Public Health Nutrition: page 1 of 11 doi:10.1017/S1368980022000696

Individual and interpersonal factors affecting dietary intake of community-dwelling older adults during the COVID-19 pandemic

Amy Ellis*, Seung Eun Jung, Frankie Palmer and Mackinsey Shahan
Department of Human Nutrition, University of Alabama, Russell Hall, Box 870311, Tuscaloosa, AL 35487, USA

Submitted 17 June 2021: Final revision received 24 November 2021: Accepted 17 March 2022

Abstract

Objective: As older adults are at higher risk for severe illness and mortality from SARS-CoV-2 infection, social distancing has been a primary means of mitigating risk. However, this lifestyle change may impact eating habits and food choices. The aim of this study was to explore individual and interpersonal factors affecting the eating behaviours and dietary intake of community-dwelling older adults during the COVID-19 pandemic.

Design: Semi-structured individual interviews were conducted. All interviews were audio-recorded and transcribed verbatim. Qualitative data were analysed using a deductive content analysis approach to identify themes.

Setting: Southeastern United States

Participants: Twenty-three men and women, 60 years of age and older (mean age 71·9 ± 7·7, 22 % male), completed both the interview and questionnaire.

Results: Themes that emerged at the individual level included changes in eating habits and foods eaten, with most participants reporting healthier food choices during the pandemic. Participants also reported more frequent cooking, improved cooking skills and cooking as a form of stress relief. Although some older adults described increased snacking and consumption of 'comfort foods', others noted no influence of mood on food choices. At the interpersonal level, an increased use of technology for social interaction and the importance of social support were identified as influencing factors.

Conclusions: Findings provide insight on how to help older adults maintain good nutrition amidst lifestyle changes imposed by social distancing. Nutrition educators may capitalise on positive behaviour changes that occurred during the pandemic such as increased cooking and increased use of technology for social interaction.

Keywords
Older adults
COVID-19
eating behaviours
dietary intake

The COVID-19 pandemic has impacted people of all ages worldwide, but the older adult population has been uniquely affected. Early in the pandemic, it was reported that adults aged 65 years and older accounted for nearly 80 % of hospitalisations, and the mortality risk for SARS-CoV-2 infection among older adults was twenty-three times that of men and women under 65 years of age[1]. Older adults are more susceptible to severe symptoms and poor prognosis from SARS-CoV-2 infection due to the gradual weakening of both innate and adaptive immune responses with advancing age[2]. At the same time, older adults often suffer from comorbidities that pose an increased risk for severe symptoms with SARS-CoV-2 infection[1]. It is estimated that over half of all older adults have two or more chronic health conditions such as hypertension, type 2 diabetes or cardiopulmonary dysfunction[3].

Considering the heightened risk of severe disease, the WHO identified older adults as a vulnerable population and issued recommendations for vigilant social distancing to mitigate risk[4]. However, public health experts have raised concern that social distancing recommendations could compromise the health of older adults by reducing social contact and worsening social isolation[5]. For example, studies prior to the pandemic demonstrated that eating out in restaurants was an important social activity for older adults. The UK National Diet and Nutrition Survey found that nearly 28 % of adults over 69 years of age dine out once weekly or more[6]. Similar data were reported by participants aged 65 years and older from the Cardiovascular Health Study[7]. In another nationally representative sample from the USA, fewer than half of adults aged 50–80 years reported frequently cooking at home in 2019[8].

*Corresponding author: Email aellis@ches.ua.edu

Social isolation is a well-recognised risk factor for poor nutrition status[9,10]. In turn, poor nutrition status can lead to further decreases in immune function as well as increased susceptibility to infections, poor wound healing, impaired mobility and loss of independence[11]. Consequently, the Gerontological Society of America's COVID-19 Task Force has identified understanding the impact of social distancing precautions on nutritional status of older adults as a research priority[2].

Researchers from other countries have reported differences in responses to pandemic lockdowns between younger and older adults. For example, among a nationally representative sample of adults from the Netherlands, researchers found that older adults were more likely than younger adults to report no changes in food-related behaviours[12]. In another study from Japan, younger adults were more likely than older adults to increase time spent cooking at home[13]. Most studies to date from the USA have focused on older adults in nursing homes or other congregate living facilities, but community-dwelling older adults are a vulnerable population, too. In addition to increased risk for severe disease from SARS-CoV-2, independently living seniors experience many age-related barriers to good nutrition such as poor dentition, decreased sense of taste and smell, and polypharmacy[14]. Community-dwelling elders are also prone to the psychosocial effects of social distancing on nutrition status[11]. Understanding factors influencing community-dwelling older adults' eating behaviours due to the COVID-19 pandemic will provide insight on how to help older adults maintain good nutrition amidst lifestyle changes imposed by social distancing. Thus, the aim of this study was to understand individual and interpersonal factors affecting the eating behaviours and dietary intake of community-dwelling older adults during the COVID-19 pandemic.

Methods

Interview guide

To explore the impact of the COVID-19 pandemic on community-dwelling older adults' eating behaviours at the individual and interpersonal levels, the semi-structured individual interview guide was developed based on a review of the literature and those constructs of the social ecological model. The social ecological model is a theoretical framework that incorporates multiple levels of influence on health behaviour. The individual level of the model focuses on personal factors, while the interpersonal level considers an individual's relationships with others such as family and friends[15]. Because a previous study based on the social ecological model identified individual- and interpersonal-level factors as the strongest barriers and facilitators to behaviour change during the COVID-19 pandemic[16], we focused on these levels of the model in the development of the interview guide.

