Appetite 200 (2024) 107531

Contents lists available at ScienceDirect

Appetite

journal homepage: www.elsevier.com/locate/appet

Eating preferences and behaviors of older immigrants in Oslo: A qualitative study

Stephanie L. Maxson [a,*], Ida Synnøve Grini [b], Øydis Ueland [b], Laura Terragni [a]

[a] Oslo Metropolitan University, Postboks 4, St. Olavs Plass, 0130, Oslo, Norway
[b] Nofima AS, Box 410, NO-1431, Ås, Norway

ARTICLE INFO

Keywords:
Older adult
Immigrant
Healthy aging
Eating behavior
Acculturation

ABSTRACT

Norway's population of older, first-generation immigrants is expected to almost triple by the year 2060 due to decreased mortality and continued immigration. Studies indicate that older immigrants in Norway have a higher rate of non-communicable disease than older non-immigrants. Eating a health-supporting diet is important for reducing disease risk and maintaining independence in older adults. The purpose of this study was to increase understanding of the eating preferences and behaviors of older, home-dwelling, first-generation immigrants in Oslo, and to identify influences on their eating preferences and behaviors. This qualitative study took a phenomenological approach to understand older immigrants' shared experience of changing eating behaviors with aging. Fourteen home-dwelling, older immigrants were recruited using a combination of purposeful random sampling and snowball sampling. In-depth interviews were conducted then analyzed according to reflexive thematic analysis. Study findings indicate that older immigrants eat a bi-cultural diet pattern. In addition, they seek out information about nutrition, and incorporate many health-supporting eating habits for disease management and prevention. In this way, older immigrants in Oslo share much in common with older non-immigrants. Hopes and worries for the future motivate older immigrants to eat more healthfully in order to maintain independence and cultural identity as long as possible. These results can be useful for designing culturally tailored programs which support eating habits for health maintenance and disease prevention among older immigrants.

1. Introduction

The worldwide population of older adults, defined as people aged 60 years and older (World Health Organization, 2002), is projected to more than double by 2050 (United Nations, 2020). A similar trend is predicted for Norway, with the number of older adults expected to increase from 1.28 million to 2.1 million by 2060 (Statistics Norway, 2022). This represents an increase of older adults from 24% to 34% of the total population - evidence that Norway's population is aging (Statistics Norway, 2022). Seven percent of older adults in Norway are also first-generation immigrants, meaning they were born outside of Norway to two foreign-born parents and four foreign-born grandparents. This population of older, first-generation immigrants is expected to grow to more than 24% of older adults by 2060 as a result of both continued immigration and the aging of existing immigrants (Statistics Norway, 2022).

While older immigrants in Norway were born in 197 countries, the three largest groups originating from outside of Europe migrated from Pakistan, Vietnam and Iran (Statistics Norway, 2022). Most older immigrants in Norway today arrived as young adults to work in the service and oil sectors (1965–1975), as family members of existing work migrants (1965–1985), or as middle-aged adults seeking asylum from countries in conflict such as Iran, Sri Lanka, Viet Nam, and the former Yugoslavia (1980–200) (Sandnes, 2017).

Non-communicable diseases (NCDs), such as type 2 diabetes and cardiovascular disease, are the leading cause of morbidity, disability and mortality among older adults worldwide (World Health Organization, 2015). Among immigrants aged 45–66 years in Norway, type 2 diabetes is about three times as prevalent, cardiovascular disease is slightly more prevalent among immigrant men, and overweight is more prevalent among immigrant women as compared to their non-immigrant peers (Kjøllesdal et al., 2019). Another study investigating health disparities

* Corresponding author.
E-mail addresses: stephmaxson@gmail.com (S.L. Maxson), ida.synnove.grini@nofima.no (I.S. Grini), oydis.ueland@nofima.no (Ø. Ueland), lterragn@oslomet.no (L. Terragni).

https://doi.org/10.1016/j.appet.2024.107531
Received 19 March 2024; Received in revised form 18 May 2024; Accepted 27 May 2024
Available online 28 May 2024

between first-generation immigrants and non-immigrant Norwegians aged 45–79 years found that immigrants in this age range have a higher incidence of NCDs (45.1%) and overweight (65.4%) than non-immigrants (41.5% and 57.6% respectively) (Qureshi et al., 2022).

When the health of older people deteriorates, both their quality of life and participation in society are negatively impacted while the cost to individuals and society are increased. Considering that NCDs contribute to loss of health and independence in older adults, reducing risk is important for supporting health with aging (World Health Organization, 2015). Cardiovascular disease and type 2 diabetes can be prevented or delayed through healthy lifestyle habits, including eating a nutritious diet and maintaining a healthy weight (World Health Organization, 2015). In addition, culturally relevant food is important for supporting a sense of belonging and well-being among immigrants, which when lacking may contribute to mental health challenges (Abbots, 2016). While healthy eating habits implemented early in life are most effective for disease prevention, diet changes made in late adulthood can also be beneficial for reducing incidence and severity of illness (World Health Organization, 2015).

Two studies investigating older immigrants from low-income countries to the United Kingdom found food choice is influenced by prevention and management of NCDs, maintaining mobility and independence, weight loss, and knowledge of a healthy diet (Asamane et al., 2019; Castaneda-Gameros et al., 2018). Health maintenance is also a major influence on the eating behavior of older non-immigrants in Norway (Grini et al., 2020). While the eating preferences and behaviors of older non-immigrants in Norway have been studied (Grini, 2012; Grini et al., 2013, 2020; Kvalsvik et al., 2021; Ueland et al., 2022), there are no similar studies of older immigrants in Norway.

Knowledge of what older immigrants in Norway eat and what influences those preferences is necessary for developing culturally tailored, dietary interventions to successfully improve health and quality of life (Farhat, 2023; Huang & Garcia, 2020). Both eating behaviors and the influences on eating behaviors can vary significantly between cultures (Wandel et al., 2008). As this is the first study of older immigrants in Norway, the aim is to explore immigrants from several different countries of origin in order to begin to fill the knowledge gap. The objectives of this study are to (1) increase understanding of the eating preferences and behaviors of home-dwelling, older immigrants in Oslo; and (2) identify factors which influence their eating preferences and behaviors.

1.1. Theory

Eating preferences and behaviors are complex, and are influenced by a variety of biological, psychological, social, environmental, and economic factors (Sallis et al., 2008; Sobal & Bisogni, 2009). Some influences affect eating preferences at any stage of life, such as socioeconomic status and food knowledge, while others are unique to specific life stages and experiences (Sobal & Bisogni, 2009). Influences specific to older adults include decreased appetite, digestive changes, loneliness, motivation for health and independence, illness, decreased mobility, and food memories (Caso & Vecchio, 2022; Govindaraju et al., 2022; Norman et al., 2021; Poggiogalle et al., 2021).

A review of literature investigating the eating habits of older adults indicates that a temporal model is valuable for understanding how the eating behaviors of older adults are influenced by their past and present experiences, as well as by their hopes for the future (Govindaraju et al., 2022). This model includes past influences such as food memory, present influences such as nutrition knowledge and health status, and future influences such as maintaining health and independence (Govindaraju et al., 2022). According to the authors, past food experiences and future health are the most important influences on the eating preferences of older adults (Govindaraju et al., 2022). The review on which this model is founded (Govindaraju et al., 2022) has a study population similar to the current study in that the older adults are not necessarily free of disease but live independently at home and prepare their own meals.

