

A review of nutritional requirements for adults aged ≥ 65 years in the UK

Article

Supplemental Material

Dorrington, N., Fallaize, R., Hobbs, D. A., Weech, M. ORCID: <https://orcid.org/0000-0003-1738-877X> and Lovegrove, J. A. ORCID: <https://orcid.org/0000-0001-7633-9455> (2020) A review of nutritional requirements for adults aged ≥ 65 years in the UK. *Journal of Nutrition*, 150 (9). pp. 2245-2256. ISSN 1541-6100 doi: 10.1093/jn/nxaa153 Available at <https://centaur.reading.ac.uk/95845/>

It is advisable to refer to the publisher's version if you intend to cite from the work. See [Guidance on citing](#).

To link to this article DOI: <http://dx.doi.org/10.1093/jn/nxaa153>

Publisher: American Society for Nutrition

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the [End User Agreement](#).

www.reading.ac.uk/centaur

CentAUR

Central Archive at the University of Reading

Reading's research outputs online

A review of nutritional requirements for adults aged ≥ 65 y in the UK.

Dorrington, Online Supplementary Material.

Supplemental references

1. Scientific Advisory Committee on Nutrition. Carbohydrates and health. London, UK: TSO, 2015.
2. Committee on Medical Aspects of Food Policy. Dietary reference values for food energy and nutrients for the United Kingdom. London, UK: HMSO Publications; 1991.
3. Scientific Advisory Committee on Nutrition. Saturated fats and health. [Internet]. 2019. Available from: <https://www.gov.uk/government/publications/saturated-fats-and-health-sacn-report> (accessed 7th April 2020).
4. Scientific Advisory Committee on Nutrition. Update on trans fatty acids and health. London, UK: TSO, 2007.
5. Scientific Advisory Committee on Nutrition. Advice on fish consumption: Benefits & risks. London, UK: TSO, 2004.
6. Scientific Advisory Committee on Nutrition. Salt and health. London, UK: TSO, 2003.
7. Expert Group on Vitamins and Minerals. Safe Upper Levels for Vitamins and Minerals. London, UK: Food Standards Agency, 2003.
8. Scientific Advisory Committee on Nutrition. Vitamin D and Health. [Internet]. 2016. Available from: <https://www.gov.uk/government/publications/sacn-vitamin-d-and-health-report> (accessed 15th September 2017).
9. Scientific Advisory Committee on Nutrition. Folate and disease prevention. London, UK: TSO, 2006.
10. UK Chief Medical Officer. Low risk drinking guidelines. [Internet]. 2016. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/545937/UK_CMOs_report.pdf (accessed 20th September 2017).
11. Public Health England. The Eatwell guide. Helping you eat a healthy, balanced diet. [Internet]. 2016. Available from: <https://www.gov.uk/government/publications/the-eatwell-guide> (accessed 20th September 2017).
12. Fukagawa NK, Anderson JW, Hageman G, Young VR, Minaker KL. High-carbohydrate, high-fiber diets increase peripheral insulin sensitivity in healthy young and old adults. *Am J Clin Nutr* 1990;52(3):524-8.
13. Gopinath B, Flood VM, Burlutsky G, Liew G, Mitchell P. Carbohydrate nutrition variables and risk of disability in instrumental activities of daily living. *European J Nutr* 2019;58(8):3221-8.
14. García-Gavilán JF, Bulló M, Camacho-Barcia L, Rosique-Esteban N, Hernández-Alonso P, Basora J, Martínez-González MA, Estruch R, Fitó M, Salas-Salvadó J. Higher dietary glycemic index and glycemic load values increase the risk of osteoporotic fracture in the PREvencion con Dieta MEDiterranea (PREDIMED)-Reus trial. *American Journal of Clinical Nutrition*. 2018;107(6):1035-42.

15. Feskens EJ, Bowles CH, Kromhout D. Carbohydrate intake and body mass index in relation to the risk of glucose intolerance in an elderly population. *Am J Clin Nutr* 1991;54(1):136-40.
16. Sahyoun NR, Jacques PF, Zhang XL, Juan W, McKeown NM. Whole-grain intake is inversely associated with the metabolic syndrome and mortality in older adults. *Am J Clin Nutr* 2006;83(1):124-31.
17. Sjögren P, Becker W, Warensjö E, Olsson E, Byberg L, Gustafsson I-B, Kalström B, Cederholm T. Mediterranean and carbohydrate-restricted diets and mortality among elderly men: A cohort study in Sweden. *Am J Clin Nutr* 2010;92(4):967-74.
18. Garcia GV, Freeman RV, Supiano MA, Smith MJ, Galecki AT, Halter JB. Glucose metabolism in older adults: a study including subjects more than 80 years of age. *J Am Geriatr Soc* 1997;45(7):813-7.
19. Taylor MK, Sullivan DK, Swerdlow RH, Vidoni ED, Morris JK, Mahnken JD, Burns JM. A high-glycemic diet is associated with cerebral amyloid burden in cognitively normal older adults. *Am J Clin Nutr* 2017;106(6):1463-70.
20. Laclaustra M, Rodriguez-Artalejo F, Guallar-Castillon P, Banegas JR, Graciani A, Garcia-Esquinas E, Ordovas J, Lopez-Garcia E. Prospective association between added sugars and frailty in older adults. *Am J Clin Nutr* 2018;107(5):772-9.
21. Charlton KE, Wolmarans P, Lombard CJ. Evidence of nutrient dilution with high sugar intakes in older South Africans. *J Human Nutr Diet* 1998;11(4):331-43.
22. Gibson S. Dietary sugars and micronutrient dilution in normal adults aged 65 years and over. *Public Health Nutr* 2001;4(6):1235-44.
23. Chai SC, Davis K, Wright RS, Pohlig R, Saltzgiver J, Caulfield A, Falk D. Added sugars in the diet are positively associated with mean arterial pressure and systolic blood pressure in older adults. *FASEB J* 2016;30(1_supplement).
24. Moshtaghian H, Louie JC, Charlton KE, Probst YC, Gopinath B, Mitchell P, Flood VM. Added sugar intake that exceeds current recommendations is associated with nutrient dilution in older Australians. *Nutrition* 2016;32(9):937-42.
25. Mansoori S, Kushner N, Suminski RR, Farquhar WB, Chai SC. Added sugar intake is associated with blood pressure in older females. *Nutrients* 2019;11(9).
26. Mozaffarian D, Kumanyika SK, Lemaitre RN, Olson JL, Burke GL, Siscovick DS. Cereal, fruit, and vegetable fiber intake and the risk of cardiovascular disease in elderly individuals. *JAMA* 2003;289(13):1659-66.
27. Fernando WMADB, Rainey-Smith SR, Gardener SL, Villemagne VL, Burnham SC, Macaulay SL, Brown BM, Bala Gupta V, Sohrabi HR, Weinborn M, et al. Associations of dietary protein and fiber intake with brain and blood amyloid-beta. *J Alzheimers Dis* 2018;61(4):1589-98.
28. Alam S, Purdie DM, Johnson AG. Evaluation of the potential interaction between NaCl and prostaglandin inhibition in elderly individuals with isolated systolic hypertension. *J Hypertens* 1999;17(8):1195-202.