Open-ended questions with probing questions are shown in Supplemental Table 1. A panel of two experts in the area of older adult nutrition, food choice behaviour and qualitative research reviewed the interview guide to establish the content validity of the interview questionnaire. A pilot interview was conducted with one older adult who met the inclusion criteria for the study. Based on feedback from the pilot interview, verbiage for the interview questions was revised slightly for clarity.

Additional questionnaire data

Participants also completed an online survey that included demographic questions and the Questionnaire for Assessing the Impact of the COVID-19 Pandemic on Older Adults (QAICPOA). The QAICPOA was introduced as a standardised tool to understand the effects of the pandemic and social distancing guidelines on behaviours and well-being of older adults[17]. The QAICPOA questionnaire included questions about communication with others during the pandemic, difficulty obtaining food and the three-item loneliness scale[18].

Participant recruitment

Purposive sampling[19] was used to recruit community-dwelling men and women aged 60 years and older. Participants were recruited in September 2020 from the Osher Lifelong Learning Institute (OLLI) at The University of Alabama. The OLLI marketing department posted recruitment flyers to their social media websites and email distribution list. In addition to the age of 60 years or older, inclusion criteria required participants to have internet access and be living independently. Participants were provided with a $10 incentive upon completion of the individual interview and questionnaire.

Data collection

Individual interviews were conducted by Zoom (Zoom Video Communications Inc., 2021). The effectiveness of Zoom videoconferencing as a means of conducting interviews for qualitative research has been previously documented[20]. Individual interviews were conducted during September and October 2020. At this time in the pandemic, lockdowns were no longer imposed, but masks and social distancing guidelines were mandated. One of the two principal investigators conducted each interview, while a research assistant took written field notes. The interviewer and research assistant debriefed after each interview to add additional reflections to the field notes. Sessions were recorded, and interviews were transcribed verbatim by an automated transcription service. A research assistant verified each transcript for accuracy. Design and implementation of this study followed the Standards for Reporting Qualitative Research (SRQR) and the Consolidated Criteria for Reporting Qualitative Studies (COREQ)[21].

Public Health Nutrition

Data analysis

Each participant was given an unidentifiable indicator, and each individual interview was transcribed verbatim. After each individual interview was transcribed, transcripts were cross-checked by two members of the research team for accuracy. Finalised transcripts were imported into NVivo 12 software (version 12, NVIVO, QSR International) and analysed using deductive content analysis, with the social ecological model theory constructs acting as predetermined themes[22,23]. Two researchers coded transcripts independently and compared results through Zoom meetings to reconcile any discrepancies, reorganising any overlapping themes and subthemes[24]. Themes and subthemes were discussed with another research team member to ensure high reliability. Supporting quotations were chosen with agreement between all research team members. Trustworthiness of the data was addressed by conducting member checking[19], peer debriefing and an audit trail to determine the validity of the findings and accuracy of the identified themes and subthemes[25]. Descriptive statistics from the online questionnaire were calculated using SPSS version 26.0. (IBM Corp.). Questionnaire data were aggregated across the entire sample without categorising participants based on their responses or matching individual interview data to questionnaire responses.

Results

Eighteen women and five men aged 60–87 years (mean age 71·9 + 7·7 years) completed both online questionnaires and individual interviews. Additional participant demographics are reported in Table 1. From the interviews, three main themes with several subthemes were identified at the individual level, and two main themes with associated subthemes emerged at the interpersonal level (Table 2). Those themes and aggregated results from the QAICPOA questionnaire are summarised as follows.

Table 1 Participant characteristics (*n* 23)

Variable	*n*
Age	
60–64	4
65–74	12
75–84	5
85 years or older	2
Gender	
Male	5
Female	18
Race	
White	22
Black/African American	1
Education	
Some college or technical school	5
College graduate	18
Employment status	
Part-time	1
Full-time	0
Retired	22

Individual-level themes

Theme A: Changes in eating habits and foods eaten

Healthier food choices emerged as one of the changes in eating behaviours among the study participants during the COVID-19 pandemic. Some participants stated that less frequent eating out was a facilitator for healthier food choices at home such as more vegetables and fruits and fewer fried foods. For example, one participant noted:

> Since I'm at home a lot more than I used to be, I can spend more time cooking, like, like preparing vegetables and fresh vegetables, and that I think has helped us as far as eating healthier, because we don't eat out. Participant 119, female, 66 years

Some participants also perceived healthier food choices as a way to take charge of their own health and relieve health anxiety related to the pandemic. For instance, one participant said:

> Yes, well, I'm trying to eat, you know, I've been reading a lot and I know that vitamin D and zinc and, and vitamin C is supposed to help your immune system. So, I've been trying to eat more vegetables and fruits. Participant 118, female, 62 years

Another noted:

> I had to be able to control what we, what I consumed. I mean, I don't (pause), I mainly, I don't eat, we eat very little saturated fat, so if I want to control that, I have to cook. Participant 116, female, 70 years

A few participants described gardening as a facilitator to healthier food choices. Participant 117, female, aged 68 years stated, 'I always have tomato plants in my backyard. But this year, I – I have planted a fall garden with different types of lettuce, spinach, mustard greens, and tatsoi'. Another said:

> Yeah. I had, five tomato plants, so we ate a lot of tomato sandwiches and a lot of salads this summer. I had three of the cherry-sized tomato plants and two of the larger-sized tomatoes. And, I also grow my own garlic, so I had harvested my garlic earlier and I had I think seventeen or eighteen garlics that I harvested. And, oh let's see, I now have planted in my garden two rows of mesclun lettuce, a row of black-seeded Simpson lettuce, a row of arugula, and three collard plants . . . If you've never eaten lettuce out of a garden, boy, you have missed something. It's fantastic. The lettuce you get in the grocery store is old. It's not fresh. Participant 125, female, 62 years

However, a few participants did describe unhealthier food choices due to the pandemic. One participant told of increased caffeine consumption, stating:

Public Health Nutrition

Table 2 Individual-level and interpersonal-level themes and subthemes with characteristic quotes from the interviews

Individual level	
Themes and subthemes	Exemplary quotes
A. Changes in eating habits and foods eaten	
• Healthier food choices	• 'For us, the, the stay-at-home order has really made things more healthy for us, just out of absolute necessity'. Participant 126, female, 60 years
• Unhealthier food choices	• 'So, it was better, it was much better before. I ate definitely more vegetables, which is what I need to do. So that's, it's been a problem, it's challenging'. Participant 116, female, 70 years
B. Changes in cooking habits	
• More frequent cooking	• 'The volume of cooking I'm doing now compared to what I used to do pre-pandemic . . . it's just astronomical because I, I cook every meal now, you know. So anyway. But, or not cook, but prepare, I guess I should say cause sometimes I'll have a sandwich'. Participant 122, female, 72 years
• Improved cooking skills	• 'And I've, I've learned that the- I've learned how to turn on the oven and the stove and how to mix things and use a mixer. Honestly, I'm not kidding. So I've learned to make meals ahead and freeze them'. Participant 126, female, 60 years
• Tried new recipes	• 'I started getting even more into trying out a lot of these recipes and enjoying a whole different way of eating'. Participant 115, female, 70 years
• Used cooking as entertainment	• 'Yes, I love cooking. So, I was going to say that, instead of finding a new recipe that I could try, I would go through the books and figure out alright what do I have on hand so I could create something with what I have on hand. So, I found that very, very helpful and fun and would break the monotony'. Participant 128, female, 69 years
• Used cooking as a stress reliever or coping strategy	• 'I think it's one of seven things that'll make you happier is to learn to cook, you know. And I do enjoy cooking'. Participant 123, male, 79 years
• Less frequent cooking	• 'I just didn't feel motivated to go to the kitchen and fix something'. Participant 103, female, 75 years
C. Influence of mood on food choices	
• Anxiety/stress	• 'I can't think of anything that was really different. Maybe I hit the ice cream a little bit more when I was feeling depressed, but I, but not, not a whole lot'. Participant 128, female, 69 years
• Boredom	• 'I think my, I think our eating habits are pretty good. My only, my problem is with all the idle time we had our hands you know you tend to snack in between meals and things like that'. Participant 120, male, 73 years
• No influence of mood on food choices	• 'I– I've never let my mood affect my weight. I generally have had an excellent appetite. And – and I eat three meals a day and usually a snack at night. So, I – I'm pretty faithful about that'. Participant 117, female, 68 years

Interpersonal level	
Themes and subthemes	Exemplary quotes
A. Alterations in social interaction	
• Less face-to-face interaction with others	• 'The thing that has changed is that normally we have dinner parties and we go to other people's houses for dinner. And we eat at church on Wednesday nights, but that's junk food. But nonetheless, we do that. And we can't do that at all. And we're not, of course we're so old, our Sunday school class, we have regular deaths. And normally, we carry food, for the services for the people who are there- can't do that'. Participant 127, female, 83 years
• Increased use of technology for social interaction as a means to adapt to less eating with others.	• 'It's really a blessing to have technology bring people together. And then there's one other meeting that I do once a week, and it's with a group of people back in Georgia, and it was created as a result of COVID. So, I – I had lost my connection to them once I moved, but as a result of COVID, this reconnection was created. So yes, if we could just get smell and taste technology'. Participant 107, female, 68 years
• Socially distanced face-to-face interactions	• 'Occasionally, I will go through maybe a drive through and get some food and take it somewhere like the park. A lot of my friends and I have been going to the park at [location] and bringing our lawn chairs and sitting out there and eating'. Participant 119, female, 66 years
• Food sharing	• 'I think food sharing- if people are comfortable with having something made from somebody else's kitchen during a pandemic- is, is very beneficial'. Participant 113, female, 70 years
B. Importance of social support	
• Support from family	• 'In some ways COVID-19 has caused our family to eat more of our meals together. So, there's a lot more socialization than, than normal among the three of us. So, it's kind of nice the three of us to be home together, actually'. Participant 120, male, 73 years
• Support from friends/community/neighbours/church	• 'Well, just that, you know, the virus is a very serious problem, and I know that a lot of older people are housebound and need support. We need to have a good safety net for people. And either, either their religious connections or their – the community that they live in with community support programs for older people, they need, we need to make the most use of those kinds of programs during this difficult time'. Participant 106, male, 87 years

Table 3 Responses to the QAICPOA questionnaire (*n* 23)

Question	*n*
How has the frequency of your communication with close friends and family changed?	
I communicate with them more often than before	7
I communicate with them about the same as before	12
I communicate with them less often than before	4
How often are you communicating with others?	
Daily	10
Several times per week	10
Once per week	3
1–2 times per month	0
Rarely or never	0
How much difficulty do you have obtaining the food you need because of the pandemic or social distancing rules?	
None	18
Some	5
Much	0
Unable or very difficult	0
How often do you feel that you lack companionship?	
Hardly ever	15
Some of the time	6
Often	2
How often do you feel left out?	
Hardly ever	15
Some of the time	6
Often	2
How often do you feel isolated from others	
Hardly ever	8
Some of the time	12
Often	3

QAICPOA = Questionnaire for Assessing the Impact of the COVID-19 Pandemic on Older Adults[12].

