


**RESEARCH ARTICLE**

# Taste, choice and timing: Investigating resident and carer preferences for meals in aged care homes

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**Abstract**

There has been little empirical investigation of the preferences of people living in aged care homes for food services. The aim of the present study was to elicit consumer preferences and their willingness to pay for food service in aged care homes. Current residents or their family members were invited to take part in the discrete choice experiment questionnaire administered via interview. Of the 109 eligible residents and 175 eligible family members approached for consent 121 (43%) participated, including 43 residents. Participant preferences were influenced by food taste, choice in relation to serving size, timing of meal selection, visual appeal, and additional cost. Participants indicated they would be willing to pay an additional \$24 (US\$18.42) per week for food which tasted excellent and \$8 (US\$6.14) per week to have choice in serving sizes. The study found that respondents were willing to pay a premium to receive food that met their expectations of taste, and for a high level of control over serving sizes, which has implications for the funding and provision of food and dining in long-term care in the future.

**KEYWORDS**

consumer, discrete choice experiment, food service, informal carer, long-term care, service design

## 1 | INTRODUCTION

Long-term care institutions (i.e., nursing homes or aged care homes) have gone through revolutionary culture change from hospital-like facilities based on a medical model of care, toward more home-like facilities, with a focus on the quality of life of residents, and providing real choices and individualized care (Dorner, 2010). Increasingly, the focus is on meeting residents' needs and preferences, and providing choice and flexibility in care. Additionally, approximately half of all

residents in aged care homes have been identified as malnourished due to poor appetite, dietary intake, and nutrient absorption (Agarwal, Marshall, Miller, & Isenring, 2016). Increasing understanding of the significant impact of malnutrition on physical health and morbidity in this population has led to calls for improvements to food provision in the sector.

It should be noted that residents in aged care are almost entirely dependent on the home for their nourishment. If residents are provided with food that is not appropriate or unsatisfactory it might be

refused and returned uneaten to the kitchen; where this occurs consistently, dietary intake will reduce, and likely malnutrition will occur (Chisholm, Jensen, & Field, 2011; Keller et al., 2014). Innovations in the sector have aimed to increase resident choice and control over the food they eat, through using restaurant style service with choice of meal at time of service, family-style meals where meals are placed in large bowls in the center of the table for self-service, buffet-style meals where residents chose from a number of options presented to them at the meal in a steam cart, or decentralized food services where food is cooked by up-skilled care staff in a small kitchen within the living quarters of the care facility, accessible to residents (Dorner, Niedert, & Welch, 2002; Nijs, de Graaf, Kok, & van Staveren, 2006; Remsburg et al., 2001).

However, traditional, large-scale hospital models of food service (characterized by residents pre-ordering meals that are pre-plated and taken to residents at a predetermined mealtime) remain strongly represented in the sector (Abbey, Wright, & Capra, 2015; Winterburn, 2009). The reasons for the overwhelming continued use of this model could include actual and perceived costs associated with changing from one food service system to an alternative system. This could require retraining of staff, revision of protocols, changes to rostering of staff, purchase of new equipment, or even renovation of buildings, combined with the uncertainty in gaining a positive outcome (e.g., improved resident satisfaction) to make this investment worthwhile.

## 1.1 | Literature review

There is some existing evidence of consumer views of food services in institutional long-term care. Evans, Crogan, and Shultz (2003) identified that providing a variety of tasty foods and ample choice were important to create a quality dining experience in their sample of 20 residents of a nursing facility, as was consideration of the social aspects of mealtimes and expressions of dignity and respect for residents from the staff working at the home. Palacios-Ceña et al. (2013a) interviewed 26 residents living in aged care homes and found that the timing of meals, and whether residents sat next to friends or companions during meals, were important determinants of mealtime experiences. Other studies concentrated on the content, taste, and presentation of the meals themselves. (Adams, Anderson, Archuleta, & Smith, 2013; Evans et al., 2003; Palacios-Ceña et al., 2013b; Wright, Connelly, Capra, & Hendrikz, 2013). Adams, Anderson, Archuleta, and Smith Kudin (2013) undertook a survey of dining style preferences among residents in a skilled nursing facility, and found that the majority of participants wanted home-style meals served in the dining room, with food served in restaurant style to their table, and found wide ranges of preferred times for meals, especially for breakfast and dinner. They highlighted that removing dining time restrictions might be a key way to increase resident satisfaction and initiate a person-centered culture in residential care. In addition, a previous cross-sectional study comparing individual and facility-level characteristics of food and dining and resident quality of life identified associations between autonomy in relation to food (e.g., having access to food between meals and having food brought in by family), use of therapeutic menus, use of china dishes, and

frequency of menu revision, with resident quality of life (Carrier, West, & Ouellet, 2009). However, the extent to which these characteristics are preferred to a greater or lesser extent by residents and family members has not been evaluated empirically. In addition, previous studies have focused on recruiting cognitively-able residents, and have generally not included residents with cognitive impairment, or the opinions of their informal carers. Residents with dementia or cognitive decline are likely to find it more difficult to express their needs and opinions through traditional methods (e.g., through verbal and written feedback), and they form a large proportion of the population within long-term care facilities (Australian Institute of Health and Welfare, 2012; World Health Organization, 2012).

