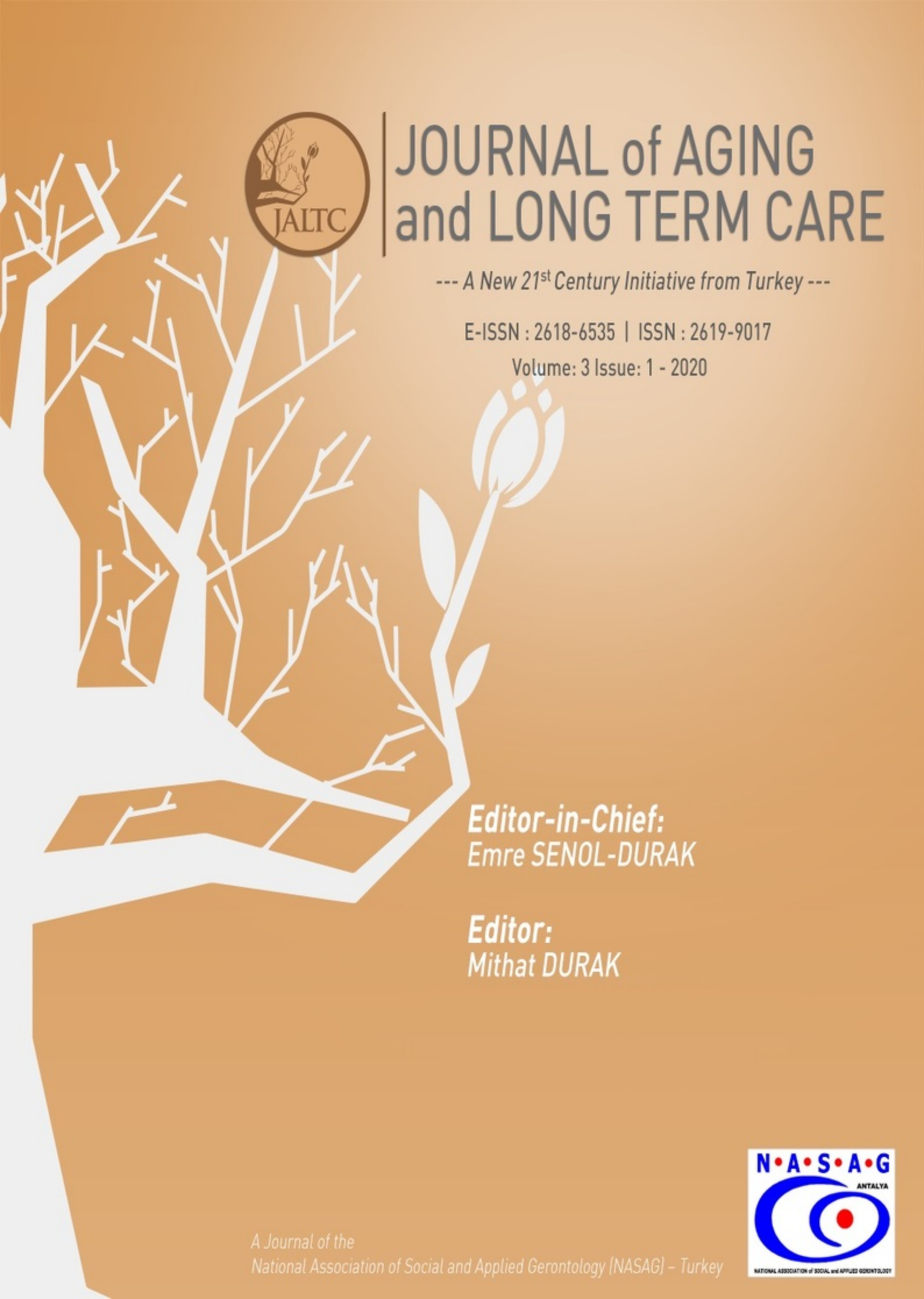

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REVIEW ARTICLE

"COVID-19 Psychology" among Older Adults: As a Grief Process

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ABSTRACT

COVID-19 Pandemic affected individuals around the world dramatically. It is a transition process influencing the coping resources of individuals. Several disorders such as coronavirus fear/anxiety, illness-anxiety disorder, and obsessivecompulsive disorder have been seen among individuals. Older adults have had trouble during the COVID-19 pandemic. Lockdown experience lasting many days, social isolation, being able to leave home in a limited time zone affect older adults negatively. The paper is focused on interpreting psychological stages determined by Elizabeth Kübler-Ross and David Kessler (2005) to the COVID-19 process. Those stages help professionals to understand older adults' reactions afterward COVID-19 Pandemic. In addition, the paper includes cognitive, behavioral, and emotional suggestions to cope with COVID-19 psychology.

Keywords: COVID-19 pandemic, COVID-19 psychology, older adults, coping, meaning-making, cognitivebehavioral-emotional strategies

Key Practitioners Message

1. Older adults have trouble during the COVID-19 pandemic and the psychological consequences are still unknown among them.
2. Among psychological disorders coronavirus fear, illness-anxiety disorder, and obsessive-compulsive disorder are more likely seen and it is difficult somehow to differentiate symptoms of those disorders.
3. The COVID-19 leads to "the loss of normal life" and therefore, psychological reactions are quite similar as in the grief process, which is defined by Elizabeth Kübler-Ross and David Kessler (2005).

A pandemic process that affects the whole world is alarming for humanity. There have been approximately 25 million cases affected by COVID-19 across the world and the numbers are going to increased (Worldometer, 2020). The COVID-19 changes most aspects of life completely including social life, economic life, and daily life. In the days when the COVID-19 virus appeared, it could not imagine that the virus would affect individuals, families, cities, and countries so much. Nowadays, people follow what is going on through a window where life is re-framed with "# stay at home". They think, examine, try to understand, and analyze the pandemic process that helps them to elaborate the COVID-19 process, which is so uncertain (Han, Cha, & Lee, 2020). In this respect, "This must be a dream of what we are going through." "Someone should tell us that a movie was made." or "How long should we stay at home?", "Will my loved ones be affected by viruses?", "Should the numbers on the TV screen agitate me?", and "What awaits me in the future?" are some questions that can hold people's minds. All these are very natural reactions that encountering in processes not known and prepare individuals for this process. Our spiritual world is in full preparation for the COVID-19

process to regulate complex emotions and thoughts. The unknown virus affects coping resources completely. While we are in a state of intensity regarding our emotions, thoughts, and behavior, people may feel mentally tired, depressed, and energized from time to time.

Psychological Effects of COVID-19 Pandemic

Psychological effects have been examined about COVID-19 Pandemic even after individuals have been increasingly affected by the virus. It is stated that the pandemic has influenced individuals as lower down subjective well-being of the individuals (Zacher & Rudolph, 2020). In an Italian study conducted approximately 1000 people revealed that there was a positive relationship between the length of social isolation time and the prevalence of psychological disorders (i.e., depression, helplessness) (Pancani, Marinucci, Aureli, & Riva, 2020). In another study examining the effect of lockdown, depression and stress rates varied between 8 to 20 percent (Atalan, 2020). In a study conducted in the US and Canada, COVID-stress includes perceived danger and contamination, financial fears, xenophobia about COVID-19, compulsions, and re-assurance seeking about health and traumatic stress reactions (Taylor et al., 2020).

Apart from those studies mentioned above, new problems are added to this. To include three of them here, coronavirus fear, illness-anxiety disorder, and obsessive-compulsive disorder are explained. However, the symptoms of those disorders are quite similar. Therefore, it is difficult to differentiate those disorders.