> But, you know, in order to get myself alert, I just have felt the need for coffee which I had religiously avoided for years. And I don't know why exactly, but suddenly caffeine and drinking Coca-Cola again, which I haven't been drinking. Suddenly that became, if it's a bad habit, then I acquired it. Participant 109, male, 73 years

Another participant explained how procuring fresh fruits and vegetables had become more difficult. She said: 'Well, the fact that I'm sheltering has made it difficult, more difficult to eat as many vegetables as I'd like to be eating'. Participant 116, female, 70 years

Notably, among this cohort of older adults, food insecurity was not a barrier for healthy food choices. Per the questionnaire, only five participants reported difficulty obtaining food because of the pandemic or social distancing rules. Of these, no one reported 'much difficulty' or 'an inability to obtain food' (Table 3).

Theme B: Changes in cooking habits

Changes in cooking habits emerged as a theme as many older adults reported cooking more since the beginning of the pandemic. For example, one participant stated:

> I would cook, I would say a couple of nights a week and then . . . I didn't cook every night. I have cooked more since I've been at home. That's, that's a given, yes. Participant 118, female, 62 years

In addition to increased frequency of cooking, a few participants described improved cooking skills. One person noted:

> I think the pandemic gave me the opportunity to do what I had always wanted to do. I had always wanted to know how to cook and just never had taken the time to do it. So, it really served, a great, service to me basically. And to our bank account. Participant 126, female, 60 years

Several participants talked about trying new recipes. One person said:

> But I'll tell you the other thing is I have been on the internet a lot to allrecipes.com, trying to figure out how to cook chicken 355 ways. So yes, I mean, it's, it's made me a little bit more creative. Well, yeah. Because like I said, I'm, for example, chicken enchiladas. You know, I hadn't made those in a blue moon. Participant 122, female, 72 years

Some older adults used cooking as a form of entertainment. For example, one person said, 'Yeah. And I, I started following a particular chef. And, I, you know, I spend a lot of time . . . yeah, I spend a lot of, a lot of time following her on the internet'. Participant 108, female, 74 years

> Others used cooking as a stress reliever. This was illustrated in one person's comment, 'That's the way I cope with when I'm getting sad or depressed

Public Health Nutrition

> is being creative helps a lot and especially with the food'. Participant 128, female, 69 years

Only a few participants noted less frequent cooking. Of these, two noted living alone as a barrier to cooking. One person explained:

> Maybe a little bit less. Just because, you know, I'm thinking, 'Eh, I don't want to go to the trouble'. You know, being a single guy living at home, I just have the dogs so, I mean, and too it's hard, you know, it's hard to find stuff, you know, just for – you know, serving for one person. Although it is, you know, it is getting a little bit better. Participant 114, male, 61 years

Theme C: Influence of mood on food choices

Some participants described working to overcome changes in mood that challenged healthy eating. Stress and anxiety emerged as the most common emotions that were associated with less healthy food choices. As one participant explained,

> So, I guess maybe I should explain it like this. It's a little bit, in as much as that I'm a little bit anxious to find out what's going on in the world with this thing and sometimes, I get more distracted by that and think less about eating the proper foods. Now don't misunderstand me, I don't grab the mac and cheese and go crazy, but I do feel like I've kind of back slid a little bit. Backslid a little bit, yeah. Participant 123, male, 79 years

Boredom was also recognised to trigger additional snacking for some participants. For instance, one person said:

> I'm an emotional eater, so, when I'm here all day and I'm in the kitchen, I'm doing a lot of tasting and a lot of, (pause), you know, also just, when you're bored, I mean, I go to the, you know, I go to the refrigerator instead of finding something else to do. Participant 126, female, 60 years

Only a couple of participants mentioned emotional eating due to sadness or depression. For instance, one person stated:

> You know, so, but my main downfall with the pandemic has been the stress, being . . . I'd eat a lot of junk food, you know . . . snacks . . . the pretzels with peanut butter and you know, you know, that kind of thing just different things that I shouldn't be eating, or ice cream, you know. Yeah, snack foods instead of the healthy foods. I just I think I have to be having something in my hand or in my mouth, you know, and I say no I shouldn't be doing it, you know, but, I guess it's to get your mind off of things. Participant 105, female, 77 years

Similarly, a few participants reported annoyance with the pandemic and social distancing requirements. However, of these, only one person perceived that annoyance affected food choices. She stated:

> Well, I'm, I'm normally a very upbeat, positive person. So, but sometimes you know it's not what I would consider, you know, something that needs attention. It's just like, I'm tired of this, you know, that kind of thing. So, I would think, Alright, I have four different half gallon flavours of ice cream in the freezer . . . Now, that will last a month or more. But it would be just like, you know, I think a good thing of chocolate would, would fit right now. Participant 128, female, 69 years

Interestingly, loneliness did not emerge as a major barrier to healthy eating among this cohort of older adults. Included in the QAICPOA questionnaire is the three-item loneliness scale[17]. According to the questionnaire data, approximately half of the participants noted feeling isolated from others at least some of the time. However, of these, only two participants said they felt left out or that they lacked companionship (Table 3).