Discrete choice experiments (DCE) offer a robust methodological approach for determining consumer preferences for health and social care services (de Bekker-Grob, Ryan, & Gerard, 2012; Lancsar & Louviere, 2008). Originally developed in mathematical psychology, DCE enables the elicitation of stated preferences for characteristics of a good or service (Papanikolaou & Palfreyman, 2013; Street & Burgess, 2007). DCE have been used extensively in health economics commonly with members of the general population or health-care workers to determine preferences for programs and services (de Bekker-Grob et al., 2012; Ryan & Gerard, 2003). However, with increasing calls to incorporate the perspectives of older people into service design, DCE are increasingly being undertaken specifically with older people and their family member carers, providing valuable information for people working in the health and aged care industry and policy-makers (Brown, Allaire, & Wiener, 2016; Dixon, Nancarrow, Enderby, Moran, & Parker, 2015; Kaambwa et al., 2015). DCE have an advantage over other methods of eliciting preferences for services (i.e., basic survey techniques) in that individuals are asked to consider a number of characteristics of a program, or service simultaneously in making their decision, which is more reflective of how consumption decisions are made in real-world settings (Ratcliffe et al., 2010; Ryan & Gerard, 2003). At the same time, DCE allow the generation of willingness to pay (WTP) values for preferred characteristics, providing a variety of information useful for design of health and social care services (Taylor & Armour, 2002).

## 1.2 | Study aim

The purpose of the present study was to undertake a detailed analysis of the preferences for how food and the dining experience are provided within aged care homes from the perspective of residents (without cognitive impairment or with mild cognitive impairment) and informal carers (predominantly family members of residents experiencing moderate and severe cognitive impairment), including an analysis of their WTP for these preferences.

## 2 | METHODS

### 2.1 | Design

This current study is part of a continuing program of research aiming to understand the preferences of consumers for the food and dining

environments in residential aged care. Prior to the DCE study, a qualitative study with people living with cognitive impairment and their informal carers was first conducted to understand their perspectives on food and dining in residential care (Milte et al., 2017). The findings of the qualitative study highlighted a journey for people with cognitive impairment, from their struggles to have their individual needs and preferences recognized in the institutional system, growing barriers to receiving care which met these needs, and ultimately a complete deterioration of meeting individualized preferences in food and dining. The study identified important concepts for meeting their preferences in food and dining: the presence of long-standing preferences for how food and dining is provided (e.g., timing of meals, size, location, involvement in mealtime routines, choice of what to consume), and institutional barriers of communicating with residents and informal carers about these needs and preferences.

Further to this preliminary study, we designed a DCE to build upon these initial findings to gain an empirical understanding of the comparative value of potential improvements to food and dining services. In addition, we sought to incorporate cost as an additional element within the DCE to facilitate the calculation of WTP values representing the investment in Australian dollars that consumers would be willing to make for improvements to food and dining services (Taylor & Armour, 2002).

## 2.2 | Questionnaire design

A DCE questionnaire comprised of four main sections was developed for aged care home residents and their family members, administered by a trained interviewer. Section A comprised a series of attitudinal statements relating to the provision of meals and care surrounding food and eating. Respondents were asked to indicate how much they agreed or disagreed with each statement on a 5-point Likert scale. Section B of the questionnaire contained the DCE, comprising a series of six choice sets involving a choice between two dining experiences in an aged care home. An example choice set is presented in the supplementary information section. The scenarios presented for consideration were based on six salient attributes of how food and dining could be provided in dining rooms. As previously described, these attributes were identified through the prior qualitative study with people living with dementia and their family members ( $n = 19$ ) to determine the key factors of importance to them in providing a good-quality food and dining experience in aged care home settings (Milte et al., 2017). A qualitative study is recommended as best practice method for sourcing the most relevant attributes for inclusion in a DCE (Coast et al., 2012). The attributes and levels included in the DCE reflected the taste of the food, degree of choice in serving size, meal provided, and flexibility in mealtimes, visual appeal, and any additional cost associated with the meal. Section C asked about their preferred times for meals, while Section D collected some basic demographic information of the participants and asked the respondent to choose their preferred times to have breakfast, lunch, and dinner provided (multiple responses were permitted).