A significant process can be experienced with a phobia about fear of catching COVID-19, and avoiding places and people where the disease will be transmitted. Those symptoms are under the umbrella of fear/anxiety that anyone with a phobia may feel nervous at the thought of his/her illness, tell that his/her heart is beating too fast, and he/she is out of breath and trembling. It is called coronavirus fear/anxiety (Lee, Jobe, Mathis, & Gibbons, 2020). Physiological concerns, dealing with ideas about self/closed one's health and disturbances in daily functioning with avoiding others to be in social life are some complaints about fear of catching COVID-19 (Arora, Jha, Alat, & Das, 2020). Similarly, a study evaluating fear of coronavirus with open-ended questions reveal that there were significant concerns about the health of relatives or loved ones, work overload of health care staff, and financial outcomes in the COVID-19 outbreak (Mertens, Gerritsen, Duijndam, Salemink, & Engelhard, 2020). In another study, those concerns can be seen in four areas fear of own health, fear for loved ones, fear about the unknown future, and fear of taking an action (Schimmenti, Billieux, & Starcevic, 2020).

Illness anxiety disorder is also seen during the COVID-19 pandemic. A condition appears in the form of a firm belief that the person is a COVID-19 disease in himself/herself. Although the person does not show any symptoms of illness anxiety disorder, he/she seeks assurance about their health (Scarella, Boland, & Barsky, 2019). In this case, he/she goes to the hospital, asks for a series of tests, and is not be convinced despite the non-occurrence of the results about COVID-19. It is mentioned that in hospital emergency conditions, it is more likely to misinterpret bodily sensations as COVID-19 (Asmundson & Taylor, 2020). In a study exploring the association between illness anxiety disorder and psychopathology relations, illness anxiety was significantly predicted depression (Lee & Crunk, 2020). Also, the study found the prevalence of depression by illness anxiety disorder increased by 6%.

Obsessive-Compulsive Disorder (OCD) is another disorder that is more likely to be seen in this process with contamination obsession and cleaning compulsion (Aardema, 2020). Healthcare professionals have mentioned the importance of cleaning hands during the COVID-19 pandemic. There has been a similar number of advertisements on media. Therefore, during this pandemic, obsession with COVID-19 virus contamination has been elevated. Rules explained by the doctors to avoid contamination can trigger the obsession with contamination. Thoughts such as "I wonder if I was able to wash my hand well enough?", "To escape COVID-19 I need to wash my hands in 30 seconds" are some examples of contamination obsession. Those obsessions followed by compulsion during the COVID-19 pandemic leads to an increase in threat perception which results in loss of reality perception (Aardema, 2020). Besides, patients with OCD are also negatively affected by the pandemic. For instance, elevated scores of OCD among one-third of OCD patients were reported since those patients had demonstrated additional obsessions and compulsions (Benatti et al., 2020). In a summary, the COVID-19 pandemic has negative psychological effects on human beings.

Older Adults Experience in COVID-19 Pandemic

Older adults have experienced several difficulties during the COVID-19 pandemic and the psychological consequences are still unknown among older adults (Kivi, Hansson, & Bjälkebring, 2020). Lockdown experience lasting many days, social isolation, being able to leave home in a limited time zone affect older adults negatively. Sharing high mortality rate due to COVID-19 among older adults (Ayalon, 2020; Worldometer, 2020), existing multiple health problems (Montero-Odasso et al., 2020; Steinman, Perry, & Perissinotto, 2020), personal losses, lack of social relations (van Tilburg, Steinmetz, Stolte, van der Roest, & de Vries, 2020), feel nervous about own health and health of the loved ones (Montero-Odasso et al., 2020) increases stress level. The high level of stress during the pandemic is pointed out to lead to sleeping problems and depression among older adults (Schrack, Wanigatunga, & Juraschek, 2020).

Besides, the living place seems to be so important during the COVID-19 pandemic. Older adults living in institutions are affected more negatively than counterparts living in their homes (Petretto, & Pili, 2020). It is mentioned that they have suffered the loss of friends living in the same institutions. They have less social contact than older adults living in their homes (van Tilburg et al., 2020). However, this does not mean living at home is better than living in an institution. Whom to live with is considered important during this break since it is easy for older adults to obtain basic needs from their loved ones. In this regard, it is mentioned that older adults living alone suffering some problems with drug and food supply (Petretto, & Pili, 2020). Similarly, older adults living at home suffer medical problems but they try to solve them themselves (Steinman et al., 2020).

Besides, older adults have experienced social pressures in society. They are perceived as "selfish" in complying with societal rules (Ayalon, 2020, p. 1221). They perceived societal threats while living in a society (van Tilburg et al., 2020). The risk is mentioned about ageism towards older adults and negative social attitudes towards older adults are increasing to discrimination of them (Ayalon, 2020; Petretto, & Pili, 2020). The lockdown has been applied to older adults around the world while people with other age ranges have continued their regular life. It is highlighted that those applications lead to a kind of perception that COVID-19 is not belonging to people but is belonging to older adults (Ayalon, 2020). During those experiences, older adults are experiencing emotional loneliness that would also decrease their well-being (van Tilburg et al., 2020). Emotional loneliness leads to potential harm with social isolation (Steinman et al., 2020). It is noted that they experience emotional burden (Parlapani et al., 2020). Besides, they are experiencing difficulty in terms of active aging (Petretto, & Pili, 2020). In addition, it is stated that personal losses increase the perceived threat resulting in higher emotional and social loneliness (van Tilburg et al., 2020). In a British study comparing before and after pandemic experiences, older adult's loneliness ratio (37% from 2017 to 2019) increased to 51% afterward COVID-19. When comparing older adults in living places, community-dwelling older adults were reported less loneliness than older adults living in institutions (van Tilburg et al., 2020).

In a qualitative study asking older adults about common stressors during COVID-19, social restrictions, concerns for the loved one, and loneliness were mostly reported stressors among US older adults (Whitehead & Torossian, in press). The study also demonstrated quantitative correlations between low psychological well-being (negative affect) and high levels of stress about concerns for loved ones and uncertainty for the future. Moreover, it was found that older adults who reported exercise/self-care, be in nature, and having faith were reported positive psychological well-being (Whitehead & Torossian, in press).

A study conducted with older adults living in Sweden revealed that older adults having higher worry about health and economic consequences of COVID-19 reported less life satisfaction, self-rated health, and higher loneliness (Kivi et al., 2020). Also, individuals with high concerns about the social consequences of COVID-19 reported less loneliness.

In a study conducted with older adults living in Greece (Parlapani et al., 2020), women reported higher depression, sleep difficulty, fear, and intolerance to uncertainty than men. Similar to Kivi et al. study (2020), they found a higher loneliness ratio among older adults living alone.

COVID-19 Pandemic Itself: As a Grief Process Among Older Adults

Older adults have lost many relatives during the COVID-19 pandemic. Besides, they have experienced numerous concerns about their health or the health of their relatives. They have gone through a limited process where they have restricted their social life to the home environment. It would not be wrong to define all these changes as "the loss of normal life". At this point, it can be considered that the psychological stages determined by Elizabeth Kübler-Ross and David Kessler (2005) for the grief process can also be experienced during the COVID-19 process. The COVID-19 itself leads to loss of daily life in routine. It is stated that losses during the COVID-19 pandemic become more complicated among older adults (Goveas & Shear, 2020). Administrators prohibit people to join the ceremony of those who had deceased due to COVID-19. Cultural and religious ceremonies could not be done that leads the grief process more complicated (Goveas & Shear, 2020). The experience of older adults during the COVID-19 pandemic is called "anticipatory grief, disenfranchised grief, and complicated grief for individuals" and those experiences are not only belonging to individuals but also their families, and their caregivers (Wallace, Wladkowski, Gibson, & White, 2020, p. e70). There is a difficulty in communication between older adults and their families. It is recommended to families as communicating older adults receiving palliative care that communication might be the last chance to connect with older adults (Wallace et al., 2020).

It is suggested to consider regular practice about grief to COVID-19 Pandemic (Wallace et al., 2020). Psychological reactions afterward COVID-19 can be explained by stages of grief defined by Elizabeth Kübler-Ross and David Kessler (2005) (Figure 1). Those stages are defined as denial, anger, bargain, depression, and acceptance. Here those reactions due to COVID-19 are explained.

