the different theories of EE and literature have focused strongly on negative emotions (e.g., Bruch, 1973; Kaplan & Kaplan, 1957). Interestingly, this study contributed to the literature as it highlights the role of positive emotions on eating behaviours, as it found that most emotions linked with the eating of Saudi adolescents were positive emotions. However, most of the previous research has associated emotional eating with negative emotions and ignored the effect of positive emotions on eating behaviours. Consequently, there is a need for research to understand the relationship

between positive feelings and emotional eating because it is possible that they are as significant as negative feelings (Bongers, 2013a).

Furthermore, the significance of mindful and mindless eating and their association with emotional eating is highlighted by the study. Also, it highlights the relationship between emotional eating, eating disorders, and disordered eating, and thus contributes to awareness about emotional well-being and mental health. Further, it provides a practical opportunity to contribute to emotional well-being, mental health, and obesity prevention through the awareness programme. Frayn et al. (2018) submitted that emotional eaters who strive to keep their weight under healthful limits could be favourably influenced by programmes which endorse exercise, eating mindfully, the management of emotions, and having an affirmative body image.

Additionally, the study contributes to the education system in Saudi Arabia by highlighting the shortcomings with regard to the provision of school-based health programmes. Furthermore, the study draws attention to different persons who bear responsibility for the health of adolescent students and their emotional well-being, such as parents, siblings, teachers, and friends. Finally, the study informed the design of an online health awareness programme for adolescents in Saudi Arabia.

#### **9.4 Limitations**

It must be noted that this study also has a number of limitations. Firstly, due to the existing policy of segregation, the qualitative phase was limited to interviews with only female students, as women are not permitted to enter boys' schools in Saudi Arabia. Thus, the study is constrained by its lack of generalisability, as insights regarding the design of the online awareness programme could be obtained only from female students. There is a need, therefore, for further qualitative research with regard to emotional eating in adolescent boys, in-depth interviews.

The generalisability of the study's outcomes is further constrained by its setting. The findings indicated the perceptions of a limited sample of 304 students from different regions in Riyadh city, which has a more urbanised sociocultural environment than other parts of the country. Consequently, the outcomes cannot be considered to be representative of the population of the different cities and regions in Saudi Arabia. Therefore, there is a need for studies that include a larger sample size and involve participants from different regions in Saudi Arabia.

Another limitation is that the study had to rely only on what the participants stated in response to the questionnaire and during the interviews. Their eating behaviour was not actually observed. Thus, there is a need for more clinical study and observation of adolescents in the country. Furthermore, since the study did not use a longitudinal design, the researcher did not follow the participants over an extended period of time. Consequently, the change of behaviour during different times of the year, such as fasting or examinations, could not be observed or measured.

Additionally, the study was constrained by the limited availability of resources to clarify the precise relationship between emotional eating and eating behaviour in general. Also, while the study proposed to highlight the connection between emotional well-being, emotional health, mental health, and obesity prevention, this could not be effectively accomplished, as the design of the questionnaire and the interview schedule placed emphasis on the design of the online awareness programme. Consequently, the scrutiny of these aspects was limited to a conceptual investigation. Relatedly, this study could not thus clarify the exact significance of emotional well-being and emotional health in the overall well-being of adolescents in Saudi Arabia.

The health awareness programme proposed by the study was limited to preliminary design, and the implementation of it could not be pursued due to the limited time available to the researcher. Moreover, since the present study focused on the design of an online awareness programme, some aspects of emotional eating behaviour were perhaps not scrutinised in-depth during the qualitative phase.

Furthermore, although this study was set in Saudi Arabia, there was no inspection of the cultural aspects used to scrutinise the participants' perceptions or reported behaviour concerning emotional eating. Such scrutiny could inform understanding of emotional eating behaviour in countries with a similar culture.

## **9.5 Recommendations**

This study draws attention to the complicated relationship between adolescents, emotions, and eating. Thus, the recommendations highlight the needs of the adolescent students towards healthy eating and healthy behaviours. The recommendations that follow are directed firstly for extending the present research; and then for various people and agencies, including researchers, parents, teachers, supervisors, social workers, and the Ministries of Health and Education.

### ***9.5.1 Recommendations for Further Research***

The present study identified a need for further research with regard to emotional eating in adolescent males. It is recommended that researchers direct their attention to aspects of emotional eating that were highlighted during the course of this study, such as positive emotional eating, and emotional overeating and undereating. Moreover, the different factors that influence emotional eating could be scrutinised in more detail.

Further, attention can be directed toward emotion-congruent and emotion-regulating eating, together with hedonic/hedonistic eating, as the present study could not place emphasis on these. Other areas for further scrutiny include mindful and mindless eating, and adolescents' coping strategies involving food. Identification of the patterns and phases of emotional eating, if any, could also be a matter for investigation.

There is a need for more clinical study and observation of adolescents in the KSA regarding their eating behaviours. Furthermore, their drinking behaviour should be investigated, as emotional drinking may be more of an issue in a hot country like Saudi than in many other countries.

There needs to be more research on cultural influences, including religious beliefs and practices, on emotional eating in adolescents in different cultures, regions and countries. A comparison of adolescents from different cultures could be undertaken to investigate their eating behaviour and the factors that influence this.

Moreover, a future study could use a qualitative lens such as Grounded Theory or Interpretative Phenomenological Analysis (IPA) to deeply scrutinise the lived experiences of participants with emotional eating behaviour. This would also help in the development of a new theory of emotional eating, which uses culture as its underlying basis.

A nationwide longitudinal study could be conducted to scrutinise the long-term behaviour and impacts related to emotional eating with regard to adolescents. This could be supported by clinical investigations, as appropriate.

### ***9.5.2 Recommendations for Parents***

Although adolescence is recognized as the period between childhood and adulthood, where individuals develop their own identities, the influence of parents cannot be overlooked. Consequently, this study recommends that parents endeavour to ensure that their children are provided with appropriate inputs regarding body image and food

predisposition. Also, parents should recognize the need for nutritional food and make every attempt to inculcate good eating habits in their children.

### ***9.5.3 Recommendations for Teachers, Supervisors and Social Workers***

Teachers also have considerable influence on adolescents. Accordingly, teachers should be included in the execution of school-based healthy eating programmes. Moreover, they should provide insights to the school leadership and through them to the relevant stakeholders in the Ministries of Health and Education regarding school nutrition programmes, curriculum modifications, and the efficacy of physical education. Further, they should take steps to facilitate awareness of healthy eating habits and emotional well-being in students.

Students' supervisors and social workers also have an obvious role to play in this. They should utilise their knowledge, values, and skills to the best of their ability to provide students with appropriate health and nutritional support, guidance, and supervision in regard to emotional well-being and mental health.

### ***9.5.4 For the Ministries of Health and Education***

As the principal stakeholders of health and education in the Kingdom, these Ministries should set up taskforces to continually scrutinise the health status of adolescents in the country. Where appropriate, these taskforces should be provided with the opportunity to collaborate with similar groups in other countries to share and obtain knowledge regarding the management of health awareness in the country, in general, and in schools, in particular. Also, providing supervisory and therapeutic services for students and providing advice and consultations by doctors, psychiatrists, and nutritionists.

Moreover, raising emotional awareness by raising the understanding of the relationship between emotions and eating and the interaction between them, because high emotional awareness could lower the risk of depression, anxiety, and associated disorders, such as EE and eating disorders. Besides, it helps people to recognize their moods and consider them which help to make the right decisions. Provide suggestions and techniques that help adolescents to increase emotional awareness, such as teaching coping strategies, emotions regulation. Furthermore, increasing mindfulness is part of the treatment for emotional eating. Correctly identified that mindfulness helped adolescents to get in touch with the body and emotions, and slow down eating. Further, mindful eating considered as specific techniques found to increase mindfulness. These procedures could be done by laying down

new policies for head teachers and teachers to follow, giving teachers further training/education, or relevant materials to give to the students.

The curriculum could also be enhanced to provide classroom sessions on healthy eating for students, which would serve to improve their awareness. Awareness programmes could also be provided for all the citizens of the country, customised to suit different age groups and social/demographic profiles. Also, it is significant to activate the physical education curriculum, especially at girls' schools. Finally, more attention should be given to the food given to students at school, and the level of care and management of school canteens should be raised.

## **9.6 Dissemination of the Research Findings**

This section briefly describes the process of how the researcher will disseminate the findings of her study. Dissemination refers to the procedure of sharing research findings with broader audiences and stakeholders (Heintzman et al., 2014). So, disseminating the research findings requires accurate planning and thought, besides considering target audiences, and how to communicate with them (Mauldin, 2020). Therefore, disseminating the results of this study will take into account several processes, which are:

### ***Engaging stakeholders***

The researcher will consider the specific parties who are responsible for the health and education of adolescent students, such as the MoH, MoE, and in particular the School Health department, which is run jointly between the MoH and the MoE, as well as the Food and Nutrition Department of the MoH.

The principle of disseminating this study also involves doctors, nutritionists, psychologists, stakeholders who are also looking after the health and well-being of adolescent students as well as the adolescent students themselves. The researcher will use the position of her work as a teacher in the MoE to work with these primary audiences. She will engage with them early, seek to involve them in the dissemination of the study's findings, and keep in touch to see how this is progressing. These will happen through the School Health Department, which covers a wide range of programmes, activities, and services provided in schools and the surrounding communities.

### ***Strategies***

The researcher will specify who will be needed to carry out the development of the online programme. Besides, the researcher will consider the following:

- Who could benefit from utilising the findings in schools and surrounding communities;
- Recognizing how and where the audience seeks or receives information, such as the services and programmes which are designed not only to affect students' health, but also to enhance the health of the environment in which they live and learn;
- Obtaining an insight into what encourages the audience and the constraints they could face through the students' participation in these strategies. Also, cooperation with the MoH and governmental and private institutions within the public sector, in addition to improving the information base for the health of children and adolescents.

### ***Resources, opportunities, and timeline***

The researcher will utilise opportunities that present themselves. For instance, she will seek to publish articles linked to the findings of this study in academic, national, and international journals. She will build partnerships with established networks, such as LinkedIn, Research Gate, and ORCID. Further, she will give presentations at national and international conferences and events concerned with eating behaviours, eating disorders, healthy behaviours, school health, and mental health to raise awareness of this study and exchange knowledge and information.

Moreover, she will present the research findings in appropriate events and activities conducted by schools, and participate in the health fairs and health promotion events held by the MoH and MoE. This will allow the researcher to achieve various goals, such as increasing understanding and awareness regarding EE and its impacts on adolescents. She will report the study results to the related local organizing groups and local stakeholders, designing and producing materials for their programmes, such as pamphlets, PowerPoint presentations, and training materials. Finally, she will develop a reasonable timeline for implementing strategies, resources, and opportunities carried out by the researcher.

## **9.7 Summary**

The present chapter offered a synopsis of the study's significant findings. Overall, the study found that the students were most likely indulging in emotional eating, indicating a great need for awareness in this matter.

Furthermore, a scrutiny of the factors which contribute to emotional eating revealed that the students were participating in emotional eating behaviour, and their eating habits and food choices were influenced by people (family, friends, and celebrities) and also social media and food brand. Also, the students' eating behaviour was influenced by certain situations (social and emotional). The study also found that the students' perceptions towards an online health awareness programme were favourable and their insights informed the design of such a programme.

This chapter also assessed the study's contributions to knowledge, noting that only one similar study has previously been published. A number of the study's limitations were noted, not least that no male students were interviewed because the existing policy of segregation did not permit the female researcher to enter boys' schools. Moreover, a variety of recommendations were made for further research, for parents, teachers, and other relevant people, and for the Ministries of Health and Education in Saudi Arabia. Finally, this chapter describes the process of how the researcher will disseminate the finding of her study with broader audiences and stakeholders.

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## APPENDICES

### Appendix 1

#### Questionnaire

##### The Emotional Eating Questionnaire (EEQ)

The questions below ask about what it is like to be young boys and girls today. This questionnaire will take about 20 minutes to complete. Your answers are confidential. There are a total of 52 questions.

Part 1: Please, choose the suitable answers.

1.	<b>School grade:</b> A. <input type="checkbox"/> 7.                      B. <input type="checkbox"/> 8.                      C. <input type="checkbox"/> 9.
2.	<b>Age:</b> A. <input type="checkbox"/> 12.                      B. <input type="checkbox"/> 13.                      C. <input type="checkbox"/> 14.                      D. <input type="checkbox"/> 15.
3.	<b>Weight:</b> A. ___ Kg.                      B. Don't know.
4.	<b>Height:</b> A. ___ cms.                      B. Don't know
5.	<b>My age when I got my first period is:</b> A. .... years.                      B. Not yet. <b>(FOR GIRL ONLY)</b>
6.	<b>I live with:</b> A. Parents.                      B. Mother.                      C. Father.                      D. Others.
7.	<b>My position among my brothers and sisters is:</b> A. Eldest.                      B. In the middle.                      C. The youngest.
8.	<b>Number of siblings who live in my immediate household is:</b> A. No siblings.                      B. 1- 3.                      C. 4 or more.
9.	<b>The number of individuals (including myself) who live in my immediate household is:</b> A. 1-3.                      B. 4-7.                      C. 8 or more.
10.	<b>The educational level of my father:</b> A. No education.                      B. Secondary or less.                      C. Bachelor or more.
11.	<b>The educational level of my mother:</b> A. No education.                      B. Secondary or less.                      C. Bachelor or more.
12.	<b>kind of house:</b> A. Villa.                      B. Flat.                      C. Floor.
13.	<b>The house is:</b> A. Owned.                      B. Rented.                      C. Sharing house with relatives.                      D. Work's house.
14.	<b>Number of house staff in the home (maid, driver, chef and others):</b> A. No house staff.                      B. 1.                      C. 2.                      D. 3 or more.