Three levels for each of the six attributes resulted in 729 possible scenarios ( $=3^6$ ), and a total of 265 356 possible pair-wise choices ( $[(729*728)/2]$ ). A D-efficient design with no prior parameters

information ( $D_2$ -error, i.e., zero priors assumed for all variables) was used to reduce the number of choice scenarios into a manageable number of 18 choice sets for presentation using the Ngene version 1.1.2 DCE design software package (ChoiceMetrics, 2014). The resulting 18 scenarios were divided into three versions of the DCE questionnaire each with six binary choice sets presented in each version. Participants were asked to choose between a pair of hypothetical scenarios reflecting an aged care home service they could receive at two different locations. Section C comprised questions regarding basic demographic information and preferred characteristics of meals.

## 2.3 | Participants and setting

Participants were recruited from three aged care homes in Australia. Recruitment occurred over a 6-month period, between October 2015 and March 2016. The study was approved by the Flinders University Social and Behavioural Research Ethics Committee (project no.: 6990). Eligible participants were either residents or family members of residents living in the facility. Family members were asked to complete the questionnaire, choosing the scenarios they would prefer to see in an aged care home caring for their resident, rather than choosing based on what they thought the resident would choose themselves if they were to be asked. Prior to completing the questionnaire, residents were administered the Psychogeriatric Assessment Scales – Cognitive Impairment Scale (or PAS-Cog) by a trained research nurse (Jorm et al., 1995). The PAS-Cog is a standardized instrument that assesses memory and other cognitive functions, and has excellent reliability and validity. It is scored on a scale between zero and 21, where a higher score indicates greater cognitive impairment. Residents with no to mild cognitive impairment (indicated by a PAS-Cog score of between 0 and 9) were then asked to complete the questionnaire themselves. Where residents had a more severe level of cognitive impairment, they were ineligible to consent to the study and complete the questionnaire. Eligibility criteria included that the resident (or the resident of the associated family member) was a current, permanent resident of the facility, and that they were not currently receiving palliative care. Following informed consent, participants took part in a face-to-face interview with trained research assistants.

## 2.4 | Data analysis

The data from the DCE were analyzed within a random utility theory framework using a conditional logit model (McFadden, 1974). The utility function to be estimated was of the following form:

$$U_{itj} = X'_{itj}\beta_i + \varepsilon_{itj},$$

where  $U_{itj}$  is the utility individual,  $i$  derives from choosing alternative  $j$  in choice scenario  $t$ ,  $x$  is a vector of observed attributes,  $\beta$  is a vector of coefficients to be estimated reflecting the desirability of the attributes (a positive sign on a coefficient indicates that as the level of that attribute increases, so does the utility derived, and vice versa), and  $\varepsilon_{itj}$  is a random error term. Except for the cost attribute, all other attributes were effects coded.

The cost attribute was treated as a continuous variable for the purposes of calculating WTP. The positive/negative WTP estimates indicate theoretically to what extent the respondents would be willing to pay/to be compensated for an attribute level. It was calculated by dividing the estimated coefficients for each attribute level by the estimated coefficient for the cost attribute. The 95% confidence intervals were calculated using the bootstrap technique (Hole, 2007). Values are reported in Australian dollars, and United States dollars (converted from Australian dollars using the exchange rate on 31/10/2017 from the Reserve Bank of Australia, 2017).

A mixed logit model was also undertaken to explore potential preference heterogeneity in the full sample (McFadden & Train, 2000). Mixed logit estimates are more reliable to use in the event that there is significant heterogeneity in preferences for characteristics, in comparison to estimates generated from the conditional logit model, which assumes homogeneous preferences between respondents (McFadden & Train, 2000). In general, the mixed logit estimates were comparable with estimates generated from the conditional logit analysis (results not shown). In addition, among the six attributes presented the mixed logit estimates suggest a certain degree of preference heterogeneity only on two attributes (i.e., "How good is the taste of food provided?" and "How much choice do I have over service size?") at the 5% significance level. Thus, considering the relatively small sample size, and the evidence of homogeneous preferences for the attributes, only the conditional logit results are presented. In addition, the analysis was undertaken for two subgroups: residents self-completing the questionnaire versus family members completing the questionnaire. All regression analyses in this paper were conducted in Stata version 14.1 (StataCorp LP, College Station, Texas, USA).

### 3 | RESULTS

#### 3.1 | Study sample

A total of 292 residents living in three aged care homes and their family members were assessed for eligibility. Among them, 109 residents and 175 family members were eligible to participate and approached for consent. The remainder of the residents and their family members were unable to participate due to cognitive impairment or health impairments, or could not be contacted during the study period. The final participants ( $n = 121$ , participating rate 43%) consisted of 43 (35%) residents and 78 (65%) family members of current residents. Characteristics of the participants are described in Table 1. The majority of participants were women (66%), and had either been living in the facility or their family member had been living in the facility for more than 2 years (46%). Most stated that they did not find the questionnaire difficult to complete (60%).