The effects of migration and nutrition knowledge in an adopted country on older immigrants has been identified as an area in need of additional research (Govindaraju et al., 2022). Influences on eating preferences and behaviors unique to immigrants include cultural and religious identity, acculturation, the nutrition transition, length of stay in host country, and competency in host country language (Lillekroken et al., 2024; Osei-Kwasi et al., 2016).

Dietary acculturation theory was identified as an appropriate lens for investigating how an older immigrant's eating preferences are influenced by migration between cultures (Satia-Abouta et al., 2002). Dietary acculturation is the process by which immigrants integrate the food traditions of their new home country together with the food traditions from their culture of origin (Osei-Kwasi et al., 2017; Satia-Abouta et al., 2002; Terragni et al., 2014; Wändell, 2013). The resulting eating pattern may be more or less health-supporting than the initial eating pattern (Satia-About a et al., 2022). The three possible outcomes for dietary acculturation are continuation of food traditions from the culture of origin, exclusive adoption of the new home country's food traditions, or a bi-cultural diet pattern combining food traditions from both the new home country and the culture of origin (Satia-Abouta et al., 2002). The most common outcome is a bi-cultural diet pattern which may exclude some traditional foods, include some new foods, and combine foods from both traditions for some meals (Satia-Abouta et al., 2002). An individual's degree of acculturation may be influenced by their length and place of residency in the adopted country, fluency in the adopted country's language, education, income, and social connectedness (Elshahat & Moffat, 2020; Satia-Abouta et al., 2002).

Studies of dietary acculturation in Norway indicate that immigrants adopt an integrated diet pattern which combines elements of both cultures' food traditions to varying degrees (Garnweidner et al., 2012; Terragni et al., 2014). While there are no previous studies of dietary acculturation among older immigrants to Norway, a systematic review found that older immigrants to western countries continue to prefer a bi-cultural diet many years after immigration as a means of maintaining their cultural identity (Lillekroken et al., 2024).

Dietary acculturation has a temporal element in that adaptation of dietary patterns is a continuous process which may change at any time in the immigration experience (Satia-Abouta et al., 2002). Conversely, the temporal model has a cultural element as food memories, such as an immigrant's traditional diet, are an influence from the past (Govindaraju et al., 2022). Together, the temporal model for older adults and dietary acculturation theory address influences on eating behaviors which vary across both time and culture, providing a theoretical framework for understanding the eating preferences and behaviors of older immigrants in this study.

2. Methods

2.1. Study design

A qualitative research design was chosen for this study because a qualitative design is useful for uncovering the meaning embedded in human experiences (Patton, 2015). Qualitative studies include different traditions of inquiry, such as hermeneutics, ethnography, and phenomenology (Creswell et al., 2018). For the purpose of this study, a phenomenological approach was selected to understand the lived experience of eating preferences and behaviors of older immigrants.

2.2. Study setting and recruitment

Data collection was conducted in the city of Oslo which is home to 25% of Norway's older immigrant population (Statistics Norway, 2022). Participants were recruited at senior and women's social centers in areas of Oslo with a higher proportion of immigrant population. A grocery gift card worth 200 Norwegian crowns was provided to each interview

participant as an incentive. Recruitment was primarily by purposeful random sampling, with the goal of recruiting older immigrants representing both genders, a variety of ages, and several different countries of origin. In this way, participants demonstrate diversity within the inclusion criteria (Patton, 2015). Snowball sampling was used to a lesser extent, where current participants and connections within the immigrant community were asked to help recruit others, fulfilling our criteria (Patton, 2015).

All 14 participants met the inclusion criteria: first-generation immigrant, 60 years or older, conversational Norwegian skills, and living at home. Participants were also required to meet the World Health Organization's definition of "healthy aging" (United Nations, 2020; World Health Organization, 2015). Consistent with this definition, participants did not have to be free of disease but rather living independently at home and physically able to participate in activities outside their home. Participants were recruited and interviewed until the researchers evaluated that the data collected were adequate in terms of richness and complexity to address the research question (Braun & Clarke, 2021a).

2.3. Interviews

Semi-structured interviews were used to gain an in-depth understanding of the influences on the eating preferences and behaviors of older immigrants in Oslo. Interview questions were divided into three sections: life history, typical dietary intake, and the influence of immigration and future concerns on eating preferences and behaviors (interview guide available in the appendix). Collecting information on life and immigration history provides context for participants' experiences. Questions about typical dietary intake were designed to learn how eating preferences reflect dietary acculturation and experiences of diet changes for health. Question development was guided by dietary acculturation theory and the Norwegian nutrition guidelines (Norwegian Directorate of Health, 2014; Satia-Abouta et al., 2002). The final group of questions was designed to increase understanding about the influences on participants' eating preferences and behaviors, especially as it relates to acculturation and future hopes. Design of this group of questions was guided by the theoretical framework, namely the temporal model for older adults and dietary acculturation theory (Govindaraju et al., 2022; Satia-Abouta et al., 2002).

In-depth, face-to-face interviews were conducted between November 2022 and February 2023. All interviews were conducted in Norwegian by the first author. The interviews lasted between 30 and 75 min, and were audio recorded for later transcription and analysis. Audio-recorded interviews were transcribed using a denaturalized approach, correcting for grammatical errors so as not to distract from interview content (Oliver et al., 2005).

2.4. Data analysis

Reflexive thematic analysis (RTA) as described by Braun and Clarke (2006 & 2021b) was selected for data analysis because it supports the identification of patterns of meaning in order to develop a deeper understanding of the human experience (Braun & Clarke, 2023; Byrne, 2022). We followed Braun and Clarke's (2006) six-phase approach to thematic analysis which involves: becoming familiar with the data; generating initial codes; searching for themes; reviewing themes; defining and naming themes; and producing the report. Transcripts of the fourteen interviews were imported into NVivo (1.7.1 for MacOS) for analysis. The first author read and re-read transcripts, assigning and revising codes. Codes were generated through the researcher's active and reflexive engagement with the data as interpreted through the lens of the theoretical framework and the researcher's own experiences (Braun & Clarke, 2021b). As familiarity with the data increased, new patterns of meaning were created. Codes were then organized under themes and sub-themes which were reviewed and adjusted by all authors throughout the analysis. Review and discussion of codes and themes by all authors lends dependability to the analysis. The analysis process continued until themes and their connections which provided an interpretation of the data had been identified.

2.5. Ethics approval

This study was planned and executed in accordance with the General Data Protection Regulation (GDPR) EU 2016/679. The principles of the Declaration of Helsinki 2008 for research on human subjects were the foundation on which the studies and data collection were constructed. The project was reviewed and approved by Nofima's Ethical Board, and the studies comply with the Norwegian Data Protection Services code of conduct. Ethics approval was confirmed in August 2022 from Norwegian Agency for Shared Services in Education and Research (Reference #671301). Participants were provided information regarding the study's purpose and their rights as participants, including their right to confidentiality. This information was provided in the Norwegian language, both oral and written. Only after explaining their rights was written consent obtained. Interview data has been de-identified and each participant assigned a pseudonym to ensure anonymity.