29. Scientific Advisory Committee on Nutrition, Committee on Toxicity. Potassium-based sodium replacers: Assessment of the health benefits and risks of using potassium-based sodium replacers in foods in the UK. [Internet]. 2017. Available from: <https://www.gov.uk/government/publications/sacn-cot-statements-on-potassium-based-sodium-replacers> (accessed 1st December 2017).
30. Kalogeropoulos AP, Georgiopoulou VV, Murphy RA, Newman AB, Bauer DC, Harris TB, Yang Z, Applegate WB, Kritchevsky SB. Dietary sodium content, mortality, and risk for cardiovascular events in older adults: The Health, Aging, and Body Composition (Health ABC) Study. *JAMA* 2015;175(3):410-9.
31. Nowak KL, Fried L, Jovanovich A, Ix J, Yaffe K, You ZY, You Z, Chonchol M. Dietary sodium/potassium intake does not affect cognitive function or brain imaging indices. *Am J Nephrol* 2018;47(1):57-65.
32. Gezmen-Karadag M, Bilici S, Acar-Tek N, Yildiran H, Akbulut G, Koksall E, Sanlier N. Relationship between dietary mineral intake and blood pressure (BP) in the elderly in Turkey. *Arch Gerontol Geriatr* 2012;55(1):106-11.
33. Mazza E, Ferro Y, Lamprinouidi T, Gazzaruso C, Doldo P, Pujia A, Montalcini T. Relationship between high sodium and low PUFA intake and carotid atherosclerosis in elderly women. *Exp Gerontol* 2018;108:256-61.
34. Mendes J, Padrão P, Moreira P, Santos A, Borges N, Afonso C, Negrão R, Amaral TF. Handgrip strength and its association with hydration status and urinary sodium-to-potassium ratio in older adults. *J Am Coll Nutr* 2019; doi: 10.1080/07315724.2019.1633439.
35. Tucker KL, Hannan MT, Chen H, Cupples LA, Wilson PW, Kiel DP. Potassium, magnesium and fruit and vegetable intakes are associated with greater bone mineral density in elderly men and women. *Am J Clin Nutr* 1999;69(4):727-36.
36. Zhu K, Devine A, Prince RL. The effects of high potassium consumption on bone mineral density in a prospective cohort study of elderly postmenopausal women. *Osteoporosis Int* 2009;20(2):335-40.
37. McGill CR, Fulgoni VL, DiRienzo D, Huth PJ, Kurilich AC, Miller GD. Contribution of dairy products to dietary potassium intake in the United States population. *J Am Coll Nutr* 2008;27(1):44-50.
38. van Dronkelaar C, van Velzen A, Abdelrazek M, van der Steen A, Weijs PJM, Tieland M. Minerals and sarcopenia; The role of calcium, iron, magnesium, phosphorous, potassium, selenium, sodium, and zinc on muscle mass, muscle strength, and physical performance in older adults: A systematic review. *J Am Medl Dir Assoc.* 2018;19(1):6-11.
39. Doyle W, Crawley H, Robert H, Bates CJ. Iron deficiency in older people: Interactions between food and nutrient intakes with biochemical measures of iron; Further analysis of the National Diet and Nutrition Survey of people aged 65 years and over. *Eur J Clin Nutr* 1999;53(7):552-9.

40. Fleming DJ, Tucker KL, Jacques PF, Dallal GE, Wilson PWF, Wood RJ. Dietary factors associated with the risk of high iron stores in the elderly Framingham Heart Study cohort. *Am J Clin Nutr* 2002;76(6):1375-84.
41. Yavuz BB, Cankurtaran M, Haznedaroglu IC, Halil M, Ulger Z, Altun B, Ariogul S. Iron deficiency can cause cognitive impairment in geriatric patients. *J Nutr Health Aging* 2012;16(3):220-4.
42. Li SY, Sun WJ, Zhang DF. Association of zinc, iron, copper, and selenium intakes with low cognitive performance in older adults: A cross-sectional study from National Health and Nutrition Examination Survey (NHANES). *J Alzheimers Dis* 2019;72(4):1145-57.
43. Vishwanathan R, Chung M, Johnson EJ. A systematic review on zinc for the prevention and treatment of age-related macular degeneration. *Invest Ophthalmol Vis Sci* 2013;54(6):3985-98.
44. Costarelli L, Giacconi R, Malavolta M, Basso A, Piacenza F, DeMartini M, Giannandrea E, Renieri C, Busco F, Galeazzi R, et al. Effects of zinc-fortified drinking skimmed milk (as functional food) on cytokine release and thymic hormone activity in very old persons: a pilot study. *Age* 2014;36(3):1421-31.
45. Couzy F, Kastenmayer P, Mansourian R, Guinchard S, Munoz-Box, R, Dirren H. Zinc absorption in healthy elderly humans and the effect of diet. *Am J Clin Nutr* 1993;58(5):690-4.
46. Couzy F, Mansourian R, Labate A, Guinchard S, Montagne DH, Dirren H. Effect of dietary phytic acid on zinc absorption in the healthy elderly, as assessed by serum concentration curve tests. *Br J Nutr* 1998;80(2):177-82.
47. Borel P, Mekki N, Boirie Y, Partier A, Alexandre-Gouabau MC, Grolier P, Beaufrere B, Portugal H, Lairon D, Azais-Braesco V. Comparison of the postprandial plasma vitamin A response in young and older adults. *J Gerontol A Biol Sci Med Sci* 1998;53(2):B133-40.
48. Feskanich D, Singh V, Willett WC, Colditz GA. Vitamin A intake and hip fractures among postmenopausal women. *JAMA* 2002;287(1):47-54.
49. Min KB, Min JY. Relation of serum vitamin A levels to all-cause and cause-specific mortality among older adults in the NHANES III population. *Nutr Metab Cardiovasc Dis* 2014;24(11):1197-203.
50. de Jonge EAL, Kieft-de Jong JC, Campos-Obando N, Booij L, Franco OH, Hofman A, Uitterlinden AG, Rivadeneira F, Zillikens MC. Dietary vitamin A intake and bone health in the elderly: The Rotterdam Study. *Eur J Clin Nutr* 2015;69:1360-1368.
51. Balboa-Castillo T, Struijk EA, Lopez-Garcia E, Banegas JR, Rodriguez-Artalejo F, Guallar-Castillon P. Low vitamin intake is associated with risk of frailty in older adults. *Age Ageing* 2018;47(6):872-9.
52. Sahyoun NR, Jacques PF, Russell RM. Carotenoids, vitamins C and E, and mortality in an elderly population. *Am J Epidemiol* 1996;144(5):501-11.
53. Paleologos M, Cumming RG, Lazarus R. Cohort study of vitamin C intake and cognitive impairment. *Am J Epidemiol* 1998;148:45-50.
54. Wengreen HJ, Munger RG, Corcoran CD, Zandi P, Hayden KM, Fotuhi M, Skoog I, Norton MC, Tschann J, Breitner JC, et al. Antioxidant intake and cognitive function of elderly men and women: The Cache County Study. *J Nutr Health Aging* 2007;11(3):230-7.