#### 3.2 | Attitudinal questions

The responses of the participants to the attitudinal questions are presented in Table 2. For some questions, responses were relatively homogeneous, with over 70% of respondents answering that they "strongly agree" or "agree" with the following statements: "It is

important that I have a choice of what to eat at each meal," "Meal-times should be set and not be flexible," "I should be asked for my opinion on the menu regularly," "I should be able to talk to a professional regularly regarding my food and eating needs," "I feel like I am given enough time to enjoy eating my meal at mealtimes," "People who need assistance at meal times are provided assistance with the appropriate patience and dignity required," "I am supported to retain as much independence as possible to feed myself," and "I should be able to decide whether I want to follow a recommended diet." For some other questions, responses were spread more evenly across the spectrum of possible responses, including "I'd like to be given the opportunity to be involved in preparing the dining room for meals," "I would prefer that more traditional foods are provided to me," "Family members should be included in making decisions about food and meals provided to me," and "If I were to deteriorate to the point that it was difficult for me to swallow food, I should be able to continue to eat and drink what I want, regardless of the risk."

**TABLE 1** Characteristics of participants

| Characteristic   | N (%) <sup>a</sup> |
|--|--------------------|
| Mean age, years (SD)   | 69 (15)            |
| Sex  |                    |
| Male   | 41 (34)            |
| Female   | 80 (66)            |
| Participant  |                    |
| Family member  | 78 (65)            |
| Resident   | 43 (35)            |
| How long have you (or your family member) been in an aged care home?     |                    |
| 1–12 months  | 39 (33)            |
| 12–24 months   | 25 (21)            |
| >24 months   | 56 (46)            |
| Highest educational qualification attained <sup>a</sup>                  |                    |
| No qualifications  | 18 (15)            |
| Completed high school  | 34 (28)            |
| Undergraduate degree or professional qualification                       | 48 (40)            |
| Postgraduate qualification   | 9 (7)              |
| Other  | 8 (6.6)            |
| Born in Australia <sup>bc</sup>  |                    |
| Yes  | 92 (77)            |
| No   | 28 (23)            |
| Mean PAS-Cog score (SD) of admitted resident                             | 4.2 (2.5)          |
| How difficult did you find this questionnaire to complete? <sup>ca</sup> |                    |
| Very difficult   | 3 (3)              |
| Moderately difficult   | 21 (17)            |
| Slightly difficult   | 21 (17)            |
| Not difficult  | 73 (60)            |

Note. PAS-Cog = Psychogeriatric Assessment Scales – Cognitive Impairment Scale; SD = standard deviations.

<sup>a</sup> Missing response from four participants.

<sup>b</sup> Missing response from one participant.

<sup>c</sup> Missing response from three participants.

**TABLE 2** Responses to attitudinal questions

| Question  | Response, N (%) |         |         |          |                   |
|---|-----------------|---------|---------|----------|-------------------|
|   | Strongly agree  | Agree   | Neither | Disagree | Strongly disagree |
| A. It is important that I have a choice of what to eat at each meal   | 76 (63)         | 38 (31) | 6 (5)   | 0 (0)    | 1 (1)             |
| B. I would prefer that more traditional foods (e.g., roasts, stews) are provided to me, not new and novel foods (e.g., pasta, noodles)  | 30 (25)         | 43 (36) | 29 (24) | 16 (13)  | 3 (2)             |
| C. Meal times should be set and not be flexible   | 41 (34)         | 62 (51) | 8 (7)   | 10 (8)   | 0 (0)             |
| D. I would like to be given the opportunity to be involved in preparing the dining room for meals   | 8 (6)           | 22 (18) | 19 (16) | 53 (44)  | 19 (16)           |
| E. I should be asked for my opinion on the menu regularly, and which foods should be added and which should be removed (1 missing response)   | 31 (26)         | 58 (48) | 13 (11) | 16 (13)  | 2 (2)             |
| F. I should be able to talk to a professional (e.g., dietitian, speech pathologist, occupational therapist, dentist) regularly regarding my eating and food needs                             | 26 (22)         | 71 (59) | 15 (12) | 6 (5)    | 2 (2)             |
| G. I feel like I am giving enough time to enjoy eating my meal at meal times (1 missing response)   | 31 (26)         | 73 (60) | 9 (7)   | 6 (5)    | 1 (1)             |
| H. Family members should be included in making decisions about food and meals provided to me (1 missing response)   | 4 (3)           | 55 (46) | 21 (17) | 34 (28)  | 6 (5)             |
| I. People who need assistance at meal times are provided assistance with the appropriate patience and dignity required (1 missing response)   | 45 (37)         | 54 (45) | 14 (12) | 5 (4)    | 2 (2)             |
| J. I am supported to retain as much independence as possible to feed myself, even when I might need some help (1 missing response)  | 40 (33)         | 67 (55) | 9 (7)   | 3 (3)    | 1 (1)             |
| K. I should be able to decide whether I want to follow a recommended diet (1 missing response)  | 30 (25)         | 62 (51) | 8 (7)   | 16 (13)  | 4 (3)             |
| L. If I were to deteriorate to the point that it was difficult for me to swallow food, I should be able to continue to eat and drink what I want, regardless of the risk (1 missing response) | 12 (10)         | 23 (19) | 14 (12) | 47 (39)  | 24 (20)           |