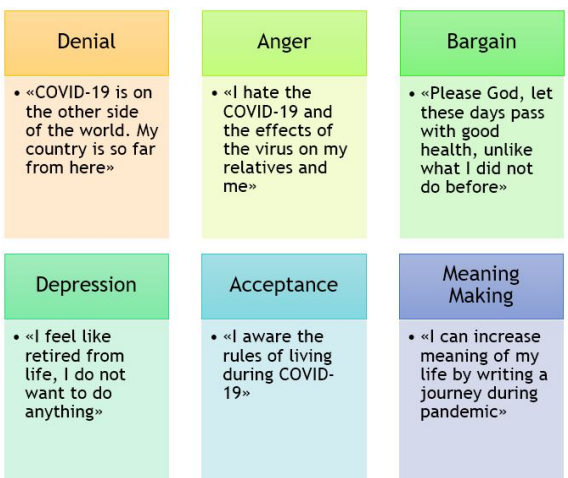
Denial

Denial is the first step. This stage helps us get away from the problem and survive in the first place (Kübler-Ross & Kessler, 2005). It can be seen among older adults in such sentences: "COVID-19 is on the other side of the world. My country is so far from here. It is impossible to reach here". It is the stage in which the person denies

the existence of the problem. Death news from other countries about COVID-19 makes no sense to older adults. The person is in shock, as if numb. This is why he/she wanted to escape from the hospital where he/she was forcibly closed due to the risk of COVID-19. Similarly, noncompliance to use mask is showing one denial response (Jetten, Reicher, Haslam, & Cruwys, 2020). In a study examining the role of denial afterward, COVID-19 revealed that there was a positive correlation between negative affect and denial in a study examining the effect of COVID-19 (Zacher & Rudolph, 2020). On the other hand, denial and shock are tools for us to cope. Denial helps us speed up feelings of grief. There is grace in denial. As someone begins to ask questions as he/she realizes the reality of loss and the danger of COVID 19, he/she unknowingly begins the process of healing. He/she is getting stronger and the denial effect that we felt so strong at first is starting to fade.

Figure 1

COVID-19 Psychology as a Grief Process Among Older Adults



Anger

Anger is a necessary stage of the healing process (Kübler-Ross & Kessler, 2005). People tend to dismiss negative emotions such as anger, to reject them. Sometimes this anger can feel like it will never end. Among nearly 2400 people living in the United Kingdom, 56% of them reported anger while 25% of them reported observing someone with anger due to COVID-19 (Han et al., 2020). It is so healthy to feel anger, even though it may seem endless. The older adults may want to shout, "How cruel is the virus COVID-19?", “I hate the COVID-19 and the effects of the virus on my relatives and me”. It is hard to manage anger. It is stated that anger during COVID-19 might lead to increase misinformation about the virus by using social media to obtain information about the virus (Han et al., 2020). Despite the leading to such problems, on the other hand, the more you feel the anger, the more it will start to dissipate, and the more you will recover. There are many other emotions underlying anger. Older adults will surely have opportunities to explore them. Sometimes it can be challenging to face the limits of anger and managing. The person can feel anger towards many people, from his/her anger towards his/her doctors, his/her family, and his/her loved ones. However, anger is a powerful tool to keep the individual "here and now" despite experiencing times of intense uncertainty such as COVID-19. It is an indicator of your anger intensity cognitively.

Bargain

Bargaining might also be seen in COVID-19 processes. Older adults' sentences including bargaining and negotiating are "Please God, let these days pass with good health, unlike what I did not do before…", "If I regain my health, I never do …". Also, other sentences are part of bargaining: "I can get rid of this virus from myself if I pay attention to my cleanliness". Bargaining is also occupied with reality as "I slept and woke up, it turns out that these days I lived were a bad dream". These pursuits are all about the desire to go back in time (Kübler-Ross & Kessler, 2005). As mentioned in the theory, guilt has appeared as an emotion that people often encounter during the negotiation process. Even with the guilt the people feel, people sit at a table and make an effort to calm it. They try to do everything since they cannot solve the guilty emotions created by the COVID-19. They subject it to take several negotiated actions that we see as the "way out" so long as they "forget" or "calm down".

Depression

After the bargaining phase, attention turns to daily life. Negative emotions manifest themselves, and grief seems to be too deep to bear (Kübler-Ross & Kessler, 2005). Older adults may feel like this situation will last forever. They are alike retired from life, they do not want to do anything, eat or sleep. They strive to get rid of grief by sleeping excessively and eating. The statistics being shown every day about COVID-19 are depressing, and depression is a normal and natural response. It would be unusual for someone not to grieve for those who died, for those who lost their health. Consistently, the higher depression rates have been seen afterward the COVID-19 Pandemic (Atalan, 2020; Pancani et al., 2020).

Acceptance

Acceptance is often confused with what happened with the concept of being "good" or "okay" (Kübler-Ross & Kessler, 2005). This stage is about accepting the reality of COVID-19 and accepting the persistence of this new situation. It is the stage that people learn to live with it. Older adults are accepting a new set of norms with which they must learn to live. They need to rearrange their lives and reconsider roles. For instance, they adopt online-social interaction with friends and family members.

Meaning Making

Kessler revealed that in addition to the stages mentioned above, a sixth stage also exists in this process. After accepting, there is an interpretation stage called finding the meaning of the event and putting the event down (Kübler-Ross & Kessler, 2005). After the loss, it can be experienced as finding meaning in the life of the person, changing life, understanding the value of life (Kübler-Ross & Kessler, 2005). In facing the virus, there is a possibility to define the meaning of life. In addition, to guide people who have had similar experiences, a process of interpretation is experienced among older adults such as explaining their experiences, writing books, writing poems, making videos, and giving pieces of training. Being able to help survivors of the COVID-19 process is also a way of making sense.

Conclusion

Older adults have been affected by the COVID-19 Pandemic that has disrupted regular life. Their psychological reactions are quite similar to reactions seen after grief. It is considered that older adults generally do not experience the above-mentioned stages separately. Each stage is not experienced linearly. Also, COVID-19 Pandemic can be accepted as the grief of “normal life”. To find meaning-making of the “new normal life”, cognitive, emotional, and behavioral recommendations are written below. As mentioned by WHO (2017) developing the internal capacity of older adults is so prominent that involves physical and psychological capacity. Therefore, these recommendations written below are considered helpful to increase intrinsic ability during a pandemic.

Cognitive Strategies

The importance of stimulating cognition is mentioned by WHO (2017). It is also related to delay dementia problems (Steinman et al., 2020). Nowadays, as a part of cognitive stimulation, there will be an intense need to gather information about the course of the disease in COVID 19 and patients with it. However, the more information about COVID 19 increases, the more anxiety will increase in individuals. Therefore, gathering moderate information from reliable sources is crucial to managing anxiety.

Uncertainty situations with a lack of information disturb and stress older adults. Tolerance to uncertainty is crucial in this pandemic process to cope with stress. When tolerance for the uncertainty of someone is low, he/she feels intense anxiety. In a study conducted with older adults during the COVID-19 Pandemic, those people reported higher loneliness (Parlapani et al., 2020). If tolerance for uncertainty level is high, adapting to the new process is easier. Collecting amount of information about COVID-19 is not useful for older adults. Being a little further away from the phone, social media, or news, for example, will increase tolerance for uncertainty. Therefore, it is recommended for older adults to change their attention on COVID-19 to other topics.

Another cognitive issue is dealing more with “self”. A restricted environment prompts older adults to reflect on their selves. During this period, it is an opportunity to explore especially on selves, individual needs, and forward-looking desires. The restricted social environment becomes a means for the individual to "socialize with himself/herself ", ”what am I thinking?", "how is my strength to endure this limited environment?", "am I durable?" questions will enable older adults to meet with self-needs. Therefore, professionals working with older adults can help older adults to restore their self-needs of them.