3. Results

The average participant age was 68.2 years, and their average length of residency in Norway was 39.6 years. While participants represent five different countries of origin (Pakistan, India, Sri Lanka, Afghanistan and former Yugoslavia), the majority immigrated from Pakistan (Table 1). This is to be expected considering that, of all immigrant groups in Norway, immigrants from Pakistan are the largest group aged 60 years and older originating from outside of Europe (Statistics Norway, 2022).

Using RTA, six themes were identified which influence the eating preferences and behaviors of older, first-generation immigrants. These themes have been organized according to the temporal model for older adults developed by Govindaraju et al. (2022) as presented in Fig. 1. Participants have been assigned pseudonyms for the purpose of protecting their identities while sharing their experiences (Table 1).

3.1. Influences from the past: dietary acculturation

All informants arrived in Norway as adults, with food habits shaped by the culture in which they were born and raised. Reminiscences of this are still tangible in their food habits many years after their arrival. At the same time, all participants report changing their diet following migration as a result of exposure to Norwegian food culture. Most participants exhibited a bi-cultural diet pattern, meaning they eat foods traditional to

Table 1
Interview participants.

Participant Pseudonym	Gender[a]	Age (years)	Country of Origin	Years in Norway
Ayesha	F	60	Pakistan	40
Bilal	M	68	Pakistan	48
Fatima	F	75	India	52
Gayan	M	68	Sri Lanka	35
Hassan	M	75	Pakistan	51
Jamila	F	62	Afghanistan	12
Khalid	M	71	Pakistan	48
Marija	F	65	former Yugoslavia	26
Priya	F	61	India	34
Rashid	M	75	Pakistan	47
Samina	F	64	Pakistan	45
Yasir	M	74	Pakistan	46
Yusuf	M	75	Pakistan	47
Zainab	F	62	Pakistan	24

[a] F = female, M = male.

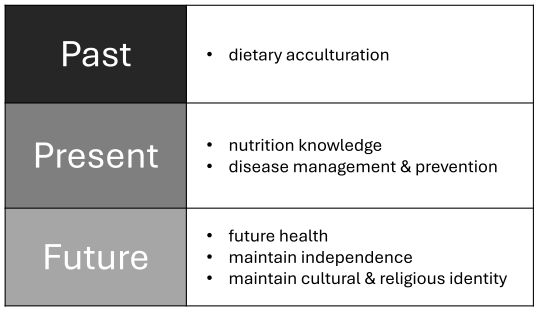

Fig. 1. Past, present and future influences on the eating preferences of older immigrants in Oslo.

both Norway and their culture of origin. Dinner is most often composed of foods from their culture of origin, for example curry with chapati (Pakistani) or chicken lamprais (Sri Lankan). Breakfast and lunch are more in line with traditional Norwegian foods, such as oatmeal with fruit and nuts for breakfast, and open-faced sandwiches with mackerel in tomato sauce for lunch. Sometimes meals combine traditions from both Norway and the culture of origin, for example salmon made with traditional Pakistani spices served with rice and bhindi (okra).

Participants eating an integrated diet explained why they prefer foods from their culture of origin for dinner. Several agreed with Samina (age 64) that "*Norwegian food has no spices. That is why I like Pakistani food – because we use a lot of spices … It's not about tradition, we just like the flavor*". Khalid (age 71) prefers the flavors because "*I am used to [this food] … When I stopped drinking mother's milk, I began eating Pakistani food*".

When asked why they prefer Norwegian foods for breakfast and lunch, participants said the foods are readily available, faster to prepare, and healthier. Bilal (age 68) eats oatmeal with nuts for breakfast because "*it is filling and healthy*", and for lunch enjoys fish "*because it is good for my body and gives us many vitamins*". Lunch foods from the culture of origin require long preparation time or reheating, whereas Norwegian foods can be eaten cold. Norwegian foods frequently eaten by participants include salmon and other fish, fishcakes, mackerel in tomato sauce, shrimp salad, oatmeal, crispbread, cheese, and jam.

A few participants reported eating a diet composed almost exclusively of Norwegian foods. These participants described their current diet as healthier than their diet prior to immigration. Marija (age 65) described how her diet initially changed when she came to Norway, saying "*I had contact only with Norwegians. We had access to fish because we could catch it ourselves. And it was too expensive for us to buy meat.*" She continued, "*Norwegian women taught me an unbelievable amount about how to cook Norwegian food … such as fish casserole, fishcakes, fish sticks, fish soup*" (Marija, age 65). Regardless of their preference for Norwegian foods, these participants say they still enjoy traditional foods from their country of origin when celebrating holidays and feast days.

Dietary acculturation is a continuous process, and as such acculturation continues to influence immigrants' food preferences in new ways (Satia-Abouta et al., 2002). Children and grandchildren born in Norway were mentioned by most participants as a more recent influence on diet. Bilal's wife prepares Norwegian meals more often to accommodate the children's preferences. According to Bilal (age 68), "*because the children were born in Norway, they don't want to eat Pakistani food every day. Therefore, we follow them*". Jamila (age 62) lives with her adult daughter who prepares Norwegian meals. Participants' grandchildren also prefer Norwegian foods. As Yasir (age 74) explained, "*the grandchildren eat both [Norwegian and Pakistani food], but they like Norwegian food best*". Ayesha (age 60) prepares Norwegian food when her grandchildren visit, as she explained, "*my daughter-in-law is Norwegian – [her] children are not able to eat spicy food*".

Participants report eating tacos, pizza, lasagna, and spaghetti which they identified as Norwegian foods. While these foods have not long been part of Norwegian food tradition, they have become a usual part of the Norwegian diet more recently due to globalization (Bugge, 2019). In particular, Texans brought the American taco to Norway in 1965 with the start of the oil industry (Folland, 2021). So, although older native Norwegians are not likely to identify these foods as traditional Norwegian foods, many older immigrants have no experience of Norway prior to the arrival of tacos and pizza. Participants eat these western foods most often when they eat with family, as Yusuf (age 75) explained, "*The entire family, kids, and grandkids, come and eat dinner with me every Saturday. I make pizza and also order pizza which the grandkids like better*."

3.2. Present influences on eating preferences

3.2.1. Nutrition knowledge

Awareness of the importance of nutrition for health, particularly as they grow older, is a theme mentioned often by informants. Interview participants demonstrated knowledge of nutrition and lifestyle habits which reduce disease risk with aging, and they proactively seek out information about how to protect their health through diet change. More than half said they seek out nutrition advice from media sources including the internet, television, radio, newspapers, magazines, and books. Media sources from Norway, their country of origin, and other nations are of interest and regularly consulted. Priya (age 61) explained "*there is always new research. I follow that closely.*" Yasir (age 74) follows several information sources, saying "*there is a lot in the media … about how dietary fat affects the body, what is healthy and what is not healthy. This has an influence on me.*"

Doctors, nutritionists, and friends are the people who provide information influencing their eating decisions. Samina (age 64) explained, "*I have been to the doctor. He says I shouldn't use a lot of oil, so that's the way I try to make it at home.*" Information from health care providers is received in clinic appointments, nutrition classes, and presentations organized by the municipality in libraries and senior centers. Ayesha (age 60) has attended nutrition classes where she learned, "*you need to eat five [fruits and vegetables] a day.*" Priya (age 61) finds support from a close group of friends, saying "*we are three friends who spend a lot of time together. So, we eat pretty much the same food and all three of us eat healthy*". A few participants consult with doctors and naturopaths from their country of origin.

