



Research report

Is there an association between food patterns and life satisfaction among Norway's inhabitants ages 65 years and older?



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ABSTRACT

The lack of information regarding older adults' health and lifestyles makes it difficult to design suitable interventions for people at risk of developing unhealthy lifestyles. Therefore, there is a need to increase knowledge about older adults' food patterns and quality of life.

Our aim was to determine associations among food patterns, anxiety, depression, and life satisfaction in Norwegian inhabitants ages 65+. The Nord-Trøndelag Health Study (The HUNT Study) is a large, population-based cohort study that includes data for 125 000 Norwegian participants. The cohort used for this study is wave three of the study, consisting of 11 619 participants age 65 and over. Cluster analysis was used to categorize the participants based on similarities in food consumption; two clusters were identified based on similarities regarding food consumption among participants. Significant differences between the clusters were found, as participants in the healthy food-patterns cluster had higher life satisfaction and lower anxiety and depression than those in the unhealthy food-patterns cluster.

The associations among food patterns, anxiety, depression, and life satisfaction among older adults show the need for increased focus on interactions among food patterns, food consumption, and life satisfaction among the elderly in order to explore how society can influence these patterns.

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1. Introduction

The number of adults age 65 and older years has more than doubled from approximately 420 million to 973 million worldwide (Goulding, Rogers, & Smith, 2003). In Westernized countries, the major cause of death has shifted from infectious diseases to non-communicable diseases (NCDs) that may be influenced by diet (Gorina, Hoyert, Lentzner, & Goulding, 2006; Heidemann et al., 2008). Since the older-adult segment of the population is increasing with such speed, there is a need to identify to what extent dietary choices correlate with quality of life and survival (Anderson et al., 2011). While aging earlier has been described as a process of progressive and irreversible biological changes resulting

in an increased risk of chronic diseases and cognitive and functional impairment (Khaw, 1997), there has been a shift in focus towards older adults' own resources and their own ability to impact and improve their quality of life (Dean, Grunert, Raats, Nielsen, & Lumbers, 2008). In order to meet this goal, it is necessary to focus on how to enhance the quality of life for older adults as well as the number of lived years (Dean et al., 2008). As people age, their food and energy intake tend to decrease, both for physiological and practical reasons (MacIntosh, Morley, & Chapman, 2000; Morley & Thomas, 1999). They do not feel as hungry as when they were younger and food preparation becomes a hassle. This may be a potential health risk because, although food intake is reduced with aging, the need for most nutrients is not reduced (Dean et al., 2008).

Norway is a Northern European country characterized as a social democratic welfare state, with generous universal public health insurance coverage, and predominately public health services (Esping-Andersen, 2013). The average life expectancy (2009) is 83 years for women and 79 for men (Krokstad et al., 2013). In Norway,

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we have seen substantial gender differences when people are asked if they are responsible for food provisions in their household. In 85% of households, the women are responsible for the food provisions. This is also revealed in women's food choices. Women scored higher on the presumably healthier dietary dimensions, whereas men scored higher on the presumably less healthy convenience diet dimension. Norway has the largest group of naive food consumers regarding food safety (Berg, 2004). In older people, dietary habits may be less related to how controlled they are and more related to their levels of openness, and emotional and social adjustment (Möttus et al., 2013). Being single or widowed was shown to be associated with a lower score in variety of food consumption, particularly vegetable variety, and this association was enhanced when combined with male gender, living alone, or having infrequent contact with friends, especially for men. Lower levels of contact with friends were associated with a reduced variety of fruits and vegetables in a graded trend for both genders; the trend was more pronounced among men. Among women but not in men, weekly contact with family was significantly and positively associated with vegetable variety (Conklin et al., 2014).

The enjoyment of food was closely linked to social networks and environment (Dean et al., 2008). Activities, experiences, and circumstances in relation to the procurement, preparation, and consumption of food and meals are significant parts of life (Grunert, Dean, Raats, Nielsen, & Lumbers, 2007). It is also known that social factors and eating environment are significant determinants for food intake (Meiselman, 1996, pp. 239–263). For older adults, the loss of social networks and changes in living circumstances are consequences of aging, and the probability of eating alone increases with age (Dean et al., 2008). Taken together, all these factors will influence older adults' relationships with food. Food fulfills basic functions for the body, but it also acts as a source of pleasure and for social construction, and in supporting the understanding of personal identity (Hausman, 2005). Considering the relationships between food and people's health, social interactions, and daily activities related to procurement, preparation, and intake, it is to be expected that food is among the important domains of life that affect a person's subjective well-being (Diener & Biswas-Diener, 2000; Diener, 2000; Hausman, 2005; Schnettler et al., 2013). The concept of life satisfaction is closely related to material, personal, and social resources (Diener, 2000; Diener, Emmons, Larsen, & Griffin, 1985).