55. Sahni S, Hannan MT, Gagnon D, Blumberg J, Cupples LA, Kiel DP, Tucker KL. High vitamin C intake is associated with lower 4-year bone loss in elderly men. *J Nutr* 2008;138(10):1931-8.
56. Sahni S, Hannan MT, Gagnon D, Blumberg J, Cupples LA, Kiel DP, Tucker KL. Protective effect of total and supplemental vitamin C intake on the risk of hip fracture – a 17-year follow-up from the Framingham Osteoporosis Study. *Osteoporos Int* 2009;20(11):1853-61.
57. Prynne CJ, D Mishra G, O'Connell MA, Muniz G, Laskey MA, Yan LY, Prentice A, Ginty F. Fruit and vegetable intakes and bone mineral status: A cross-sectional study in 5 age and sex cohorts. *Am J Clin Nutr* 2006;83(6):1420-8.
58. Dong Y, Chen X, Liu Y, Shu Y, Chen T, Xu L, Li M, Guan X. Do low-serum vitamin E levels increase the risk of Alzheimer disease in older people? Evidence from a meta-analysis of case-control studies. *Int J Geriatr Psychiatry* 2017;33(2):e257-e263.
59. Mezzetti A, Zuliani G, Romano F, Costantini F, Pierdomenico SD, Cuccurullo F, Fellin R. Vitamin E and lipid peroxide plasma levels predict the risk of cardiovascular events in a group of healthy very old people. *J Am Geriatr Soc* 2001;49(5):533-7.
60. Ortega RM, Requejo AM, Lopez-Sobaler AM, Andres P, Navia B, Perea JM, Robles F. Cognitive function in elderly people is influenced by vitamin E status. *J Nutr* 2002;132(7):2065-8.
61. Ble A, Cherubini A, Volpato S, Bartali B, Walston LD, Windham BG, Bandinelli S, Lauretani F, Guralnik JM, Ferrucci L. Lower plasma Vitamin E levels are associated with the frailty syndrome: The InCHIANTI study. *J Gerontol A Biol Sci Med Sci* 2006;61(3):278-83.
62. Capuron L, Moranis A, Combe N, Cousson-Gelie F, Fuchs D, De Smedt-Peyrusse V, Barberger-Gateau P, Layé S. Vitamin E status and quality of life in the elderly: influence of inflammatory processes. *Br J Nutr* 2009;102(10):1390-4.
63. Bulló M, Estruch R, Salas-Salvado J. Dietary vitamin K intake is associated with bone quantitative ultrasound measurements but not with bone peripheral biochemical markers in elderly men and women. *Bone* 2011;48(6):1313-8.
64. Misra D, Booth SL, Tolstykh I, Felson DT, Nevitt MC, Lewis CE, Torner J, Neogi T. Vitamin K deficiency is associated with incident knee osteoarthritis. *Am J Med* 2013;126(3):243-8.
65. Shea MK, Kritchevsky SB, Hsu FC, Nevitt M, Booth SL, Kwoh CK, McAlindon TE, Vermeer C, Drummen N, Harris TB, et al. The association between vitamin K status and knee osteoarthritis features in older adults: The Health, Aging and Body Composition Study. *Osteoarthritis Cartilage* 2015;23(3):370-8.
66. Shea MK, Loeser RF, Hsu F-C, Booth SL, Nevitt M, Simonsick EM, Strotmeyer ES, Vermeer C, Kritchevsky SB. Vitamin K status and lower extremity function in older adults: The Health Aging and Body Composition Study. *J Gerontol A Biol Sci Med Sci* 2016;71(10):1348-55.
67. van Ballegooijen AJ, van Putten SR, Visser M, Beulens JW, Hoogendijk EO. Vitamin K status and physical decline in older adults-The Longitudinal Aging Study Amsterdam. *Maturitas* 2018;113:73-9.

68. Presse N, Belleville S, Gaudreau P, Greenwood CE, Kergoat M-J, Morais JA, Payette H, Shatenstein B, Ferland G. Vitamin K status and cognitive function in healthy older adults. *Neurobiol Aging* 2013;34(12):2777-83.
69. Chouet J, Ferland G, Feart C, Rolland Y, Presse N, Boucher K, Barberger-Gateau P, Beauchet O, Annweiler C. Dietary vitamin K intake is associated with cognition and behaviour among geriatric patients: The CLIP Study. *Nutrients* 2015;7(8):6739-50.
70. Hooper L, Bunn D, Jimoh FO, Fairweather-Tait SJ. Water-loss dehydration and aging. *Mech Ageing Dev* 2014;136:50-8.
71. Scherer R, Maroto-Sanchez B, Palacios G, Gonzalez-Gross M. Fluid intake and recommendations in older adults: More data are needed. *Nutr Bull* 2016;41(2):167-74.
72. Volkert D, Beck AM, Cederholm T, Cruz-Jentoft A, Goisser S, Hooper L, Kiesswetter E, Maggio M, Raynaud-Simon A, Sieber CC, et al. ESPEN guideline on clinical nutrition and hydration in geriatrics. *Clin Nutr* 2019;38(1):10-47.
73. Bialecka-Debek A, Pietruszka B. The association between hydration status and cognitive function among free-living elderly volunteers. *Aging Clin Exp Res* 2019;31(5):695-703.
74. Katsanos CS, Kobayashi H, Sheffield-Moore M, Aarsland A, Wolfe RR. Aging is associated with diminished accretion of muscle proteins after the ingestion of a small bolus of essential amino acids. *Am J Clin Nutr* 2005;82(5):1065-73.
75. Milan AM, D'Souza RF, Pundir S, Pileggi CA, Thorstensen EB, Barnett MP, Markworth JF, Cameron-Smith D, Mithcell CJ. Older adults have delayed amino acid absorption after a high protein mixed breakfast meal. *J Nutr Health Aging* 2015;19(8):839-45.
76. Rafii M, Chapman K, Elango R, Campbell WW, Ball RO, Pencharz PB, Courtney-Martin G. Dietary protein requirement of men > 65 years old determined by the indicator amino acid oxidation technique is higher than the current estimated average requirement. *J Nutr* 2016;146(4):681-7.
77. Coelho-Junior HJ, Milano-Teixeira L, Rodrigues B, Bacurau R, Marzetti E, Uchida M. Relative protein intake and physical function in older adults: A systematic review and meta-analysis of observational studies. *Nutrients* 2018;10(9).
78. Ottestad I, Løvstad AT, Gjevestad GO, Hamarsland H, Benth JS, Andersen LF, Bye A, Biong AS, Retterstøl, Iversen PO, et al. Intake of a protein-enriched milk and effects on muscle mass and strength. A 12-week randomized placebo controlled trial among community-dwelling older adults. *J Nutr Health Aging*. 2017;21(10):1160-9.
79. Mitchell CJ, Milan AM, Mitchell SM, Zeng N, Ramzan F, Sharma P, Knowles SO, Roy NC, Sjödin A, Wagner K-H, et al. The effects of dietary protein intake on appendicular lean mass and muscle function in elderly men: a 10-wk randomized controlled trial. *Am J Clin Nutr* 2017; 106(6):13375-1383.