Family members were also mentioned as influencing healthy eating behavior. Jamila's daughter, who works as a nurse, tells her not to eat bananas or grapes "*and she buys food for me with very little fat*" (Jamila, 62). Marija's daughter "*is very keen on eating healthy. She buys books for me about food*" (Marija, age 65). Marija (age 65) and her husband have an agreement "*that we will say to each other when you are eating chocolate, you don't need to eat so much.*"

3.2.2. Disease management and prevention

Interviews revealed that all participants have changed their diets to include more health-supporting foods. Although none of the participants claimed to eat healthfully all the time, participants report a variety of healthy diet choices with the goal of reducing disease risk and supporting best possible health with aging. Reported diet changes include eating more fiber, vegetables, and protein; and eating less fat, sugar, carbohydrates, and red meat.

Reducing dietary fat is the diet change most frequently reported by participants. Yusuf (age 75) explained that "*Pakistani food traditionally is made with a lot of butter and oil. That which I have changed … I use very little oil, and don't use butter at all.*" Some reported changing to cooking oils rich in unsaturated fats, such as canola and olive oil. Jamila (age 62) has learned to choose low fat dairy foods, explaining "*I have low-fat milk and low-fat butter. Everything I eat is low-fat.*" A few participants use an air fryer in place of deep frying, while others now cook more often by roasting or boiling instead of frying. As Khalid (age 71) explained, "*at my age, we eat mostly boiled food instead of fried*".

Efforts to eat less sugar and fewer simple carbohydrates was reported

by most participants. As Ayesha (age 60) shared "*it isn't good to eat a lot of sugar. The doctor said my blood sugar is borderline, so I have to be careful … I have to eat less bread and less rice*." Yasir (age 74) said that when he was working, "*I drank more soda and other sweets*", but since retirement he intentionally consumes less sugar. Priya (age 61) said she makes desserts for guests, "*but otherwise we eat very little sugar at home*."

Knowledge of the benefits and sources of dietary fiber was demonstrated by a number of participants. As Yusuf (age 75) shared, "*I avoid soft bread. I [buy] whole wheat bread. And when I make pizza, I make it with wholewheat flour*." Samina (age 64) has learned to increase fiber in homemade waffles by replacing half the flour with rolled oats because "*it is very healthy and fills you up*". Hassan (age 75) reads nutrition labels to identify foods rich in fiber, as he explained "*There are many different types [of crispbread], but I buy the one that has a lot of fiber*".

Participants shared their strategies for increasing vegetable consumption. Jamila (age 62) started to eat more vegetables to reach her weight loss goal, and "*prepares vegetables every day*" to maintain her weight. A few participants prepare fresh smoothies to increase vegetable consumption. For example, Marija (age 65) said "*I have so much in the smoothie … such as kale and spinach … also, cucumber and banana*". Priya (age 61) has a different strategy, saying, "*two times a week I eat only salad for dinner. Then I drop all grain products*."

Most participants said they eat smaller and/or less frequent meals for health. Gayan (age 68) explained "*I have to be careful. Although I eat four times a day, I don't eat much*." Yasir (age 74) has also reduced his portion sizes as he's aged, sharing that he eats "*less food each time I eat, and I try not to eat so late in the evening*". Hassan (age 75) has developed a similar habit, saying, "*If I eat too much, then I feel heavy. So, I don't eat too much … just enough*".

A few participants are choosing to eat less red meat, such as Marija and her husband who eat a meatless dinner two days per week. When asked whether she eats much Yugoslavian food, Marija (age 65) replied, "*It is a lot of meat and a lot of fat, and a lot of … no*". Hassan (age 75) also eats less red meat, explaining "*If you look several years back, I was eating a lot of red meat, ground beef, and such things, but now very little*". Jamila said her protein and iron were low after surgery several years ago, so she is intentional about eating beans, chicken or lamb with every dinner. "*It has my health - it has protein*" (Jamila, age 62).

3.3. Healthy eating habits as an investment in the future

3.3.1. Future health

When discussing motivations for choosing a healthy diet, protecting future health was a common theme mentioned during the interviews. Some participants began eating healthfully many years ago to reduce disease risk while others volunteered information about diagnosed health conditions, saying they began making diet changes in order to manage an existing illness. Type 2 diabetes, hypertension, hypercholesterolemia, and osteoporosis are illnesses mentioned by participants. All participants who shared information about existing diagnoses also described their efforts to change their diets to manage or reduce disease severity, thus investing in their future health. For example, Ayesha became motivated to change her diet after being diagnosed with a heart condition. She explained, "*Before I ate everything, but now I am careful with fatty food … I have learned to eat less red meat*" (Ayesha, age 60). Since being diagnosed with diabetes, Zainab (age 62) "*can't eat so much bread or rice due to diabetes. So, I try to eat more vegetables … and maybe a slice of bread, but not too much.*"

Avoiding disability and early death is a strong motivator for some participants to eat a health-supporting diet. "*Because it is not easy to live with illness and other problems. I don't want to die so fast – I want to live a long time*," said Zainab (age 62). Priya is motivated by the deeply personal loss of her brothers at a young age. "*They have left a mark on my life. They ate very unhealthily, got diabetes, and had more and more complications. That is something I am very afraid of – that I don't go down the same road*" (Priya, age 61). Samina wants to have better health than her mother who was bedridden for the last years of her life. "*She was not able to stand or walk, so she just laid in bed. And she had high blood pressure and diabetes. That is why I eat healthy food*" (Samina, age 64).

3.3.2. Maintaining independence

Maintaining independence with aging was a common concern among participants who wish to remain in their homes to the end of their lives. Khalid (age 71) acknowledged that "*health is very important for life … I want to be healthy as long as I am alive. I don't want to be dependent [on others] … I don't want to live in a nursing home*". Marija (age 65) also feels strongly that "*one wants to live as long as possible, but that you are healthy enough that you never need help from others … We don't want to be a burden to our children*."

One advantage of maintaining independence is the opportunity for an individual to participate in activities and relationships which give their lives meaning. Travel and volunteer work were mentioned by several participants. Yasir (age 74) would like to see more of the world, Gayan (age 68) travels often to Denmark, while Khalid (age 71) enjoys exploring Norway. Ayesha (age 60) shared that her hopes center around family, saying "*I look forward to when my grandchildren are very big. I hope they will come to me so we can spend time together … They are my life*".

3.3.3. Maintaining cultural and religious identity

Several participants expressed concern for maintaining cultural and religious identity if they eventually become too ill to live at home. Specifically, they worry that nursing homes in Norway may not offer halal food. "*If I have to live in a nursing home, do you have one that is consistent with my traditions*?" (Yasir, age 74). Ayesha shared similar worries for the future. "*I may live in a nursing home … I am worried we won't get halal food [in the nursing home]. [There are] many Muslims [in Norway] … Not everyone likes Norwegian food … Not only me – I am thinking about others, too. I can eat fish … But if the chicken is not halal, then I can't eat it. These things are very worrisome*" (Ayesha, age 60).

Yasir emphasized the connection between identity and dignity. "*As long as I am healthy, I want to have a dignified life in my old age. Where, for example, it is free. You can eat whatever you want. And if [I am] in a nursing home, then you have one arranged according to my tradition. That is what I define as a dignified life*" (Yasir, age 74).

