

*Educating health care professionals on the importance of proper diets. An online course on nutrition, health and sustainability*

Article

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1 Educating health care professionals on the importance of proper diets. An online course on  
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35 **Abstract**

36 The majority of university curricula for health professionals does not incorporate courses on  
37 human nutrition and its links with human and planetary health. This primarily applies to  
38 medical and pharmacy students, who have important counseling roles and are at the  
39 forefront of public health. To address this important issue, EIT Food recently launched an  
40 online course on nutrition, health, and sustainability. Learners were able to provide feedback  
41 on the course through an end-of-course survey and social interaction on the FutureLearn  
42 platform. The course was very well attended worldwide and received positive feedback from  
43 learners. A total of 3,858 students enrolled in the program, from >20 countries. Learners  
44 reported inadequate training on nutrition in their own curriculum and indicated they would  
45 use key insights from the course to inform their own practice. This report provides insights  
46 from the course, which could be used as guidance for future initiatives.

47

48 **Keywords:** nutrition; education; food sustainability; health; micronutrients; micronutrients;  
49 public health

50

## 51 **Introduction**

52 A healthy diet is the best predictor of a long healthy life expectancy and, conversely,  
53 when inadequate and/or improper is a prognosticator of a sharply curtailed expectancy  
54 (Kalache et al. 2021). Indeed, some reports place improper diets and lack of physical  
55 exercise as the second risk factor of all-cause mortality (Mokdad et al. 2004; Kris-Etherton,  
56 Petersen, Despres, Braun, et al. 2021). Therefore, it is very important for healthcare  
57 professionals to have an awareness to engage with patients who might have anecdotal  
58 evidence.

59 Nutrition science is complex. Unlike pharmacology, the effects of food and food  
60 component are relatively small and become visible after years of exposure (Visioli 2012).  
61 Also, it is almost impossible to perform randomized controlled trials of food items and to use  
62 placebos, not to mention controlling for seasonality variations of foods nutrition composition  
63 and accounting for the impact of the food matrix on potential health effects. All these  
64 difficulties notwithstanding, some guidelines are being formulated and public health bodies  
65 are at work to implement them (Kris-Etherton, Petersen, Despres, Anderson, et al. 2021).

66 Moreover, a large proportion of the world population is 'over fed and under nourished',  
67 i.e., caloric/energy excess and lack of essential nutrients. This can lead to health  
68 deficiencies, rapidly increasing global obesity rates, excess chronic diseases, and  
69 premature mortality (Willett et al. 2019; Kalache et al. 2021).

70 In addition to the aforementioned, it should be highlighted that food insecurity remains  
71 a matter of concern worldwide (Norris et al. 2021; FAO 2021). Yet, the prevalence of poverty  
72 and extreme poverty in the global population is slowly declining (Roser and Ortiz-Ospina  
73 2013; World Bank 2020). Parallely, the world population is continually increasing (Food and  
74 Agriculture Organization of the United Nations 2017). Both these facts concomitantly mean  
75 that more people need access to food, whose production must increase to match the  
76 demand (Hemrich 2020; FAO 2021). Unfortunately, this leads to over exploitation of

77 resources, e.g. overfishing, land impoverishment, overly large use of pesticides and  
78 herbicides, and land grabbing just to name a few (Willett et al. 2019).

79 In this scenario, it is surprising that most university curricula for health professionals  
80 worldwide omit teaching on human nutrition and its links with human and planetary health  
81 (Kahan and Manson 2017; Ball, Hughes, and Leveritt 2010; Devries et al. 2014). This is  
82 significant for medical and pharmacy students, who have important counseling roles and  
83 are at the forefront of public health and facilitators of behavior change.

84 To address the knowledge gap, the European Institute of Innovation and Technology  
85 (EIT) Food recently launched an online course on nutrition, health, and sustainability. The  
86 aim of this report is to describe the results the course, which can be used as guidance for  
87 future initiatives. In particular, we report how many students accessed the course, what was  
88 their feedback and how fixing weaknesses will further strengthen future similar initiatives.