80. Kim I-Y, Schutzler S, Schrader AM, Spencer HJ, Azhar G, Wolfe RR, Ferrando AA. Protein intake distribution pattern does not affect anabolic response, lean body mass, muscle strength or function over 8 weeks in older adults: A randomized-controlled trial. *Clin Nutr* 2018; 37(2):488-493.
81. Kim IY, Schutzler S, Schrader A, Spencer H, Kortebein P, Deutz NE, Wolfe RR, Ferrando AA. Quantity of dietary protein intake, but not pattern of intake, affects net protein balance primarily through differences in protein synthesis in older adults. *Am J Physiol Endocrinol Metab* 2015;308(1):E21-8.
82. Houston DK, Nicklas BJ, Ding J, Harris TB, Tylavsky FA, Newman AB, eLee JS, Sahyoun NR, Visser M, Kritchevsky SB. Dietary protein intake is associated with lean mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr* 2008;87(1):150-5.
83. Isanejad M, Mursu J, Sirola J, Kroger H, Rikkinen T, Tuppurainen M, Erkkilä AT. Association of protein intake with the change of lean mass among elderly women: The Osteoporosis Risk Factor and Prevention - Fracture Prevention Study (OSTPRE-FPS). *J Nutr Sci* 2015;4:e41.
84. Farsijani S, Morais JA, Payette H, Gaudreau P, Shatenstein B, Gray-Donald K, Chevalier S. Relation between mealtime distribution of protein intake and lean mass loss in free-living older adults of the NuAge study. *Am J Clin Nutr* 2016;104(3):694-703.
85. Isanejad M, Mursu J, Sirola J, Kroger H, Rikkinen T, Tuppurainen M, Erkkilä AT. Dietary protein intake is associated with better physical function and muscle strength among elderly women. *Br J Nutr* 2016;115(7):1281-91.
86. McDonald CK, Ankarfeldt MZ, Capra S, Bauer J, Raymond K, Heitmann BL. Lean body mass change over 6 years is associated with dietary leucine intake in an older Danish population. *Br J Nutr* 2016;115(9):1556-62.
87. McLean RR, Mangano KM, Hannan MT, Kiel DP, Sahni S. Dietary protein intake is protective against loss of grip strength among older adults in the Framingham Offspring cohort. *J Gerontol A Biol Sci Med Sci* 2016;71(3):356-61.
88. Farsijani S, Payette H, Morais JA, Shatenstein B, Gaudreau P, Chevalier S. Even mealtime distribution of protein intake is associated with greater muscle strength, but not with 3-y physical function decline, in free-living older adults: the Quebec longitudinal study on Nutrition as a determinant of successful aging (NuAge study). *Am J Clin Nutr* 2017;106(1):113-24.
89. Verreijen AM, Engberink MF, Houston DK, Brouwer IA, Cawthon PM, Newman AB, Tylavsky FA, Harris TM, Weijs PJM, Visser M. Dietary protein intake is not associated with 5-y change in mid-thigh muscle cross-sectional area by computed tomography in older adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr* 2019;109(3):535-43.
90. Asp ML, Richardson JR, Collene AL, Droll KR, Belury MA. Dietary protein and beef consumption predict for markers of muscle mass and nutrition status in older adults. *J Nutr Health Aging* 2012;16(9):784-90.