4. Discussion

This study has investigated the eating preferences and behaviors of home-dwelling, older immigrants in Oslo, and identified factors which influence their eating preferences and behaviors. Findings indicate that older immigrants eat an acculturated diet pattern, and that they incorporate many health-supporting eating habits. Hopes and worries for the future motivate older immigrants to eat more healthfully in order to maintain health and independence as long as possible. Other influences on eating preferences identified in this study include nutrition knowledge and disease management and prevention.

Study findings indicate that participants mostly follow a bi-cultural diet pattern 20–59 years after immigrating to Norway. This pattern has also been identified in other studies conducted with immigrants to Norway (Garnweidner et al., 2012; Johansen et al., 2010; Mellin-Olsen & Wandel, 2005) but has not been specifically identified among older immigrants. The maintenance of elements of own food culture indicates, as suggested by other studies (Rieger et al., 2021; Sturkenboom et al., 2016), that the temporal dimension - how long immigrants have been living in the host country - may not be considered adequate for predicting dietary acculturation, and that other interconnected factors need to be taken into consideration. The growth of immigrant communities and the increased opportunities to find food from the own country, particularly in larger cities such as Oslo, facilitates keeping aspects of the traditional culture in everyday contexts such as dinner, in addition to special celebrations (Berggreen-Clausen et al., 2022; O'Mara et al., 2021). The incorporation of Norwegian foods tends instead to occur for

breakfast and lunch. Similar to the findings of two review articles on immigrants' food habits, participants said that in the past they began eating Norwegian foods for breakfast and lunch when they were working due to convenience (Lillekroken et al., 2024; Osei-Kwasi et al., 2016). An interesting finding of this study is that participants have maintained these Norwegian meals, also after they retired and have potentially more time for food preparation, indicating that bi-cultural diets are part of their daily food habits.

An important contribution of this study is that it indicates how health concerns are interwoven with dietary acculturation. Participants expressed willingness to make a variety of changes to food preferences and cooking methods in order to protect their health. These findings are consistent with the findings for ethnically diverse older adults in the United Kingdom who also strive to follow a healthy diet to reduce risk of illness (Asamane et al., 2019; Castaneda-Gameros et al., 2018). Interestingly, older immigrants in Norway share much in common with older non-immigrants who's food preferences are also strongly influenced by desire to protect health with aging (Grini et al., 2020).

Attention towards health was shown also by the fact that participants proactively seek out information about the effects of diet on health from a variety of sources, then apply that knowledge when making decisions about which foods to buy, how to prepare them, and how often to eat them. According to two recent reviews, older adults who are knowledgeable about the connection between health and diet make healthier eating decisions and have more control over what they eat (Caso & Vecchio, 2022; Walker-Clarke et al., 2022). A study from the United Kingdom found that older immigrants who demonstrated knowledge of a healthy diet consumed sodium, fat, and trans unsaturated fat within the recommended guidelines for reducing NCD risk (Castaneda-Gameros et al., 2018).

While participants report making many health-supporting eating decisions, this study is unable to determine whether participants' nutrition knowledge and eating behaviors have direct benefit to their health. Previous research may shed some light. For example, a cross-sectional study in older, home-dwelling Europeans found that good nutrition knowledge is associated with lower body mass index (Jeruszka-Bielak et al., 2018). Also, a review by Caso and Vecchio (2022) indicates that older adults who are physically active and in relatively good health tend to eat a healthier diet including more fresh fruits and vegetables.

Desire to avoid future illness and early death was participants' primary motivator for implementing health-supporting diet changes. A study of older adult health behaviors in the U.S. found that not all older adults are motivated by growing old to improve their diets (Bardach et al., 2016). However, older adults who did feel motivated by aging recognized their susceptibility to illness and were motivated to accept responsibility for their health (Bardach et al., 2016). While all participants expressed motivation to make healthy eating decisions, some started changing their diet to reduce disease risk many years ago, while others began making diet changes for health only after being diagnosed with an NCD. Some participants shared they were motivated to eat a health-supporting diet as a result of experiencing family members who suffered complications and early death from an NCD, a motivating influence which has been previously documented (Asamane et al., 2019).

Consistent with two recent review articles exploring older adults' eating behaviors (Govindaraju et al., 2022; Walker-Clarke et al., 2022), participants expressed a strong sense of motivation to eat healthfully in order to increase their chance of remaining independent and realizing future hopes. The older immigrants interviewed wish to remain healthy and independent in the future so they may continue to enjoy the company of family, and be actively engaged in the world, such as through volunteer work and travel. These future goals are similar to goals identified in studies of older adults in western countries, both immigrant (Castaneda-Gameros et al., 2018; Conkova & Lindenberg, 2020) and non-immigrant (Caso & Vecchio, 2022; Govindaraju et al., 2022; Host et al., 2016; Lundkvist et al., 2010).

Uncertainties about the quality of care they will receive if they are eventually unable to live independently is a priority concern older adults have in common (Conkova & Lindenberg, 2020; Govindaraju et al., 2022). Some concerns expressed by participants are, however, unique to the immigrant population, such as whether they will be supported in maintaining their cultural and religious identity should they require nursing home care in the future. Needs and preferences specific to older adults from a variety of cultural and religious traditions, such as spicy foods and halal meals, are important not only to ensure nutritional needs are met in nursing homes, but also to ensure their cultural and religious identities are respected and cared for, protecting mental health and dignity at the end of life (Elshahat et al., 2023; Lillekroken et al., 2024).

Preserving cultural identity in Norwegian nursing homes is a topic that only recently has emerged as a problem in the health sector (Høy et al., 2016), given Norway's brief history as an immigration country (Czapka & Sagbakken, 2020). Among immigrant dementia patients in Norway, familiar foods enjoyed in their early life have been shown to improve mood, appetite, and independent eating skills (Hanssen & Kuven, 2016). While halal foods are available for older immigrants receiving nursing home care due to dementia, the variety and quality of these foods is limited and they are not prepared in a culturally familiar way (Sagbakken et al., 2020). In Norway and Quebec (Girard & El Mabchour, 2019; Sagbakken et al., 2020), nursing home staff often call on family members of immigrant residents to provide home-prepared foods in order to prevent residents from skipping meals which over time can lead to malnutrition and weight loss (Paker-Eichelkraut et al., 2013). This indicates a need to adapt nursing home care to be inclusive of an increasingly culturally diverse population.

This study aims to address the research gap regarding the eating preferences and behaviors of older immigrants in Norway. As presented, the findings of this study are very much in line with the findings of similar studies of older immigrants in other western countries, indicating the tendency of bi-cultural food habits. This study has also demonstrated that the diets of older immigrants and non-immigrants in Norway are guided by many of the same influences. Of particular relevance is the aim to maintain health in order to avoid becoming dependent on a health care system which is not adapted to their bi-cultural food habits. By viewing the results through the lens of both dietary acculturation and the temporal model for older adults, this study offers enhanced understanding of the influences on older immigrants' food preferences which may be useful for designing interventions supporting improved health and quality of life.