**Part 2-A: Please, rate how much you agree with each sentence.**

No	Sentence	Never	Little	Sometimes	Usually
15.	I eat slowly and taste every piece of food which I eat.				
16.	I eat quickly.				
17.	I exercise regularly.				
18.	I avoid eating unhealthy food.				
19.	Before eating, I spend a moment to pay attention to food's shape and colour and smell its fragrance.				
20.	I notice the flavours in the food while eating it.				
21.	I read the food calories when I choose food.				
22.	I consume large quantities of food in a short period of time.				
23.	When I do a good job, my parents reward me with food				

**Part 2-B: Please, rate how much you agree with each sentence.**

24.	Pressure or anxiety makes me eat more food.				
25.	I eat even when I'm not hungry.				
26.	I eat food to feel better when I'm sad, worried, bored ... etc.).				
27.	I award myself by eating.				
28.	I eat constantly to feel happy, even I am not hungry.				
29.	I eat to feel safe.				
30.	I cannot resist food and eat continuously.				

**Part 3-A: Please, rate how much you agree with each sentence.**

31.	When I am feeling "down" a little snack will lift my mood.				
32.	When I'm down I have more desire to eat.				
33.	When I am pressured or working under a deadline I have the urge to snack.				
34.	I eat more when I am stressed -worried or afraid than when I am calm.				

No	Sentence	Never	Little	Sometimes	Usually
35.	When I am irritated, I eat more.				
36.	When I get angry, eating will make me feel better.				
37.	I eat more than usual when I am bored.				
38.	Eating makes me feel better when I am bored.				
39.	When I am alone my appetite is increased and then I eat more.				
40.	I eat less when other people are around.				
41.	If I'm feeling really good, I don't worry about the type or quantity of food I eat.				
42.	When I'm happy, having a favourite snack makes me feel even better.				

**Part 3-B: Please complete the following statements (YOU CAN CHOOSE MORE THAN ONE ANSWER):**

**43. Who has influenced my interest in my body shape: (YOU CAN CHOOSE MORE THAN ONE ANSWER)**

- A. Father.                      B. Mother.                      C. Siblings.                      D. Friends.  
 E. Famous people.            F. Social media (Twitter, Instagram, Snapchat, Face book).    G. None of these.

**44. My food choices are influenced by: (YOU CAN CHOOSE MORE THAN ONE ANSWER)**

- A. Parents.                      B. Siblings.    C. Friends.    D. Social media (TV, Twitter, Instagram, Snapchat, Facebook, YouTube).    E. Food brand (company) and Commercial ads.    F. None of these.

**45. I am more prone to eating during: (YOU CAN CHOOSE MORE THAN ONE ANSWER)**

- A. my period (**FOR GIRL ONLY**).    B. Fasting days.    C. Weekend and holidays.    D. social and religious events (e.g. 'Eid and party).    E. Meeting with friends or relatives.    F. None of these.

**46. The food that would be more appealing to me is: (YOU CAN CHOOSE MORE THAN ONE ANSWER)**

1. Healthy food (e.g. fruits, vegetables, rice and chicken).    B. Fast food.  
 C. snack (e.g. chocolate and chips).    D. No answer.

**47. The drinks that would be more appealing to me are: (YOU CAN CHOOSE MORE THAN ONE ANSWER)**

- A. Water.    B. Soft drinks.    C. Juices.    D. Energy drinks.    E. No answer.

48. What emotions come to mind when you think of eating? List three:

1. -----
2. -----
3. -----

49. Do you think healthy eating is a problem for young people in Saudi Arabia?

1. Yes.
2. No.

Part 4: Please complete the following sentences:

50. I prefer the following social networking apps: (YOU CAN CHOOSE MORE THAN ONE ANSWER)

1.  2.  3.  4. 
5.  6.  7. Other: -----

51. I would like an online programme raising awareness on healthy eating to include:  
(YOU CAN CHOOSE MORE THAN ONE ANSWER)

1. Video clips/animations.
2. lectures/presentations.
3. Activities.
4. Games.
5. Short information about healthy eating.
6. opportunities to talk to other young people.
7. Advice.
8. Meal Plans
9. Other: -----

52. What type of app/ website would you use to remind yourself of healthy eating?  
(YOU CAN CHOOSE MORE THAN ONE ANSWER)

- A. App/ website that helps me monitor what I eat.
- B. App/ website that gives me advice about healthy eating.
- C. App/ website that shows me to exercise to stay fit.
- D. App/Website that helps me discuss healthy eating with other young people

**We would like to interview some of you and find out more about how we can design a website that will help young people find out about healthy eating. If you are happy to be contacted and invited to participate in our interview, please fill in the following:**

Student name: ----- Student number: (-----)

School name: -----

E-mail address: -----

**Thank you so much for taking the time to complete this questionnaire.**

## استبيان عن الاكل العاطفي للطالبات.

الاستبيان التالي يهدف الى التعرف على الطريقة التي تأكل بها الفتيات اليوم. سوف يستغرق هذا الاستبيان حوالي ٢٠ دقيقة للإجابة عليه. مجموع الأسئلة ٥٢ سؤال. المطلوب منك التكرم بالإجابة على أسئلة الاستبيان، علماً أن إجاباتك سوف تكون سرية.

قسم أ- اختاري الاجابة المناسبة مما يأتي:

١.	الصف الدراسي: أ. اول متوسط <input type="checkbox"/> . ب. ثاني متوسط <input type="checkbox"/> . ج. ثالث متوسط <input type="checkbox"/> .
٢.	العمر: أ. ١٢ سنة <input type="checkbox"/> . ب. ١٣ سنة <input type="checkbox"/> . ج. ١٤ سنة <input type="checkbox"/> . د. ١٥ سنة <input type="checkbox"/> .
٣.	الوزن: أ. -----كم. ب. لا أعلم <input type="checkbox"/> .
٤.	الطول: أ. -----سم. ب. لا اعلم <input type="checkbox"/> .
٥.	عمرى عند حدوث اول دورة شهرية: ----- سنة. (خاص بالطالبات فقط)
٦.	اسكن في المنزل مع: أ. الأب والأم <input type="checkbox"/> . ب. الأم <input type="checkbox"/> . ج. الأب <input type="checkbox"/> . د. آخرين <input type="checkbox"/> .
٧.	ترتيبى بين اخواني واخواتى: أ. الأخت الكبرى <input type="checkbox"/> . ب. الأخت الوسط <input type="checkbox"/> . ج. الأخت الصغرى <input type="checkbox"/> .
٨.	عدد الأخوة والاخوات المقيمين في المنزل: أ. لا يوجد اخوة <input type="checkbox"/> . ب. ١-٣ اخوة <input type="checkbox"/> . ج. ٤ أو أكثر <input type="checkbox"/> .
٩.	عدد جميع الافراد والخدم المقيمين في المنزل وانا معهم: أ. ١-٣ افراد <input type="checkbox"/> . ب. ٤-٧ افراد <input type="checkbox"/> . ج. ٨ او اكثر <input type="checkbox"/> .
١٠.	المستوى التعليمي للأب: أ. غير متعلم <input type="checkbox"/> . ب. ثانوي او اقل <input type="checkbox"/> . ج. جامعي او اعلى <input type="checkbox"/> .
١١.	المستوى التعليمي للأم: أ. غير متعلمة <input type="checkbox"/> . ب. ثانوي او اقل <input type="checkbox"/> . ج. جامعية او اعلى <input type="checkbox"/> .
١٢.	نوع المنزل: أ. فيلا <input type="checkbox"/> . ب. شقة <input type="checkbox"/> . ج. دور <input type="checkbox"/> .
١٣.	المنزل هو: أ. ملك <input type="checkbox"/> . ب. إيجار <input type="checkbox"/> . ج. منزل مشترك مع الأقارب <input type="checkbox"/> . د. منزل تابع للعمل <input type="checkbox"/> .
١٤.	عدد الخدم في المنزل (الخادمات، السائق، طباط، آخرين): أ. لا يوجد <input type="checkbox"/> . ب. ١ <input type="checkbox"/> . ج. ٢ <input type="checkbox"/> . د. ٣ أو أكثر <input type="checkbox"/> .

القسم ب- اختاري الإجابة المناسبة مما يأتي:

الرقم	الجملة	لا افعل نلك ابدأ	قليلاً	بعض الأحيان	دائماً
١٥.	اتناول الطعام ببطيء واتذوق كل قطعة اتناولها من الطعام.				
١٦.	اتناول الطعام بسرعة.				

الرقم	الجملة	لا افعل نك ابدأ	قليلاً	بعض الأحيان	دائماً
١٧.	امارس الرياضة بانتظام.				
١٨.	اتجنب تناول الطعام الغير مفيد.				
١٩.	قبل تناول الطعام، اأمل شكله، لونه، رائحته.				
٢٠.	اميز النكهات الموجودة في الطعام اثناء تناوله .				
٢١.	اقرأ كمية السعرات الموجودة على عبوة الطعام قبل تناوله.				
٢٢.	اتناول كمية كبيرة من الطعام في وقت قصير .				
٢٣.	عندما أقوم بعمل جيد، يكافئني والدائي بالطعام (مثل الوجبات سريعة، الحلويات وغيرها)..				
٢٤.	الضغط أو القلق يجعلني اتناول المزيد من الطعام.				
٢٥.	اتناول الطعام حتى إذا لم اشعر بالجوع.				
٢٦.	اتناول الطعام لأحسن مشاعري السيئة مثل (الحزن، القلق، الخوف، الملل، الوحدة وغيرها).				
٢٧.	اكافئ نفسي بالأكل.				
٢٨.	أكل باستمرار لأشعر بالسعادة، حتى إذا لم اشعر بالجوع.				
٢٩.	تناول الطعام يساعدني على الإحساس بالأمان او الراحة.				
٣٠.	لا أستطيع مقاومة الطعام مما يجعلني اتناول الطعام بشكل مستمر.				
٣١.	عندما احس بشعور سيئ، فإن تناول قليل من الطعام يحسن مزاجي.				
٣٢.	عندما احس بشعور سيئ تزداد لدي الرغبة في تناول الطعام.				
٣٣.	عندما أكون مضغوط او يجب على انتهاء العمل في وقت معين تزداد لدي الرغبة لتناول الطعام.				
٣٤.	يزداد تناولي للطعام عندما أحس بالضغط او القلق او الخوف بشكل أكبر منه عندما أحس بهدوء الاعصاب.				

الرقم	الجملة	لا افعل نك ابدأ	كثلاً	بعض الأحيان	دائماً
٣٥.	عندما اغضب، يزداد تناول الطعام.				
٣٦.	عندما اغضب، تناول الطعام يحسن مشاعري.				
٣٧.	عندما اشعر بالملل، اتناول الطعام بشكل أكبر من المعتاد.				
٣٨.	الأكل يحسن شعوري عندما أشعر بالملل.				
٣٩.	عندما أكون لوحدي تزداد شهيتي للطعام مما يجعلني اتناول مزيداً منه.				
٤٠.	اتناول كمية أقل من الطعام عندما أكون مع أشخاص آخرين.				
٤١.	عندما أحس بالسعادة، لا اهتم بكمية او نوع الطعام الذي اتناوله.				
٤٢.	تناول التسالي او الأطعمة المفضلة لدي يزيد إحساسي بالسعادة.				

### القسم ج- اختاري الإجابة المناسبة مما يأتي:

٤٣. اهتمامي بشكل جسمي يتأثر بـ: (يمكنك اختيار أكثر من إجابة)

- أ. الأب      ب. الأم      ج. الأخوة      د. الأصدقاء      هـ. الأشخاص المشاهير.  
و. وسائل التواصل الاجتماعي (تويتر، انستجرام، سناب شات، فيسبوك، يوتيوب).  
ز. لا يوجد إجابة مما سبق.

٤٤. تتأثر اختياري للطعام بـ: (يمكنك اختيار أكثر من إجابة)

- أ. الوالدين.      ب. الإخوة.      ج. الأصدقاء.      د. وسائل التواصل الاجتماعي (تويتر، انستجرام، سناب شات، فيسبوك، يوتيوب).  
هـ. اسم الشركة المنتجة للطعام (مثلاً جالكسي، نستله، امريكانا) والإعلانات التجارية.      ز. لا يوجد إجابة مما سبق.

٤٥. يزداد تناول الطعام في الأوقات التالية: (يمكنك اختيار أكثر من إجابة)

- أ. اثناء الدورة الشهرية.      ب. أيام الصيام.      ج. في العطلات الأسبوعية والاجازات.      د. المناسبات الدينية والاجتماعية (مثل الأعياد والحفلات).  
هـ. الاجتماع مع الأصدقاء والأقارب.      و. لا يوجد إجابة مما سبق.

٤٦. الطعام المفضل لدي هو: (يمكنك اختيار أكثر من إجابة)

- أ. الطعام الصحي (مثل الفواكة، الخضروات، الأرز، الدجاج).      ب. الوجبات السريعة.      ج. الوجبات الخفيفة (مثل الشوكولاتة والبطاطس).      د. لا يوجد إجابة مما سبق.

٤٧. المشروب المفضل لدي هو: (يمكنك اختيار أكثر من إجابة)

- أ. الماء.      ب. العصائر.      ج. المشروبات الغازية.      د. مشروبات الطاقة.      هـ. لا يوجد إجابة مما سبق.



## Appendix 2

### Interview questions

#### Interview Schedule

The duration of the interview is not expected to exceed 30 minutes. It will focus around designing an online healthy eating awareness programme by using technology.

Prior to the commencement of the interview, the researcher will

1. Introduce herself and provide an overview.
2. Remind the interviewee that the conduct of this study is governed by principles of confidentiality and anonymity, and that extra care will be taken to protect the obtained data.
3. Given the opportunity to ask any question or raise concerns.

Interviewer: Maali

Interviewee name: ----- No. ( ) School name: -----

Signe: ----- Location: -----

Date: ----- Time: -----

## Interview

### Designing an online healthy eating awareness programme.

1. We are planning to develop an online resource on healthy eating. Do you think it can work better than other media (eg leaflets, booklets) and why?
2. What type of online resources would you use (eg app, website, etc)?
3. What functions/ features do you think would be helpful to include in a healthy eating programme by using technology?-----  
-----
4. How often do you think it should be updated? Why?
5. What kind of information do you think young people will find interesting / appealing to make use of the online resource?  
-----  
-----
6. Do you think an app can help young people about healthy eating?      A. Yes.      B. No.  
If yes, how it will help then? -----  
-----  
If no, why?
7. Would you prefer avatars (cartoon's characters) or real people?  
-----  
-----
8. Are there things on social media or online generally that influence young people's eating habits or help young people with healthy eating? Y/N How? -----  
-----

9. In conclusion, do you have suggestions or observations that can help to design a program by using technology to promote health and healthy eating behaviour in young people?