"Breaking to problems from the past” is also necessary for the individual to strengthen his / her self in this period. Thinking about problems from the past reduces the strength of the individual's self in this period. It is useful to give a "break" to these problems. The fact that the older adult devotes all his strength to his/her current self will strengthen himself/herself, it will also enable him/her to struggle with the problems of the past in the long run. Therefore, it is not a waste of time to take a "break" from problems from the past.

"Breaking to future problems” is also useful during the COVID-19 pandemic. During this period, especially future problems come to one’s mind. Even if an older adult does not want to, his/her problems about the future are to take his/her thoughts captive. Problems related to the future also weaken the individual's current self-power. It is therefore important to take a "break" from these problems. This break will help build energy for the individual's self.

Emotional Strategies

The emotional needs of older adults are also important during the COVID-19 Pandemic. Social isolation is noted to lead to emotional burden (Parlapani et al., 2020). It is quite useful to notice kinds of feelings. Feelings that are not noticed in daily life create an emotional burden on individuals. Also, sharing and expressing feelings are important points. Professionals might encourage older adults to express all kinds of emotions. It is recommended to share even negative emotions since these emotions disappear after shared. Writing letters to those who have missed, participating in artistic activities (drawing), and applying drama at home is useful to express emotions.

Behavioral Strategies

During COVID-19 Pandemic, creating a routine life at home is so crucial. Routine life helps older adults to relieve anxiety. Following a daily schedule, allow older adults to collect their thoughts as well. In addition, organizing a home environment is recommended. It is quite useful to gain new habits at home which help to distract attention towards pandemic. Sports activities conducted at home might be useful for them (Steinman et al., 2020). Also, organizing online meetings through Social Media is suggested. Adult children and grandchildren may help older adults to organize online social interaction.

In a conclusion, the negative psychological impact of the COVID-19 Pandemic on older adults is considered important. Older adults' reactions during the pandemic can be attributable to stages of grief. To increase older adults' internal capacity, several cognitive, emotional, and behavioral recommendations are explained in the present study. Further studies are needed to examine older adults' psychological well-being.

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ORIGINAL RESEARCH

Dietary Intake and Related Factors of Residents of Assisted Living Memory Care

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ABSTRACT

Assisted living memory care (ALMC) residents present with specific needs and challenges. Knowledge regarding their nutritional intake and the relationship to cognitive ability, demographics, and dining behaviors is limited. This quality improvement project was conducted to determine the dietary intake of ALMC residents and identify factors related to the adequacy of their dietary intake to inform the development of strategies to enhance their dietary intake. Ingested food and fluids and ingestion behaviors were recorded over a 12-hour (7 AM -7 PM) observation. Related factors examined were obtained from chart review. Food Processor Nutritional Analysis Software was used to determine nutrient intake with the calculation of percent of recommended amounts based on BMI, age, and activity level. Thirty-two residents (75% females; mean age 86.5 years, SD=7.84) of four ALMC units (eight per unit) were subjects of this study. Their Global Deterioration Scores ranged from 3 to 7, with 60% at 5 or greater. Average BMI was 25.47 kg/m2 (range 14.1-40.4 kg/m2). Major dietary components (protein, calories, carbohydrates) were consumed in adequate amounts based on the percent of recommended. The percent of recommended fiber intake was low (mean 61.57%) with saturated fat intake extremely high (mean 243.80%). Micronutrients were below recommended levels except for cholesterol, vitamin C, sodium, and iron. Four subject groups, relative to level (inadequate, moderately inadequate, adequate, exceeds recommended) of nutritional intake, were identified based on hierarchical clustering with all nutrient data. Using protein intake as a representative nutrient variable, regression analysis indicated that 44.1% of the variance was explained by cognitive ability and setting after adjusting for their interaction. A balance of adequate intake while allowing ALMC residents' choice in food selection is essential. Further research is needed to address dining standards specific to the ALMC population that recognizes cognitive ability, food offerings, and dining behaviors.

Keywords: Dietary intake, dietary reference intakes, assisted living, dementia

Key Practitioners Message

1. A comprehensive assessment of the nutritional status of ALMC residents, inclusive of cognitive ability and setting characteristics, is necessary.
2. Ensure that the menu in ALMC units offers selections that include sources of fiber, are lower in saturated fat, and assist the resident to meet the recommended intake of micronutrients.
3. Provide education to help staff recognize how to support the highest level of function for those residents who have difficulty in completing a meal for a variety of reasons.

Introduction

Older adults residing in long-term care (LTC) facilities are at high risk of malnutrition as a result of poor dietary intake (Keller et al., 2017). Poor nutritional status and weight loss among this population are associated with falls, poor wound healing,

hospitalization, greater health care use, and diminished quality of life (Keller et al., 2017). A rapidly growing population in LTC is residents of assisted living memory care (ALMC) units. Although it is recognized that residents of assisted living facilities (ALFs) do not require the level of care of skilled nursing facilities (SNFs) residents, they still experience significant cognitive and physical impairments and multiple chronic conditions (Harris-Kojetin et al., 2016). The residents of ALMC units present with more cognitive impairments than the AL population in general, thus putting this group at higher risk for inadequate dietary intake.

Several recent systematic reviews have focused on interventions to support food and drink intake for individuals with dementia as well as specifically addressing the eating behavior of individuals with dementia in nursing homes (NH). An interprofessional team conducted a systematic review and meta-analysis of the effectiveness of interventions that directly (Abdelhamid et al., 2016) or indirectly (Bunn et al., 2016) support food and drink intake of individuals with dementia. In both reviews, no clear effective, or ineffective interventions were discerned. The small and short-term nature of the intervention studies reviewed was a major limitation. In a scoping review of the literature, Cipriani, Carlesi, Lucetti, Danti, and Nuti (2016) reported that most people with dementia, especially in the later stages, present with abnormal eating behaviors, eating problems, and dietary changes. These authors stress the importance of being aware of the eating problems for the implementation of early interventions. Liu, Galik, Boltz, Nahm, and Resnick (2015) reviewed research specially focused on the effect of interventions on eating performance for older adults with dementia in LTC. Of the 11 studies reviewed, both training programs and the mealtime assistance offered by staff showed effectiveness in improving eating performance.

Whear et al. (2014) focused on the effectiveness of mealtime interventions on behavioral symptoms of NH residents with dementia. The investigators found that music, changes to food service, dining environment alternations, and group conversation improved mealtime behavior. Poor study quality limited the analysis, but there was a trend in favor of improved behavioral symptoms.

The European Society for Clinical Nutrition and Metabolism (ESPEN) recognized that nutritional problems are part of the trajectory of the dementia disease process, thus putting these persons at high risk for malnutrition. ESPEN developed evidence-based guidelines for nutrition care for those with dementia-related to the risk of malnutrition. Twenty-six recommendations were developed in the categories of screening and assessment, strategies to support oral nutrition, provision of oral supplements, and artificial nutrition and hydration (Volkert et al., 2015).

Even though there have been recent systematic reviews on nutrition for those with dementia as well as the establishment of the ESPEN guidelines, only two studies have specifically addressed the intake of a resident of ALMC units. Reed, Zimmerman, Sloane, Williams, and Boustani (2005) reported observational data related to the amount of food and fluid intake among AL and NH residents with dementia. The results of the study indicated that both groups had low food and fluid intake (54% of AL; 62% of NH). Similar results were reported by Simmons, Coelho, Sandler, and Schnelle (2018) based on a quality improvement (QI) project that was implemented to provide a system to manage feeding assistance care processes for residents of ALMC. They found that a significant proportion of ALMC residents consumed less than 50% of their meals. Observations were completed to collect the intake in both studies, but actual dietary intake was not recorded.

The purpose of this QI project was to determine the dietary intake of ALMC residents and identify factors associated with food intake and nutritional status. Factors explored include: 1) participant characteristics (i.e., age, cognitive ability); 2) perception of factors influencing intake of food and fluid; 3) ingestion behaviors (behaviors demonstrated during any ingestion session and level of assistance provided); 4) engagement at meals, and 5) community of residence.