4.1. Limitations and strengths

The majority of study participants were born in Pakistan, and as such they are representative of the largest group of older immigrants in Norway who originate from outside of Europe. However, dietary patterns can be very distinct depending on where immigrants originate from. For this reason, understanding of the influences on older immigrant eating behaviors would be further enhanced by investigating older adults from some of the other countries from which older immigrants in Norway originate. It is possible that the older immigrants who volunteered to be interviewed had stronger interest in nutrition and health than those at recruitment sites who did not volunteer, which may overemphasize older immigrants' motivation to eat healthfully. Because recruitment took place at social centers, participants were socially well-connected, a characteristic associated with healthier food choices among older adults (Gele et al., 2016; Govindaraju et al., 2022; Walker-Clarke et al., 2022). Conversational fluency in the language of their adopted homeland, an inclusion criterion for this study, is associated with higher health literacy and better health outcomes as compared with first-generation immigrants with low language proficiency (Mantwill & Schulz, 2017; Sagong & Yoon, 2021). Further research is needed to investigate the eating behaviors of older immigrants who do not meet these criteria.

Only immigrants with conversational Norwegian skills were included, for ease of communication without an interpreter. While this likely excluded some immigrants from participating, a recent survey found that 46 percent of first-generation immigrants speak Norwegian at home as their primary language (Statistics Norway, 2016). The percentage who speak Norwegian at home is higher for groups who have lived in Norway longer, for example immigrants from Pakistan (61%) and Sri Lanka (74%) (Statistics Norway, 2016).

This is one of the first studies investigating eating preferences and behaviors among Norway's older immigrant population, providing thus novel and needed knowledge. While this study does identify significant influences on the eating preferences of older immigrants, this list is not complete. Further studies are needed to investigate other potential influences such as the nutrition transition, economic status, food cost, and public health policies. Adoption of more than one theoretical perspective enriches interpretation and analysis (Yardley et al., 2013), allowing the opportunity to identify both similarities and differences in eating preferences between older immigrants and non-immigrants in Norway. Dependability of this study is increased by the collaboration and discussion among all authors during data coding and interpretation (Cope, 2014). The reflexive process of the analysis contributes to confirmability, ensuring study findings are shaped by participants' experiences and not by researchers' motives (Braun & Clarke, 2019).

5. Conclusion

Study findings indicate that home-dwelling, older immigrants in Oslo tend to have bi-cultural dietary habits and are motivated to make diet changes supporting health in order to reduce their risk of illness, and preserve independence, identity, and quality of life into the future. In this way, older immigrants in Oslo share much in common with older non-immigrants. While traditional food culture has a significant influence on eating preferences among older immigrants, study participants revise traditional recipes from their culture of origin and adopt new dietary habits in order to meet their health goals. While this study does not attempt to identify all possible influences on the eating preferences and behaviors of home-dwelling, older immigrants, it has increased understanding of the factors which influence their eating decisions for health with aging. These results can be useful for designing culturally tailored programs which support eating habits for health maintenance and disease prevention among older immigrants.

Funding

This work was supported by the Foundation for Research Levy on Agricultural Products: The Strategic Research Program FoodForFuture (NFR 314318 – FFL).

Ethical statement

This study was planned and executed in accordance with the General Data Protection Regulation (GDPR) EU 2016/679. The principles of the Declaration of Helsinki 2008 for research on human subjects were the foundation on which the studies and data collection were constructed. The project was reviewed and approved by Nofima's Ethical Board, and the studies comply with the Norwegian Data Protection Services code of conduct. Ethics approval was confirmed in August 2022 from Norwegian Agency for Shared Services in Education and Research (Reference #671301).

CRediT authorship contribution statement

Stephanie L. Maxson: Writing – original draft, Visualization, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Ida Synnøve Grini:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Øydis Ueland:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Investigation, Conceptualization. **Laura Terragni:** Writing – review & editing, Validation, Supervision, Project administration, Methodology, Investigation, Conceptualization.

Declaration of competing interest

None.

Data availability

The data that has been used is confidential.

References

Abbots, E.-J. (2016). Approaches to food and migration: Rootedness, being and belonging. In J. Watson, & J. Klein (Eds.), *The Handbook of food and anthropology* (pp. 115–132). Bloomsbury. https://doi.org/10.5040/9781474298407.0013.

Asamane, E. A., Greig, C. A., Aunger, J. A., & Thompson, J. L. (2019). Perceptions and factors influencing eating behaviours and physical function in community-dwelling ethnically diverse older adults: A longitudinal qualitative study. *Nutrients, 11*(6). https://doi.org/10.3390/nu11061224. Article 1224.

Bardach, S. H., Schoenberg, N. E., & Howell, B. M. (2016). What motivates older adults to improve diet and exercise patterns? *Journal of Community Health, 41*(1), 22–29. https://doi.org/10.1007/s10900-015-0058-5

Berggreen-Clausen, A., Hseing Pha, S., Mölsted Alvesson, H., Andersson, A., & Daivadanam, M. (2022). Food environment interactions after migration: A scoping review on low- and middle-income country immigrants in high-income countries. *Public Health Nutr, 25*(1), 136–158. https://doi.org/10.1017/S1368980021003943

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative research in sport, exercise, and health, 11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2021a). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative research in sport, exercise and health, 13*(2), 201–216. https://doi.org/10.1080/2159676X.2019.1704846

Braun, V., & Clarke, V. (2021b). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology, 18*(3), 328–352. https://doi.org/10.1080/14780887.2020.1769238

Braun, V., & Clarke, V. (2023). Toward good practice in thematic analysis: Avoiding common problems and be(com)ing a knowing researcher. *International Journal of Transgender Health, 24*(1), 1–6. https://doi.org/10.1080/26895269.2022.2129597

Bugge, A. (2019). *Fattigmenn, tilslørte bondepiker og rike riddere: mat og spisevaner i Norge fra 1500-tallet til vår tid.* Cappelen Damm akademisk.

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality and Quantity, 56*(3), 1391–1412. https://doi.org/10.1007/s11135-021-01182-y

Caso, G., & Vecchio, R. (2022). Factors influencing independent older adults (un) healthy food choices: A systematic review and research agenda. *Food Research International, 111476*. https://doi.org/10.1016/j.foodres.2022.111476

Castaneda-Gameros, D., Redwood, S., & Thompson, J. L. (2018). Nutrient intake and factors influencing eating behaviors in older migrant women living in the United Kingdom. *Ecology of Food and Nutrition, 57*(1), 50–68. https://doi.org/10.1080/03670244.2017.1406855

Conkova, N., & Lindenberg, J. (2020). The experience of aging and perceptions of "aging well" among older migrants in The Netherlands. *The Gerontologist, 60*(2), 270–278. https://doi.org/10.1093/geront/gnz125

Cope, D. G. (2014). Methods and meanings: Credibility and trustworthiness of qualitative research. *Oncology Nursing Forum, 41*(1), 89–91. https://doi.org/10.1188/14.Onf.89-91

Creswell, J. W., Poth, C. N., & Creswell, J. W. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Sage.

Czapka, E. A., & Sagbakken, M. (2020). "It is always me against the Norwegian system." barriers and facilitators in accessing and using dementia care by minority ethnic groups in Norway: A qualitative study. *BMC Health Services Research, 20*(1), 954. https://doi.org/10.1186/s12913-020-05801-6

Elshahat, S., & Moffat, T. (2020). Dietary practices among Arabic-speaking immigrants and refugees in western societies: A scoping review. *Appetite, 154*, Article 104753. https://doi.org/10.1016/j.appet.2020.104753

Elshahat, S., Moffat, T., Gagnon, O., Charkatli, L., & Gomes-Szoke, E. D. (2023). The relationship between diet/nutrition and the mental health of immigrants in western societies through a holistic bio-psycho-socio-cultural lens: A scoping review. *Appetite, 183*, Article 106463. https://doi.org/10.1016/j.appet.2023.106463

Farhat, G. (2023). Culturally tailored dietary interventions for improving glycaemic control and preventing complications in south asians with type 2 diabetes: Success and future implications. *Healthcare, 11*(8), 1123. https://www.mdpi.com/2227-9032/11/8/1123.