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**Thank you so much for your time**

## المقابلة الشخصية

عزيزتي الطالبة ،،

في البداية اتقدم لك بجزيل الشكر لقبولك المشاركة في المقابلة والإجابة على الأسئلة المطروحة. من المتوقع ان لا تتجاوز مدة المقابلة ٣٠ دقيقة، وسوف تركز المقابلة على تصميم برنامج لتعزيز الصحة ورفع الوعي بالأكل الصحي باستخدام التكنولوجيا.

قبل البدء بالمقابلة سوف تقوم الباحثة بالآتي:

١. التعريف بنفسها وتقديم لمحة عامة عن المقابلة.
٢. اخبار الطالبة ان المعلومات التي يتم جمعها في هذه المقابلة سرية ولن يطلع عليها سوى الباحثة.
٣. اخبار الطالبة ان الفرصة متاحة لها لطرح أي سؤال ترغبه اثناء المقابلة.

اسم الباحثة: معالي العوده.

اسم الطالبة: -----  
الصف: -----

اسم المدرسة: -----  
مكان المقابلة: -----

الإيميل: -----

رقم الهاتف: -----

التاريخ: -----  
الوقت: -----

التوقيع: -----

## أسئلة المقابلة

١. هل تعتقد ان استخدام برامج الانترنت لتعزيز الصحة ورفع الوعي بالأكل الصحي بين الشباب والشابات أكثر فاعلية من استخدام الطرق التقليدية مثل المنشورات، الكتيبات وغيرها؟  
أ. نعم. ب. لا.

لماذا؟  
-----  
-----  
-----

٢. ما هي مصادر الانترنت التي تستخدمونها (مثل التطبيقات، البرامج، المواقع الالكترونية وغيرها)؟

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-----  
-----

٣. باعتقادك ماهي الوظائف والمزايا المفيدة من استخدام التكنولوجيا في برامج تعزيز الصحة والأكل الصحي؟

-----  
-----  
-----

٤. هل ينبغي تحديثها باستمرار؟ لماذا؟

-----  
-----  
-----

٥. باعتقادك ما نوع المعلومات الي يجدها الشباب والشابات ممتعة وجاذبة لهم في استخدام مصادر الانترنت؟

-----  
-----  
-----

٦. هل تعرفين تطبيق ممكن ان يساعد الشباب والشابات على تعزيز الصحة الاكل الصحي؟

أ. نعم. ب. لا.

إذا كانت الإجابة نعم، ما هو التطبيق وكيف ممكن ان يساعدهم؟

---

---

إذا كانت الإجابة لا، لماذا؟

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٧. في البرامج هل تفضلين الشخصيات الكرتونية ام الشخصيات الحقيقية؟

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٨. هل هناك في وسائل التواصل الاجتماعي او الانترنت عموماً شيء يساعد على تعزيز صحة وسلوك الاكل الصحي عند الشباب؟

أ. نعم. ب. لا.

كيف؟

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٩. في الختام هل لديك اقتراحات او ملاحظات ممكن ان تساعد في تصميم برنامج باستخدام التكنولوجيا لتعزيز صحة وسلوك الاكل الصحي عند الشباب والشابات؟

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شكراً جزيلاً لتعاونك والاجابة على أسئلة الاستبيان.

### Appendix 3

#### Example of the thematic analysis of the interview

##### Thematic Analysis

The following table explains how the Thematic Analysis was applied in this study. It contains the information of the transcript of an interview with a girl student (grade 9). The transcript was translated from Arabic into English and coded according to different themes and sub-themes. The second column includes the assigned codes to the correspondent text in the first column. The texts that are highlighted with different colours in the first column represent the different themes (categories).

**Table 1: An example of applying of Thematic Analysis by the study**

10/04/2017 Transcript of the interviews about Emotional eating among girl students	Codes
<p><b>Q1. We are planning to develop an online resource on healthy eating. Do you think it can work better than other media (e.g. leaflets, booklets) Yes / No, and why?</b></p> <p><b>P8-1:</b> Yes, most of young people use modern programmes and spend more time using them than old ways, because, these programmes are more attractive and you could obtain the required information by using these programmes. Also, they help people to look for answers and solutions for any inquiry in quickly and directly ways and vice versa, because, traditional methods only allow to read the existent information without any opportunity to inquire or get additional information.</p> <p><b>Q2. What type of online resources would you use (e.g. app, website, etc.)?</b></p> <p><b>P8-2:</b> I prefer using mobile devices because it has all applications that I need. YouTube is my first preference as it allows you to save clips by using another applications. This gives an opportunity to watch missed clips especially from Snap Chat because Snap Chat allows to display clips for only 24 hours. The next preference is Snap Chat because it provides a quick information and allows to follow celebrities who are interested in the same field. Also, it makes possible to communicate with</p>	<p>Attractive</p> <p>Required information</p> <p>Solutions for inquiries</p> <p>Quickly directly</p> <p>Getting additional information</p> <p>Variety applications</p> <p>Saving clips</p> <p>Constant &amp; continuity</p> <p>Quick information</p> <p>Gathering people following celebrities</p> <p>Communicating asking</p> <p>Funny pictures &amp; clips</p> <p>Sharing interests &amp; thoughts</p> <p>Express opinions</p> <p>Sharing others' thoughts</p> <p>Community level</p>

them and ask them about any inquiries. Instagram is the third preference because it contains pictures and short clips, which are funny, especially from people and celebrities with the same interests. Then, Twitter as this application provides an opportunity to express different opinions and thoughts widely and to share others' views at the whole community level. These programmes are the most attractive application to young people aged 15 years.

**Q3. What functions/ features do you think would be helpful to include in a healthy eating programme by using technology?**

**P8-3:** Technology programmes can be used to encourage young people to practise the right exercise. They also help to manage time and guide to healthy eating behaviour because when young people practise exercise continuously. These programmes are very useful for people, who have a greater desire to increase the health level of body and maintain it by practising healthy eating.

**Q4. How often do you think it should be updated? Why?**

**P8-4:** Updating programmes and Apps is very important to attract people because maybe the first design is uncompleted and there are some important things that have not been included. So, updating will be important to benefit from comments and opinions of the users of the programme in order to develop it more. Also, when a programme is issued, after a period of time, another competed application will appear. So, the programme should be developed to be ranked in a high quality level and to have more using by youth.

**Q5. What kind of information do you think young people will find interesting / appealing to make use of the online resource?**

**P8-5:** Young people love programmes and applications that can be used in different ways. This property makes them to not be boring to their users. Also, youth people prefer programmes and apps that can be used without internet connection in order to use them outside home at any time. Many youths also use internet programmes to search for answers to their questions because using these programmes are faster to find the right answers than traditional methods. Often, youth people tend to search and follow celebrities' lives and try to imitate them. They are also

Practise the right sport  
Regulate time  
Encourage healthy eating  
Linking exercise with healthy eating.

Attractiveness  
Continuous updating

Developed upon users' feedback

Keep up with modern standards and programmes.

Variation/interesting

Available all the time

Answer questions  
Quickness

Imitate celebrities' lives

A modern style of healthy eating and wearing

Sports' alerts

Body shape & weight

Drinking water alerts

Reminders to drink water  
Sharing with friends  
Sharing information

<p>interested about fashion and home, which affects on the way of their healthy eating and wearing behaviour.</p>	<p>A pleasant competition</p>
<p><b>Q6. Do you think an app can help young people about healthy eating?</b></p>	<p>Enthusiasm</p>
<p><b>A. Yes. B. No.</b></p>	<p>Efficiency and high quality</p>
<p><b>If yes, how it will help then?</b></p>	
<p><b>If no, why?</b></p>	
<p><b>P8-6:</b> Yes, I know an application of practising exercise, which sends alerts at times that I specified (my leisure time). This application requires information about the body shape, weight and gender. I have introduced to this programme by a female celebrity, who I follow in SnapChat and I have used it for a while. Also, I know another application about drinking water, where I set the alarm to remind me every hour to drink water. This application requires to know your length, weight, gender, and whether any exercise you practising or not. This application makes me to carry water with me constantly to drink when I get the reminder. There also another important advantage of this app, is sharing information among friend, for example when a friends is available on Facebook or Instagram you can share information such as how much water each one has drunk. This can create a pleasant competition between them because everyone can see the quantity of water that others drank, which encourage you to drink water. In my opinion, most of the applications are not in the desired form as still they have lack of important features.</p>	<p>Real characters Interaction Real experiences Asking any enquiry</p> <p>Promoting health Downloading applications &amp; programmes Answering health questions Quick answer Blogs Personal pages Sharing experiences Comments Different answers</p> <p>Designing a healthy application Healthy eating Drinking water Exercising One application Ease of use Educational Healthy behaviour Healthy eating Maintaining weight Personal account User name/Secret number Direction Interaction School &amp; students connection Recording a student's report &amp; inquiries Sport, eating &amp; health Alerts Teacher's answer</p>
<p><b>Q7. Would you prefer avatars (cartoon's characters) or real people?</b></p>	
<p><b>P8-7:</b> I prefer real characters because their influence and interaction are greater and their experiences are real. It is possible to communicate with them and ask them questions. In my opinion, cartoon characters suitable for children aged 10 years and younger.</p>	
<p><b>Q8. Are there things on social media or online generally that influence young people's eating habits or help young people with healthy eating? Y/N How?</b></p>	
<p><b>P8-8:</b> Yes, using mobile is very effective in promoting health awareness, because it is possible to download various applications and programmes. Also, through the modern programmes, young people can look for</p>	

answer to any question related to health at any time and they can get the answer quickly instead of reading the traditional methods. Blogs and personal pages are also useful because they allow people to benefit from others' experiences, comments, and different answers.

**In conclusion, do you have suggestions or observations that can help to design a program by using technology to promote health and healthy eating behaviour in young people?**

I hope that a healthy application to be designed that collects cares about healthy eating, drinking water and exercising in one application, instead in different or separate applications because using one application will be easier to be used. Also, allocate one class weekly to educate students about healthy behaviour, healthy eating and maintaining weight. In addition, this app to be a good sources for reading and learning. Also, it is a good idea for schools to allocate a personal account for each student which can be accessed by a user name and password. This way can provide a direct interaction between school and students by recording a student's report during a week. Students can report their inquiries in the site, whether for sports, eating, health and other issues. In this way alerts can be sent to the teachers to answer the students' inquiries.

## Appendix 4

### Information sheets and consent forms for all parties (English and Arabic versions)

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



#### **Head teacher's information sheet**

**The study title:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

#### **Dear Head teacher,**

I am a PhD student at the Institute of Education, the University of Reading. Your students are invited to participate in this research study which examines Saudi adolescent girls' experience towards emotional eating. The aim of this project is to identify their views towards healthy eating behaviours and design a relevant online healthy eating awareness program focusing on the needs of teenage students.

Before you decide whether your schools will take part, it is important for you to understand more about the research. Please, take the time to read the following information carefully.

#### **What is the purpose of the study?**

This study aims to examine and understand factors that contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating programme that addresses teenage needs. It will include the use of questionnaires and interviews (one-to-one) to explore adolescent students' perceptions on the topic of healthy eating. The students are selected from intermediate schools in Riyadh city.

#### **Why have students been chosen to take part?**

Students will be invited to take part in this study as their views will offer invaluable support to develop an online healthy eating programme for peers.

#### **What will happen when students take part of it?**

Initially, students will be invited to complete a short questionnaire. They will be asked to complete that questionnaire anonymously but each questionnaire will be given a unique code. If they are willing to support the study further, they can choose to take part in interviews (one-to-one) By filling the field at the end of the questionnaire to approve participating in the interview. The questionnaire will take a maximum of 15 minutes to complete at their own convenience. Regarding the interview, it will take place face to face at school at a mutually convenient date and time and will last around 20 minutes. With their agreement, the interview will be audio recorded and transcribed. This transcript will then be shared with them to check for accuracy and to confirm that they are still happy for it to be used in the research. If any of the students get upset about their eating behaviours, we will liaise with you and the school counsellor during the process of identifying and supporting students further.

#### **Do students have to take part?**

Students should understand that their participation is voluntary; it is up to them to decide whether or not to take part. Taking part will not influence school grades in any way. Information will not be shared with individual teachers. If students decide to take part they will be given this information

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)  
sheet to keep and asked to sign a consent form. Even if they decide to take part, they are still free to withdraw at any



time and without giving any reason by contacting me via email on:  
[M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

Also, the information sheet and consent form have prepared for parents to seek their permission in writing, and to give them the opportunity to decline consent if they do not agree.

### **What are the possible advantages and disadvantages of taking part?**

Participants will benefit from the opportunity to reflect on their perceptions towards healthy eating and how it can contribute to their health.

### **Will what students say be kept confidential and what will happen to the result of the research?**

Any data collected will be held in strict confidence and no real names will be used in this study or in any subsequent publications. The completed questionnaires and the interview records of this study will be kept private. The data collected in the study will provide the basis of my PhD thesis. The thesis will be published in hard copy and electronic format which will be housed at the Institute of Education in the University of Reading. The data and the analysis of the data will also be used to produce articles, books, conference papers, as well as presented in conferences and lectures. In any of these formats I reassure you that the identity and anonymity of all participants will be protected. All information collected will be kept strictly confidential (subject to legal limitations). In order to protect the anonymity of each participant, pseudonyms will be used to ensure participants cannot be identified. All electronic data will be held securely in password-protected files on a non-shared PC and all paper documentation will be held in locked cabinets in a locked office.

In line with University policy, data generated by the study will be kept securely in paper or electronic form for a period of five years after the completion of the research project, and then will be securely destroyed. Anonymised data gathered in this research may be preserved and made publicly available for others to consult and re-use.

### **Who has reviewed the study?**

This application has been reviewed by the University of Reading Research Ethics Committee and has been given a favourable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request.

