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FOODSERVICE SATISFACTION DOMAINS IN GERIATRICS, REHABILITATION AND AGED CARE

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Abstract: *Objective:* To develop a foodservice satisfaction instrument for residential aged care and geriatric/rehabilitation units. The quality of care and food provided for clients in long-term care facilities is critical for the prevention of malnutrition. *Design:* Cross-sectional survey and in-depth interviews. *Setting:* Nine residential aged care facilities and two geriatric/rehabilitation units in Southeast Queensland, Australia. *Participants:* A total of 103 geriatric/rehabilitation patients and 210 aged care residents. The median age was 84 years, with 72.1 % females. *Measurements:* Candidate satisfaction items were obtained from: (i) secondary analysis of acute care foodservice satisfaction data; (ii) focus groups with expert geriatrics/rehabilitation and aged care dietitians; (iii) pre-testing of instrument content, presentation format and response-scale (n=40) and (iv) pilot testing of the instrument (n=313). Sixty-one items on foodservice attributes, an overall satisfaction question, and demographic/contextual information were tested. *Results:* Principal components factor analysis and Velicer's MAP test revealed foodservice satisfaction was represented by 18 items within four factors: meal quality and enjoyment (α=0.91), autonomy (α=0.64), staff consideration (α=0.79), hunger and food quantity (α=0.67) and six independent items, totalling 24 foodservice characteristics. This represented around 40% of the variance in foodservice satisfaction. When a further 13 foodservice items were retained due to practical importance, the analysis explained around 64% of the variance in foodservice satisfaction. *Conclusion:* The Resident Foodservice Satisfaction Questionnaire is a novel measure of resident foodservice satisfaction and can be used to provide evidence for changes to food services that may improve or enhance resident satisfaction and assist in the prevention of a significant and modifiable cause of malnutrition.

Key words: Foodservice, satisfaction, older adults, quality of care, long-term care.

Introduction

Malnutrition in long-term care (geriatric/rehabilitation units and residential aged care) is a significant issue internationally, with a prevalence of 30% - 65% (1-3). Malnutrition discussed here refers to protein-energy-under-nutrition, rather than over-nutrition and is defined as "a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein, and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition) and function and clinical outcome" (4). Its clinical pertinence is extensive, as it may exacerbate mortality and morbidity, and increase health care costs due to longer recovery times and extended hospital stays (5). Food intake per se is the most important risk factor for malnutrition (6). Quality of life is substantially influenced by the quality of food services in long-term care (7), as the purpose of foodservice extends beyond the provision of essential nutrients and is a mechanism for choice, control, socialization, connectedness and comfort.

Understanding client foodservice preferences and presenting food that clients enjoy has the potential to enhance quality of life, satisfy client expectations and reduce the risk of malnutrition through improving food consumption. Despite this, the majority of published research on service quality in long-term care facilities has measured resident opinions of foodservices briefly, relying on three to five questions (8-16). Four international studies have investigated this in more detail (17-20); however, each developed a different instrument, samples were generally small (n=50-205) and methods of instrument design, choice of rating scale and response options were not reported.

The aims of this study were to develop a foodservice satisfaction instrument that represents residents' opinions and incorporates items that are useful for foodservice managers. The purpose of this paper is to demonstrate the step-by-step methodology for the development of the instrument and to describe its psychometric properties. A theoretical model of foodservice satisfaction in long-term care is presented, as well as novel analysis methods for satisfaction data.

Methods

Instrument Design

The first section of the instrument recorded resident age, gender, ethnicity (country of birth and first language), length of stay, timing of meal choice, appetite, self-rated health (21), diet type and the timing of instrument completion. Selection of candidate foodservice satisfaction items commenced with secondary analysis of age-stratified data collected during 1996 – 2001 using the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFPSQ) (n=2347), formerly the Wesley Hospital Foodservice Patient Satisfaction Questionnaire (WHFPSQ) (23, 24). Due to their relevance to residents aged >70 years, items about vegetable texture, meal taste and variety

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were expanded (25). Further candidate items were derived from themes in the international literature, including food quantity, snacks and refreshments between meals, opportunities to make menu suggestions, meal choice and the timing of meal service (26, 27). Space for general comments was available. Consultation with dietitians and managers with geriatrics, rehabilitation and aged care experience (n=20) assisted in refining items and format.