### 3.3 | Discrete choice experiment model estimation

The results of the DCE analysis are presented in Table 3. All the attributes included in the DCE (including the taste of food, degree of choice over serving size, timing of choice of meal, available times for meals, visual appeal of meals, and any additional cost) were statistically significant in the full sample, indicating they contributed significantly to participant preferences for food and dining in aged care homes. The largest positive coefficient (indicating that the attribute was highly preferred by the participants) was for food provided tasting excellent, and the largest negative coefficient (indicating an attribute that was strongly avoided by the participants) was for food provided tasting poor. This indicates that the taste of the food was highly important factor to participants, as compared to the other attributes included. Having no choice in the meal provided was also a strong determinant of negative preferences for the participants, indicating that having a choice of what they (or their family members) can eat in aged care homes was also important to participants. Increasing choice over serving size was viewed positively by participants indicated by coefficients increasing from negative to positive values, but with smaller coefficients (thus less strength of preference) than excellent-tasting food, for example. However, participants were more reserved regarding their consideration of choice as it applied to timing of meals, with larger positive coefficient for having meals at a set time, and a negative coefficient for eating within a 1–2 h time range, or eating at any time. This indicates that participants more positively viewed meals provided at a set time than at flexible times.

When comparing the coefficients from the resident and family member subsamples, some differences were observed. For example, the choice about serving size was a significant factor for family members, but not for residents themselves. Regarding when to eat the meal, “any time I like” was strongly aversely viewed by family members, but insignificant among residents. It should also be noted that the cost attribute was negative, but insignificant among residents, while it was significantly negative among family members.

The results of the WTP analysis based on the full sample is provided in Table 4. This presents how much participants would be willing to pay in Australian Dollars (AUD) for the different characteristics of food service. For example, on average, participants would be willing to pay an additional \$24 (US\$18.42) per week for food that tasted excellent, or an additional \$8 (US\$6.14) per week to have a large amount of choice over serving sizes. Some attributes were associated with negative WTP estimates, indicating the participants would want to be compensated for these characteristics, including poor-tasting food, no choice over serving sizes, having no choice of meal, and having no set time for meals.

The participants were also asked to list their preferred times for breakfast, lunch, and dinner (Figure 1). Over half of respondents indicated their preferred time for breakfast was at 8:00 a.m, followed by 19% indicating their preferred time was 9:00 a.m, and a smaller number preferring 7:00 or 10:00 a.m. A significant number (26%) of participants indicated that they preferred breakfast at a time not prelisted listed on the questionnaire, with a range covering 6:30–



**TABLE 3** Conditional logit estimates of preferences for food and dining service for the full sample, and resident and family member subgroups