### **What happens if students change their mind?**

Students can change their mind at any time without any repercussions. During the research, they can withdraw from the activities at any time. If they change their mind after data collection has ended, we will discard their data.

### **What happens if something goes wrong?**

In the unlikely case of concern or complaint, you can contact the supervisor of the researcher: Dr Yota Dimitriadi, University of Reading; Tel: +44(0)1183782688, email: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



'This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct'.

*Thank you for your time.*

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



### **Head teacher's Consent Form**

**Title of study:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

I have read the information sheet about the project and received a copy of it. I understand what the purpose of the study is, and what is required of students. All the questions have been answered. (Yes / No)

Name of head teacher: .....

- 1- I confirm that I have read and understood the information sheet for the above study. (Yes / No)
- 2- **I agree to students' taking part in the above study** (Yes / No)
- 3- I agree to students' taking part in the interview (Yes / No)
- 4- I agree to the interview being tape-recorded. (Yes / No)
- 5- I understand that students' participation is voluntary and that they can withdraw from the research at any time **without giving any reason.** (Yes / No)

Signed: .....

Date: .....

**Name of researcher taking consent:** Maali Aloudah

**Researcher e-mail address:** [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



### **Administrator's information sheet**

**The study title:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

**Dear Administrator,**

I am a PhD student at the Institute of Education in the University of Reading. Students are invited to participate in this research study which examines Saudi adolescent girls' experience towards emotional eating. The aim of this project is to identify their views towards healthy eating behaviours and design a relevant online healthy eating awareness program focusing on the needs of teenage students.

Before you decide whether your schools will take part, it is important for you to understand more about the research. Please, take the time to read the following information carefully.

#### **What is the purpose of the study?**

This study aims to examine and understand factors that contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating programme that addresses teenage needs. It will include the use of questionnaires and interviews (one-to-one) to explore adolescent students' perceptions on the topic of healthy eating. The students are selected from intermediate schools in Riyadh city.

#### **Why have students been chosen to take part?**

Students will be invited to take part in this study as their views will offer invaluable support to develop an online healthy eating programme for peers.

#### **What will happen when students take part of it?**

Initially, students will be invited to complete a short questionnaire. They will be asked to complete that questionnaire anonymously but each questionnaire will be given a unique code. If they are willing to support the study further, they can choose to take part in interviews (one-to-one) by filling the field at the end of the questionnaire to approve participating in the interview. The questionnaire will take a maximum of 30 minutes to complete at their own convenience. Regarding the interview, it will take place face to face at school at a mutually convenient date and time and will last around 20 minutes. With their agreement, the interview will be audio recorded and transcribed. This transcript will then be shared with them to check for accuracy and to confirm that they are still happy for it to be used in the research.

#### **Do students have to take part?**

Students should understand that their participation is voluntary; it is up to them to decide whether or not to take part. Taking part will not influence school grades in any way.

Information will not be shared with individual teachers. If students decide to take part, they will be given this information sheet to keep and asked to sign a consent form. Even if they decide to take part,

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



they are still free to withdraw at any time and without giving any reason by contacting me via email on: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

Also, the information sheet and consent form have prepared for parents to seek their permission in writing, and to give them the opportunity to decline consent if they do not agree.

### **What are the possible advantages and disadvantages of taking part?**

Participants will benefit from the opportunity to reflect on their perceptions towards healthy eating and how it can contribute to their health.

### **Will what students say be kept confidential and what will happen to the result of the research?**

Any data collected will be held in strict confidence and no real names will be used in this study or in any subsequent publications. The completed questionnaires and the interview records of this study will be kept private. The data collected in the study will provide the basis of my PhD thesis. The thesis will be published in hard copy and electronic format which will be housed at the Institute of Education in the University of Reading. The data and the analysis of the data will also be used to produce articles, books, conference papers, as well as presented in conferences and lectures. In any of these formats I reassure you that the identity and anonymity of all participants will be protected. All information collected will be kept strictly confidential (subject to legal limitations). In order to protect the anonymity of each participant, pseudonyms will be used to ensure participants cannot be identified. All electronic data will be held securely in password-protected files on a non-shared PC and all paper documentation will be held in locked cabinets in a locked office.

In line with University policy, data generated by the study will be kept securely in paper or electronic form for a period of five years after the completion of the research project, and then will be securely destroyed. Anonymised data gathered in this research may be preserved and made publicly available for others to consult and re-use.

### **Who has reviewed the study?**

This application has been reviewed by the University of Reading Research Ethics Committee and has been given a favourable ethical opinion for conduct. The University has the appropriate insurances in place. Full details are available on request.

### **What happens if students change their mind?**

Students can change their mind at any time without any repercussions. During the research, they can withdraw from the activities at any time. If they change their mind after data collection has ended, we will discard their data.

### **What happens if something goes wrong?**

In the unlikely case of concern or complaint, you can contact the supervisor of the researcher: Dr Yota Dimitriadi, University of Reading; Tel: +44(0)1183782688, email: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



'This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct'.

Thank you for your time.

**Administrator's Consent Form**

**Title of study:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

I have read the information Sheet about the project and received a copy of it. I understand what the purpose of the study is, and what is required of students. All the questions have been answered.

Name of administrator: .....

- 1- I confirm that I have read and understood the information sheet for the above study. (Yes /  No)
- 2- I have been given the opportunity to ask students questions by using questionnaire. (Yes / No)
- 3- I agree to students' taking part in the interview being tape-recorded. ( Yes / No)
- 4- I understand that students' participation is voluntary and that they can withdraw from the research at any time **without giving any reason.** ( Yes / No)
- 5- **I agree to students' taking part in the above study** (Yes / No)

Signed: .....

Date: .....

**Name of researcher taking consent:** Maali Aloudah

**Researcher e-mail address:** [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

## خطاب معلومات للإداري المسئول

عنوان الدراسة: التعرف على تجارب الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم برنامج توعوي عن الأكل الصحي باستخدام التكنولوجيا.

عزيزي الإداري المسئول،

انا طالبة دكتوراه بكلية التربية في جامعة ريدينغ. احتاج الى مشاركة الطلاب والطالبات السعوديين في هذه الدراسة البحثية التي تدرس تجاربهم مع الأكل العاطفي. والهدف من هذا البحث هو دراسة خبراتهم والحصول على وجهات نظرهم تجاه سلوكيات الأكل العاطفي وتصميم برنامج باستخدام التكنولوجيا يهدف الى رفع الوعي الصحي مع التركيز على احتياجات الطلاب الصحية في سن المراهقة.

ما هو الهدف من الدراسة؟

تهدف هذه الدراسة الى فهم تجارب الاكل العاطفي عند الطلاب والطالبات السعوديين الذين تتراوح أعمارهم من ١٢ الى ١٥ سنة بهدف تصميم برنامج باستخدام التكنولوجيا يهدف الى تناول احتياجات المراهقين ورفع الوعي الصحي لديهم. سوف تتضمن هذه الدراسة استخدام استبيان واجراء مقابلة شخصية مع الطلاب والطالبات للحصول على خبراتهم وتصوراتهم، وسوف يتم اختيارهم من المدارس المتوسطة في مدينة الرياض.

لماذا يتم اختيار الطلاب والطالبات للمشاركة في الدراسة؟

الطلاب والطالبات في المرحلة المتوسطة في المدارس السعودية مدعوون للمشاركة في هذه الدراسة للحصول على فهم أكبر عن تجربتهم في الاكل العاطفي بهدف استخدام خبراتهم وتصوراتهم في تصميم برنامج لرفع الوعي الصحي للتقليل من سلوك الاكل العاطفي ورفع سلوك الاكل الصحي، لذلك تعتبر تصوراتهم وخبراتهم ذات قيمة عالية لتحقيق الهدف من الدراسة.

ما هي الإجراءات التي تتم خلال مشاركة الطلاب والطالبات في الدراسة؟

اولاً: الاستبانة: تتم دعوة المشاركين للإجابة على استبيان الدراسة، وسوف تكون اجاباتهم سرية وليس من الضروري كتابة اسمهم. وإذا كان لديهم رغبة لدعم الدراسة بشكل أكبر من خلال موافقتهم على اجراء المقابلة الشخصية، سوف يطلب منهم تسجيل موافقتهم في الخانة المخصصة لذلك في نهاية الاستبانة. سوف يستغرق الاستبيان كحد اقصى ٣٠ دقيقة لإكماله في مع توفير بيئة مريحة لذلك.

ثانياً: المقابلة الشخصية: ويتم اجراءها لعينة مختارة من المشاركين كل على حده في مكان مناسب في المدرسة وسوف يتم استخدام أوراق وجهاز لتسجيل الإجابات وحفظها. سوف يتم عرض الإجابات على المشاركين مرة أخرى للتأكد من موافقتهم عليها ومن ثم حفظها واستخدامها بشكل سري من قبل الباحثة فقط.

### هل يجب على الطلاب والطالبات المشاركة في الدراسة؟

من الضروري جداً أن يعرف الطلاب والطالبات ان مشاركتهم في الدراسة اختيارية، ولهم الاختيار في المشاركة في الدراسة او عدمها. كما ان مشاركتهم ليس له أي علاقة بتحصيلهم من الدرجات الدراسية. كما ان المعلومات التي يتم الحصول عليها منهم لن يطلع عليها المعلمين او المعلمات.

الطلاب والطالبات اللذين يتم اختيارهم للمشاركة في الدراسة سوف يتم اعطاءهم هذا النموذج لتزويدهم بالمعلومات الخاصة بالبرنامج وتوضيح أن آلية المشاركة اختيارية، ومن ثم التوقيع بالموافقة على المشاركة في البرنامج. وإذا تمت مشاركتهم في الدراسة فإن لهم الاحقية في الانسحاب من الدراسة في أي وقت بدون تقديم أي سبب للانسحاب فقط الاعتذار عن طريق اخبار الباحثة او ارسال رسالة الى البريد الإلكتروني التالي: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

### ماهي الفائدة المرجوة من المشاركة في البرنامج؟

المشاركين في البرنامج سوف تتاح لهم الفرصة لطرح تجاربهم وخبراتهم حول الأكل العاطفي وتوضيح تصوراتهم وآرائهم حول تصميم برنامج لرفع الوعي الصحي والذي له أثر في المساهمة في رفايتهم الجسمية والعاطفية.

### هل المعلومات سوف تكون سرية، وماذا سيحدث لنتائج البحث؟

جميع البيانات التي يتم جمعها سوف تكون سرية ولن يتم استخدام أو عرض أسماء المشاركين في الدراسة، كما ان جميع الاستبانات والتسجيل الخاص بالمقابلة الشخصية سوف يتم حفظها في مكان خاص.

تعتبر البيانات التي يتم جمعها في هذه الدراسة هي المعلومات الأساسية لدراستي لمرحلة الدكتوراه. وسيتم نشر رسالة الدكتوراه في نسخة مطبوعة وأخرى إلكترونية والتي سيكون مقرها في كلية التربية في جامعة ريدينغ في المملكة المتحدة. كما سيتم استخدام البيانات وتحليلها لأهداف علمية مثل إصدار مقالات وكتب وأوراق خاصة للمشاركة في المؤتمرات، فضلا عن تقديم العروض في المؤتمرات والمحاضرات. في أي من هذه المشاركات لن يتم الكشف عن اسماء المشاركين وسوف تكون محمية. وستبقى جميع المعلومات التي تم جمعها محفوظة بسرية تامة مع مراعاة القيود القانونية من أجل حماية هوية كل مشارك، وسيتم استخدام أسماء مستعارة لضمان انه لا يمكن تحديد المشاركين. وسوف توضع جميع البيانات الإلكترونية بشكل آمن في الملفات المحمية بكلمة مرور على جهاز كمبيوتر وستحفظ جميع الوثائق الورقية في خزائن مغلقة في مكتب مقفل.

وتمشيا مع سياسة الجامعة، سيتم الاحتفاظ بالبيانات الناتجة عن الدراسة بشكل آمن في شكل ورقي أو إلكتروني لمدة خمس سنوات بعد الانتهاء من المشروع البحثي، وبعد ذلك سوف يتم تدميرها بشكل آمن.

### من هي الجهة التي قامت بمراجعة هذا الطلب؟

لقد تمت مراجعة هذا الطلب وقراءته من قبل لجنة أخلاقيات البحوث وإعطاء الرأي بأنها موافقة للسلوك الأخلاقي. وتمتلك الجامعة التأمينات المناسبة للمكان، التفاصيل الكاملة متوفرة عند الطلب.

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



ماذا يحدث إذا أراد الطلاب أو الطالبات الانسحاب من المشاركة؟

يمكن للطلاب والطالبات خلال البحث تغيير رأيهم والانسحاب في أي وقت دون ابداء أي تبرير. وإذا تم تغيير رأيهم بعد جمع البيانات، فإنه سوف يتم تجاهل البيانات الخاصة بهم.

ماذا يحدث إذا حدث خطأ ما؟

في هذه الحالة لا داعي للقلق أو الشكوى، يمكنك التواصل مع المشرفة على الباحثة: د يوتا ديميتريادي، جامعة ريدينغ.

الهاتف: +44 (0) 1183782688، بريد إلكتروني: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

"لقد تم عرض هذه الدراسة في أعقاب إجراءات لجنة أخلاقيات البحوث في جامعة ريدينغ وتم إعطاء الرأي الأخلاقي انها موثبة للسلوك الأخلاقي".

شكرا جزيلاً لتعاونك وقراءة النموذج.

#### نموذج موافقة الإداري المسؤول

عنوان الدراسة: التعرف على تجارب الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم

برنامج توعوي عن الأكل الصحي باستخدام التكنولوجيا.

لقد قرأت ورقة المعلومات الخاصة بالدراسة وحصلت على نسخة منها. وأنا اتفهم ما هو الغرض من هذه الدراسة وما هو المطلوب من الطلاب والطالبات. ولقد تم الرد على جميع الأسئلة.

اسم المسؤول: .....