Although some participants associated changes in mood with changes in eating behaviours, other participants denied any impact of mood or emotion on dietary intake. As one participant noted, 'I don't think it does anything. I've never wanted to comfort myself with food. Music is my thing, but not food. And my husband doesn't either'. Participant 127, female, 83 years

Interpersonal-level themes

Theme A: Alterations in social interaction

At the interpersonal level, alterations in social interaction emerged as a prominent theme with influences on eating behaviours. As described above, loneliness was not commonly reported among the older adults we interviewed. Nonetheless, participants did universally report less face-to-face interaction with others. However, despite less face-to-face interaction, questionnaire data showed that only four participants reported communicating with close friends and family less often than before. The vast majority of participants reported communicating with others at least several times per week (Table 3). The most frequently cited methods of staying in touch with others were phone calls, texting, video calls, email, and social media.

During the interviews, many participants described the increased use of technology for social interaction. In some cases, technology was used to adapt to less frequent eating with others. One participant described how she and her husband adapted their usual practices of eating with others to a virtual format, saying:

> We were used to eating out twice, three times a week with friends. We're retired. My husband had breakfast with a group of men. I had coffee every Thursday with a group of women. We ate dinner with a group every Wednesday night faithfully. Usually went out with a group after church on Sunday. All

Public Health Nutrition

> of those things. Our social life went to zero. What we have done is both of us instituted Zoom meetings with our friends. My husband got, the men all go and they meet every morning, every Wednesday morning at 9 o'clock on Zoom. They don't, several of the men in that group have health issues and the restaurant they went to is a little hole in the wall in downtown [location name]. They just can't go there. I mean, it's just not safe. But there are 15 men that meet Wednesday morning at 9 o'clock on Zoom. And, I have a, you know, I have a group of about 6 or 8 women who meet every Thursday morning and we have coffee. We're on probably hour and a half to chat every Thursday morning, which is what we would have done ordinarily, but we would have done it at the local coffee shop. Participant 113, female, 70 years

Despite less face-to-face interaction overall, some participants described creative ideas for socially distanced gatherings that included food and beverages. One participant provided a vivid example, saying:

> When COVID first hit and everybody was isolating, we would have gatherings on our driveway with anywhere from 4 to 12 neighbours that would come over. And we would just socially distance – everybody would bring their own lawn chair and we had chairs all over – and I had an ice cream party. I made homemade ice cream for one of them. And I served it so everybody wasn't getting their hands on things, they'd come up one at a time and I served them whatever they want. And another time we just put out just some, just some finger food type of stuff. And then the heat hit and we just stopped having it, so we're gonna probably start up doing something – I just ordered a little fire pit for our backyard. What I hope to do is be able to start inviting 2 to 4 people at a time where we can just sit out there, and I'll put out some finger foods or something. Participant 115, female, 70 years

> Food sharing was also identified by a few participants as a way of staying socially connected with others. As one participant said, 'People are less reluctant for you to bring something to share. So, yes, I would say yes, that's a different food behavior'. Participant 108, female, 74 years

> Another participant explained: You cook a casserole. What are you going to do with it? You know? So, luckily, my son lives right down the road. And I – I'll call him and say, 'I'm bringing you supper'. Participant 122, female, 72 years

Theme B: Importance of social support

Finally, for older adults who described positive changes in dietary intake and food-related behaviours, social support was acknowledged as a facilitator. Several participants spoke of social support from family, and some commented about how more time at home had led to more meals together with immediate family members. For example, one person said:

> So COVID really, if anything, in a sense, we stay home more, which I love. I mean now we don't have the, the need or the ability to go places, which, so, it sort of forces us to stay home to be safe. But we're happy at home. Participant 115, female, 70 years

Other participants described social support from friends and neighbours. For example, one participant who lives alone described the importance of her friends as a social network. She explained:

> My family is in Chattanooga and Nashville and Memphis. And I'm here, but I have a close support of friends here. And we don't we may not see each other except maybe once a couple, every couple of weeks or so, but we talk every day. And I have two groups of people that I speak with every morning just to make sure that everybody is still living. And not laying on the floor. Participant 117, female, 68 years

Another participant told of food-related social support from a neighbour, stating:

> We have a neighbour next door who's a bachelor and he likes to cook and he knows a lot about food, so he's our primary go-to person once or twice a week that does our shopping for us. Participant 106, male, 87 years

A few older adults also reported social support from church friends specifically. They explained that even though their faith communities were not meeting face to face for congregate worship, their friends from church remained important social contacts. For instance, one person noted, 'The home fellowship group with our church that we were very, very close to, went to Zoom when the virus came in'. Participant 128, female, 69 years

Similarly, another participant said:

> I have a lot of church contacts. My friends from church, they keep in touch with us and, you know, in case we have an emergency need for anything, they're very good about helping us if we can't get our neighbour. Participant 106, male, 87 years

Discussion

This study explored the effects of the COVID-19 pandemic and associated social distancing requirements on the eating behaviours and dietary intake of independent, community-dwelling older adults in the southeastern United States. By describing their personal experiences, participants provided valuable insights that may help nutrition educators promote positive adaptive coping strategies to maintain good nutrition. Multiple themes emerged at the individual

and interpersonal levels that may guide future nutrition interventions.