Folland, M. A. (2021). *Taco Norway: The history of a national dish*. University of Oslo [Unpublished masters thesis].
Garnweidner, L. M., Terragni, L., Pettersen, K. S., & Mosdol, A. (2012). Perceptions of the host country's food culture among female immigrants from africa and asia: Aspects relevant for cultural sensitivity in nutrition communication. *Journal of Nutrition Education and Behavior, 44*(4), 335–342. https://doi.org/10.1016/j.jneb.2011.08.005
Gele, A. A., Pettersen, K. S., Torheim, L. E., & Kumar, B. (2016). Health literacy: The missing link in improving the health of Somali immigrant women in Oslo. *BMC Public Health, 16*(1), 1134. https://doi.org/10.1186/s12889-016-3790-6
Girard, A., & El Mabchour, A. (2019). Meal context and food offering in Quebec public nursing homes: The perspectives of first-generation immigrant residents, family members, and frontline care aides. *International Journal of Migration, Health and Social Care, 15*(3), 226–246. https://doi.org/10.1108/ijmhsc-02-2019-0015
Govindaraju, T., Owen, A. J., & McCaffrey, T. A. (2022). Past, present and future influences of diet among older adults - a scoping review. *Ageing Research Reviews, 77*, Article 101600. https://doi.org/10.1016/j.arr.2022.101600
Grini, I. S. B. (2012). *Matvaner hos aktive eldre [Food habits of the active elderly] Oslo and Akershus University College]*. https://hdl.handle.net/10642/1576.
Grini, I. S. B., Bugge, A. B., Granli, B. S., Mortvedt, H. S., Honkanen, P., & Ueland, Ø. (2013). Mat og måltider for aktive eldre - en studie av aktive eldres preferanser, prioriteringer og praksiser [Food and meals for active elderly - a study of active older adults' preferances, priorities and practices] (24/2013). Nofima https://nofima.no/publikasjon/1082280/.
Grini, I. S. B., Bugge, A. B., & Ueland, Ø. (2020). Health-related factors influencing food choices of active home-living older adults in Norway. *Norsk tidsskrift for ernæring, 18*(2), 14–20. https://doi.org/10.18261/ntfe.18.2.3
Hanssen, I., & Kuven, B. M. (2016). Moments of joy and delight: The meaning of traditional food in dementia care. *Journal of Clinical Nursing, 25*(5–6), 866–874. https://doi.org/10.1111/jocn.13163
Host, A., McMahon, A. T., Walton, K., & Charlton, K. (2016). 'While we can, we will': Exploring food choice and dietary behaviour amongst independent older Australians. *Nutrition and Dietetics, 73*(5), 463–473. https://doi.org/10.1111/1747-0080.12285
Høy, B., Lillestø, B., Slettebø, Å., Sæteren, B., Heggestad, A. K. T., Caspari, S., Aasgaard, T., Lohne, V., Rehnsfeldt, A., Råholm, M.-B., Lindwall, L., & Nåden, D. (2016). Maintaining dignity in vulnerability: A qualitative study of the residents' perspective on dignity in nursing homes. *International Journal of Nursing Studies, 60*, 91–98. https://doi.org/10.1016/j.ijnurstu.2016.03.011
Huang, Y.-C., & Garcia, A. A. (2020). Culturally-tailored interventions for chronic disease self-management among Chinese Americans: A systematic review. *Ethnicity and Health, 25*(3), 465–484. https://doi.org/10.1080/13557858.2018.1432752
Jeruszka-Bielak, M., Kollajtis-Dolowy, A., Santoro, A., Ostan, R., Berendsen, A. A. M., Jennings, A., Meunier, N., Marseglia, A., Caumon, E., Gillings, R., de Groot, L. C. P. G. M., Franceschi, C., Hieke, S., & Pietruszka, B. (2018). Are nutrition-related knowledge and attitudes reflected in lifestyle and health among elderly people? A study across five European countries [original research]. *Frontiers in Physiology, 9*. https://doi.org/10.3389/fphys.2018.00994
Johansen, K. S., Bjørge, B., Telle Hjellset, V., Holmboe-Ottesen, G., Råberg, M., & Wandel, M. (2010). Changes in food habits and motivation for healthy eating among Pakistani women living in Norway: Results from the InnvaDiab-DEPLAN study. *Public Health Nutrition, 13*(6), 858–867. https://doi.org/10.1017/S1368980009992047
Kjøllesdal, M., Straiton, M. L., Øien-Ødegaard, C., Aambø, A., Holmboe, O., Johansen, R., Grewal, N. K., & Indseth, T. (2019). *Health among immigrants in Norway: Living conditions among immigrants 2016*. Norwegian Institute of Public Health. https://doi.org/10.1093/eurpub/ckz186.041
Kvalsvik, F., Øgaard, T., & Jensen, Ø. (2021). Environmental factors that impact the eating behavior of home-living older adults. *International Journal of Nursing Studies Advances, 3*, Article 100046. https://doi.org/10.1016/j.ijnsa.2021.100046
Lillekroken, D., Bye, A., Halvorsrud, L., Terragni, L., & Debesay, J. (2024). Food for soul—older immigrants' food habits and meal preferences after immigration: A systematic literature review. *Journal of Immigrant and Minority Health*, 1–31. https://doi.org/10.1007/s10903-023-01571-5
Lundkvist, P., Fjellström, C., Sidenvall, B., Lumbers, M., & Raats, M. (2010). Management of healthy eating in everyday life among senior Europeans. *Appetite, 55*(3), 616–622. https://doi.org/10.1016/j.appet.2010.09.015
Mantwill, S., & Schulz, P. J. (2017). Does acculturation narrow the health literacy gap between immigrants and non-immigrants—an explorative study. *Patient Education and Counseling, 100*(4), 760–767. https://doi.org/10.1016/j.pec.2016.10.021
Mellin-Olsen, T., & Wandel, M. (2005). Changes in food habits among Pakistani immigrant women in Oslo, Norway. *Ethnicity and Health, 10*(4), 311–339. https://doi.org/10.1080/13557850500145238
Norman, K., Hass, U., & Pirlich, M. (2021). Malnutrition in older adults-recent advances and remaining challenges. *Nutrients, 13*(8). https://doi.org/10.3390/nu13082764. Article 2764.
Norwegian Directorate of Health. (2014). Anbefalinger om kosthold, ernæring og fysisk aktivitet [Recommendations on diet, nutrition, and physical activity] (IS-2170). Retrieved from https://www.helsenorge.no/kosthold-og-ernaring/kostrad/helsedirektoratets-kostrad/.
Oliver, D. G., Serovich, J. M., & Mason, T. L. (2005). Constraints and opportunities with interview transcription: Towards reflection in qualitative research. *Social Forces, 84*(2), 1273–1289. https://doi.org/10.1353/sof.2006.0023
O'Mara, J., Waterlander, W., & Nicolaou, M. (2021). Exploring the role of the food environment in dietary acculturation: A study amongst Moroccan immigrants in The Netherlands. *International Journal of Environmental Research and Public Health, 18*(7), 3328. https://www.mdpi.com/1660-4601/18/7/3328.