1- أؤكد أنني قد قرأت وفهمت ورقة المعلومات الخاصة بالدراسة المذكورة أعلاه. (  نعم /  لا )

2- أوافق على إعطاء الباحثة الفرصة لطرح الأسئلة على الطلاب والطالبات عن طريق (الاستبانة، المقابلة الشخصية،

الهاتف، البريد الإلكتروني) (  نعم /  لا ).

3- أوافق للطلاب أو الطالبات المشاركة في المقابلة الشخصية وتسجيلها. (  نعم /  لا )

4- أنا أتفهم أن مشاركة الطلاب والطالبات تطوعية وأنهم يستطيعون الانسحاب من الدراسة في أي وقت دون ابداء أي

سبب. (  نعم /  لا )

5- أنا أوافق للطلاب والطالبات المشاركة في الدراسة المذكورة أعلاه (  نعم /  لا )

التوقيع: .....

التاريخ: .....

اسم الباحثة: معالي العودة.

عنوان البريد الإلكتروني للباحثة: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

Student: Maali Aloudah  
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Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



### **Parents' information sheet**

**The study title:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

#### **Dear Parents,**

I am a PhD student at the University of Reading, UK. Your child is invited to participate in a research project which examines Saudi adolescent girls' experience towards emotional eating.

Please, take the time to read the following information carefully to know more about the research.

#### **What is the purpose of the study?**

This study aims to examine and understand factors that contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating programme that addresses teenage needs.

#### **Why have students been chosen to take part?**

Students will be invited to take part in this study as their views will offer invaluable support to develop an online healthy eating programme for peers.

#### **What will happen when students take part of it?**

Initially, students will complete a short questionnaire, it will take a maximum of 30 minutes to complete at their own convenience. Students can choose to take part in interviews (one-to-one) by filling the field at the end of the questionnaire to approve participating in the interview. Regarding the interview, it will take place face to face at school at a mutually convenient date and time. With their agreement, the interview will be audio recorded and transcribed. This transcription will then be shared with them to check for accuracy and to confirm that they are still happy for it to be used in the research.

#### **Do students have to take part?**

The participation is voluntary. Taking part will not influence school grades in any way and information will not be shared with individual teachers. If students decide to take part they will be given this information sheet to keep and asked to sign a consent form. Students are still free to withdraw at any time and without giving any reason by contacting me via email on:

[M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

Student: Maali Aloudah  
Email: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)  
Supervisor: Dr. Yota Dimitriadi,  
Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



**What are the possible advantages and disadvantages of taking part?**

Participants will benefit from the opportunity to reflect on their perceptions towards healthy eating and how it can contribute to their health.

**Will what students say be kept confidential and what will happen to the result of the research?**

The completed questionnaires and the interview records of this study will be kept private. No identifiers linking you or the school to the study will be included in any sort of report. Participants will be assigned a code and will be referred to by that number in all records.

In line with the University's policy on the management of research data, anonymised data gathered in this research may be preserved and made publicly available for others to consult and re-use. The data collected in the study will provide the basis for my PhD thesis.

The data and the analysis of the data may also be used to produce articles, books, conference papers, as well as presented in conferences and lectures. In any of these formats I reassure you that the identity and anonymity of all participants will be protected.

**Who has reviewed the study?**

This application has been reviewed by the University of Reading Research Ethics Committee. Full details are available on request.

**What happens if students change their mind?**

Students can withdraw from the activities at any time. If they change their mind after data collection has ended, we will discard their data.

**What happens if something goes wrong?**

In the unlikely case of concern or complaint, you can contact the supervisor of the researcher: Dr Yota Dimitriadi, University of Reading; Tel: +44(0)1183782688, email: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

'This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct'.

*Thank you for your time.*

Student: Maali Aloudah  
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### **Parents' Consent Form**

**Title of study:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

I have read the information sheet about the project and received a copy of it. I understand what the purpose of the study is, and what is required of my child. All the questions have been answered.

Name of parent: .....

- 1- I confirm that I have read and understood the information sheet for the above study. (Yes / No)
- 2- **I agree for my child to take part in the above study** (Yes / No)
- 3- I agree to my child to take part in the interview (Yes / No)
- 4- I agree to the interview being tape-recorded (Yes / No)
- 5- I understand that my child's participation is voluntary and that he/she can withdraw from the research at any time **without giving any reason.** (Yes / No)

Signed: .....

Date: .....

**Name of researcher taking consent:** Maali Aloudah

**Researcher e-mail address:** [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

### خطاب معلومات لأولياء الأمور

عنوان الدراسة: التعرف على تجارب الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم برنامج توعوي عن الأكل الصحي باستخدام التكنولوجيا.

عزيزي ولي الأمر،،

انا طالبة دكتوراه بكلية التربية في جامعة ريدينغ. احتاج الى مشاركة الطلاب والطالبات السعوديين في هذه الدراسة البحثية التي تدرس تجاربهم مع الأكل العاطفي. والهدف من هذا البحث هو دراسة خبراتهم والحصول على وجهات نظرهم تجاه سلوكيات الأكل العاطفي وتصميم برنامج باستخدام التكنولوجيا يهدف الى رفع الوعي الصحي مع التركيز على احتياجات الطلاب الصحية في سن المراهقة.

ما هو الهدف من الدراسة؟

تهدف هذه الدراسة الى فهم تجارب الاكل العاطفي عند الطلاب والطالبات السعوديين الذين تتراوح أعمارهم من ١٢ الى ١٥ سنة بهدف تصميم برنامج باستخدام التكنولوجيا يهدف الى تناول احتياجات المراهقين ورفع الوعي الصحي لديهم.

لماذا يتم اختيار الطلاب والطالبات للمشاركة في الدراسة؟

الطلاب والطالبات في المرحلة المتوسطة في المدارس السعودية مدعوون للمشاركة في هذه الدراسة للحصول على فهم أكبر عن تجربتهم في الاكل العاطفي بهدف استخدام خبراتهم وتصوراتهم في تصميم برنامج لرفع الوعي الصحي للتقليل من سلوك الاكل العاطفي ورفع سلوك الاكل الصحي، لذلك تعتبر تصوراتهم وخبراتهم ذات قيمة عالية لتحقيق الهدف من الدراسة.

ما هي الإجراءات التي تتم خلال مشاركة الطلاب والطالبات في الدراسة؟

اولاً: الاستبانة: تتم دعوة المشاركين للإجابة على استبيان الدراسة، وسوف تكون اجاباتهم سرية وليس من الضروري كتابة اسماهم. وإذا كان لديهم رغبة لدعم الدراسة بشكل أكبر من خلال موافقتهم على اجراء المقابلة الشخصية، سوف يطلب منهم تسجيل موافقتهم في الخانة المخصصة لذلك في نهاية الاستبانة. سوف يستغرق الاستبيان كحد اقصى ٣٠ دقيقة لإكماله في مع توفير بيئة مريحة لذلك.

ثانياً: المقابلة الشخصية: ويتم اجراءها لعينة مختارة من المشاركين على حده في مكان مناسب في المدرسة وسوف يتم استخدام أوراق وجهاز لتسجيل الإجابات وحفظها. سوف يتم عرض الإجابات عليهم مرة أخرى للتأكد من موافقتهم عليها ومن ثم حفظها واستخدامها بشكل من قبل الباحثة فقط.

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### هل يجب على الطلاب والطالبات المشاركة في الدراسة؟

مشاركة الطلاب والطالبات في الدراسة اختيارية ولن يكون له أي علاقة بتحصيلهم من الدرجات الدراسية. كما ان المعلومات التي يتم الحصول عليها منهم لن يطلع عليها المعلمين او المعلمات.  
الطلاب والطالبات اللذين يتم اختيارهم للمشاركة في الدراسة سوف يتم اعطاءهم هذا النموذج لتزويدهم بالمعلومات الخاصة بالبرنامج وتوضيح أن آلية المشاركة اختيارية، ومن ثم التوقيع بالموافقة على المشاركة في البرنامج. وإذا تمت مشاركتهم في الدراسة فإن لهم الأحقية في الانسحاب من الدراسة في أي وقت بدون تقديم أي سبب للانسحاب فقط الاعتذار عن طريق اخبار الباحثة او ارسال رسالة الى البريد الإلكتروني التالي: [M.A.H.Aloudah@student.reading.ac.u](mailto:M.A.H.Aloudah@student.reading.ac.u)

### ماهي الفائدة المرجوة من المشاركة في البرنامج؟

المشاركين في البرنامج سوف تتاح لهم الفرصة لطرح تجاربهم وخبراتهم حول الأكل العاطفي وتوضيح تصوراتهم وآرائهم حول تصميم برنامج لرفع الوعي الصحي والذي له أثر في المساهمة في رفاهيتهم الجسمية والعاطفية.

### هل المعلومات سوف تكون سرية، وماذا سيحدث لنتائج البحث؟

جميع البيانات التي يتم جمعها سوف تكون سرية كما ان جميع الاستبانات والتسجيل الخاص بالمقابلة الشخصية سوف يتم حفظها في مكان خاص.  
تعتبر البيانات التي يتم جمعها في هذه الدراسة هي المعلومات الأساسية لدراستي لمرحلة الدكتوراه. وسيتم نشر رسالة الدكتوراه بغرض الفائدة العلمية. كما ستساهم هذه الرسالة في أهداف علمية مثل إصدار مقالات وكتب والمحاضرات. وستبقى جميع المعلومات التي تم جمعها محفوظة بسرية تامة.

### من هي الجهة التي قامت بمراجعة هذا الطلب؟

لقد تمت مراجعة هذا الطلب وقراءته من قبل لجنة البحوث في جامعة ريدينغ والموافق عليه. المعلومات متوفرة عند الطلب.

### ماذا يحدث إذا أراد الطلاب او الطالبات الانسحاب من المشاركة؟

يمكن للطلاب والطالبات خلال البحث تغيير رأيهم والانسحاب في أي وقت دون تقديم أي مبرر. وإذا تم تغيير رأيهم بعد جمع البيانات، فإنه سوف يتم تجاهل البيانات الخاصة بهم.

### ماذا يحدث إذا حدث خطأ ما؟

في هذه الحالة لا داعي للقلق أو الشكوى، يمكنك التواصل مع المشرفة على الباحثة: د يوتا ديميتريادي، جامعة ريدينغ.

الهاتف: +44 (0) 1183782688، بريد إلكتروني: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

شكرا جزيلاً لتعاونك وقراءة النموذج.

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### نموذج موافقة ولي الأمر

عنوان الدراسة: التعرف على تجارب خبرات الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم برنامج توعوي عن الأكل الصحي باستخدام التكنولوجيا.

لقد قرأت المعلومات الخاصة بالدراسة وحصلت على نسخة منها. وأنا أفهم ما هو الغرض من هذه الدراسة.

اسم ولي الأمر: .....

- 1- أؤكد أنني قد قرأت وفهمت ورقة المعلومات الخاصة بالدراسة المذكورة أعلاه. (  نعم /  لا )
- 2- أوافق على إعطاء الباحثة الفرصة لطرح الأسئلة على ابني/ ابنتي عن طريق (الاستبانة، المقابلة الشخصية، الهاتف، البريد الإلكتروني) (  نعم /  لا ).
- 3- أوافق لأبني/ ابنتي بالمشاركة في المقابلة الشخصية وتسجيلها. (  نعم /  لا )
- 4- أنا أفهم أن مشاركة الطلاب والطالبات تطوعية وأنهم يستطيعون الانسحاب من الدراسة في أي وقت دون إبداء أي سبب. (  نعم /  لا )
- 5- أنا أوافق لأبني/ ابنتي المشاركة في الدراسة المذكورة أعلاه (  نعم /  لا ).

التوقيع: .....

التاريخ: .....

اسم الباحثة: معالي العودة.

عنوان البريد الإلكتروني للباحثة:

[M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

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### **Student information sheet**

**The title:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

#### **Dear Participant,**

I am a PhD student at the University of Reading. You are invited to participate in this research study which examines Saudi adolescent girls' experience towards emotional eating.

Please, take the time to read the following information carefully to know more about the research.

#### **What is the purpose of the study?**

This study aims to examine and understand factors that contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating programme that addresses teenage needs.

#### **Why have students been chosen to take part?**

You are invited to take part in this study as your views will offer invaluable support to develop an online healthy eating programme for peers.

#### **What will happen when students take part of it?**

Initially, you will be invited to complete a short questionnaire. It will take a maximum of 20 minutes to complete.. You can choose whether you would like to take part in interviews (one-to-one) by filling the field at the end of the questionnaire. If you agree to be interviewed, the interview will take place face to face at school at a mutually convenient date and time. With your agreement, the interview will be audio recorded and transcribed. This transcript will then be shared with you to check for accuracy and to confirm that you are happy for it to be used in the research.

#### **Do students have to take part?**

Your participation is voluntary. Taking part will not influence your school grades in any way and information will not be shared with individual teachers. If you decide to take part, you will be given this information sheet to keep and asked to sign a consent form. You will be still free to withdraw at any time and without giving any reason by contacting me via email at: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

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Email: [Y.dimitriadi@reading.ac.uk](mailto:Y.dimitriadi@reading.ac.uk)



### **What are the possible advantages and disadvantages of taking part?**

You will find it useful to reflect on healthy eating and support further work for other young people your age.

### **Will what students say be kept confidential and what will happen to the result of the research?**

Any data collected will be held in strict confidence and no real names will be used in this study or in any subsequent publications. The completed questionnaires and the interview records of this study will be kept private. The data collected in the study will provide the basis of my PhD thesis. The thesis will be published in hard copy and electronic format which will be housed at the Institute of Education in the University of Reading. The data and the analysis of the data will also be used to produce articles, books, conference papers, as well as presented in conferences and lectures. In any of these formats I reassure you that the identity and anonymity of all participants will be protected. All information collected will be kept strictly confidential (subject to legal limitations). In order to protect the anonymity of each participant, pseudonyms will be used to ensure participants cannot be identified. All electronic data will be held securely in password-protected files on a non-shared PC and all paper documentation will be held in locked cabinets in a locked office.

In line with University policy, data generated by the study will be kept securely in paper or electronic form for a period of five years after the completion of the research project, and then will be securely destroyed. Anonymised data gathered in this research may be preserved and made publicly available for others to consult and re-use.