89

## 90 **Methods**

91 In 2020, EIT Food convened a group of experts participating in the European  
92 Knowledge and Innovation Community (KIC) network. Acknowledging the lack of education  
93 on human nutrition pervasive of global tertiary education, the initiative was launched to  
94 prepare a three-week course encompassing key aspects of human nutrition, including  
95 sustainability of future food systems and diets.

96 The overarching goal of the course, as seen by its structure, are: a) to learn the  
97 fundamentals of nutrition; b) to gain insights on the importance of macro and micronutrients;  
98 and c) to address the nutritional needs through life, how they evolve and facilitate behaviour  
99 change. All enclosed in a sustainability framework to underscore the interconnection of food  
100 at many levels : social, societal, and environmental.

101 Several meetings were held online and the final version of the course – called  
102 Nutrition, Health, and Sustainability (NHS) - was agreed upon on 25 September 2020. We

103 used the FutureLearn platform and ran a first, two-week release of the course from 30  
104 November 2020 to 23 January 2021. The course was advertised via the International  
105 Federation of Medical Students Associations, social networks and by snowball  
106 advertisement, using the teachers' contacts and participating universities' networks.  
107 Participation in the first edition of the course was limited to medical students.

108 Following the positive feedback that was received (e.g., course feedback and  
109 reviews, online interactions with the attendees, direct exchange in the Q&A board), we  
110 further improved the course and expanded it to a three-week program. Three more editions  
111 were then launched (from 19 July 2021 to 19 September 2021 Run 1, then from 18 October  
112 2021 to 2 January 2022 Run 2, and from 4 April 2022 to 31 December 2022), of which the  
113 second featured a collaboration with FOR9A (aka Forsa), a platform connecting young  
114 people across the Middle East and North Africa with educational and professional  
115 opportunities worldwide.

116 The syllabus included a variety of topics such as, e.g. the role of diet on health and  
117 disease, society (dietary trends, cultural importance of food, etc.), diet composition (macro-  
118 and micronutrients), diet and non-communicable diseases, nutrition guidelines, diet and  
119 food systems, and the relation between healthy diets and the environment.

120 The total cost was 60K EUR over 3 years including staff costs,  
121 travel/subsistence/accommodation, and marketing. The complete course can be found (and  
122 accessed) [here](#). Note that a final knowledge test (if successfully completed) grants students  
123 a certificate of completion. The course is available in English and Spanish.

124

## 125 **Results**

126 A total of 5,523 (as of 11th July 2022) students enrolled in the program. In terms of  
127 country distribution, Egypt and the United Kingdom were the countries with the majority of  
128 attendees, accounting for 12.78% and 12.54%, respectively (Table). Twenty-five percent of



129 participants declared being medical students and 21% as medical/healthcare professionals,  
130 although the course was open to students of any background.

131 Seventy-two percent of students were females, 27.6% were males, and 0.4%  
132 nonbinary (Figure). Nearly 23% of learners declared to be employed full time, 15.6% were  
133 working part time, and 16% were retired (Figure). Most, i.e. 22.6% of students reported to  
134 be in the 18-25 age group and 18.5% were older, i.e. 26-35 (Figure).

135 Key feedback from participants confirmed that nutrition and food are scarcely  
136 addressed in the core curriculum around the globe, with responses indicating a content of  
137 2-8 hours typically. This figure does not include biochemistry, physiology, and other  
138 technical content regarding the uptake of nutrients in the body, but rather the number of  
139 hours focused on the role of food and healthy nutrition in the context of a healthy lifestyle  
140 and as a possible pathway for the treatment of typical food-related non-communicable  
141 diseases.

142 Learners were encouraged to engage in conversations throughout the course (see  
143 Supplementary File 2 for examples). Of note, 59% of students declared that the course  
144 exceeded their expectations, whereas another 37% was fully satisfied with the NHS course.  
145 Further, 93% of participants stated that they gained knowledge. From a medical training  
146 viewpoint, it is worth underscoring that 74% of participants **stated that they** immediately  
147 applied the information learned right after completing the course.