Individual-level themes

Although a few participants reported more unhealthy food choices such as increased caffeine consumption and decreased intake of fresh vegetables, most older adults among this cohort said they had eaten healthier since the pandemic began. This is consistent with research from Spain that found healthier eating patterns and diet habits among younger adults during pandemic confinement[26]. For some participants in our study, the threat of illness from the virus motivated them to consider their previous eating habits, and they perceived choosing to eat more fruits and vegetables as a preventative measure to remain healthy. Previous literature supports the notion that an internal locus of control is associated with healthier food choices as well as other positive health behaviours[27–29]. However, previous research has also reported a declining sense of control over one's own health with advancing age[30]. Our results suggest that by talking with older adults about food-related behaviours and choices within their control, health care providers may help seniors improve nutrition status while fostering their autonomy. Gardening was also identified by some participants as a facilitator for the consumption of more vegetables. A review of gardening intervention studies among older adults revealed that most studies to date have examined the effects on energy expenditure and physical function[31]. Although studies of those outcomes have produced equivocal results, future studies should consider effects of gardening on dietary intake along with other potential physical and psychological benefits.

Changes in cooking habits emerged as a strong facilitator for healthier food choices. Studies worldwide have similarly reported increases in home cooking since the beginning of the pandemic[32–35]. In different countries and across various age groups, the increase in home cooking has been associated with greater intake of fruits and vegetables and less consumption of processed foods and fast foods[35,36]. In the current study, participants described a sense of satisfaction and accomplishment from improved cooking skills. Some participants also described cooking as stress reliever and a form of entertainment. Another qualitative study similarly reported that cooking reduced boredom and negative feelings related to COVID-19. The authors concluded that cooking may provide an 'escape' from pandemic-related stress[32]. Considering reported declines in home cooking in the years preceding COVID-19[37], nutrition educators may seize the opportunity to encourage this behaviour change among community-dwelling older adults post-pandemic.

At the individual level, some participants noted that stress, anxiety and boredom posed challenges to healthy eating. Particularly, these older adults reported a tendency to consume more sweet foods and energy-dense snack foods that are often categorised as 'comfort foods'[38]. Other studies with younger adults have likewise described emotional eating in response to perceived stress[33,39] and boredom[40] from the pandemic. However, it is important to point out that among our cohort, several older adults denied any influence of mood or emotions on their food choices. A few even described a staunch resilience against allowing mood or emotion to impact their eating behaviours. These individuals identified other strategies they used to cope with pandemic-induced stress and boredom, for example, sewing, music or online activities. Again, these ideas present an opportunity for nutrition educators to encourage alternative behaviours that may counteract stress-induced emotional eating.

Interpersonal-level themes

At the interpersonal level, alteration in social interactions emerged as a theme associated with changes in food-related activities. Social isolation is a well-known nutritional risk factor[9], and we hypothesised that the social distancing restrictions imposed by COVID-19 would compromise nutrition by worsening social isolation. To the contrary, although the older adults did report less face-to-face interaction with others, many also described the increased use of technology for social interaction. Phone conversations and text messages were the most frequently used methods of staying in touch with others, but many participants also used video calls, email and social media for social contact. Use of technology for social interaction also helped some participants compensate for the inability to eat with others as they described virtual happy hours and other food-related get-togethers. Eating alone has been associated with nutrition risk[10]; however, social contact may take many forms, and alternatives to in-person contact have not been widely examined in nutrition research. This offers an opportunity for future intervention studies.

Although all participants acknowledged fewer in-person gatherings due to the pandemic, some described creative and resourceful socially distanced face-to-face interactions. For example, participants described eating with others outdoors with chairs spaced out. These gatherings took place at parks, on driveways and in backyards with careful attention to food safety and COVID precautions. A few participants also identified food sharing as a means of social contact. To our knowledge, food sharing has not been explored as a facilitator for social contact or adaptive coping by previous studies, but our results suggest that further investigation is warranted.

Social support was recognised as a facilitator for healthy eating by several participants. Social support has been defined in different ways in the literature, but most definitions consider social support to include both emotional support and instrumental, hands-on

Public Health Nutrition

assistance[9]. The older adults in this study described emotional support from immediate family members in their households. However, even those who did not live with family could identify friends, neighbours and church members who provided both emotional and instrumental support. Benefits of church-based social support for overall health[41] and fewer depressive symptoms[42,43] had been described prior to the pandemic. Before the pandemic, social support from religious-based fellowships often involved physically going to places of worship to be with others. Findings from the current study provide unique insight into ways older adults adapted and maintained a sense of community even when they were unable to physically get together with their congregations. These strategies could be adapted beyond religious settings to help older adults find social support from various civic organisations and social groups. When conducting nutrition assessments, Registered Dietitians should inquire about support networks and help older adult clients identify resources for social support.

Limitations

Results of this study suggest multiple ideas for clinicians and researchers to help community-dwelling older adults maintain good nutrition status when faced with major life stressors such as the pandemic. However, results may not be widely generalisable as the older adults in this study were all relatively well educated, from the same geographic area, and predominately White and female. Findings may be much different among those with food insecurity, lower socio-economic status or among those with more physical limitations. Indeed, a recent review article described discordant results among studies that evaluated the impact of the COVID-19 pandemic on psychological symptoms of older adults in Canada. The authors highlighted that older adults represent a very heterogeneous group, so different segments of the population may be impacted differently[44]. Because all interviews for this study were conducted by Zoom, all participants in this study were somewhat tech savvy. Results may differ among older adults without access to computers, tablets or smartphones. However, policy changes during the pandemic opened internet access to some communities that did not previously have access, expanding the potential for technology-based communication to under-served areas[45]. This provides an opportunity for practitioners and agencies that serve older adults to educate seniors about how technology can be used for social connectedness. Despite these limitations, the study was strengthened by rigorous qualitative methods and a research team that was trained and experienced in the methodology. Member checking also revealed no discrepancies between the researchers' interpretation of the results and that of the participants themselves.