91. Loenneke JP, Loprinzi PD, Murphy CH, Phillips SM. Per meal dose and frequency of protein consumption is associated with lean mass and muscle performance. *Clin Nutr* 2016;35(6):1506-11.
92. Gingrich A, Spiegel A, Kob R, Schoene D, Skurk T, Hauner H, Sieber CC, Volkert D, Kiesswetter E. Amount, distribution, and quality of protein intake are not associated with muscle mass, strength, and power in healthy older adults without functional limitations – An enable study. *Nutrients* 2017;9(12).
93. Alexandrov NV, Eelderink C, Singh-Povel CM, Navis GJ, Bakker SJL, Corpeleijn E. Dietary protein sources and muscle mass over the life course: The Lifelines Cohort Study. *Nutrients* 2018;10(10).
94. ten Haaf DSM, van Dongen EIJ, Nuijten MAH, Eijssvogels TMH, de Groot LCPGM, Hopman MTE. Protein intake and distribution in relation to physical functioning and quality of life in community-dwelling elderly people: Acknowledging the role of physical activity. *Nutrients* 2018;10(4).
95. Coelho-Junior HJ, Calvani R, Gonçalves IO, Rodrigues B, Picca A, Landi F, Bernabei R, Uchida MC, Marzetti E. High relative consumption of vegetable protein is associated with faster walking speed in well-functioning older adults. *Aging Clin Exp Res* 2019;31(6):837-44.
96. Krok-Schoen JL, Price AA, Luo M, Kelly OJ, Taylor CA. Low dietary protein intakes and associated dietary patterns and functional limitations in an aging population: A NHANES analysis. *J Nutr Health Aging* 2019;23(4):338-47.
97. Coelho-Junior HJ, Rodrigues B, Uchida M, Marzetti E. Low protein intake is associated with frailty in older adults: A systematic review and meta-analysis of observational studies. *Nutrients* 2018;10(9).
98. Groenendijk I, den Boeft L, van Loon LJC, de Groot LCPGM. High versus low dietary protein intake and bone health in older adults: A systematic review and meta-analysis. *Comput Struct Biotechnol J* 2019;17:1101-12.
99. Mendonça N, Kingston A, Granic A, Jagger C. Protein intake and transitions between frailty states and to death in very old adults: the Newcastle 85+ study. *Age Ageing* 2020;49(1):32-8.
100. Mendonça N, Granic A, Hill TR, Siervo M, Mathers JC, Kingston A, Jagger C. Protein intake and disability trajectories in very old adults: The Newcastle 85+ Study. *J Am Ger Soc* 2019;67(1):50-6.
101. Ortolá R, Struijk EA, García-Esquinas E, Rodríguez-Artalejo F, Lopez-Garcia E. Changes in dietary intake of animal and vegetable protein and unhealthy aging. *Am J Med* 2020;133(2):231-239.e7.
102. Langsetmo L, Shikany JM, Burghardt AJ, Cawthon PM, Orwoll ES, Cauley JA, Taylor BC, Shousboe JT, Bauer DC, Vo TN, et al. High dairy protein intake is associated with greater bone strength parameters at the distal radius and tibia in older men: A cross-sectional study. *Osteoporos Int* 2018;29(1):69-77.
103. Nilsson A, Rojas DM, Kadi F. Impact of meeting different guidelines for protein intake on muscle mass and physical function in physically active older women, *Nutrients* 2018;10(9).
104. Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE, Morley JE, Phillips S, Sieber C, Stehle P, et al. Evidence-based recommendations for optimal dietary protein intake in older people: A position paper from the PROT-AGE study group. *J Am Med Dir Assoc* 2013;14(8):542-59.

105. Margolin G, Huster G, Glueck CJ, Speirs J, Vandegrift J, Illig E, Wu J, Streicher P, Tracy T. Blood pressure lowering in elderly subjects: a double-blind crossover study of omega-3 and omega-6 fatty acids. *Am J Clin Nutr* 1991;53(2):562-72.
106. Houston DK, Ding J, Lee JS, Garcia M, Kanaya AM, Tylavsky FA, Newman AB, Visser M, Kritchevsky SB. Dietary fat and cholesterol and risk of cardiovascular disease in older adults: The Health ABC Study. *Nutr Metab Cardiovasc Dis* 2011;21(6):430-7.
107. Blekkenhorst LC, Prince RL, Hodgson JM, Lim WH, Zhu K, Devine A, Thompson PL, Lewis JR. Dietary saturated fat intake and atherosclerotic vascular disease mortality in elderly women: a prospective cohort study. *Am J Clin Nutr* 2015;101(6):1263-8.
108. Marklund M, Leander K, Vitström M, Laguzzi F, Gigante B, Sjögren, Cederholm T, de Faire U, Hellénus ML, Risérus U. Polyunsaturated fat intake estimated by circulating biomarkers and risk of cardiovascular disease and all-cause mortality in a population-based cohort of 60-year-old men and women. *Circulation* 2015;132(7):586-94.
109. Lemaitre RN, King IB, Mozaffarian D, Kuller LH, Tracy RP, Siscovick DS. N-3 polyunsaturated fatty acids, fatal ischemic heart disease, and nonfatal myocardial infarction in older adults: The Cardiovascular Health Study. *Am J Clin Nutr* 2003;77(2):319-25.
110. Clarke R, Shipley M, Armitage J, Collins R, Harris W. Plasma phospholipid fatty acids and CHD in older men: Whitehall study of London civil servants. *Br J Nutr* 2009;102(2):279-84.
111. Julibert A, del Mar Bibiloni M, Mateos D, Angullo E, Tur JA. Dietary fat intake and metabolic syndrome in older adults. *Nutrients* 2019;11(8).
112. Alagheband FR, Lankinen M, Värri M, Sirola J, Kröger H, Erkkilä AT. Dietary fatty acids were not independently associated with lipoprotein subclasses in elderly women. *Nutr Res* 2017;43:60-8.
113. Meyer KA, Kushi LH, Jacobs DR, Folsom AR. Dietary fat and incidence of type 2 diabetes in older Iowa women. *Diabetes Care* 2001;24(9):1528-35.
114. Solfrizzi V, Colacicco AM, D'Introno A, Capurso C, Torres F, Rizzo C, et al. Dietary intake of unsaturated fatty acids and age-related cognitive decline: A 8.5-year follow-up of the Italian Longitudinal Study on Aging. *Neurobiol Aging* 2006;27(11):1694-704.
115. Naqvi AZ, Harty B, Mukamal KJ, Stoddard AM, Vitolins M, Dunn JE. Monounsaturated, trans, and saturated fatty acids and cognitive decline in women. *J Am Geriatr Soc* 2011;59(5):837-43.
116. Jayanama K, Theou O, Godin J, Cahill L, Rockwood K. Association of fatty acid consumption with frailty and mortality among middle-aged and older adults. *Nutrition* 2020;70:110610.
117. Martínez-Ramírez MJ, Palma S, Martínez-González MA, Delgado-Martínez AD, de la Fuente C, Delgado-Rodríguez M. Dietary fat intake and the risk of osteoporotic fractures in the elderly. *Eur J Clin Nutr* 2007;61(9):1114-20.
118. Muka T, Blekkenhorst LC, Lewis JR, Prince RL, Erler NS, Hofman A, Franco OH, Rivadeneira F, Fieffe-de Jong JC. Dietary fat composition, total body fat and regional body fat distribution in two Caucasian populations of middle-aged and older adult women. *Clin Nutr* 2017;36(5):1411-9.