### **Who has reviewed the study?**

This application has been reviewed by the University of Reading Research Ethics Committee. Full details are available on request.

### **What happens if students change their mind?**

Students can withdraw from the activities at any time. If they change their mind after data collection has ended, we will discard their data.

### **What happens if something goes wrong?**

In the unlikely case of concern or complaint, you can contact the supervisor of the researcher: Dr Yota Dimitriadi, University of Reading; Tel: +44(0)1183782688, email: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

‘This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct’.

Thank you for your time.

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### **Student's Consent Form**

**Title of study:** Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.

I have read the information sheet about the project and received a copy of it. I understand what the purpose of the study is, and what is required of me. All my questions have been answered.

Name of participant: .....

- 1- I confirm that I have read and understood the information sheet for the above study. (Yes / No)
- 2- I have been given the opportunity to ask questions about the study. (Yes / No)
- 3- **I agree to take part in the above study** (Yes / No)
- 4- I agree to take part in the interview. (Yes / No)
- 5- I agree for the interview to be tape-recorded. (Yes / No)
- 6- I understand that my participation is voluntary and that I can withdraw from the research at any time **without giving any reason.** (Yes / No)

Signed: .....

Date: .....

**Name of researcher taking consent:** Maali Aloudah

**Researcher e-mail address:** [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

### خطاب معلومات للطالب/ة

عنوان الدراسة: التعرف على تجارب الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم برنامج توعوي عن الأكل الصحي باستخدام التكنولوجيا.

عزيزي الطالب/ عزيزتي الطالبة،،

انا طالبة دكتوراه بكلية التربية في جامعة ريدينغ. احتاج الى مشاركة الطلاب والطالبات السعوديين في هذه الدراسة البحثية التي تدرس تجاربهم مع الأكل العاطفي. والهدف من هذا البحث هو دراسة خبراتهم والحصول على وجهات نظرهم تجاه سلوكيات الأكل العاطفي وتصميم برنامج باستخدام التكنولوجيا يهدف الى رفع الوعي الصحي مع التركيز على احتياجات الطلاب الصحية في سن المراهقة.

ما هو الهدف من الدراسة؟

تهدف هذه الدراسة الى فهم تجارب الاكل العاطفي عند الطلاب والطالبات السعوديين الذين تتراوح أعمارهم من ١٢ الى ١٥ سنة بهدف تصميم برنامج باستخدام التكنولوجيا يهدف الى تناول احتياجات الفتيان والفتيات ورفع الوعي الصحي لديهم.

لماذا يتم اختيار الطلاب والطالبات للمشاركة في الدراسة؟

الطلاب والطالبات في المرحلة المتوسطة في المدارس السعودية مدعوون للمشاركة في هذه الدراسة للحصول على فهم أكبر عن تجربتهم في الاكل العاطفي بهدف استخدام خبراتهم وتصوراتهم في تصميم برنامج لرفع الوعي الصحي للتقليل من سلوك الاكل العاطفي ورفع سلوك الاكل الصحي، لذلك تعتبر تصوراتهم وخبراتهم ذات قيمة عالية لتحقيق الهدف من الدراسة.

ما هي الإجراءات التي تتم خلال مشاركة الطلاب والطالبات في الدراسة؟

اولاً: الاستبانة: تتم دعوة المشاركين للإجابة على استبيان الدراسة، وسوف تكون اجاباتهم سرية وليس من الضروري كتابة اسماءهم. وإذا كان لديهم رغبة لدعم الدراسة بشكل أكبر من خلال موافقتهم على اجراء المقابلة الشخصية، سوف يطلب منهم تسجيل موافقتهم في الخانة المخصصة لذلك في نهاية الاستبانة. سوف يستغرق الاستبيان كحد اقصى ٣٠ دقيقة لإكماله في مع توفير بيئة مريحة لذلك.

ثانياً: المقابلة الشخصية: ويتم اجراءها لكل لعينة مختارة من المشاركين على حده في مكان مناسب في المدرسة وسوف يتم استخدام أوراق وجهاز لتسجيل الإجابات وحفظها. سوف يتم عرض الإجابات عليهم مرة أخرى للتأكد من موافقتهم عليها ومن ثم حفظها واستخدامها بشكل سري من قبل الباحثة فقط.

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### هل يجب على الطلاب والطالبات المشاركة في الدراسة؟

من الضروري جداً ان يعرف الطلاب والطالبات ان مشاركتهم في الدراسة اختيارية، ولهم الاختيار في المشاركة في الدراسة او عدمها. كما ان مشاركتهم ليس له أي علاقة بتحصيلهم من الدرجات الدراسية. كما ان المعلومات التي يتم الحصول عليها منهم لن يطلع عليها المعلمين او المعلمات.

الطلاب والطالبات اللذين يتم اختيارهم للمشاركة في الدراسة سوف يتم اعطاءهم هذا النموذج لتزويدهم بالمعلومات الخاصة بالبرنامج وتوضيح أن آلية المشاركة اختيارية، ومن ثم التوقيع بالموافقة على المشاركة في البرنامج. وإذا تمت مشاركتهم في الدراسة فإن لهم الاحقية في الانسحاب من الدراسة في أي وقت بدون تقديم أي سبب للانسحاب فقط الاعتذار عن طريق اخبار الباحثة او ارسال رسالة الى البريد الإلكتروني التالي: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)

### ماهي الفائدة المرجوة من المشاركة في البرنامج؟

المشاركين في البرنامج سوف تتاح لهم الفرصة لطرح تجاربهم وخبراتهم حول الأكل العاطفي وتوضيح تصوراتهم وآرائهم حول تصميم برنامج لرفع الوعي الصحي والذي له أثر في المساهمة في رفايتهم الجسمية والعاطفية.

### هل المعلومات سوف تكون سرية، وماذا سيحدث لنتائج البحث؟

جميع البيانات التي يتم جمعها سوف تكون سرية ولن يتم استخدام أو عرض أسماء المشاركين في الدراسة، كما ان جميع الاستبانات والتسجيل الخاص بالمقابلة الشخصية سوف يتم حفظها في مكان خاص.

تعتبر البيانات التي يتم جمعها في هذه الدراسة هي المعلومات الأساسية لدراسي لمرحلة الدكتوراه. وسيتم نشر رسالة الدكتوراه في نسخة مطبوعة وأخرى إلكترونية والتي سيكون مقرها في كلية التربية في جامعة ريدينغ في المملكة المتحدة. كما سيتم استخدام البيانات وتحليلها لأهداف علمية مثل إصدار مقالات وكتب وأوراق خاصة للمشاركة في المؤتمرات، فضلاً عن تقديم العروض في المؤتمرات والمحاضرات. في أي من هذه المشاركات لن يتم الكشف عن اسماء المشاركين وسوف تكون محمية. وستبقى جميع المعلومات التي تم جمعها محفوظة بسرية تامة مع مراعاة القبول القانونية من أجل حماية هوية كل مشارك، وسيتم استخدام أسماء مستعارة لضمان انه لا يمكن تحديد المشاركين. وسوف توضع جميع البيانات الإلكترونية بشكل آمن في الملفات المحمية بكلمة مرور على جهاز كمبيوتر وستحفظ جميع الوثائق الورقية في خزائن مغلقة في مكتب مقفل.

وتمشيا مع سياسة الجامعة، سيتم الاحتفاظ بالبيانات الناتجة عن الدراسة بشكل آمن في شكل ورقي أو إلكتروني لمدة خمس سنوات بعد الانتهاء من المشروع البحثي، وبعد ذلك سوف يتم تدميرها بشكل آمن.

### من هي الجهة التي قامت بمراجعة هذا الطلب؟

لقد تمت مراجعة هذا الطلب وقراءته من قبل لجنة أخلاقيات البحوث وإعطاء الرأي بأنها موافقة للسلوك الأخلاقي. وتمتلك الجامعة التأمينات المناسبة للمكان، التفاصيل الكاملة متوفرة عند الطلب.

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ماذا يحدث إذا أراد الطلاب او الطالبات الانسحاب من المشاركة؟  
يمكن للطلاب والطالبات خلال البحث تغيير رأيهم والانسحاب في أي وقت دون تقديم أي مبرر. وإذا تم تغيير رأيهم بعد جمع البيانات، فإنه سوف يتم تجاهل البيانات الخاصة بهم.

ماذا يحدث إذا حدث خطأ ما؟  
في هذه الحالة لا داعي للقلق أو الشكوى، يمكنك التواصل مع المشرفة على الباحثة: د يوتا ديميتريادي، جامعة ريدينغ.  
الهاتف: +44 (0) 1183782688، بريد إلكتروني: [y.dimitriadi@reading.ac.uk](mailto:y.dimitriadi@reading.ac.uk)

"لقد تم عرض هذه الدراسة في أعقاب إجراءات لجنة أخلاقيات البحوث في جامعة ريدينغ وتم إعطاء الرأي الأخلاقي انها مواتية للسلوك الأخلاقي".

شكرا جزيلاً لتعاونك وقراءة النموذج.

#### نموذج موافقة الإداري المسؤول

عنوان الدراسة: التعرف على تجارب الطلاب والطالبات مع الأكل العاطفي والحصول على تصوراتهم بغرض تصميم برنامج توعوي باستخدام التكنولوجيا.

لقد قرأت ورقة المعلومات الخاصة بالدراسة وحصلت على نسخة منها. وأنا اتفهم ما هو الغرض من هذه الدراسة وما هو المطلوب من الطلاب والطالبات. ولقد تم الرد على جميع الأسئلة.

اسم المسؤول: .....

1- أؤكد أنني قد قرأت وفهمت ورقة المعلومات الخاصة بالدراسة المذكورة أعلاه. (  نعم /  لا).

2- أوافق على إعطاء الباحثة الفرصة لطرح الأسئلة على الطلاب والطالبات عن طريق (الاستبانة، المقابلة الشخصية، الهاتف، البريد الإلكتروني) (  نعم /  لا).

3- أوافق للطلاب او الطالبات المشاركة في المقابلة الشخصية وتسجيلها. (  نعم /  لا).

4- أنا أتفهم أن مشاركة الطلاب والطالبات تطوعية وأنهم يستطيعون الانسحاب من الدراسة في أي وقت دون إبداء أي سبب. (  نعم /  لا).

5- أنا أوافق للطلاب والطالبات المشاركة في الدراسة المذكورة أعلاه (  نعم /  لا).

التوقيع: .....

التاريخ: .....

اسم الباحثة: معالي العودة.

عنوان البريد الإلكتروني للباحثة: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk)





2016/12/07

رقم الملف: ME376

رقم السجل المدني: 1000384758

إفـادة

تفيد الملحقية الثقافية بسفارة المملكة العربية السعودية في لندن بأن الطالبة / معالي  
عبدالرحمن حمد العوده مبتعثت من قبل وزارة التعليم لدراسة الدكتوراه في تخصص التعليم  
في جامعة Reading اعتبارا من 2015/5/21 إلى تاريخ 2018/4/18.  
وقد مُنحت هذه الإفادة بناءً على طلبها لتقديمها الى وزارة التعليم - قسم ادارة التطوير والبحوث.  
وتقبلوا تحياتي وتقديري،،

القائم بأعمال الملحقية الثقافية

ب [Redacted] ودية في لندن  
[Redacted] النعيم



الرقم: ..... التاريخ: ..... الموافق: ..... المرفقات: .....

## Appendix 6

### Questionnaire of Garaulet

**Table IIa**  
*Emotional Eater Questionnaire (EEQ) Garaulet*

<b>1. Do the weight scales have a great power over you? Can they change your mood?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>2. Do you crave specific foods?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>3. Is it difficult for you to stop eating sweet things, especially chocolate?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>4. Do you have problems controlling the amount of certain types of food you eat?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>5. Do you eat when you are stressed, angry or bored?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>6. Do you eat more of your favourite food and with less control when you are alone?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>7. Do you feel guilty when eat "forbidden" foods, like sweets or snacks?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>8. Do you feel less control over your diet when you are tired after work at night?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>9. When you overeat while on a diet, do you give up and start eating without control, particularly food that you think is fattening?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always
<b>10. How often do you feel that food controls you, rather than you controlling food?</b>			
<input type="checkbox"/> Never	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Generally	<input type="checkbox"/> Always

**Scores:** Value "0" = Never; Value "1" = Sometimes; Value "2" = Generally; Value "3" = Always.

For the clinical Practice:

**Score between 0-5:** You are a *non-emotional eater*. Your emotions have little or nothing to do in your eating behavior. You are a person with great stability with respect to your feeding behaviour. You eat when you feel hungry, regardless of external factors or emotions.

**Score between 6-10:** You are a *low emotional eater*. It is rare that you solve your problems with food. However, you feel that certain foods affect your will.

**Score between 11-20:** You are an *emotional eater*. Your responses indicate that to some extent your emotions influence your diet. Feelings and mood in some moments of your life determine how much and how you eat.

**Score between 21-30:** You are a *very emotional eater*. If you're not careful, food will control your life. Your feelings and emotions constantly rotate around your food.

## Appendix 7

### Emotional Eating Questionnaire

#### EMOTIONAL EATING QUESTIONNAIRE



Patient Name	Date of Birth	MRN
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#### Are you an emotional eater?

Once we know the specifics of your emotional eating habits, we can develop a plan to help you cope with your emotions without using food. The statements below are examples of the most common types of emotional eating: depressed eating (items 1 – 3), anxiety/stress eating (4 – 6), angry eating (7 – 9), bored eating (10 – 12), lonely eating (13 – 15), and happy eating (16 – 18). We will discuss this in greater detail at one of your upcoming appointments.

