

The Wisdom of Old Age: Placing the Older Adult at the Heart of Healthy Eating

Miriam E Clegg¹ & Katherine M Appleton²

¹School of Food & Nutritional Sciences, University College Cork, Cork, Ireland. Email: mclegg@ucc.ie

²Department of Psychology, Bournemouth University, Bournemouth, UK. Email: k.appleton@bournemouth.ac.uk

Abstract: Poor diet and inadequate nutrient consumption are known to be causal in the development of chronic health conditions, many of which increase with age. Older adults also typically have reduced appetite and consequently are often not meeting dietary and nutrient requirements. The causes of reduced appetite are known to be multifactorial but mechanistically are not well understood. Heightened gut hormone responding and poor dentition in older adults have been implicated. Solutions to reduced appetite, including the use of oral nutritional supplements, are often not well received, with older adults preferring to consume “real” foods. Numerous studies have now demonstrated the value of food-based interventions; however some concerns, such as those related to sensory appeal, familiarity and price, can be exacerbated by age. As such, acceptance of solutions by the older generation is paramount in ensuring intervention success, and working with older adults to co-create food-based solutions is more likely to see positive outcomes. The co-creation of foods and dietary advice has been well received across a range of nutrients, including fibre and protein. However, it must also be acknowledged that there are stark individual differences in social gradients and in health between groups of older adults, and this is not always represented in the current literature. Increased awareness of dietary and food requirements in this population group is still needed, and in exploring solutions, much can be gained from consulting with older adults themselves.

Keywords: elderly; food intake; diet; preferences, appetite

Older adulthood is associated with a range of physical health conditions, many of which are exacerbated by poor nutrition and unhealthy dietary consumption. Cardiovascular disease, metabolic syndrome, Type II diabetes, and osteoporosis, all known to increase with age (Caspersen, et al., 2012; Cooper, et al., 2011; Rodgers et al., 2019), are well recognized to result in part from the consumption of a diet high in saturated fats and sugars, and/or low in fruits, vegetables, fibre, vitamins, and minerals (Ahmad, Isherwood, Umpleby & Griffin, 2020; Aune et al., 2017; Hooper, et al., 2020). Poor bone health, reduced immune function, and low muscle size, mass and function are associated with low intakes of protein and protein-rich foods (Bauer et al, 2013; De Souza & Martini, 2010; Deutz et al., 2014; Volpi et al., 2013), to result in increased risk of falls, fractures and infection, reduced independence and well-being, increased polypharmacy and dependence on health care professional and services, increased morbidity and mortality (Bauer et al, 2013; Caspersen et al.,

2012; De Souza & Martini, 2010; Deutz et al., 2014; Rodgers et al., 2019; Volpi et al., 2013). Research often cites that 1/10 adults aged 65+ years is malnourished or at risk of malnutrition based on 2015 statistics, however recent research from Age UK highlights that this may be even higher since the pandemic (Age UK, 2021).

Good dietary intake can mitigate or reduce these concerns (Clegg & Williams, 2018). However older adults have lower appetite and energy intake compared to younger adults (Giezenaar, et al., 2016) making adequate dietary intake difficult to achieve. This reduction in appetite, which was first named by John Morley as the “anorexia of ageing” (Morley & Silver, 1988), occurs in 15–30% of older people (Malafarina, Uriz-Otano, Gil-Guerrero & Iniesta, 2013). Anorexia of ageing may be caused by pathological factors such as chronic diseases or depression (Cabrera, Mesas, Garcia, & de Andrade, 2007; Lorenzo M Donini, Savina, & Cannella, 2003), social factors such as loneliness and widowhood (Ramic et al., 2011) or physiological factors such as delayed gastric emptying, and changes to the senses of taste and smell (Ahmed & Haboubi, 2010). Three papers in this Special Issue highlight the role of physiological factors on appetite during ageing. The first demonstrated that objective oral health, assessed via number of teeth and use of dentures, and subjective poor oral health, assessed using the short version of the Oral Impacts on Daily Performances, were both significantly associated with a higher probability of developing anorexia of ageing (Kusama, et al., 2024). Across two studies, Holliday, et al., (2024), and Dagibasi, et al., (2024), focused on appetite hormone responses in ageing. Holliday et al., (2024) compared ghrelin responses in older adults with low appetites or healthy appetites to those in younger adults. They found a higher fasting ghrelin and an augmented ghrelin response to feeding in older adults with low appetite, but not in the older adults with a healthy appetite, compared to younger adults. These findings suggests that alterations to ghrelin metabolism are not functions of ageing *per se* and may be independent causal mechanisms of anorexia of ageing. The findings were confirmed and further extended in the study by Dagibasi et al., (2024), which considered ghrelin and additional gut hormones GLP-1 (glucagon-like peptide-1) and PYY (peptide-YY). This study again demonstrated heightened gut hormone response to food intake in some older adults, those with a low appetite phenotype, and that this augmented responding may be causal in the anorexia of ageing, independent of age.