119. de Oliveira PA, Kovacs C, Moreira P, Magnoni D, Saleh MH, Faintuch J. Unsaturated fatty acids improve atherosclerosis markers in obese and overweight non-diabetic elderly patients. *Obes Surg* 2017;27(10):2663-71.
120. Polychronopoulos E, Pounis G, Bountziouka V, Zeimbekis A, Tsiligianni I, Qira BE, Gotsis E, Metallinos G, Lionis C, Panagiotakos D. Dietary meat fats and burden of cardiovascular disease risk factors, in the elderly: a report from the MEDIS study. *Lipids Health Dis* 2010;9(1):30.
121. Laguzzi F, Alsharari Z, Riserus U, Vikstrom M, Sjögren P, Gigante B, Hellénius ML, Cederholm T, Bottai M, de Faire U, et al.. Cross-sectional relationships between dietary fat intake and serum cholesterol fatty acids in a Swedish cohort of 60-year-old men and women. *J Hum Nutr Diet* 2016;29(3):325-37.
122. Liu Y, Poon S, Seeman E, Hare DL, Bui M, Iuliano S. Fat from dairy foods and ‘meat’ consumed within recommended levels is associated with favourable serum cholesterol levels in institutionalised older adults. *J Nutr Sci* 2019;8:e10.
123. Bolland MJ, Leung W, Tai V, Bastin S, Gamble GD, Grey A, Reid IR. Calcium intake and risk of fracture: Systematic review. *BMJ* 2015;351:h4580.
124. Dawson-Hughes B, Dallal GE, Krall EA, Sadowski L, Sahyoun N, Tannenbaum S. A controlled trial of the effect of calcium supplementation on bone density in postmenopausal women. *N Engl J Med* 1990;323:878-83.
125. Nieves JW, Barrett-Connor E, Siris ES, Zion M, Barlas S, Chen YT. Calcium and vitamin D intake influence bone mass, but not short-term fracture risk, in Caucasian postmenopausal women from the National Osteoporosis Risk Assessment (NORA) study. *Osteoporosis Int* 2008;19(5):673-9.
126. Warensjö E, Byberg L, Melhus H, Gedeberg R, Mallmin H, Wolk A, Michaëlsson K. Dietary calcium intake and risk of fracture and osteoporosis: prospective longitudinal cohort study. *BMJ* 2011;342:d1473.
127. Samieri C, Coupez VG, Lorrain S, Letenneur L, Alles B, Féart C, Paineau D, Barberger-Gateau P. Nutrient patterns and risk of fracture in older subjects: Results from the Three-City Study. *Osteoporosis Int* 2013;24(4):1295-305.
128. Sahni S, Mangano KM, Kiel DP, Tucker KL, Hannan MT. Dairy intake is protective against bone loss in older vitamin D supplement users: The Framingham Study. *J Nutr* 2017;147(4):645-52.
129. Feskanich D, Meyer HE, Fung TT, Bischoff-Ferrari HA, Willett WC. Milk and other dairy foods and risk of hip fracture in men and women. *Osteoporosis Int* 2018;29(2):385-96.
130. Aslam H, Holloway-Kew KL, Mohebbi M, Jacka FN, Pasco JA. Association between dairy intake and fracture in an Australian-based cohort of women: A prospective study. *BMJ Open* 2019;9(11).
131. Radavelli-Bagatini S, Zhu K, Lewis JR, Prince RL. Dairy food intake, peripheral bone structure, and muscle mass in elderly ambulatory women. *J Bone Miner Res* 2014;29(7):1691-700.
132. Włodarek D, Glabska D, Kolota A, Adamczyk P, Czekaj A, Grzeszczak W, Drozdowska B, Pluskiewicz W. Calcium intake and osteoporosis: The influence of calcium intake from dairy products

on hip bone mineral density and fracture incidence – a population-based study in women over 55 years of age. *Public Health Nutr* 2014;17(2):383-9.

133. Hallkvist OM, Johansson J, Nordstrom A, Nordström P, Hult A. Dairy product intake and bone properties in 70-year-old men and women. *Arch Osteoporos* 2018;13(1).
134. Institute of Medicine. Dietary reference intakes for calcium and vitamin D. Washington, DC: National Academies Press, 2011.
135. World Health Organisation. Keep fit for life: Meeting the nutritional needs of older persons. [Internet]. 2002. Available from: whqlibdoc.who.int/publications/9241562102_annexes.pdf (accessed 20th September 2017).
136. National Health and Medical Research Council. Nutrient reference values for Australia and New Zealand including recommended dietary intakes. Canberra, Australia: National Health and Medical Research Council, 2006.
137. Devine A, Dick IM, Heal SJ, Criddle RA, Prince RL. A 4-year follow-up study of the effects of calcium supplementation on bone density in elderly postmenopausal women. *Osteoporos Int* 1997;7(1):23-8.
138. Peacock M, Liu G, Carey M, McClintock R, Ambrosius W, Hui S, Johnston CC. Effect of calcium or 25OH vitamin D3 dietary supplementation on bone loss at the hip in men and women over the age of 60. *J Clin Endocrinol Metab* 2000;85(9):3011-9.
139. Grados F, Brazier M, Kamel S, Duver S, Heurtebize N, Maamer M, Mathieu M, Garabédian M, Sebert JL, Fardellone P. Effects on bone mineral density of calcium and vitamin D supplementation in elderly women with vitamin D deficiency. *Joint Bone Spine* 2003;70(3):203-8.
140. Prince RL, Devine A, Dhaliwal SS, Dick IM. Effects of calcium supplementation on clinical fracture and bone structure: Results of a 5-year, double-blind, placebo-controlled trial in elderly women. *Arch Intern Med* 2006;166(8):869-75.
141. Zhu K, Devine A, Dick IM, Wilson SG, Prince RL. Effects of calcium and vitamin D supplementation on hip bone mineral density and calcium-related analytes in elderly ambulatory Australian women: A five-year Randomized controlled trial. *J Clin Endocrinol Metab* 2008;93(3):743-9.
142. Karkkainen M, Tuppurainen M, Salovaara K, Sandini L, Rikkonen T, Sirola J, Honkanen R, Jurvelin J, Alhava E, Kroger H. Effect of calcium and vitamin D supplementation on bone mineral density in women aged 65-71 years: a 3-year randomized population-based trial (OSTPRE-FPS). *Osteoporosis Int* 2010;21(12):2047-55.
143. Salovaara K, Tuppurainen M, Karkkainen M, Rikkonen T, Sandini L, Sirola J, Honkanen R, Alhava E, Kröger H. Effect of vitamin D(3) and calcium on fracture risk in 65- to 71-year-old women: A population-based 3-year randomized, controlled trial – the OSTPRE-FPS. *J Bone Miner Res*;25(7):1487-95.
144. Prentice RL, Pettinger MB, Jackson RD, Wactawski-Wende J, Lacroix AZ, Anderson GL, Chlebowski RT, Manson JE, Van Horn L, Vitolins MZ, et al. Health risks and benefits from calcium and vitamin

D supplementation: Women's Health Initiative clinical trial and cohort study. *Osteoporosis Int* 2013;24(2):567-80.