In their study, Grunert et al. (2007) found a significant moderate correlation between "satisfaction with food-related life" and mental health. Good mental health facilitated high scores on life satisfaction and was related to food intake (Grunert et al., 2007). Furthermore, there have been reports of associations between psychological factors such as mood and stress and food consumption among elderly persons (Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010). Studies have even shown that psychological stress affects elderly persons' eating habits (Wallis & Hetherington, 2004), health, and well-being and that greater perceived stress is associated with lower fruit, vegetable, and protein intake; increased consumption of salty snacks; higher intake of sweets; and lower participation in physical activity among older adults (Laugero, Falcon, & Tucker, 2011). We also know that stress may affect diet and physical activity (Laugero et al., 2011). In this study, an association between psychological stress and anxiety as barriers to healthy eating was documented (Laugero et al., 2011). Healthy diets are associated with better emotional well-being among older adults (Milte, Thorpe, Crawford, Ball, & McNaughton, 2015). It has been shown repeatedly that depressed older adults experience considerably more somatic symptoms, including loss of weight or appetite (Shapiro, Roberts, & Beck, 1999). A focus on food consumption and eating patterns is therefore, appropriate in order to

ensure that older people who are depressed receive the nutrition they require.

Earlier studies have focused on dietary components or specific nutrients in relation to both physical and mental health. To analyze food patterns that examine the overall diet may have some advantages, as food-pattern analysis can capture the complexity of the found diet (Anderson et al., 2011; Hu, 2002). Previous dietary studies have identified two major dietary patterns – the "prudent" pattern with high intakes of vegetables, fruit, fish, poultry and whole grains, and the "Western" pattern with high intakes of red meat, processed meats, refined grains, French fries and sweets/desserts (Heidemann et al., 2008; Hu, 2002).

Food patterns can be analyzed using one of two approaches – multivariate statistical techniques such as factor or cluster analysis, or dietary scoring methods informed by guidelines and recommendations or diet-quality indices (McNaughton, Ball, Crawford, & Mishra, 2008; Milte et al., 2015). Food patterns may play a major role in the health and functioning of people over the age of 65 (Drewnowski & Evans, 2001); furthermore, it seems likely that optimal nutrition and physical activity contribute significantly to the overall quality of life for older adults. No single group in our society can benefit more from improved diet than elderly adults (Evans, 1999). Among older people, relative food preference is found to be related to how open and emotionally and socially adjusted they are (Möttus et al., 2013). Although personality traits themselves are not likely to be modifiable in order to influence people's dietary behaviors, this information suggests potential barriers to a healthy diet (lack of intellectual curiosity—and perhaps information—and social embeddedness), which may be more easily modifiable. Indeed, of special interest is the finding that more open and intellectually curious people are the most likely to adopt healthy dietary habits; this may indicate that healthy food items are generally somewhat alien and unfamiliar to older people (Möttus et al., 2013).

Helping people to increase their life expectancy and improve their quality of life is the primary goal of the Healthy People report (Prevention & Promotion, 2011). In order to achieve both better health and longer life expectancy, increased attention to health promotion and food patterns among elderly persons is important. The lack of epidemiological information about people's health and lifestyles makes it difficult to identify suitable interventions for people at risk of developing unhealthy lifestyles. Enhanced health-related quality of life is a goal of health promotion, and there is, therefore, a need to increase knowledge about motivation for behavioral changes and perceived benefits as assessed using quality-of-life measures (Drewnowski & Evans, 2001).

Increased knowledge about motivation for behavioral changes, such as how to change elderly persons' food patterns from eating unhealthy food to eating healthier food, is needed. In this context, it is important to explore the impact of food consumption and life satisfaction related to mental health. The aim of this study is, therefore, to investigate associations between food patterns, life satisfaction, and mental health among Norwegian inhabitants age 65+ using the wave three cohort from the Nord-Trøndelag Health (HUNT) study. Nord-Trøndelag constitutes one of 19 counties and is geographically situated in the central part of the country. The population size is relatively stable (128 694 in 2006), and in- and out-migration has been low. In all the HUNT surveys, data were collected in each of the 24 municipalities in the county by using temporarily located health examination sites staffed by certified fieldwork teams (Krokstad et al., 2013). The education level in Nord-Trøndelag is mostly the same as the average for Norway in general, while income and pension are somewhat lower than for the average population in Norway (Norway, 2016).

Based on this background, the following hypotheses were

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