Traditional solutions to lower appetites and food intakes with age have relied on Oral Nutritional Supplements (ONS); fortified liquid, semi-solids or powders specifically designed to combat some of the nutritional consequences of the anorexia of ageing (BAPEN, 2024). ONS however can result in limited improvements in body weight and health; an artefact of the high satiating effects of protein, poor compatibility with existing eating habits and low tolerance by older adults (Gosney, 2003). Work in this Special Issue addresses some of these concerns. Warner et al., 2024 tested the acceptability and feasibility of a supplement using leucine-rich GMP on appetite, food intake and gut hormone response. Glycomacropeptide (GMP) is free from or low in amino acids shown to have appetite-suppressive effects, however the results found that food intake and gut hormone responses were not different between GMP and whey protein isolate. The study participants also reported uncertainty about supplements and a preference for eating “real” foods. Hetherington and colleagues (2024) conducted four focus groups on ONS with 18 adults aged 70-80 years with some experience of these products. Participants associated ONS with serious health conditions and end-

of-life care, aligning them more with medications than with foods, limiting their acceptability as a preventive measure. Sensory characteristics, largely based on taste and texture were primary barriers to consumption, as were again perceptions of ONS as ‘artificial’ or ‘manufactured’, not ‘real’ foods, with the negative potential to also replace ‘real’ foods.

With a preference for real foods, numerous studies now demonstrate the value of food-based interventions for a number of outcomes related to the health of older adults (Formica et al., 2020; Granic et al., 2020; Lin et al., 2024; Morton et al., 2018). The importance of acceptance by the older generation is paramount (Smith et al., 2024). An obvious step forward is to consult older adults when developing interventions, to then refine interventions following feedback or testing. In this Special Issue, in the study by Norton et al., 2024, older adults were queried first on their awareness, knowledge, attitudes and behaviours towards dietary fibre, and these insights were used in the development of population-specific educational materials. These educational materials were then found to be informative, engaging, useful and likely to be shared by the target population, demonstrating the value of the consultative work. In the study by Smith and colleagues, 2024, older adults were first consulted on the acceptability and their preferences regarding fortifying foods at home. Recipes were subsequently developed, and tried at home by older adults to demonstrate success. Even a simple strategy such as increasing the variety of foods within a meal can be identified as challenging by this population group. Hendriks-Hartensveld et al., (2024) employed a questionnaire study to investigate older adult’s perceptions of meals with variety in the meat element, vegetable element, both meat and vegetables, or neither. All meals were considered to be too large, but participants were also less willing to prepare those with variety in the meat component (both with and without variety in the vegetable component) and these meals were likely to be less liked.

The value of consulting older adults themselves in healthy eating for this age group is obvious. Certain features of food consumption seem universal; the importance of taste, an awareness of foods, diet and health, and concerns over availability and affordability. Both the studies by Norton et al., (2024), and Smith et al., (2024), and a further questionnaire study in Brazilian older adults (Teodoro et al., 2024) highlight the importance of health, sensory appeal, familiarity and price as key determinants of healthy food consumption in this age group. Some concerns however are also specific to the older adult population, or may be exacerbated by age (Best & Appleton 2013). Examples include physical changes, such as disruptions to digestive function (Dagibasi et al., 2024; Holliday et al., 2024), practical concerns, such as consuming hard textures, preparing tough textures, and carrying heavy and bulky foods (Best & Appleton, 2013; Kusama et al., 2024), and social concerns such as a lower income, reduced social opportunities and reduced abilities in social situations (Kusama et al., 2024; van den Heuvel et al., 2018). Changing dietary concerns with age, to result in a need to increase protein intakes and adjust to digestive disruptions, are increasingly recognized (Smith et al, 2024; van den Heuvel et al., 2018). The studies above also highlight an increasing importance for ingredient naturalness in a desire for ‘real’ and unprocessed foods (Norton, et al., 2024; Smith et al., 2024; Teodoro et al., 2024; Thomas et al., 2021).

Also apparent, however, is the variety between individuals; one person's preferences are not the same as another's; limitations, circumstances and situations will differ; ageing is subject to variation in interpersonal rates of change. It must be acknowledged alongside individual differences, that there are stark social gradients in health between groups of older adults, and this is not always represented in the current literature. For example, between 2018 and 2020 females living in the most deprived areas of the UK were expected to live only 66.3% of their lives in good general health, compared to 82.0% for those in the least deprived areas (Census, 2021). Davies & Reid (2024), explore the role of third sector volunteer 'meal makers' over the age of 55 years, working on behalf of the organisation Food Train, in addressing food insecurity in rural or food desert communities in Scotland. The work highlighted how volunteers bridge gaps in social care and mediate food access barriers with diners who lack statutory or informal care, illuminating inequalities faced by isolated older adults. Volunteer engagement provides opportunities for food secure older adults to share local knowledge and build networks of food support and social inclusion for food insecure older adults. Only seven older volunteers were interviewed in this study, highlighting how difficult it can be to engage with disadvantaged groups. Older adults are not a homogeneous group and many segments of this population are under-represented in nutritional research and policy making decisions (Choudhury et al., 2012). Disadvantages for some population segments are exaggerated with ageing, emphasising the need to put these groups at the core of the research agenda.

Overall, increased awareness of specific dietary changes and considerations in this population group is still needed, and this awareness is especially acute for policy-makers, health practitioners, in older adults themselves, their family members and carers (Clegg, et al., 2023). Secondly, in looking for solutions, much can be gained from consulting older adults on their attitudes, preferences and perceptions. Under-nutrition in older adults is a multi-faceted multi-causal concern affecting a highly heterogeneous population group. Ageing itself is predictable, but variable by individual circumstance and experience, therefore, one size/solution is definitely unlikely to fit all!

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