145. Petridou ET, Kousoulis AA, Michelakos T, Papathoma P, Dessypris N, Papadopoulos FC, Stefanadis C. Folate and B-12 serum levels in association with depression in the aged: a systematic review and meta-analysis. *Aging Ment Health* 2016;20(9):965-73.
146. Kado DM, Karlamangla AS, Huang MH, Troen A, Rowe JW, Selhub J, Seeman TE. Homocysteine versus the vitamins folate, B-6, and B-12 as predictors of cognitive function and decline in older high-functioning adults: MacArthur studies of successful aging. *Am J Med* 2005;118(2):161-7.
147. Tucker KL, Qiao N, Scott T, Rosenberg I, Spiro A. High homocysteine and low B vitamins predict cognitive decline in aging men: the Veterans Affairs Normative Aging Study. *Am J Clin Nutr* 2005;82(3):627-35.
148. McLean R, Jacques P, Selhub J, Fredman L, Tucker K, P. Kiel D, Cupples LA, Hannan MT. Plasma vitamin B6 and bone mineral density in elderly men and women: The Framingham Study. *J Bone Miner Res* 2006;21(Suppl 1).
149. Morris MS, Selhub J, Jacques PF. Vitamin B-12 and folate status in relation to decline in scores on the Mini-Mental State Examination in the Framingham Heart Study. *J Am Geriatr Soc* 2012;60(8):1457-64.
150. Gougeon L, Payette H, Morais JA, Gaugreau P, Shatenstein B, Gray-Donald K. Intakes of folate, vitamin B-6 and B-12 and risk of depression in community-dwelling older adults: The Quebec Longitudinal Study on Nutrition and Aging. *Eur J Clin Nutr* 2016;70(3):380-5.
151. Hughes CF, Ward M, Tracey F, Hoey L, Molloy AM, Pentieva K, McNulty H. B-vitamin intake and biomarker status in relation to cognitive decline in healthy older adults in a 4-year follow-up study. *Nutrients* 2017;9(1):E53.
152. Robins Wahlin TB, Wahlin A, Winblad B, Backman L. The influence of serum vitamin B-12 and folate status on cognitive functioning in very old age. *Biol Psychol* 2001;56(3):247-65.
153. de Lau LM, Refsum H, Smith AD, Johnston C, Breteler MM. Plasma folate concentration and cognitive performance: Rotterdam Scan study. *Am J Clin Nutr* 2007;86(3):728-34.
154. Aparicio Vizuite A, Robles F, Rodriguez-Rodriguez E, Maria Lopez-Sobaler A, Maria Ortega R. Association between food and nutrient intakes and cognitive capacity in a group of institutionalized elderly people. *Eur J Nutr* 2010;49(5):293-300.
155. McNeill G, Jia X, Whalley LJ, Fox HC, Corley J, Gow AJ, Brett CE, Starr JM, Deary IJ. Antioxidant and B vitamin intake in relation to cognitive function in later life in the Lothian Birth Cohort 1936. *Eur J Clin Nutr* 2011;65(5):619-26.
156. Mendonça N, Granic A, Mathers JC, Martin-Ruiz C, Wesnes KA, Seal CJ, Jagger C, Hill TR. One-carbon metabolism biomarkers and cognitive decline in the very old: The Newcastle 85+ Study. *J Am Med Dir Assoc* 2017;18(9): 806.e19-806.e27.

157. Moore K, Hughes CF, Hoey L, Ward M, Cunningham C, Molloy AM, Strain JJ, McCarroll K, Casey MC, Tracey F, et al. B-vitamins in relation to depression in older adults over 60 years of age: The Trinity Ulster Department of Agriculture (TUDA) Cohort Study. *J Am Dir Assoc* 2019;20(5):551-557.e1.
158. Vidoni ML, Gabriel KP, Luo ST, Simonsick EM, Day RS. Vitamin B12 and homocysteine associations with gait speed in older adults: The Baltimore Longitudinal Study of Aging. *J Nutr Health Aging* 2017;21(10):1321-8.
159. Jelcic M, Jonker C, Deeg DJH. Effect of low levels of serum vitamin B(12) and folic acid on cognitive performance in old age: A population-based study. *Dev Neuropsychol* 2001;20(3):565-71.
160. Hin H, Clarke R, Sherliker P, Atoyebi W, Emmens K, Birks J, Scheneede J, Ueland PM, Nexø E, Scott J, et al. Clinical relevance of low serum vitamin B-12 concentrations in older people: the Banbury B-12 study. *Age Ageing* 2006;35(4):416-22.
161. van Wijngaarden JP, Dhonukshe-Rutten RAM, Brouwer-Brolsma EM, Enneman AW, Swart KMA, van Dijk SC, In 't Veld PH, van Schoor NM, van der Velde N, de Jonge R, et al. Vitamin B12 intake and related biomarkers: Associations in a Dutch elderly population. *J Nutr Health Aging* 2017;21(10):1268-76.
162. Struijk EA, Lana A, Guallar-Castillon P, Rodriguez-Artalejo F, Lopez-Garcia E. Intake of B vitamins and impairment in physical function in older adults. *Clin Nutr* 2017. doi: 10.1016/j.clnu.2017.05.016.
163. Bonetti F, Brombo G, Magon S, Zuliani G. Cognitive status according to homocysteine and B-group vitamins in elderly adults. *J Am Ger Soc* 2015;63(6):1158-1163.
164. Institute of Medicine. Dietary reference intakes for thiamin, riboflavin, niacin, vitamin B-6, folate, vitamin B-12, pantothenic acid, biotin, and choline. Washington, DC: National Academies Press, 1998.
165. Ruitenberg A, van Swieten JC, Witteman JCM, Mehta KM, van Duijn CM, Hofman A, Breteler MM. Alcohol consumption and risk of dementia: the Rotterdam Study. *Lancet* 2002;359(9303):281-6.
166. Espeland MA, Gu L, Masaki KH, Langer RD, Coker LH, Stefanick ML, Ockene J, Rapp SR. Association between reported alcohol intake and cognition: Results from the Women's Health Initiative Memory study. *Am J Epidemiol* 2005;161(3):228-38.
167. Stampfer MJ, Kang JH, Chen J, Cherry R, Grodstein F. Effects of moderate alcohol consumption on cognitive function in women. *New Eng J Med* 2005;352(3):245-53.
168. Espeland MA, Coker LH, Wallace R, Rapp SR, Resnick SM, Limacher M, Powell LH, Messina CR. Association between alcohol intake and domain-specific cognitive function in older women. *Neuroepidemiology* 2006;27(1):1-12.
169. McGuire LC, Ajani UA, Ford ES. Cognitive functioning in late life: The impact of moderate alcohol consumption. *Ann Epidemiol* 2007;17(2):93-9.
170. Hogenkamp PS, Benedict C, Sjögren P, Kilander L, Lind L, Schioth HB. Late-life alcohol consumption and cognitive function in elderly men. *Age* 2014;36(1):243-9.