Pre-testing of content, format and response-scales was conducted with residents from an aged care facility and geriatric rehabilitation units (n=40). Different versions were trialed due to the lack of published studies outlining optimal response scales and formats for older adults: (i) the ACHFPSQ "always" to "never" scale (23) (ii) a percentage agreement scale (0%, 25%, 50%, 75%, 100%); (iii) five Chernoff faces, from frown to smile (28) and (iv) a visual analogue scale from "extremely like" to "extremely dislike".

Data Collection

A convenience sample of residents in geriatric rehabilitation units at two publicly funded general hospitals, and residents across nine aged care facilities in Southeast Queensland, Australia, were recruited during 2003 and 2004 for instrument pilot testing. Australian aged care facilities were formerly called nursing homes and hostels, with"high care" or "low care" residents respectively. Currently, each facility has a mixture of low care and high care residents. This study focused on "low care" residents.

Ethical approval was granted by the University of Queensland Behavioral and Social Sciences Ethical Review Committee, two large hospital research ethics committees and one large aged care facility. Participants needed to be able to communicate their views and must have been living in the facility for at least one week. Age limits on inclusion criteria were not imposed, as a representative distribution of the long-term care population was sought. The five-page instrument took 15-45 minutes to complete, either independently or with assistance, following a standard protocol. Residents and patients were assured of confidentiality. To reduce the interviewer bias, an administration protocol was used to conduct the survey as a structured interview with respondents who were physically or visually impaired.

Statistical Methodology

Statistical analyses were performed using the Statistical Package for the Social Sciences Version 11.5.1 (2003, SPSS Inc., Chicago, IL, USA). Exploratory factor analysis with varimax rotation was used to group highly correlated items that formed "constructs" or "factors" (29). Eigenvalues represent the variability in satisfaction associated with each "factor" (30). Velicer's minimum average partial correlation (MAP) test separated strong from weak factors, and was a more statistically reliable approach than the "eigenvalue greater than one" convention (31). Cronbach's alpha coefficients approaching 0.70 and above were considered reliable (32).

Results

Pretesting

Pretesting (n=40) indicated the ACHFPSQ format was preferred. The rating scale remained as "always" to "never", although, the format was changed from ticking boxes to circling/marking the relevant word ("always", "often", "sometimes", "rarely" or "never") adjacent to each item. This is considered optimal in empirical research design to reduce respondent burden and improve response accuracy (33). The "does not apply" option was added to reduce "neutral" responses and to indicate when survey items were irrelevant. Items about resident preferences; the social environment; noise levels in the dining room; the identification of chewing and swallowing problems; whether meals suited residents' food texture requirements; the provision of assistance at meals and the consideration of cultural and religious dietary needs were contributed by the dietitians' focus group.

The instrument for pilot testing contained 61 items on foodservice attributes. This included nine items from the ACHFPSQ (previously WHFPSQ); eight from the Dietitian's focus group and 44 from themes identified in the published literature. These were rated from five, "always" to one, "never". An overall satisfaction question was rated from five, "very good" to one, "very poor", and demographic, contextual and general comments sections were included. Consistent with good questionnaire design, 14 of the 61 items were worded negatively to minimize acquiescence bias from residents choosing random, positive or neutral answers.. This is prevalent in older populations, sicker residents or those from lower income groups, and results from a dependence on others for care, a desire to show gratitude, or fear of retribution (34).

Pilot Testing

Responses totaled 313 (geriatric/rehabilitation hospital unit n = 103; aged care facility n = 210). Demographic and contextual data are presented in Table one. The median age was 84 years (48-102 years). The percentage of males recruited from the older age groups was lower than for the younger age groups, depicting known trends in ageing (35).