Materials and Methods

Population

Thirty-two residents (8 men, 24 women) living in one of the four ALMC facilities in Florida, South Dakota, and Minnesota were participants in this observational study. The study was done as a facility-wide QI project, consisting of several components, including meal observation. The SQUIRE 2.0 Standards for Quality Improvement Reporting (SQUIRE, 2015) served as a guide for this quality improvement project due to the low potential of harm or burden to the participants with a potential to improve the quality of life and safety of the select population. The project was approved as exempt status by the Institutional Review Board of the University of Minnesota (STUDY00002165).

Measurements and Data Collection

Food and fluid intake and ingestion behaviors were captured by two experienced research nurses (PG and CS) through an observational process. Observation of dietary intake was completed in common areas of the unit (not in residents' private apartments) over 12 hours. They had completed a pilot observational study to refine the written instrument and clarify the categories for the amounts consumed and ingestion behaviors. The pilot observation study revealed a 92% inter-rater reliability. One observer was responsible for recording consumed amounts and behaviors for a maximum of four residents with both observers present at the same time at each facility.

The amount, type, and time of food and fluid ingestion were recorded from 7 AM through 7 PM. Neither food nor beverages were typically consumed after 7 PM. The amount of food and fluid consumed was observed

before, during, and after mealtime. Observation during the meal allowed the capture of total food and fluid intake as well as that spilled or taken from another resident. The level of assistance required for the majority of each meal was also recorded. Behaviors that influence intake that was identified in the pilot and the literature were also captured during the observation. Refer to the results sections for specific behaviors.

During the 12-hour observation, the resident engagement during meals, planned, and unplanned activity was recorded. The "Daily Engagement Observation Rating Tool for the Montessori-Inspired Lifestyle Program" was used to record the engagement level. This author developed a tool that was used to capture the level of engagement for residents in the memory care units of the facilities. The engagement was observed for seven ten-minute periods (three meals, two planned activities, and two unplanned activities) during the 12 hours. The engagement was recorded as positive, neutral, negative, or failed for each minute of the 10-minute periods.

Health records were abstracted to obtain demographic and other characteristics of the residents, including age, gender, height, weight, cognitive ability, and prescribed medications. Weights were not measured during the time of the study, but rather the most recent weight in residents' charts was used for this study.

The Global Deterioration Scale (GDS) (Reisburg, 2005) score available in the health record was obtained as a measure of cognitive ability. The GDS was used for assessment of primary degenerative dementia and was completed a minimum of every six months or if the condition changed. The scale has the following levels: 1 = no cognitive decline, 2 = very mild cognitive decline (age-associated memory impairment), 3 = mild cognitive decline (mild cognitive impairment), 4 = mild cognitive decline (mild dementia), 5 = moderately severe cognitive decline (moderate dementia), 6 = severe cognitive decline (moderately severe dementia), and 7 = very severe cognitive decline (severe dementia) (Reisburg, 2005).

Participants were interviewed following the observation to complete the Ingestion Perception and Feelings Survey. The survey explored participants' reasons for eating and drinking, as well as factors influencing ingestion behavior. These factors were identified in the literature as well as in the pilot.

Assessment of Dietary Intake and Dietary Reference Intakes (DRI) Adherence

Dietary intake data, including foods and beverages, were entered in Food Processor Nutritional Analysis Software (version 11.2.274, ESHA Research, Salem, OR). Most food data were manually entered into Food Processor using standardized Sysco (food product wholesaler) recipes, and remaining foods were entered using the Food Processor food database. DRI adherence was determined using Food Processor, which compared actual intake to current recommendations. Recommended intake of energy and nutrients was standardized to 100% DRI based on age, sex, body mass index (BMI), and physical activity level. Because activity level was not known, all DRIs were based on the assumption that residents were sedentary.

Statistical Analysis

Statistical analyses were performed in SAS 9.4 (SAS Institute, Cary, NC) and R 3.5.2 (R Core Team, Vienna, Austria). Baseline characteristics were reported as means and standard deviation (SD) for continuous variables and frequencies for categorical variables. Dietary intake was reported across categories of prescribed medications and adjusted for age, sex, BMI, and energy intake. Intake of specific food groups was reported as means and SD. Hierarchical clustering was implemented to identify groups of residents based on profiles of nutrient intake.

Results

Participant Characteristics

There were 32 ALMC residents observed, mean age 83.5 ± 7.84 years and 75%, female. Baseline characteristics of residents are shown in Table 1. The average BMI was 25.47 kg/m2 (range 14.1-40.4 kg/m2). Fifty percent of the residents were overweight or obese; however, three women were underweight. The average number of medications prescribed was more than nine (range 1-19). The prevalence of polypharmacy (five or more medications prescribed) among the residents was 31.3%, and the prevalence of excessive polypharmacy (10 or more medications prescribed) was 53.1%. Additionally, 36.7% of residents scored 5 on the GDS, and 23.3% scored 6 or higher. The vast majority (81.2%) of residents were independent in feeding.

Table 1

Baseline Characteristics of Residents Living in Assisted Living Memory Care

	Mean (SD)		
	Men (n=8)	Women (n=24)	All (n=32)
Age, Years	83.5 (±7.84)	87.5 (±7.10)	86.5 (±7.37)
BMI, Kg/m^2	24.79 (±3.39)	25.69 (±6.30	25.47 (±4.86)
Underweight	0	3 (12.50%)	3 (9.4%)
Normal Weight	5 (62.5%)	8 (33.33%)	13 (40.6%)
Overweight	3 (37.5%)	10 (41.67%)	13 (40.6%)
Obese	0	3 (12.5%)	3 (9.4%)
Cognitive Ability (Global Deterioration Scale Score), n (%)			
3	0	3 (12.5%)	3 (9.4%)
4	4 (50%)	5 (15.6%)	9 (28.1%)
5	0	11 (34.3%)	11 (34.3%)
6 and Above	3 (37.5%)	4 (12.5%)	6 (21.8%)
Not Documented	1 (12.5%)	1 (3.1%)	2 (6.3%)
Level of Assistance During Meals n (%)			
Total Independence	7 (87.5%)	19 (79.2%)	26 (81.2%)
Partial Dependence	1 (12.5%)	3 (12.5%)	4 (12.5%)
Total Dependence	0	2 (8.3%)	2 (6.3%)

Ingestion Behaviors and Perception of Factors

Fifteen participants presented with one or more ingestion behaviors with 17 participants not presenting with any of the listed behaviors. Those behaviors that were specifically observed were (number of residents

with behavior): inappropriate use of fingers (n = 7), spilling (n = 5), inappropriate use of utensils (n = 4), unable to maintain attention during the meal (n = 4), inappropriate reaching (n = 1), dozing (n = 1), bite-size too large (n = 1), chews and spits out food (n = 1), and could not terminate meal (n = 1). Not observed were unable to locate all food, coughing, choking, drooling, difficulty swallowing, hoarding food in the mouth, and stealing food. The occurrence of the observed behaviors was categorized as "noted" (occurred, but not consistently) and "consistently noted" (occurred at several of the meals consistently). Five participants demonstrated more than one behavior during the observation with two of these five participants demonstrating four different behaviors. The frequency of the behaviors is presented in a previous publication (Gaspar, Scherb, and Rivera-Mariani, 2019).

Twenty-three of the 32 residents (72%) could provide a meaningful response to questions regarding their perception of factors that may affect the intake of food and fluids. Over half of the respondents identified that feeling hungry and having food that looks and tastes good increases their intake. Eleven respondents (48%) indicated that feeling thirsty increases their intake, but that they seldom experience thirst. Limited dietary intake included feelings of fullness, experiencing nausea or stomach upset, fear of leaking urine, and fear of falling. Table 2 provides a summary of the responses of the residents. For both ingestion behaviors and perception of factors, the number of participants with each response limited the statistical analysis.