| Attribute <sup>a</sup>                       | Full        |                 | Resident    |                 | Family      |                 |
|--|-------------|-----------------|-------------|-----------------|-------------|-----------------|
|  | coefficient | SE <sup>b</sup> | coefficient | SE <sup>b</sup> | coefficient | SE <sup>b</sup> |
| How good is the taste of the food provided?  |             |                 |             |                 |             |                 |
| Not very                                     | -0.833      | (0.080)***      | -0.552      | (0.115)***      | -1.037      | (0.114)***      |
| Satisfactory                                 | 0.275       | (0.072)***      | 0.319       | (0.112)***      | 0.257       | (0.096)***      |
| Excellent                                    | 0.558       | (0.087)***      | 0.233       | (0.117)**       | 0.780       | (0.132)***      |
| How much choice do I have over serving size? |             |                 |             |                 |             |                 |
| No choice                                    | -0.237      | (0.092)**       | -0.263      | (0.167)         | -0.250      | (0.115)***      |
| A little                                     | 0.037       | (0.091)         | 0.042       | (0.180)         | 0.033       | (0.105)         |
| A lot of choice                              | 0.200       | (0.092)**       | 0.221       | (0.153)         | 0.217       | (0.125)*        |
| When do I choose what I would like to eat?   |             |                 |             |                 |             |                 |
| No choice                                    | -0.481      | (0.075)***      | -0.535      | (0.140)***      | -0.477      | (0.095)***      |
| The day before the meal                      | 0.280       | (0.077)***      | 0.299       | (0.148)**       | 0.298       | (0.101)***      |
| At the time of serving                       | 0.201       | (0.072)***      | 0.236       | (0.131)*        | 0.179       | (0.089)**       |
| When do I eat my meal?                       |             |                 |             |                 |             |                 |
| Anytime I like                               | -0.210      | (0.073)***      | -0.221      | (0.117)         | -0.233      | (0.097)**       |
| Within a 1–2 h range                         | -0.099      | (0.062)         | -0.268      | (0.109)**       | 0.013       | (0.082)         |
| At a set time                                | 0.309       | (0.084)***      | 0.489       | (0.124)***      | 0.220       | (0.112)*        |
| How visually appealing is the food?          |             |                 |             |                 |             |                 |
| Not very                                     | -0.210      | (0.079)***      | -0.180      | (0.143)         | -0.241      | (0.100)**       |
| Satisfactory                                 | 0.347       | (0.078)***      | 0.469       | (0.144)***      | 0.264       | (0.093)***      |
| Excellent                                    | -0.137      | (0.080)*        | -0.289      | (0.141)**       | -0.023      | (0.106)         |
| How much extra would I need to pay?          |             |                 |             |                 |             |                 |
| Cost   | -0.023      | (0.007)***      | -0.017      | (0.012)         | -0.029      | (0.009)***      |
| Observations                                 | 1390        |                 | 478         |                 | 912         |                 |

\*\*\* $p < .01$ , \*\* $p < .05$ , \* $p < .1$ .

<sup>a</sup> Cost attribute was included as a continuous variable; all other attributes were effect coded.

<sup>b</sup> Cluster robust standard errors (SE) in brackets.

8:45 a.m. The majority of respondents (70%) indicated midday as their preferred time for lunch, with 20% preferring 1:00 p.m., and only a small number preferring 2:00 p.m. Again, a significant proportion of respondents (25%) indicated they preferred an alternative time for lunch, with times listed ranging from 11:30 a.m. to 12:30 p.m. For dinner, there was a more even spread of respondents over the preferred times, with 5:00 p.m. preferred by 45%, and 6:00 p.m. preferred by 37%, and a small number preferring 7:00 p.m. Again, a large number of respondents (29%) preferred another specific time for dinner, with suggested times ranging from between 5:15 p.m. to 11:00 p.m.

## 4 | DISCUSSION

This is the first study to empirically compare preferences for characteristics of food and dining in residential care using DCE. Participant preferences were influenced by taste, choice in relation to serving size, timing of meal, visual appeal, and additional cost. In our study, preferred times for meals varied greatly for respondents, and in addition, a significant number of respondents specified mealtimes outside the options presented to them, indicating how specific they are regarding their preferred time for meals, as has also been shown in previous studies (Adams et al., 2013; Crogan, Evans, Severtsen, &

Shultz, 2004; Evans et al., 2003). However, in our current study, participants were reserved regarding flexibility in the timing of meals, with resident respondents in particular more positively viewing meals provided at a set time than at flexible times. A similar trend was reflected with timing of choice of meal content, with residents and family members preferring to choose their meal the day before the meal, as compared to having no choice or choosing at the time the meal is served. Interestingly, the use of flexible meal service techniques, such as family-style meal service (e.g., meals served in platters to a table with residents encouraged to serve themselves), have been shown to improve mealtime participation, body weight, and quality of life in residents, which the studies' authors hypothesized may result from the increased focus on independence and delay of choice of food until the time of consumption associated with family-style meals (Altus, Engelman, & Mathews, 2002; Nijs et al., 2006). Respecting resident individual preferences for food has also been identified previously as highly important to residents and a determinant of satisfaction with service (Adams et al., 2013; Bangerter, Heid, Abbott, & Van Hantsma, 2016; Crogan et al., 2004). Given these previous studies, it might be expected that residents would prefer scenarios with increased choice and flexibility in mealtimes. Therefore, it appears that the relationship between flexibility, autonomy, choice, and resident outcomes and satisfaction in aged care homes is more complex and is a worthy subject of future research. For residents and