**To gain a better understanding of your emotional eating tendencies, read the statements below and check the statements that are true for you.**

- |   |  |
|---|--|
| <input type="checkbox"/> 1. When I am feeling “down” or “blue” a little snack will lift my mood.      | <input type="checkbox"/> 10. I look forward to eating something when I’m bored.                              |
| <input type="checkbox"/> 2. When I’m depressed I have more desire to eat.                             | <input type="checkbox"/> 11. I eat more than usual when there is nothing to do.                              |
| <input type="checkbox"/> 3. If someone disappoints me I want to eat something.                        | <input type="checkbox"/> 12. If time is passing slowly, I look forward to having a snack.                    |
| <input type="checkbox"/> 4. When I am pressured or working under a deadline I have the urge to snack. | <input type="checkbox"/> 13. Being alone increases my appetite.  |
| <input type="checkbox"/> 5. I eat more when I am stressed than when I am calm.                        | <input type="checkbox"/> 14. I am less likely to eat when other people are around versus when I’m by myself. |
| <input type="checkbox"/> 6. If I am worried or afraid of something, I tend to eat.                    | <input type="checkbox"/> 15. Eating makes me feel better when I am lonely.                                   |
| <input type="checkbox"/> 7. When people irritate me I want to get something to eat.                   | <input type="checkbox"/> 16. I celebrate with food when I’m in a good mood.                                  |
| <input type="checkbox"/> 8. I have had something to eat “just to teach him/her a lesson”.             | <input type="checkbox"/> 17. If I’m feeling really good, I don’t worry about my diet.                        |
| <input type="checkbox"/> 9. When I get angry, eating will make me feel better.                        | <input type="checkbox"/> 18. When I’m happy, having a favorite snack makes me feel even better.              |

**How would you describe your relationship with food?** (Please feel free to use the back side of this paper as needed):

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Appointment Date:

## Appendix 8

### Ethical Approval documents & Risk Assessment Form for Research Activities

University of Reading  
Institute of Education  
**Ethical Approval Form A (version May 2015)**



Tick one: PhD student

Name of applicant (s): Maali Aloudah.

Title of project: **Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.**

Name of supervisor (for student projects): Dr. Yota Dimitriadi.

**Please complete the form below including relevant sections overleaf.**

	YES	NO
<b>Have you prepared an Information Sheet for participants and/or their parents/carers that:</b>	✓	
a) explains the purpose(s) of the project	✓	
b) explains how they have been selected as potential participants	✓	
c) gives a full, fair and clear account of what will be asked of them and how the information that they provide will be used	✓	
d) makes clear that participation in the project is voluntary	✓	
e) explains the arrangements to allow participants to withdraw at any stage if they wish	✓	
f) explains the arrangements to ensure the confidentiality of any material collected during the project, including secure arrangements for its storage, retention and disposal	✓	
g) explains the arrangements for publishing the research results and, if confidentiality might be affected, for obtaining written consent for this	✓	
h) explains the arrangements for providing participants with the research results if they wish to have them	✓	
i) gives the name and designation of the member of staff with responsibility for the project together with contact details, including email. If any of the project investigators are students at the IoE, then this information must be included and their name provided	✓	
k) explains, where applicable, the arrangements for expenses and other payments to be made to the participants	(N.A)	
j) includes a standard statement indicating the process of ethical review at the University undergone by the project, as follows: ‘This project has been reviewed following the procedures of the University Research Ethics Committee and has been given a favourable ethical opinion for conduct’.	✓	
k) includes a standard statement regarding insurance: “The school has the appropriate insurances in place. Full details are available on request”.	✓	
<b>Please answer the following questions</b>		
1) Will you provide participants involved in your research with all the information necessary to ensure that they are fully informed and not in any way deceived or misled as to the purpose(s) and nature of the research? (Please use the subheadings used in the example information sheets on blackboard to ensure this).	✓	

2) Will you seek written or other formal consent from all participants, if they are able to provide it, in addition to (1)?	✓		
3) Is there any risk that participants may experience physical or psychological distress in taking part in your research?			✓
4) Have you taken the online training modules in data protection and information security (which can be found here: <a href="http://www.reading.ac.uk/internal/imps/Staffpages/imps-training.aspx">http://www.reading.ac.uk/internal/imps/Staffpages/imps-training.aspx</a> )?	✓		
5) Have you read the Health and Safety booklet (available on Blackboard) and completed a Risk Assessment Form to be included with this ethics application?	✓		
6) Does your research comply with the University's Code of Good Practice in Research?	✓		
	YES	NO	N.A.
7) If your research is taking place in a school, have you prepared an information sheet and consent form to gain the permission in writing of the head teacher or other relevant supervisory professional?	✓		
8) Has the data collector obtained satisfactory DBS clearance?			✓
9) If your research involves working with children under the age of 16 (or those whose special educational needs mean they are unable to give informed consent), have you prepared an information sheet and consent form for parents/carers to seek permission in writing, or to give parents/carers the opportunity to decline consent?	✓		
10) If your research involves processing sensitive personal data <sup>1</sup> , or if it involves audio/video recordings, have you obtained the explicit consent of participants/parents?	✓		
11) If you are using a data processor to subcontract any part of your research, have you got a written contract with that contractor which (a) specifies that the contractor is required to act only on your instructions, and (b) provides for appropriate technical and organisational security measures to protect the data?			✓
12a) Does your research involve data collection outside the UK?	✓		
12b) If the answer to question 12a is "yes", does your research comply with the legal and ethical requirements for doing research in that country?	✓		
13a) Does your research involve collecting data in a language other than English?	✓		
13b) If the answer to question 13a is "yes", please confirm that information sheets, consent forms, and research instruments, where appropriate, have been directly translated from the English versions submitted with this application.	✓		
14a. Does the proposed research involve children under the age of 5?			✓
14b. If the answer to question 14a is "yes": My Head of School (or authorised Head of Department) has given details of the proposed research to the University's insurance officer, and the research will not proceed until I have confirmation that insurance cover is in place.			N/A
<b>If you have answered YES to Question 3, please complete Section B below</b>			

Please complete **either** Section A **or** Section B and provide the details required in support of your application. Sign the form (Section C) then submit it with all relevant attachments (e.g. information sheets, consent forms, tests, questionnaires, interview schedules) to the Institute's Ethics Committee for consideration. Any missing information will result in the form being returned to you.

<b>A:</b> My research goes beyond the 'accepted custom and practice of teaching' but I consider that this project has <b>no</b> significant ethical implications. (Please tick the box.)	✓
Please state the total number of participants that will be involved in the project and give a breakdown of how many there are in each category e.g. teachers, parents, pupils etc.	

<sup>1</sup> Sensitive personal data consists of information relating to the racial or ethnic origin of a data subject, their political opinions, religious beliefs, trade union membership, sexual life, physical or mental health or condition, or criminal offences or record.

There will be 300 students in total involved in the project. After consultation with the Ministry of Education 5 intermediate schools for girls (ages 12-15) and 5 intermediate schools for boys (ages 12-15) will be approached in different regions in Riyadh. The Ministry will select schools that have a good IT lab to facilitate the completion of the student questionnaire. Systematic sampling\* will be employed to select 30 students per school (150 male and 150 female students in total) and invite them to complete the questionnaire.

\*10 students per year group will be selected by getting access to all the student names and then deciding upon the nth participant to select on that list.

Out of the 300 students, it is anticipated that 20 students will be invited to take part in face-to-face interview (10 boys + 10 girls). In terms of boys engagement we are liaising with schools to organise a way to include boys in the study that is appropriate to the Saudi norms.

The title: "Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program".

In Saudi Arabia, adolescents make up about 25% of the population. Adolescence stage is considered as a period of psychological, emotional and physical change [1]. Recently, there is a big concern about mental health problems among Saudi adolescents in both boys and girls [2]. In regarding to emotional disorders, it appeared to be related to emotional eating by responding to emotions through food consumption which can play a significant role in increase the consumption of food which is rich in energy [3]. Several studies have confirmed that unhealthy eating behaviours were prevalent among Saudi teenagers [4] [5]. Adolescents' challenges to control their emotions can subsequently create negative impact on them in different ways, e.g. their ability to involve in learning, make friends and engage in family relationships [6]. Also, dropping –out of school and poor education level. This wastes education resources and seriously impairs the economic and social potential of such children [1].

If adolescents are correctly groomed and cared for, emotionally and physically, they will enjoy good mental and physical health. Healthy eating awareness program in schools play a crucial role in healthy building, prevent disease and personality development of adolescents [1].

In spite of the recent increase in awareness and interest to promote health among Saudi people, very few studies underline the significance of emotional wellbeing and making the right food choices and sensible eating behaviour. Additionally, the perceptions and experiences of students regarding emotional eating, particularly in the 12-15-year-old age group, have not been researched.

This study undertaken aims to explore factors that may contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating awareness programme that addresses teenage needs.

This study will be based on a mixed method approach. The research question focuses on young people's perceptions on healthy eating rather than eating disorders. The researcher is liaising with the Ministry of Education and with schools about support they offer for young people who may want to discuss eating behaviours further with their schools. There will be discussions with the schools about participation or exclusion of students who may have already been identified as 'vulnerable' by the school.

Schools will be contacted and access will be arranged through the Educational Supervision Department and the school headteacher. Participation is voluntary and information sheets will be shared with parents and students. It is up to students to decide whether or not to take part. If they decide to take part, they will be given the information sheet to keep and asked to sign a consent form. Taking part will not influence school grades in any way. Data will not be shared with individual teachers. Even if they decide to take part, they are still free to withdraw at any time and without giving any reason by contacting me via email on: [M.A.H.Aloudah@student.reading.ac.uk](mailto:M.A.H.Aloudah@student.reading.ac.uk).

The statement of the ethical consideration will be placed in consent forms to indicate the process of ethical review at the University undergone by the project.

It is expected that the duration of the project will be three weeks. If ethical clearance is achieved, we would like the project to commence in the spring term (around Easter time).

References:

- [1] Medical and Behavioral Problems among Saudi Adolescents. (2013). International Journal of Health Sciences, 7(2), V–VI.
- [2] Koenig, H. G., Al Zaben, F., Sehlo, M. G., Khalifa, D. A., Al Ahwal, M. S., Qureshi, N. A., & Al-Habeeb, A. A. (2014). Mental Health Care in Saudi Arabia: Past, Present and Future. Open Journal of Psychiatry, 4(02), 113.
- [3] Kontinen, H., Männistö, S., Sarlio-Lähteenkorva, S., Silventoinen, K., & Haukkala, A. (2010). Emotional eating, depressive symptoms and self-reported food consumption. A population-based study. Appetite, 54(3), 473-479.
- [4] Al-Subaie, A. (1998), "Eating attitudes test in Arabic: Psychometric features and normative data," Saudi Medical Journal, vol. 19, no. 6, pp. 769–775.
- [5] Al-Adawi, S., Dorvlo, A., Burke, D., Al-Bahlani, S., Martin, R and Al-Ismaily, S, (2002), "Presence and severity of anorexia and bulimia among male and female omani and non-omani adolescents," Journal of the American Academy of Child and Adolescent Psychiatry, vol. 41, no. 9, pp. 1124–1130.
- [6] James, K. 2003. A health promoting college for 16–19 year old learners. Leicester: National Institute of Adult Continuing Education (NIACE). [http://www.niace.org.uk/Research/HDE/Documents/health\\_promoting\\_college.pdf](http://www.niace.org.uk/Research/HDE/Documents/health_promoting_college.pdf) (accessed January 9, 2007).

**B:** I consider that this project **may** have ethical implications that should be brought before the Institute's Ethics Committee.

Please state the total number of participants that will be involved in the project and give a breakdown of how many there are in each category e.g. teachers, parents, pupils etc.

Give a brief description of the aims and the methods (participants, instruments and procedures) of the project in up to 200 words.

1. Title of project
2. Purpose of project and its academic rationale
3. Brief description of methods and measurements
4. Participants: recruitment methods, number, age, gender, exclusion/inclusion criteria
5. Consent and participant information arrangements, debriefing (attach forms where necessary)
6. A clear and concise statement of the ethical considerations raised by the project and how you intend to deal with them.
7. Estimated start date and duration of project

**C: SIGNATURE OF APPLICANT:**

**Note:** a signature is required. Typed names are not acceptable.

I have declared all relevant information regarding my proposed project and confirm that ethical good practice will be followed within the project.

Signed:



Print Name: Maali Aloudah

Date: 2/11/2016.

STATEMENT OF ETHICAL APPROVAL FOR PROPOSALS SUBMITTED TO THE INSTITUTE ETHICS COMMITTEE

This project has been considered using agreed Institute procedures and is now approved.

Signed:  .. Print Name: Xiao Lan Curdt-Christiansen Date...27 July 2017....  
(IoE Research Ethics Committee representative) \*

\* A decision to allow a project to proceed is not an expert assessment of its content or of the possible risks involved in the investigation, nor does it detract in any way from the ultimate responsibility which students/investigators must themselves have for these matters. Approval is granted on the basis of the information declared by the applicant.

## Risk Assessment Form for Research Activities

University of Reading  
Institute of Education  
Risk Assessment Form for Research Activities February 2014



Select one: Staff project:  PGR project:  MA/UG project:

Name of applicant (s): Maali Aloudah.

Title of project: **Exploring young students' perceptions of emotional eating with the purpose of informing the design of an online healthy eating awareness program.**

Name of supervisor (for student projects): Dr. Yota Dimitriadi.