148 The participants also provided key insights through the social interaction of learners on  
149 the FutureLearn platform. They reported multiple uses of the content, namely: a) To inform  
150 their own practices as a consumer, both to improve their own health and to live more  
151 sustainably; b) To inform their practice in engaging with potential patients, both in supporting  
152 healthier lifestyles and as an additional potential treatment pathway for certain diseases; or  
153 c) To inform community-based and public health advice, towards both healthier populations  
154 and more sustainable communities.

155

156 **Discussion**

157 Proper training on human nutrition, the past, present, and future of diets, and the  
158 effects of what we eat on the environment, are predominantly absent from medical schools'  
159 and other health professionals' curricula. This is unfortunate because a) the lay public and,  
160 hence, patients are very interested in the health effects of what they eat and b) balanced  
161 diets lessen the burden of non-transmissible diseases and contribute to health span (Willett  
162 et al. 2019). There is no rapid solution to this issue because it would take many years to  
163 change educational programs worldwide. Nonetheless, web-based platforms now allow for  
164 relatively easy access to very large number of academic courses.

165 EIT Food convened a group of experts and used an online educational platform to  
166 reach out to interested students worldwide. Our experience indicated the success of this  
167 initiative, which can be replicated by other suitable scholarly bodies. This is important from  
168 an educational perspective in that it suggest that online teaching – if carefully crafted and  
169 supervised - can bring about tangible results in a short timeframe.

170 The success of the course is testified by the numerous positive feedbacks that were  
171 posted by a variety of students (see examples in Supplementary File 1). Some negative  
172 comments (Supplementary File 1) helped the organizer fine-tune later runs.

173 One issue that became apparent from reading some commentaries is that of regional  
174 differences. To address it, we tried to provide guidelines from different regions when national  
175 dietary guidelines were discussed and participants were stimulated to lookup the guidelines  
176 from their respective country and engage in discussion about the similarities and differences.

177 There are at least three advantages associated with using an online platform. The  
178 first, obvious one is that the course can be attended by a very high number of students,  
179 disposing of the need for large auditoriums and associated technical equipment, in the end  
180 abating costs. Another one is that the course is available 24/7 and can be followed by a

181 diverse cohort, e.g. working students (Figure). Finally, the course can be rapidly modulated  
182 based on feedback and can be updated based on the most recent scientific literature. The  
183 major drawbacks are probably a) the need for students to have access to internet (which,  
184 alas, is problematic in many areas of the world); b) to be proficient in English or Spanish and  
185 to be internet-savvy; and c) the absence of face-to-face interactions with teachers, which  
186 has been an important part of education since Aristoteles and his Peripatetics. However, it  
187 is very likely that future, digital native generations will be able to access wide-band  
188 connections, virtual reality tools, and many other innovations we can only imagine to  
189 facilitate their learning. In the long-term, our course maybe helpful to improve the public  
190 health nutrition and reduce hospital economic burden via general practitioner/medical  
191 service (fostering lifestyle interventions and becoming agents of change).

192 In conclusion, we built and ran a successful international online course on nutrition,  
193 health, and sustainability. We hope that other educational bodies will follow this example  
194 and implement other courses with the ultimate goal of filling gaps in schooling, especially  
195 higher education.

196

#### 197 **Declaration of interest**

198 The authors declare no conflict of interest associated with this paper.

199

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251

## 252 Figure legend

253 Figure. Distribution by gender (Panel A), employment status (Panel B), and age (Panel C).

254 Data are percentages

255 **Supplementary File 1**

256 Examples of students' feedbacks. Comments were anonymized to comply with the  
257 General Data Protection Regulation law (Regulation (EU) 2016/679 of the European  
258 Parliament and of the Council).

259

260 **Supplementary File 1**

261 Examples of discussion prompts.

262

263  
264

**Table. Enrolments by country (top 15)**

<b>Country</b>	<b>Enrolments</b>
United Kingdom	518
Egypt	496
Algeria	217
Saudi Arabia	194
Morocco	158
Jordan	153
Australia	122
Netherlands	113
India	106
Iraq	105
Italy	84
United States of America	83
Spain	78
Turkey	63
Palestine	55

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266