Conclusions

According to WHO estimates, one in six people worldwide will be 60 years of age or older by 2030[46]. Results of this study demonstrate the resilience of older adults amidst the worst pandemic in more than 100 years. By relating participants' first-hand experiences during the COVID-19 pandemic, these findings have implications for clinicians and future research. When working with community-dwelling older adults, health care providers should inquire about cooking skills, mood and social contacts of their clients. Some of the same strategies for adaptive coping to maintain healthy eating that were described in our interviews may be helpful to other seniors. Multiple opportunities exist for nutrition researchers to further explore positive changes in food-related behaviours such as cooking and use of technology for social contact. Research into facilitators of good nutrition status is imperative to meet the Healthy People 2030 developmental objective to 'increase the proportion of older adults who engage in preparedness activities for a widespread outbreak of contagious disease'[47].

Acknowledgements

Acknowledgements: The researchers thank the Osher Lifelong Learning Institute (OLLI) for their assistance with recruitment for this study. *Financial support:* Funded by the Julie O'Sullivan Maillet Research Grant Award of the Academy of Nutrition and Dietetics Foundation. *Conflict of interest:* There are no conflicts of interest. *Authorship:* A.E. and S.E.J. designed the research study and provided oversight. A.E., S.E.J. and F.P. participated in data collection and data analysis. M.S. participated in data collection. A.E. drafted the manuscript, and all authors contributed significantly to editing of the final manuscript. *Ethics of human subject participation:* This study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving research study participants were approved by the University of Alabama Institutional Review Board. Written informed consent was obtained from all participants.

References

1. Mueller AL, McNamara MS & Sinclair DA (2020) Why does COVID-19 disproportionately affect older people? *Aging* **12**, 9959–9981.
2. Resnick B, Zimmerman S & Gerontological Society of America C-TF (2021) COVID-19 Recommendations for Research from the Gerontological Society of America COVID-19 Task Force. *Gerontologist* **61**, 137–140.
3. Saffel-Shrier S, Johnson MA & Francis SL (2019) Position of the Academy of Nutrition and Dietetics and the Society for Nutrition Education and Behavior: food and Nutrition