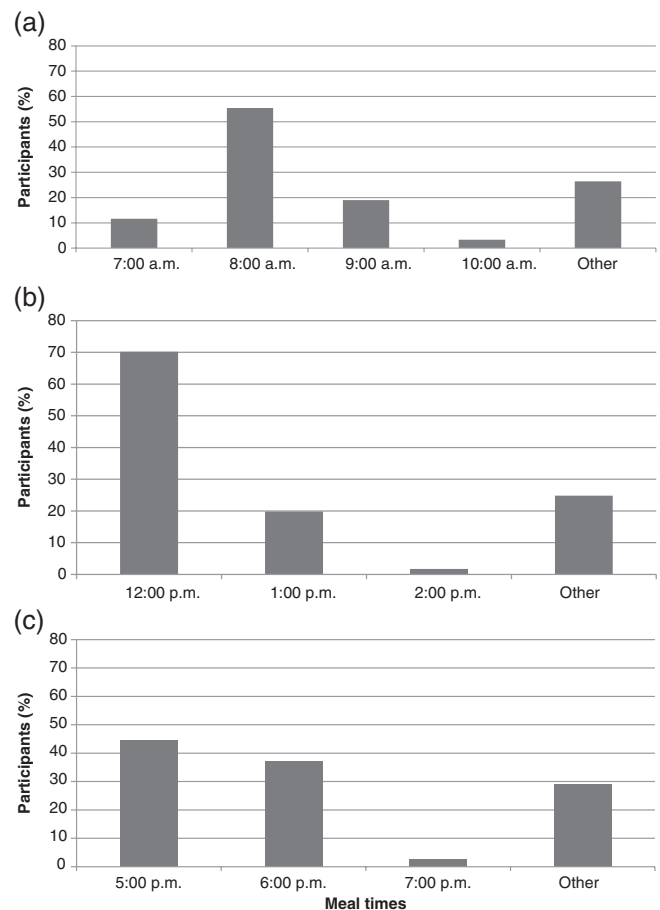
**TABLE 4** WTP estimates based on full sample

|  | WTP AUD (USD)    | 95% confidence interval |         |
|--|------------------|-------------------------|---------|
| How good is the taste of the food provided?  |                  |                         |         |
| Not very                                     | -40.463 (-31.00) | -84.665                 | -21.514 |
| Satisfactory                                 | 11.804 (9.04)    | 5.303                   | 28.282  |
| Excellent                                    | 23.976 (18.36)   | 13.979                  | 55.321  |
| How much choice do I have over serving size? |                  |                         |         |
| No choice                                    | -11.831 (-9.06)  | -29.386                 | -3.360  |
| A little                                     | 1.577 (1.21)     | -6.192                  | 13.627  |
| A lot of choice                              | 8.579 (6.57)     | 0.763                   | 23.427  |
| When do I choose what I would like to eat?   |                  |                         |         |
| No choice                                    | -23.244 (-17.80) | -48.683                 | -12.421 |
| The day before the meal                      | 12.015 (9.20)    | 5.622                   | 25.882  |
| At the time the meal is served               | 8.636 (6.62)     | 2.339                   | 24.411  |
| When do I eat my meal?                       |                  |                         |         |
| Anytime I like                               | -10.244 (-7.85)  | -24.452                 | -1.849  |
| Within a 1–2 h range                         | -4.266 (-3.26)   | -12.164                 | 1.046   |
| At a set time                                | 13.284 (10.18)   | 5.858                   | 30.800  |
| How visually appealing is the food?          |                  |                         |         |
| Not very                                     | -10.287 (-7.88)  | -24.356                 | -2.442  |
| Satisfactory                                 | 14.918 (11.43)   | 7.089                   | 37.017  |
| Excellent                                    | -5.865 (-4.49)   | -19.198                 | 0.839   |

AUD = Australian dollars; WTP = willingness to pay; USD = United States dollars.

<sup>a</sup> Confidence intervals estimated using bootstrap method (with 10 000 replications).

family members, it might not be having unlimited choice that is the preferred model; it could be they want their individual needs and preferences to be understood by the care provider, and for strategies to be put into place to meet those individual preferences on a daily basis by the care provider. For example, this was expressed in the qualitative work undertaken as part of this overall project as the desire for the care provider and care staff to take the time to know and respect the individual and their preferences and needs (Milte et al., 2017). Therefore, the emphasis for older people could be on the care provider and staff taking the time to understand and putting the resources into fulfilling their individual preferences, rather than simply providing more options for residents, but leaving the fulfilment of choice through utilizing those options up to the residents and their family members. Supporting this concept, studies of preferences and satisfaction for older adults to participate in consumer-directed care programs (which give responsibility for planning, decision-making, and administering aged care services to the individual receiving the care or their caregiver) highlighted that while participants in these programs were generally satisfied, older adults have different preferences for how these types of services are delivered, particularly older people might find the administration and responsibilities associated with having increased control over their care a burden (Ottmann, Allen, & Feldman, 2013). Therefore, the extent to which to exercise choice over care provided is in itself a choice, and older adults and their informal carers may want to be highly involved in decisions about their care, or they may want care to be planned and provided for them by the provider – but in accordance with their preferences.