Osei-Kwasi, H. A., Nicolaou, M., Powell, K., Terragni, L., Maes, L., Stronks, K., Lien, N., Holdsworth, M., & on behalf of the, D.c. (2016). Systematic mapping review of the factors influencing dietary behaviour in ethnic minority groups living in Europe: A DEDIPAC study. *International Journal of Behavioral Nutrition and Physical Activity, 13*(1), 85. https://doi.org/10.1186/s12966-016-0412-8
Osei-Kwasi, H. A., Powell, K., Nicolaou, M., & Holdsworth, M. (2017). The influence of migration on dietary practices of Ghanaians living in the United Kingdom: A qualitative study. *Annals of Human Biology, 44*(5), 454–463. https://doi.org/10.1080/03014460.2017.1333148
Paker-Eichelkraut, H. S., Bai-Habelski, J. C., Overzier, S., Strathmann, S., Heseker, H., Stehle, P., & Lesser, S. (2013). Nutritional status and related factors in elderly nursing home residents: Comparative cross-sectional study in migrants and native Germans. *Journal of nutrition in gerontology and geriatrics, 32*(4), 330–342. https://doi.org/10.1080/21551197.2013.842198
Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). Sage.
Poggiogalle, E., Kiesswetter, E., Romano, M., Saba, A., Sinesio, F., Polito, A., Moneta, E., Ciarapica, D., Migliaccio, S., Suwalska, A., Wieczorowska-Tobis, K., Pałys, W., Łojko, D., Sulmont-Rossé, C., Feart, C., Brug, J., Volkert, D., & Donini, L. M. (2021). Psychosocial and cultural determinants of dietary intake in community-dwelling older adults: A determinants of diet and physical activity systematic literature review. *Nutrition, 85*, 111131. https://doi.org/10.1016/j.nut.2020.111131, 111131.
Qureshi, S. A., Kjøllesdal, M., & Gele, A. (2022). Health disparities, and health behaviours of older immigrants & native population in Norway. *PLoS One, 17*(1), Article e0263242. https://doi.org/10.1371/journal.pone.0263242
Rieger, E. Y., Terragni, L., & Czapka, E. A. (2021). Experiences and perceptions of body weight among Turkish immigrant women in Norway. *International Journal of Migration, Health and Social Care, 17*(1), 92–104. https://doi.org/10.1108/IJMHSC-08-2020-0077
Sagbakken, M., Ingebretsen, R., & Spilker, R. S. (2020). How to adapt caring services to migration-driven diversity? A qualitative study exploring challenges and possible adjustments in the care of people living with dementia. *PLoS One, 15*(12), Article e0243803. https://doi.org/10.1371/journal.pone.0243803
Sagong, H., & Yoon, J. Y. (2021). Pathways among frailty, health literacy, acculturation, and social support of middle-aged and older Korean immigrants in the USA. *International Journal of Environmental Research and Public Health, 18*(3), 1245. https://doi.org/10.3390/ijerph18031245
Sallis, J. F., Owen, N., & Fisher, E. (2008). Ecological models of health behavior. In *Health behavior and health education: Theory, research and practice. Ecological Models of health behavior health Behavior and health education: Theory, research, and practice* (pp. 465–482).
Sandnes, T. (2017). Innvandrere i norge 2017 [immigrants in Norway 2017]. *Oslo-Kongsvinger: Statistics Norway*, (155). Retrieved from https://www.ssb.no/befolkning/artikler-og-publikasjoner/_attachment/332154?_ts=162901a1050.
Satia-Abouta, J., Patterson, R. E., Neuhouser, M. L., & Elder, J. (2002). Dietary acculturation: Applications to nutrition research and dietetics. *Journal of the American Dietetic Association, 102*(8), 1105–1118. https://doi.org/10.1016/s0002-8223(02)80079-7
Sobal, J., & Bisogni, C. A. (2009). Constructing food choice decisions. *Annals of Behavioral Medicine, 38*, S37–S46. https://doi.org/10.1007/s12160-009-9124-5
Statistics Norway. (2016). Levekår blant innvandrere I norge 2016 [living conditions among immigrants in Norway 2016] (2017/13). Retrieved from https://www.ssb.no/sosiale-forhold-og-kriminalitet/artikler-og-publikasjoner/levekar-blant-innvandrere-i-norge-2016.
Statistics Norway. (2022). Eldre Innvandrere i Norge: Demografi, boforhold, inntekt, formue og helse [Elderly Immigrants in Norway: Demographics, living conditions, income, wealth and health] (2022/2). Retrieved from https://www.ssb.no/en/befolkning/innvandrere/artikler/elderly-immigrants-in-norway.
Sturkenboom, S. M., Dekker, L. H., Lamkaddem, M., Schaap, L. A., de Vries, J. H. M., Stronks, K., & Nicolaou, M. (2016). Acculturation and dietary patterns among residents of Surinamese origin in The Netherlands: The HELIUS dietary pattern study. *Public Health Nutrition, 19*(4), 682–692. https://doi.org/10.1017/S1368980015001391
Terragni, L., Garnweidner, L. M., Pettersen, K. S., & Mosdol, A. (2014). Migration as a turning point in food habits: The early phase of dietary acculturation among women from south asian, african, and middle eastern countries living in Norway. *Ecology of Food and Nutrition, 53*(3), 273–291. https://doi.org/10.1080/03670244.2013.817402
Ueland, Ø., Grini, I. S. B., Schillinger, I., & Varela, P. (2022). Opportunities and barriers for food intake in older age - a Norwegian perspective. *Food & Nutrition Research, 66*. https://doi.org/10.29219/fnr.v66.8628
United Nations. (2020). UN decade of healthy ageing: Action plan 2021-2030. Retrieved from https://www.who.int/publications/m/item/decade-of-healthy-ageing-plan-of-action.
Walker-Clarke, A., Walasek, L., & Meyer, C. (2022). Psychosocial factors influencing the eating behaviours of older adults: A systematic review. *Ageing Research Reviews, 77*, Article 101597. https://doi.org/10.1016/j.arr.2022.101597
Wandel, M., Råberg, M., Kumar, B., & Holmboe-Ottesen, G. (2008). Changes in food habits after migration among South Asians settled in Oslo: the effect of demographic, socio-economic and integration factors. *Appetite, 50*(2), 376–385. https://doi.org/10.1016/j.appet.2007.09.003
Wändell, P. E. (2013). Population groups in dietary transition. *Food & Nutrition Research, 57*(1), Article 21668. https://doi.org/10.3402/fnr.v57i0.21668

World Health Organization. (2002). *Active ageing : A policy framework*. Geneva: World Health Organization. Retrieved from https://apps.who.int/iris/handle/10665/67215.

World Health Organization. (2015). World report on ageing and health. Retrieved from https://www.who.int/publications/i/item/9789241565042.

Yardley, S., Brosnan, C., & Richardson, J. (2013). Sharing methodology: A worked example of theoretical integration with qualitative data to clarify practical understanding of learning and generate new theoretical development. *Medical Teacher, 35*(3), e1011–e1019. https://doi.org/10.3109/0142159X.2012.733045