Programs for Community-Residing Older Adults. *J Acad Nutr Diet* **119**, 1188–1204.
4. Harapan H, Itoh N, Yufika A *et al.* (2020) Coronavirus disease 2019 (COVID-19): a literature review. *J Infect Public Health* **13**, 667–673.
5. Palmer K, Monaco A, Kivipelto M *et al.* (2020) The potential long-term impact of the COVID-19 outbreak on patients with non-communicable diseases in Europe: consequences for healthy ageing. *Aging Clin Exp Res* **32**, 1189–1194.
6. Adams J, Goffe L, Brown T *et al.* (2015) Frequency and socio-demographic correlates of eating meals out and take-away meals at home: cross-sectional analysis of the UK national diet and nutrition survey, waves 1–4 (2008–12). *Int J Behav Nutr Phys Act* **12**, 51.
7. Kumanyika S, Tell GS, Shemanski L *et al.* (1994) Eating patterns of community-dwelling older adults: the Cardiovascular Health Study. *Ann Epidemiol* **4**, 404–415.
8. Wolfson JA, Leung CW & Richardson CR (2020) More frequent cooking at home is associated with higher Healthy Eating Index-2015 score. *Public Health Nutr* **23**, 2384–2394.
9. Vesnaver E & Keller HH (2011) Social influences and eating behavior in later life: a review. *J Nutr Gerontol Geriatr* **30**, 2–23.
10. Bjornwall A, Mattsson Sydner Y, Koochek A *et al.* (2021) Eating alone or together among community-living older people-a scoping review. *Int J Environ Res Public Health* **18**, 3495.
11. Leslie W & Hankey C (2015) Aging, nutritional status and health. *Healthcare* **3**, 648–658.
12. Poelman MP, Gillebaart M, Schlinkert C *et al.* (2021) Eating behavior and food purchases during the COVID-19 lockdown: a cross-sectional study among adults in the Netherlands. *Appetite* **157**, 105002.
13. Hayashi F & Takemi Y (2021) Factors influencing changes in food preparation during the COVID-19 pandemic and associations with food intake among Japanese adults. *Nutrients* **13**, 1–16.
14. Shlisky J, Bloom DE, Beaudreault AR *et al.* (2017) Nutritional considerations for healthy aging and reduction in age-related chronic disease. *Adv Nutr* **8**, 17–26.
15. Golden SD & Earp JA (2012) Social ecological approaches to individuals and their contexts: twenty years of health education & behavior health promotion interventions. *Health Educ Behav* **39**, 364–372.
16. Coroiu A, Moran C, Campbell T *et al.* (2020) Barriers and facilitators of adherence to social distancing recommendations during COVID-19 among a large international sample of adults. *PLoS One* **15**, e0239795.
17. Cawthon PM, Orwoll ES, Ensrud KE *et al.* (2020) Assessing the impact of the COVID-19 pandemic and accompanying mitigation efforts on older adults. *J Gerontol A Biol Sci Med Sci* **75**, e123–e125.
18. Hughes ME, Waite LJ, Hawkley LC *et al.* (2004) A short scale for measuring loneliness in large surveys: results from two population-based studies. *Res Aging* **26**, 655–672.
19. Harris JE, Gleason PM, Sheean PM *et al.* (2009) An introduction to qualitative research for food and nutrition professionals. *J Am Diet Assoc* **109**, 80–90.
20. Archibald M, Ambagtsheer R, Casey M *et al.* (2019) Using zoom videoconferencing for qualitative data collection: perceptions and experiences of researchers and participants. *Int J Qual Methods* **18**, 1–8.
21. Dossett LA, Kaji AH & Cochran A (2021) SRQR and COREQ reporting guidelines for qualitative studies. *JAMA Surg* **156**, 875–876.
22. Assarroudi A, Nabavi FH, Armat MR *et al.* (2018) Directed qualitative content analysis: the description and elaboration of its underpinning methods and data analysis process. *J Res Nursing* **23**, 42–55.
23. Hsieh H & Shannon S (2005) Three approaches to qualitative content analysis. *Qual Health Res* **15**, 1277–1288.
24. Graneheim UH & Lundman B (2004) Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today* **24**, 105–112.
25. Thomas E & Magilvy JK (2011) Qualitative rigor or research validity in qualitative research. *J Spec Pediatr Nurs* **16**, 151–155.
26. Rodriguez-Perez C, Molina-Montes E, Verardo V *et al.* (2020) Changes in dietary behaviours during the covid-19 outbreak confinement in the Spanish COVIDiet Study. *Nutrients* **12**, 1730.
27. AbuSabha R & Achterberg C (1997) Review of self-efficacy and locus of control for nutrition- and health-related behavior. *J Am Diet Assoc* **97**, 1122–1132.
28. Neymotin F & Nemzer LR (2014) Locus of control and obesity. *Front Endocrinol* **5**, 159.
29. Cobb-Clark DA, Kassenboehmer SC & Schurer S (2014) Healthy habits: the connection between diet, exercise, and locus of control. *J Econ Behavior Organ* **98**, 1–28.
30. Robinson SA & Lachman ME (2017) Perceived control and aging: a mini-review and directions for future research. *Gerontology* **63**, 435–442.
31. Nicklett EJ, Anderson LA & Yen IH (2016) Gardening activities and physical health among older adults: a review of the evidence. *J Appl Gerontol* **35**, 678–690.
32. Guler O & Haseki MI (2021) Positive psychological impacts of cooking during the COVID-19 lockdown period: a qualitative study. *Front Psychol* **12**, 635957.
33. Marty L, de Lauzon-Guillain B, Labesse M *et al.* (2021) Food choice motives and the nutritional quality of diet during the COVID-19 lockdown in France. *Appetite* **157**, 105005.
34. Kriaucioniene V, Bagdonaviciene L, Rodriguez-Perez C *et al.* (2020) Associations between Changes in Health behaviours and body weight during the COVID-19 quarantine in Lithuania: the Lithuanian COVID diet study. *Nutrients* **12**, 3119.
35. Pfeifer D, Resetar J, Gajdos Kljusuric J *et al.* (2021) Cooking at home and adherence to the Mediterranean Diet During the COVID-19 confinement: the experience from the Croatian COVID diet study. *Front Nutr* **8**, 617721.
36. Murphy B, Benson T, McCloat A *et al.* (2020) Changes in consumers' food practices during the COVID-19 lockdown, implications for diet quality and the food system: a cross-continental comparison. *Nutrients* **13**, 20.
37. Smith LP, Ng SW & Popkin BM (2013) Trends in US home food preparation and consumption: analysis of national nutrition surveys and time use studies from 1965–1966 to 2007–2008. *Nutr J* **12**, 45.
38. Dallman MF, Pecoraro N, Akana SF *et al.* (2003) Chronic stress and obesity: a new view of "comfort food". *Proc Natl Acad Sci USA* **100**, 11696–11701.
39. Shen W, Long LM, Shih CH *et al.* (2020) A humanities-based explanation for the effects of emotional eating and perceived stress on food choice motives during the COVID-19 pandemic. *Nutrients* **12**, 2712.
40. Coulthard H, Sharps M, Cunliffe L *et al.* (2021) Eating in the lockdown during the Covid 19 pandemic; self-reported changes in eating behaviour, and associations with BMI, eating style, coping and health anxiety. *Appetite* **161**, 105082.
41. Krause N (2002) Church-based social support and health in old age: exploring variations by race. *J Gerontol B Psychol Sci Soc Sci* **57**, S332–347.
42. Chatters LM, Taylor RJ, Woodward AT *et al.* (2015) Social support from church and family members and depressive

Public Health Nutrition

symptoms among older African Americans. *Am J Geriatr Psychiatry* **23**, 559–567.
43. Roh HW, Hong CH, Lee Y *et al.* (2015) Participation in physical, social, and religious activity and risk of depression in the elderly: a community-based three-year longitudinal study in Korea. *PLoS One* **10**, e0132838.
44. Lebrasseur A, Fortin-Bedard N, Lettre J *et al.* (2021) Impact of the COVID-19 pandemic on older adults: rapid review. *JMIR Aging* **4**, e26474.
45. Hlatshwako TG, Shah SJ, Kosana P *et al.* (2021) Online health survey research during COVID-19. *Lancet Digit Health* **3**, e76–e77.
46. World Health Organization (2021) Ageing and Health Fact Sheet. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health (accessed November 2021).
47. Hasbrouck L (2021) Healthy people 2030: an improved framework. *Health Educ Behav* **48**, 113–114.

Public Health Nutrition