Engagement during meals was recorded as neutral approximately 70% of the time for the participants at all meals; indicating that there was little or no attempt at conversation and they were focused on eating. Two of the sites each had 54% of the meal engagement minutes as neutral, with the other 46% as positive engagement. Conversations between residents and/or staff were noted as positive engagement. The other two sites had 88% and 83% of the 10 minutes recorded as neutral. These differences are incorporated in the analysis when a site is used as a variable.

Dietary Intake

Measures of central tendency of the dietary intake for study participants for the 24-hour meal observation period are presented in Table 3. Many nutrients were consumed in adequate amounts except for fiber, vitamin A, vitamin B6, calcium, and potassium. Large individual differences, according to range and SD, were found for nutrients, vitamins, and minerals.

After adjusting for age, BMI, and energy (kcal) intake, statistically significant differences (p = 0.02 - 0.04) were found between men and women for grams (g) of protein per kilogram (kg) of body weight, milligram (mg) of sodium, and mg of sodium per 1000 kcal. On average, women consumed 0.2 g protein per kg more than men per day (p = 0.04). Men consumed significantly more sodium than women per day (p = 0.02). Sodium intake per 1000 calories was 2329 mg/kcal for men and 1718 mg/kcal for women (p = 0.03).

Table 2

Participant Responses Regarding Limiting or Increasing Food and Fluid Intake

Perception	N	Limits Intake		Increases Intake	
		n	%	n	%
Feeling of Fullness	23	6	26.09%		
Fear of Leaking Urine	23	4	17.39%		
Fear of Falling	23	3	13.04%		
Fear That Legs Will Swell	23	1	4.35%		
Nausea or Stomach Upset	23	5	21.74%		
Hunger	23	1 (never)	4.35%	13 (seldom)	56.52%
Thirsty	23			11	47.83%
Dining Experience	23			9	39.13%
Food Looks Good	23			16	69.57%
Food Tastes Good	23			17	73.91%
Being Offered	23			8	34.78%
Participating in Activities	23			4	17.39%

Note. The responses of the participants to the questions about fears, emotions and experiences that limit or increase food and fluid intake are presented in the table.

As shown in Table 4, the mean daily intake of fruit juice was 1.33 (8-ounce servings), fruit intake was 1.74 cups (total fruit intake was 3 cups), 1.6 cups of vegetables, 0.34 servings of whole grain, and 0.91 servings of dairy products. The mean servings of sweet food products consumed per day were 3.45.

Table 3

Measures of Central Distribution for Percent of the Recommended Amount for Each Dietary Component, Micronutrient, and Vitamin Analyzed by Food Processor for Assisted Living Memory Care Residents (N=32).

Dietary Component and Micronutrients	Mean	Median	SD	Min.	Max.
Calories % of Recommended	148.20	137.79	37.52	77.40	232.72
Calories from Fat % of Recommended	219.85	213.46	65.99	79.60	360.80
Calories from Saturated Fat % of Recommended	243.80	239.23	83.11	69.97	422.50
Protein % of Recommended	156.83	148.38	45.83	83.56	268.07
Carbohydrates % of Recommended	121.26	112.59	34.19	62.46	212.74
Total Fiber % of Recommended	61.57	57.03	22.20	29.07	127.57
Fat % of Recommended	220.15	214.23	65.99	79.57	360.80
Saturated Fat % of Recommended	243.80	239.23	83.11	69.97	422.50
Cholesterol % of Recommended	130.13	109.74	58.51	56.74	247.66
Water % of Recommended	40.73	38.24	17.55	13.15	106.83
Vitamin A RAE % of Recommended	36.62	31.24	30.18	0.54	132.64
Vitamin B6 % of Recommended	83.55	74.14	29.28	46.05	159.76
Vitamin C % of Recommended	228.80	202.62	133.52	8.37	651.46
Calcium % of Recommended	60.86	58.73	21.82	30.97	133.20
Iron % of Recommended	144.82	130.52	45.91	83.43	245.70
Magnesium % of Recommended	27.59	20.74	24.30	4.33	109.10
Potassium % of Recommended	49.99	47.84	13.66	23.26	88.85
Sodium % of Recommended	184.82	164.80	69.79	95.45	386.34
Zinc % of Recommended	90.53	71.37	46.18	39.29	196.09

Note. SD = standart deviaton, Min. = minimum value, Max. = maximum value

To classify the patients based on the profiles of nutrient intake, hydration, and demographics, hierarchical clustering was implemented (Table 5). Four clusters were identified: cluster 1 with 2 subjects, cluster 2 with 13, cluster 3 with 7, and cluster 4 with 10. With these clusters, the medians were compared based on the following categories: hydration variables, nutrients, vitamins, and minerals. When considering the gender for each cluster, an even distribution was evident in cluster 1, but for the other three clusters, the majority were females. Another demographic variable considered was the setting/sites (A, B, C, D) of the residents. The residents in cluster 1 were both from setting A. Cluster 2 was mainly in settings A and B, cluster 3 was mainly in set C, and cluster 4 was mainly in setting D. Lastly, the GDS was also considered among

the demographics among the cluster groups. Residents in clusters 1 and 2 generally were at GDS level 4. Nevertheless, the highest proportion of GDS for clusters 3 and 4 was level 5; cluster 4 also having residents at GDS levels 6 and 7.

Table 4

Comparison of Food Group Intake of Assisted Living Memory Care Residents With 2015-20 Dietary Guideline for Americans

Food Group	Mean (SD) [serving/day]	Recommendations (2000 calories/day)
Fruit	1.74 (±1.32)	[a]2 cups
Fruit Juice	1.33 (±1.24)	1 (8 oz equivalent) serving/day
Vegetables	1.63 (±1.10)	[b]2.5 cups/day
Whole Grains	0.34 (±0.60)	3 (1 oz equivalent) servings/day
Refined Grain	3.03 (±1.44)	[c]3 (1 oz equivalent) servings/day
Dairy	0.91 (±0.73)	3 (8 oz equivalent) servings/day
Lean Meat	1.28 (±0.72)	[d]5.5 (1-ounce equivalent) servings of protein/day, vary your protein, limit saturated fat to 22 g/day
Red/Processed Meat	1.97 (±0.82)	[e]5.5 (1 oz equivalent) servings/day
Sweets	3.45 (±1.47)	[f]50 g/day
Coffee	1.30 (±1.33)	[g]3-5 (8 oz equivalent) servings/day

Note 1. The footnotes descriptions used in the table are presented below.

[a] 1 cup of fruit is equal to 1 cup raw or cooked fruit, 1/2 cup dried fruit, or 1 cup 100% fruit juice. At least half of the recommendation should come from whole fruit.

[b] Vary vegetables, consuming dark-green, starchy, red and orange, beans and peas, and other types of vegetables.

[c] Consume half of grains from whole grains for a total of 6 ounces per day.

[d] Vary protein foods for a total of 5.5 ounces per day. Limit saturated fat to 22 grams/day.

[e] Vary protein foods for a total of 5.5 ounces per day. Limit saturated fat to 22 grams/day or 10% of daily calories.

[f] Limit added sugars to no more than 50 g/day or 10% of daily calories.

[g] Moderate coffee consumption may be incorporated into healthy eating styles, but individuals who do not currently consume caffeinated beverages are not encouraged to start.

For energy, macronutrient, and hydration variables, cluster 1 had the highest (or second-highest) median for all variables except for cholesterol, saturated fat, and saturated fat calories. For variables in which cluster 1 was the highest or second-highest, cluster 2 was the lowest. Interestingly, cluster 2 did not record a value that was highest among all groups. Cluster 3 recorded the highest values for carbohydrates, fat, calories from fat, calories from saturated fat, and water. Cluster 4 recorded the highest values for cholesterol. Cluster 1 recorded the highest medians for all vitamins. On the contrary, cluster 2 recorded the lowest medians for all vitamins. As with vitamins, and most variables, cluster 1 recorded the highest medians for all of the minerals. Again, similar to vitamins, cluster 2 reported the lowest medians of the minerals except for calcium and sodium. In conclusion, after performing hierarchical clustering with energy, macronutrients, vitamins, and minerals, four groups were identified, and each with distinct profiles of demographics, hydration, energy, macronutrients, vitamins, and minerals.