**FIGURE 1** Respondent preferred times for (a) breakfast, (b) lunch, and (c) dinner

The extent to which these concepts also apply to food services and care more broadly in residential care needs further research.

Further work is needed to elucidate the reasoning behind the strong preference shown for meals at set times and for choice of content of meal prior to the time of meal, and the wide variation in preferred mealtimes indicated by participants. One potential scenario in which meals could be provided in this way would be providing residents meals at regular times each day, but at a time predetermined and agreed to between themselves and the facility. In addition, having flexible mealtimes for residents could be a source of disutility through requiring additional effort on their behalf to organize meals for themselves, rather than having them arrive at a set time. A previous qualitative study indicated that set mealtimes serve as a proxy clock for residents, providing a structure around which other activities and norms of the institution occur, thus accounting for the value of set mealtimes in our current study (Palacios-Ceña et al., 2013b). For family members, the low value of flexible mealtimes likely represents a concern that residents might not eat if left to choose the mealtimes themselves. Another potential explanation is that residents and family members tended to choose the situation that most reflected what they were used to, rather than risking the potential unknowns of a different system of food provision. This phenomenon, sometimes called “status quo bias”, has been identified as occurring in a number of preference studies previously (Salkeld, Ryan, & Short, 2000). The current study was undertaken in three facilities with

traditional models of food service (as is currently still the norm in many facilities). In future studies, it would be useful to include participants with prior experience with food services incorporating flexible meal times, or meal choice at time of service, to determine whether experience with these systems changes preferences. In addition, in this study, we were able to include participants from three facilities to increase the generalizability of the findings; however, future studies, including larger numbers of participants from a greater number of facilities, and more diverse geographic regions, would give more confidence to the applicability of these findings to the sector more generally. Further qualitative studies with diverse participants experiencing traditional or more innovative food service systems could provide useful insights for the development of food service systems that meet the needs of aged care residents and their family members.

In addition, the inclusion of the cost attribute within the DCE facilitated the calculation of a WTP as a means of indicating the relative value to consumers of attribute levels. Respondents indicated they would pay up to an additional \$24 per week to receive a better-quality food and dining experience. Adding this amount to the weekly catering budget would be equivalent to a 15% increase; based on an average spend on catering (including staff wages and on costs, food costs, consumables, and equipment purchases) reported by facilities in Australia of \$130 per week (Ansell, Davey, & Vu, 2012). This additional investment could be used to purchase better-quality or additional ingredients to improve the taste of the food, or to fund additional staff members in the kitchen to spend more time preparing food, or ongoing training for staff to upskill or to refresh their skills in food preparation and provision to maximize the quality of the food and dining experience for residents. In addition, this type of information could be useful to policy-makers and long-term care providers as a mechanism for assessing the quality of the dining experience for residents. This might be particularly relevant for the introduction of consumer-directed models of care across the aged care sector, the central aim of which is to empower residents with more choice and control over the services that they receive.

#### 4.1 | Conclusion

The present study is the first study internationally to apply discrete choice experiment methodology to assess the preferences of aged care home residents for characteristics of food and dining that are most valued by consumers. The findings indicate that the taste of food, degree of flexibility, and timing of choice around meals, visual appeal, and any additional cost all play an important role in preferences for food and dining in aged care homes. In particular, this study highlights that strategies to maintain and improve the taste of the food provided are critical to consumer satisfaction in the area, and that these should be prioritized. For example, maintaining food preparation and cooking within facilities (so that residents can smell food as it is being prepared, and to minimize loss in flavor compounds during transport and reheating), access to professional development and improved education for food service professionals, and investment toward better quality ingredients. In addition, the study has implications for policy-makers. It is notable that current assessment of the quality of aged care homes in Australia, and more broadly

internationally, and standards for food and dining, often focus on clinical or medical issues (e.g., providing nutritionally-adequate food or dining) (Australian Aged Care Quality Agency, 2014; Castle & Ferguson, 2010). Given the importance of the taste of food, and the likely impact of poor tasting food on the nutritional status, health, and quality of life of residents, it can be argued that the taste of food should be considered as an additional assessment criterion for evaluating the quality of aged care home services from a consumer perspective. The DCE approach has potential applicability in facilitating widespread quality assessment of the dining experience of aged care home residents from their own perspective. Furthermore, in this study, we found that respondents were willing to pay a premium to receive food that met their expectations of taste, and for a high level of control over serving sizes, which has implications for the funding and provision of food and dining in long-term care in the future.

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#### AUTHOR CONTRIBUTIONS

Study design: M.C., R.M., M.M., J.R.

Data collection: M.C, R.M.

Data analysis: G.C., R.M.

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## SUPPORTING INFORMATION

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