**A: Please complete the form below:**

Brief outline of Work/activity:	<p>This study is aiming to explore possible reasons why young people turn to unhealthy eating behaviours and coping mechanisms. It is important to study the relationship between emotions and eating behaviour in adolescents in order to provide suitable suggestions not only for those who are affected but for all. It would also assist in determining possible adolescent attitudes about eating behaviour and provide suitable awareness aimed at enhancing and promoting healthy eating. This study aims to examine and understand factors that contribute to emotional eating of adolescent Saudi Arabian students (aged 12 to 15 years) and design a relevant online healthy eating programme that addresses teenage needs.</p> <p>This study will be based on a mixed method approach. It is expected that around 300 students will be involved in the project: 150 boys and 150 girls. All of them will be invited to complete a questionnaire. Each questionnaire will be allocated a unique reference code to help the research select a number of students (20 students: 10 boys and 10 girls) for follow up 1:1 interviews. The researcher will select students who display higher tendencies towards emotional eating. The interviews will focus on exploring ways to develop an online healthy eating awareness program for students their age.</p> <p>The schools will be contacted and access will be arranged through Educational Supervision Department, head teacher, parents and students. Participation is voluntary; it is up to students to decide whether or not to take part. Taking part will not influence school grades in any way. Data will not be shared with individual teachers. If they decide to take part they will be given information sheet to keep and asked to sign a consent form. Even if they decide to take part, they are still free to withdraw at any time and without giving any reason by contacting me via the school or email me on: M.A.H.Aloudah@student.reading.ac.uk.</p> <p>We expect that the duration of the project will be three weeks.</p>
Where will data be collected?	Data will be selected from ten intermediate schools (5 for boys and 5 for girls) in different regions, which will reflect different sociocultural levels in Riyadh city in Saudi Arabia.
Significant hazards:	Schools have a duty to maintain a safe area of work. There is the danger that as a result of the questionnaire students finds their reflection on self-image upsetting.
Who might be exposed to hazards?	There will be no physical hazards.
Existing control measures:	<p>The school's rooms and premises fall within the schools' administration responsibilities. Discussion with schools and support officers at the school:</p> <p>Discussion with the school will precede data collection. If vulnerable students are identified, they will not be asked to be involved in the data collection. At the same time, school support will be visible to students who may feel they want to talk about their eating patterns. We will be liaising with school counsellors (or the equivalent of that role) in order to support students who may get affected.</p> <p>The focus of the research is on healthy eating rather than eating disorders and questions have been</p>

	<p>phrased to avoid young people exposing themselves. There is information in the participant letter about school support for students who may feel affected. The information letter also state that the researcher will support students who may find the questions upsetting.</p> <p>We have also adapted the questions in the questionnaire and the interview based on feedback from the Ethics Committee.</p> <p>However, eating behaviours have not been receiving the same attention in Saudi Arabia and students may not perceive the questions in the same way that students in the UK would.</p>
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Are risks adequately controlled:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
----------------------------------	---

If NO, list additional controls and actions required:	Additional controls	Action by:

**B: SIGNATURE OF APPLICANT:**

I have read the Health and Safety booklet posted on Blackboard, and the guidelines overleaf.  
 I have declared all relevant information regarding my proposed project and confirm risks have been adequately assessed and will be minimized as far as possible during the course of the project.

Signed: ..... Print Name: Maali Aloudah Date: 02/11/2016.

STATEMENT OF APPROVAL TO BE COMPLETED BY SUPERVISOR (FOR UG AND MA STUDENTS) **OR** BY IOE ETHICS COMMITTEE REPRESENTATIVE (FOR PGR AND STAFF RESEARCH).

This project has been considered using agreed Institute procedures and is now approved.

Signed:..... Print Name: Xiao Lan Curdt-Christiansen Date...27 July 2017  
 (IoE Research Ethics Committee representative) \*

\* A decision to allow a project to proceed is not an expert assessment of its content or of the possible risks involved in the investigation, nor does it detract in any way from the ultimate responsibility which students/investigators must themselves have for these matters. Approval is granted on the basis of the information declared by the applicant.

## Appendix 9

### Axis I: Eating Behaviours of Adolescents

Statement	Response level						Mean ranking	Standard deviation	Order of the statement	Response level
			Never	Little	Sometimes	Usually				
15 I eat slowly and taste every piece of food which I eat.	boys	N	22	34	75	20	2.63	.893	2	High
		%	14.6	22.5	49.7	13.2				
	girls	N	13	27	75	38	2.90	.872		
		%	8.5	17.6	49.0	24.8				
	Total	N	35	61	150	58	2.76	.893		
		%	11.5	20.1	49.3	19.1				
16 I eat quickly.	boys	N	37	49	47	18	2.30	.973	5	Medium
		%	24.5	32.5	31.1	11.9				
	girls	N	53	42	50	8	2.08	.939		
		%	34.6	27.5	32.7	5.2				
	Total	N	90	91	97	26	2.19	.961		
		%	29.6	29.9	31.9	8.6				
17 I exercise regularly	boys	N	18	46	51	36	2.70	.966	4	Medium
		%	11.9	30.5	33.8	23.8				
	girls	N	42	73	25	13	2.06	.883		
		%	27.5	47.7	16.3	8.5				
	Total	N	60	119	76	49	2.38	.977		
		%	19.7	39.3	25.3	16				
18 I avoid eating unhealthy food	boys	N	33	53	51	14	2.30	.916	6	Medium
		%	21.9	35.1	33.8	9.3				
	girls	N	40	72	34	7	2.05	.817		
		%	26.1	47.1	22.2	4.6				
	Total	N	73	125	85	21	2.18	.876		
		%	24.0	41.1	28.0	6.9				
19 Before eating, I spend a moment to pay attention to food's shape and colour and smell its fragrance	boys	N	39	36	31	45	2.54	1.170	3	High
		%	25.8	23.8	20.5	29.8				
	girls	N	19	25	42	66	3.00	1.076		
		%	12.4	16.3	27.5	43.1				
	Total	N	58	61	73	111	2.77	1.145		
		%	19.1	20.1	24.0	36.5				
20 I notice the flavours in	boys	N	17	32	49	53	2.91	1.006	1	High
		%	11.3	21.2	32.5	35.1				

Statement	Response level		Never	Little	Sometimes	Usually	Mean ranking	Standard deviation	Order of the statement	Response level
the food while eating it.	girls	N	15	32	44	62	3.00	1.007		
		%	9.8	20.9	28.8	40.5				
	Total	N	32	64	93	115	2.96	1.006		
		%	10.5	21.1	30.6	37.8				
21 I read the food calories when I choose food.	boys	N	96	28	16	11	1.62	.944	9	Poor
		%	63.6	18.5	10.6	7.3				
	girls	N	100	25	20	8	1.58	.908		
		%	65.4	16.3	13.1	5.2				
	Total	N	196	53	36	19	1.60	.925		
		%	64.5	17.4	11.8	6.3				
22 I consume large quantities of food in a short period of time.	boys	N	59	39	37	16	2.07	1.031	8	Medium
		%	39.1	25.8	24.5	10.6				
	girls	N	58	35	42	18	2.13	1.056		
		%	37.9	22.9	27.5	11.8				
	Total	N	117	74	79	34	2.10	1.042		
		%	38.5	24.3	26.0	11.2				
23 When I do a good job, my parents reward me with food	boys	N	77	23	38	13	1.91	1.052	7	Medium
		%	51	15.2	25.2	8.6				
	girls	N	38	38	63	14	2.35	.955		
		%	24.8	24.8	41.2	9.2				
	Total	N	115	61	101	27	2.13	1.026		
		%	37.8	20.1	33.2	8.9				
<b>Total arithmetic mean for "adolescent eating behaviours"</b>							2.341	.983	---	Medium

## Appendix 10

### Axis II: Emotional Eating Level

Statement	Response level				Mean ranking	Standard deviation	Order of the statement	Response level				
	Never	Little	Sometimes	Usually								
24 Pressure or anxiety makes me eat more food.	Boys	N	85	25	29	12	1.79	1.071				
		%	56.3	16.6	19.2	7.9						
	Girls	N	44	33	49	27			2.39	1.083		
		%	28.8	21.6	32.0	17.6						
	Total	N	129	58	78	39					2.09	1.091
		%	42.4	19.1	25.7	12.8						
25 I eat even when I'm not hungry.	Boys	N	56	40	35	20	2.13	1.060				
		%	37.1	26.5	23.2	13.2						
	Girls	N	40	49	42	22			2.30	1.014		
		%	26.1	32.0	27.5	14.4						
	Total	N	96	89	77	42					2.21	1.039
		%	31.6	29.3	25.3	13.8						
26 I eat food to feel better when I'm sad, worried, bored, etc..	boys	N	67	21	44	19	2.10	1.112				
		%	44.4	13.9	29.1	12.6						
	Girls	N	36	37	40	40			2.55	1.118		
		%	23.5	24.2	26.1	26.1						
	Total	N	103	58	84	59					2.33	1.136
		%	33.9	19.1	27.6	19.4						
27 I reward myself by eating.	Boys	N	54	30	47	19	2.21	1.070				
		%	36.0	20.0	31.3	12.7						
	Girls	N	30	39	53	31			2.56	1.060		
		%	19.6	25.5	34.6	20.3						
	Total	N	84	69	100	50					2.38	1.060
		%	27.7	22.8	33.0	16.5						
28 I constantly eat to feel happy, even when I am not hungry.	Boys	N	75	37	26	13	1.85	.998				
		%	49.7	24.5	17.2	8.6						
	Girls	N	44	42	39	27			2.32	1.077		
		%	28.9	27.6	25.7	17.8						
	Total	N	119	79	65	40					2.09	1.064
		%	39.3	26.1	21.5	13.2						
29 I eat to feel safe.	Boys	N	68	38	25	20	1.98	1.074				
		%	45.0	25.2	16.6	13.2						
	Girls	N	48	47	37	21			2.20	1.035		
		%										

		%	31.4	30.7	24.2	13.7				
	Total	N	116	85	62	41	2.09	1.058		
		%	38.2	28.0	20.4	13.5				
30	Boys	N	55	40	32	24	2.17	1.092		
		%	36.4	26.5	21.2	15.9				
	Girls	N	47	42	47	17	2.22	1.008	4	
		%	30.7	27.5	30.7	11.1			Medium	
	Total	N	102	82	79	41	2.19	1.049		
		%	33.6	27.0	26.0	13.5				
<b>Total arithmetic of mean "emotional factors to eat"</b>							2.197	1.071	---	Medium

## Appendix 11

### Axis III: Emotional (Psychological) Factors for Eating

Statement	Response level				Mean ranking	standard deviation	Order of the statement	Response level
	Never	Little	Sometimes	Usually				
31 When I am feeling "down" a little snack will lift my mood.	Boys	N	50	49	31	21	4	Medium
		%	33.1	32.5	20.5	13.9		
	Girls	N	26	44	45	38		
		%	17.0	28.8	29.4	24.8		
	Total	N	76	93	76	59		
		%	25.0	30.6	25.0	19.4		
32 When I'm down I have more desire to eat.	Boys	N	77	38	25	11	9	Medium
		%	51.0	25.2	16.6	7.3		
	Girls	N	48	35	45	25		
		%	31.4	22.9	29.4	16.3		
	Total	N	125	73	70	36		
		%	41.1	24.0	23.0	11.8		
33 When I am pressured or working under a deadline I have the urge to snack.	Boys	N	58	41	41	11	8	Medium
		%	38.4	27.2	27.2	7.3		
	Girls	N	53	47	33	20		
		%	34.6	30.7	21.6	13.1		
	Total	N	111	88	74	31		
		%	36.5	28.9	24.3	10.2		
34 I eat more when I am stressed, worried or afraid than when I am calm.	Boys	N	88	32	24	7	11	Medium
		%	58.3	21.2	15.9	4.6		
	Girls	N	62	46	29	16		
		%	40.5	30.1	19.0	10.5		
	Total	N	150	78	53	23		
		%	49.3	25.7	17.4	7.6		
35 When I am irritated, I eat more.	Boys	N	100	22	21	8	12	Poor
		%	66.2	14.6	13.9	5.3		
	Girls	N	72	39	30	12		
		%	47.1	25.5	19.6	7.8		
	Total	N	172	61	51	20		
		%	56.6	20.1	16.8	6.67		
36 When I get	Boys	N	73	39	23	16	10	Medium
		%	48.3	25.8	15.2	10.6		

Statement	Response level						Mean ranking	standard deviation	Order of the statement	Response level
		Never	Little	Sometimes	Usually					
angry, eating will make me feel better.	Girls	N	54	44	37	18	2.12	1.028		
		%	35.3	28.8	24.2	11.8				
	Total	N	127	83	60	34	2.00	1.032		
		%	41.8	27.3	19.7	11.2				
37 I eat more than usual when I am bored.	Boys	N	64	32	30	25	2.11	1.132	7	Medium
		%	42.4	21.2	19.9	16.6				
	Girls	N	43	51	30	29	2.29	1.075		
		%	28.2	33.3	19.6	19.0				
	Total	N	107	83	60	54	2.20	1.106		
		%	35.2	27.3	19.7	17.8				
38 Eating makes me feel better when I am bored.	Boys	N	47	40	37	27	2.29	1.093	3	Medium
		%	31.1	26.5	24.5	17.9				
	Girls	N	30	54	34	34	2.67	2.680		
		%	19.6	35.3	22.2	22.2				
	Total	N	77	94	71	61	2.48	2.057		
		%	25.3	30.9	23.4	20.13				
39 When I am alone my appetite is increased and then I eat more.	Boys	N	55	44	30	22	2.13	1.066	6	Medium
		%	36.4	29.1	19.9	14.6				
	Girls	N	47	36	38	32	2.36	1.127		
		%	30.7	23.5	24.8	20.9				
	Total	N	102	80	68	54	2.24	1.102		
		%	33.6	26.3	22.4	17.8				
40 I eat less when other people are around.	Boys	N	35	47	33	36	2.46	1.094	2	High
		%	23.2	31.1	21.9	23.8				
	Girls	N	31	33	45	44	2.67	1.100		
		%	20.3	21.6	29.4	28.8				
	Total	N	66	80	78	80	2.57	1.100		
		%	21.7	26.3	25.7	26.3				
41 If I'm feeling really good, I don't worry about the type or quantity of food I eat.	Boys	N	53	39	25	34	2.26	1.164	5	Medium
		%	35.1	25.2	16.1	22.5				
	Girls	N	37	45	34	37	2.46	1.106		
		%	24.2	29.4	22.2	24.2				
	Total	N	90	84	59	71	2.37	1.138		
		%	29.6	27.6	19.4	23.4				

Statement	Response level				Mean ranking	standard deviation	Order of the statement	Response level
	Never	Little	Sometimes	Usually				
42 When I'm happy, having a favourite snack makes me feel even better.	Boys	N	27	19	39	66	2.95	1.133
		%	17.9	12.6	25.8	43.7		
	Girls	N	23	25	24	81	3.07	1.139
		%	15.0	16.3	15.7	52.9		
	Total	N	50	44	63	147	3.01	1.136
		%	16.4	14.5	20.7	48.4		
<b>Total arithmetic mean for "psychological, personal, social and cultural factors to eat"</b>					2.240	660.	---	Medium