Table 5
Differences Between Clusters

Cluster	N	Setting[a]	GDS[b]	Intake
1	2	A	4	The highest intake of almost all nutrients, vitamins, and minerals
2	13	A & B	4 (1,5 &6)	Lowest intake of almost all nutrients, vitamins, and minerals
3	7	C	5 (4,6)	Highest intake of carbohydrates, fat and saturated fat calories, and water
4	10	D	5 (3,6,7)	Highest intake of cholesterol

Note 1. [a] Most represented, [b] Most represented; other scores

Discussion

The dietary intake of this ALMC population was compared to DRIs and the Dietary Guidelines for Americans (DGA) prepared by the U.S. Department of Health and Human Service and the U.S. Department of Agriculture (HHS & USDA, 2015). The median intake of calories and macronutrients exceeded DRI recommendations, while the median intake of fiber, vitamin A, vitamin B6, calcium, and potassium were below recommendations. Several nutrients were consumed over recommendations. Percent calories (% kcal) from fat, % kcal from saturated fat, fat (g), saturated fat (g), vitamin C, and sodium were in excess of 200% of daily recommendations. Calories from saturated fat should be no more than 10% of total daily calories according to the DGA. Sodium is another nutrient that should not be consumed in excessive amounts, especially among older adults, as it increases the risk of heart disease and stroke (CDC, 2016). According to the DGA, sodium intake should not exceed 2300 mg per day, and the mean intake of the residents in the study far exceeds that by nearly 2000 mg (HHS & USDA, 2015). The intake of the majority of vitamins and minerals was below the recommendations.

Previous research that addressed the dietary intake of AL residents with dementia reported that a significant proportion of the AL residents had inadequate food and fluid intake (Reed et al., 2005; Simmons et al., 2018). A comparison with actual nutrient intake could not be made, as these studies based intake on the percent of the meal ingested.

The systematic review of seven studies of protein and calorie intake of patients with Alzheimer's disease (AD), both community-dwelling and in LTC facilities, compared to those considered cognitively normal was conducted by Doorduijn, van de Rest, van der Flier, Visser, and de van der Schueren (2019). No difference in intake was found between the two groups, yet the heterogeneity across articles was a limitation. A review of the results of each study does indicate that the energy and protein intake of the subjects with AD was lower than the mean intake of energy and protein intake of the participants of this project, except for one that had similar results to the present study. The study of Volkert, Pauly, Stehle, and Sieber (2011) also found that the NH residents who ate orally had a mean daily energy intake of 1535 (±413) kcal and mean protein intake of 54.2 (±9)g/d. These averages are significantly lower than the mean energy intake of 2320.1 (±472) kcal and mean protein intake of 78.76 (±19) g/d of the participants of this project.

The study of Goes et al. (2014), which reported the average percent of the recommended intake for 24 nutrients for a sample of 30 community-dwelling individuals with probable AD, provided results that allowed the best comparison with the nutritional intake amounts reported in this study. It is recognized that this sample is community-dwelling and the level of cognitive ability of the sample is less impaired than the participants of this study. The overall intake of nutrients

had a similar trend for the participants of this study and subjects of the Goes et al. (2014) study. For those nutrients that the mean intake was over 100% of the recommended for the participants of this study, their actual intake was higher than the Goes et al. participants except sodium was slightly lower, even though it was extremely high for both groups.

Comparison of the nutrient intake of the participants could also be made with the report of Akner and Flöistrup (2003), which included 54 NH residents, of whom 39 had a diagnosis of dementia. They based the dietary intake of their NH sample on the 5-day weighed method, similar to Goes et al. (2014), the sample of this study had a comparable trend in the nutrients analyzed. The average intake of the participants of this study for those nutrients that were greater than 100% of the recommended amount was also higher than the intake of the NH residents in the study conducted by Akner and Flöistrup (2003). An important finding of the study was the individual heterogeneity of the dietary intake of the NH sample. Even when individual requirements based on body weight were considered, there was a variation of at least two-three-fold for most nutrients and some micronutrients. The variation in the nutrient intake among the participants of this project was also wide.

The residents' food group intake was compared to the 2015-2020 DGA (HHS & USDA, 2015). The DGA recommends three servings daily for whole grain and dairy products and 2.5 servings for vegetables; which participants did not consume in adequate amounts. Because the mean intake of whole fruit was greater than the mean intake of fruit juice, the diet pattern is consistent with the recommendation of consuming more fruit as whole fruit. Participants did not consume adequate amounts of whole grain, vegetable, or dairy products. Refined grains, added sugar (as represented by intake of sweet food products [e.g., cake, cookies, pie]) and fruit juice was consumed over recommendations (HHS & USDA, 2015). The excess ingestion of these energy-dense foods may have contributed to the high-calorie intake among some residents.

While the facility menus of the present study meet the dietary guidelines, allowing residents to make choices in their meal and snack selection may have created an opportunity for ingestion of more energy-dense, rather than nutrient-dense foods and fluids. This highlights an opportunity for the culinary department to develop healthier menu options. For example, Greek yogurt parfaits can replace ice cream sundaes for dessert or snacks.

The cluster analysis identified two factors, cognitive ability, and setting, that accounted for 44% of the variance in protein intake, which served to represent overall nutritional intake. The levels of cognitive ability for each cluster, with consideration of the nutritional intake, reflect that those participants with the highest abilities (GDS of 4) and those with the most impairment (GDS of 6 and 7) had the highest nutritional intake. It is surmised that staff has been trained on how to serve a meal and how to feed those who are dependent. A similar finding was supported in the work of Gaspar (1988) and Gaspar et al. (2019) related to the group with the lowest fluid intake. The challenge is helping staff recognize how to support the highest level of function for those residents who have difficulty in completing a meal for a variety of reasons. Identification of the cues for a resident who cannot independently complete the meal is essential so that appropriate verbal prompts and/or physical assistance can be provided.

The setting was identified as the second factor in the cluster analysis. Several differences in settings existed. Three of the settings had fully implemented the Montessori Inspired Lifestyle (MIL) as a foundation for care. One of these settings had a group of residents who were at a lower physical and cognitive ability than the other two communities, limiting their full participation in the MIL environment. This was reflected in the level of engagement among the participants. The two settings with the lowest nutritional intake were more likely to be recorded as neutral, rather than positive, for engagement. Another difference between settings was the staff level of involvement in the dining experience. Staff at one setting sat with the residents and joined them in the meal. They were able to prompt residents at the table with ingestion as well as engage in conversation. Participants' intake of food at this setting was higher for most nutrients than at the other settings.

The identification of these two factors (cognitive ability and setting) supports the need for interventions and staff training for the implementation of interventions that will enhance intake for select ALMC residents. Specific interventions for promoting the dietary intake of residents of ALMC have not been tested. Simmons et al. (2018) reported on the implementation of a QI project that demonstrated that the intake of the residents can be enhanced through sustained levels of mealtime feeding assistance and between-meal snacks.

Several recent systematic reviews have been conducted to determine if any specific interventions have improved the food and fluid intake of LTC residents with dementia. Neither of the systemic reviews completed by Abdelhamid et al. (2016) or Bunn et al. (2016) identified any strong evidence on effectiveness or lack of effectiveness of specific interventions enhancing ingestion via direct support or by indirect support for those with dementia respectively. Liu et al. (2015) and Liu, Cheon, and Thomas (2014) in 2 different systematic reviews evaluated the effects of interventions on mealtime difficulties among older adults with dementia. Nutritional supplements, mealtime assistance, and training/education of staff were supported as approaches to optimize eating performance. The systematic review conducted by Whear et al. (2014) focused on mealtime interventions to improve

behavioral symptoms. Only one of the studies included in this review was conducted in an ALMC unit and had only five subjects. Results were promising, but not conclusive on the effectiveness of any intervention. The ESPEN guidelines on nutrition in dementia (Volkert et al., 2015) provides 26 recommendations that were developed by a multi-disciplinary working group. These guidelines propose recommendations related to assessment, environment, support, and use of supplements across the span of cognitive abilities. The grade of evidence is very low or low for 21 of the 26 recommendations with the group recognizing the need for further study. The other authors also note that the quality of the studies that were used in the systematic reviews was of low quality with moderate quality at best for several studies.