171. García-Esquinas E, Ortolá R, Galán I, Soler-Vila H, Laclaustra M, Rodríguez-Artalejo F. Moderate alcohol drinking is not associated with risk of depression in older adults. *Sci Rep* 2018;8(1):11512.
172. Vasiliadis HM, Payette MC, Berbiche D, Grenier S, Hudon C. Cognitive decline and alcohol consumption adjusting for functional status over a 3-year period in French speaking community living older adults. *J Public Health* 2019;41(2):e177-e84.
173. Corley J, Jia X, Brett CE, Gow AJ, Starr JM, Kyle JA, McNeill G, Deary IJ . Alcohol intake and cognitive abilities in old age: The Lothian Birth Cohort 1936 Study. *Neuropsychology* 2011;25(2):166-75.
174. Davis BJK, Vidal J-S, Garcia M, Aspelund T, van Buchem MA, Jonsdottir MK, Sigurdsson S, Harris TB, Gudnason V, Launer LJ. The alcohol paradox: Light-to-moderate alcohol consumption, cognitive function, and brain volume. *J Gerontol A Biol Sci Med Sci* 2014;69(12):1528-35.
175. Downer B, Jiang Y, Zanjani F, Fardo D. Effects of alcohol consumption on cognition and regional brain volumes among older adults. *Am J Alzheimers Dis Other Dement* 2015;30(4):364-74.
176. Mukamal KJ, Cushman M, Mittleman MA, Tracy RP, Siscovick DS. Alcohol consumption and inflammatory markers in older adults: the Cardiovascular Health Study. *Atherosclerosis* 2004;173(1):79-87.
177. Bryson CL, Mukamal KJ, Mittleman MA, Fried LP, Hirsch CH, Kitzman DW, Siscovick DS. The association of alcohol consumption and incident heart failure: the Cardiovascular Health Study. *J Am Coll Cardiol* 2006;48(2):305-11.
178. Mukamal KJ, Chiuve SE, Rimm EB. Alcohol consumption and risk for coronary heart disease in men with healthy lifestyles. *JAMA* 2006;166(19):2145-50.
179. Mukamal KJ, Psaty BM, Rautahaiju PM, Furberg CD, Kuller LH, Mittleman MA, Gottdiener JS, Siscovick DS. Alcohol consumption and risk and prognosis of atrial fibrillation among older adults: The Cardiovascular Health Study. *Am Heart J* 2007;153(2):260-6.
180. Muscari A, Bianchi G, Conte C, Forti P, Magalotti D, Pandolfi P, Vaccheri A, Zoli M. No direct survival effect of light to moderate alcohol drinking in community-dwelling older adults. *J Am Ger Soc* 2015;63(12):2526-33.
181. Costa P, Grassi M, Iacoviello L, Zedde M, Marcheselli S, Silvestrelli G, De Lodovici M, Sessa M, Zini A, Paciaroni M, et al. Alcohol intake and the risk of intracerebral hemorrhage in the elderly: The MUCH-Italy. *Neurology* 2018;91(3):e227-e235.
182. Jaubert MP, Jin Z, Russo C, Schwartz JE, Homma S, Elkind MS, Rundek T, Sacco RL, Di Tullio MR. Alcohol consumption and ambulatory blood pressure: a community-based study in an elderly cohort. *Am J Hypertens* 2014;27(5):688-94.
183. Gonçalves A, Jhund Pardeep S, Claggett B, Shah Amil M, Konety S, Butler K, Kitzman DW, Rosamond W, Fuchs FD, Solomon SD. Relationship between alcohol consumption and cardiac structure and function in the elderly. *Circ Cardiovasc Imaging* 2015;8(6):e002846.

184. Knott CS, Coombs N, Stamatakis E, Biddulph JP. All cause mortality and the case for age specific alcohol consumption guidelines: pooled analyses of up to 10 population based cohorts. *BMJ* 2015;350:h384.
185. Ortolá R, García-Esquinas E, López-García E, León-Muñoz LM, Banegas JR, Rodríguez-Artalejo F. Alcohol consumption and all-cause mortality in older adults in Spain: An analysis accounting for the main methodological issues. *Addiction*. 2019;114(1):59-68.
186. Daskalopoulou C, Stubbs B, Kralj C, Koukounari A, Prince M, Prina AM. Associations of smoking and alcohol consumption with healthy ageing: A systematic review and meta-analysis of longitudinal studies. *BMJ Open*. 2018;8(4):e019540.
187. Mukamal KJ, Mittleman MA, Longstreth WT, Newman AB, Fried LP, Siscovick DS. Self-reported alcohol consumption and falls in older adults: Cross-sectional and longitudinal analyses of the Cardiovascular Health Study. *J Am Ger Soc* 2004;52(7):1174-9.
188. Mukamal KJ, Robbins JA, Cauley JA, Kern LM, Siscovick DS. Alcohol consumption, bone density, and hip fracture among older adults: The Cardiovascular Health Study. *Osteoporos Int* 2007;18(5):593-602.
189. Maraldi C, Harris TB, Newman AB, Kritchevsky SB, Pahor M, Koster A, Satterfield S, Ayonayon HN, Fellin R, Volpato S. Moderate alcohol intake and risk of functional decline: The Health, Aging and Body Composition Study. *J Am Geriatric Soc* 2009;57(10):1767-75.
190. Ortolá R, García-Esquinas E, Galán I, Rodríguez-Artalejo F. Patterns of alcohol consumption and health-related quality of life in older adults. *Drug Alcohol Depend*. 2017;159:166-73.
191. Buja A, Scafato E, Sergi G, Manzato E, Maggi S, Perissinotto E. Moderate consumption of alcohol in the elderly: From metabolism to pathology. *Epidemiol Prev* 2011;35(5-6):38-9.
192. Shah M, Paulson D, Nguyen V. Alcohol use and frailty risk among older adults over 12 years: The Health and Retirement Study. *Clin Gerontol* 2018;41(4):315-25.
193. Ortolá R, García-Esquinas E, Soler-Vila H, Ordovas JM, López-García E, Rodríguez-Artalejo F. Changes in health status predict changes in alcohol consumption in older adults: The Seniors-ENRICA cohort. *J Epidemiol Community Health* 2019;73(2):123-9.
194. Ganry O, Baudoin C, Fardellone P. Effect of alcohol intake on bone mineral density in elderly women - The EPIDOS Study. *Am J Epidemiol* 2000;151(8):773-80.