Participants identified factors that they perceived as influencing food and fluid intake including a feeling of fullness, experiencing nausea or stomach upset, fear of leaking urine, and fear of falling. Even though the numbers are limited as some of the participants could not respond in a meaningful way to the survey, their responses are important. Bunn, Hooper, and Welch (2018) in a scoping review of existing policies and guidelines addressing dehydration and malnutrition in residential care indicate that insight from residents themselves is needed to identify factors related to intake. The need to follow up with residents regarding the reasons for not eating is essential, as there may be an underlying cause such as a medication causing nausea.

The observed ingestion behaviors such as inappropriate use of fingers, spilling, inappropriate use of utensils, and unable to maintain attention during the meal are not uncommon among those with dementia. Volicer (1987) indicated that the ability to self-feed is lost within eight years after the onset of dementia. Addressing these behaviors to ensure the adequacy of nutrient intake needs to be included in an individualized resident-centered approach. It is important to recognize the presence of each of these behaviors as a plan of care is developed for the resident.

Murphy, Holmes, and Brooks (2017) conducted focus groups and interviews with front-line NH staff to develop a model of day-to-day application for delivering food and nutrition for people with dementia in care homes (Making the Most of Mealtime). They identified “person-centered nutritional care” as the overarching theme of the model. Person-centered nutritional care captures the specific ingestion and dining behaviors of the resident as well as their perceptions of their lack of eating. Residents of ALMC may be struggling to maintain their highest level of function while they are losing function. It is a challenge for staff to help residents who are struggling with progressive loss of their independence and yet assist them to meet their nutritional needs. Techniques that provide meaningful prompts when the resident is distracted or unable to focus on the meal are needed. Individualized care also needs to address when physical assistance with eating should start during a meal.

The Making the Most of Mealtime team developed a comprehensive conceptual framework that views the food intake of LTC residents as based on multi-level and inter-related determinants of food intake. The framework was used to develop a tool for the evaluation of several factors that influence the mealtime experience in LTC (Murphy et al., 2017). The research of this group and others who use the tool will contribute to the understanding of the mealtime experience, and hopefully will examine the subpopulation of those in LTC with dementia in the future.

Strengths and Limitations

A methodological strength of the study is that meal observation is one of the most reliable dietary assessment tools (Baglio et al., 2004). Additionally, inter-rater reliability was high, and the researchers were able to observe a manageable number of residents at once. Our study has helped identify a gap in the literature and highlights the unique needs of this population. The ALMC population has cognitive impairments that require 24-hour supervision, but residents have the ability to make decisions at the moment. They are provided with food choices at meals and snacks as part of the focus on resident-centered care. Even though the daily menus provide the recommended daily requirements needed, the resident choices and actual intake are respected. For example, there is a whole grain choice for each meal, but residents generally do not select that choice. Therefore, our study contributes to the literature and provides direction in improving our understanding of dietary intake and the factors that may influence it in this population. This improved understanding may help develop future interventions in the ALMC setting.

The present study has some limitations. The 12-hour observation period introduces the possibility that foods and fluids were missed between 7 PM and 7 AM. Some residents may have taken medications and been offered snack foods during these evening hours. However, because this was a memory care unit, the residents were closely monitored and were not able to hoard food in their private rooms, which reduces the possibility that residents may have consumed food throughout the night. No information regarding dietary supplement intake was recorded. If residents were taking supplements, the inclusion of this additional nutrient information in the analysis may have altered the results, potentially eliminating findings of diet inadequacy. There was some concern that staff behavior was altered due to the presence of observers, as they may have been working more attentively and adhering to the standards better than usual. However, it would have been difficult for staff to alter usual behavior throughout the entire 12-hour observation period. The small sample size and characteristics of the study population limit the generalizability of the study,

as the residents were White and resided only in memory care units owned/managed by one company. Generalization of findings to other long-term memory care settings should be done with caution, particularly because of the small study size and short observation duration.

Implications

The intake of several dietary components, including the majority of vitamins and minerals, was below the recommended daily intake for the majority of the ALMC participants. Yet there was a high intake of carbohydrates, saturated fat, and sodium and adequate intake of protein by the majority of the participants. A focus on providing choices that will provide for adequate nutrient and micronutrient intake as well as offer lower ingestion of sodium, carbohydrates, and saturated fat is necessary. Residents should be monitored frequently for weight changes as consistent intake of excessive calories could lead to weight gain. On the other hand, low food ingestion and low caloric intake could contribute to weight loss. Additionally, poor intake of essential nutrients from foods like vegetables, whole grains, and dairy could result in nutrient deficiencies and other symptoms.

A focus on resident-centered care is essential. Recognition of residents' cognitive and physical abilities during the eating and dining experience, providing them with the level of assistance that helps them maintain their highest level of function and addressing the behaviors and perceptions that potentially influence behavior will enhance their intake.

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Conflict of Interest

- There are several financial conflicts to report. At the time of the project Dr. Gaspar, Ms. Finsaas, and Mr. Holmes were full-time employees for The Goodman Group, which was the owner or oversaw the management of the sites that the study was conducted. Dr. Scherb had a consultant contract with The Goodman Group for this project. Ms. Risley was a graduate student at the time of the project but was hired by The Goodman Group to assist with the dietary analysis. She did a project for her Master's degree using the database used for this manuscript. None of the authors have a personal conflict to report.

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The major goal of the ***Journal of Aging and Long-Term Care (JALTC)*** is to advance the scholarly contributions that address the theoretical, clinical and practical issues related to aging and long-term care. The ***JALTC***, while making efforts to create care services for older people at the best quality available that are more humane, that pay special attention to people's dignity, aims from the perspective of the whole aging process- to discuss Social Care Insurance as a human right, to contribute care for older people to be transformed into an interdisciplinary field, to integrate care services for older people and gerontological concepts and to create more effective collaboration between them, to enhance the quality of care services for older people and the quality of life of caregivers from medical, psychological and sociological perspectives, to highlight the cultural factors in care for older people, to increase the potential of formal and informal care services, to provide wide and reachable gerontological education and training opportunities for caregivers, families and the older people.

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"National Association of Social and Applied Gerontology (NASAG)"has recently assumed responsibility for the planning and introduction of a new international journal, namely, the **Journal of Aging and Long-Term Care (JALTC)**. With world societies facing rapid increases in their respective older populations, there is a need for new 21st century visions, practices, cultural sensitivities and evidenced-based policies that assist in balancing the tensions between informal and formal long-term care support and services as well as examining topics about aging.

The **JALTC** is being launched as the official journal of the **NASAG**. The preceding journal aims to foster new scholarship contributions that address theoretical, clinical and practical issues related to aging and long-term care. It is intended that the **JALTC** will be the first and foremost a multidisciplinary and interdisciplinary journal seeking to use research to build quality-based public policies for long-term health care for older people.

It is accepted that aging and long-term care is open to a diverse range of interpretations which in turn creates a differential set of implications for research, policy, and practice. As a consequence, the focus of the journal will be to include the full gamut of health, family, and social services that are available in the home and the wider community to assist those older people who have or are losing the capacity to fully care for themselves. The adoption of a broader view of aging and long-term care allows for a continuum of care support and service systems that include home base family and nursing care, respite day care centers, hospital and hospice care, residential care, and rehabilitation services. It is also crucial to be aware that life circumstances can change suddenly and dramatically resulting in the need for transitional care arrangements requiring responsive, available, accessible, affordable and flexible health care service provision.

For further assistance and more detailed information about the JALTC and the publishing process, please do not hesitate to contact Editor-in-Chief of the JALTC via sending an e-mail: editor-in-chief@jaltc.net
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