The long-term care foodservice satisfaction literature does not provide information on response rates; however, the 71 % response in the geriatric rehabilitation setting and the 78 % response in the aged care setting was higher than the average 44 % response from a health care sector in a similar geographical location in 2001 (36). Responses to all instrument items were obtained from 79 % (248/313) of the sample. Data were missing in a random pattern and not for particular items. Chi-square analyses indicated respondents and non-respondents did not differ significantly by age (categorical) ($p=0.76$), gender ($p=0.30$), appetite ($p=0.37$), or self-rated health ($p<0.06$). Respondents on "normal" diets accounted for 72.5 % of the sample, with 27.5 % on modified diets. Of these, around 14% were on fat, carbohydrate, salt, fluid or other restrictions, while 4.5% were on high protein, high energy diets. Approximately

63 % (198) received assistance to complete the survey, due to visual or physical impairment. There was no statistically significant difference in results for those who were assisted compared to those who were not.

Table 1
Demographic and contextual characteristics of a sample of geriatric/rehabilitation patients and residential aged care clients 2003-2004 (n=313)

	N	Proportion (per cent)	Median	Min; Max
AGE	304	97.1	84	48;102
<65 years	22	7.0	NA	NA
65-74 years	29	9.3	NA	NA
75-84 years	105	33.5	NA	NA
85-94 years	129	41.2	NA	NA
95 years or more	19	6.1	NA	NA
Missing	9	2.9	NA	NA
GENDER				
Male	83	26.6	NA	NA
Female	225	72.1	NA	NA
Missing	4	1.3	NA	NA
LENGTH OF STAY				
(months)	296	94.9	12	0.25; 288
Missing	16	5.1	NA	NA
SELF-RATED HEALTH				
Excellent	16	5.1	NA	NA
Very good	61	19.6	NA	NA
Good	117	37.5	NA	NA
Fair	98	31.4	NA	NA
Poor	12	3.8	NA	NA
Missing	8	2.6	NA	NA
DIET TYPE				
Normal	227	72.5	NA	NA
Fat or carbohydrate modified	18	5.8	NA	NA
Texture modified soft	9	2.9	NA	NA
Fibre modified	4	1.3	NA	NA
High protein, high energy	14	4.5	NA	NA
Pureed	6	1.9	NA	NA
Reduced/low salt or fluid restriction	5	1.6	NA	NA
Other restriction	21	6.7	NA	NA
Not sure	2	0.7	NA	NA
Missing	7	2.2	NA	NA
APPETITE				
Worse than normal	51	16.3	NA	NA
Normal	223	71.2	NA	NA
Better than normal	31	9.9	NA	NA
Missing	8	2.6	NA	NA

Principal components factor analysis was completed (n=248). Velicer's MAP test recommended the retention of the four strongest factors. These comprised 24 items, listed in Table two. All factors had Cronbach's alpha coefficients higher than or approaching the reliable level of 0.7.

Items comprising each factor influenced their naming and are shown in the correlation matrix in Table three. Numbers in bold show items highly correlated within each factor.

Factor one, "meal quality and enjoyment", encompassed more aspects than "food quality" alone and had the highest internal consistency. Factor two, "autonomy", related to the consultation of resident preferences, food choices and dining location. A cultural menu preference item was tested as part of the initial 61 items, but was not statistically significant. This may be because the sample comprised a small proportion of participants from culturally-diverse backgrounds (5 %). The item, "I am able to make suggestions for the menu", encompassed this aspect of resident satisfaction. Factor three, "staff consideration", represented items fundamental to the care of residents by staff. Factor four, "hunger and food quantity", has implications for the prevention and/or treatment of malnutrition.

Table 2
Statements comprising factors in the Resident Foodservice Satisfaction Questionnaire and Cronbach's alpha reliability statistics (α) (n=248)

Factor 1: MEAL QUALITY AND ENJOYMENT (α = 0.91)
• The meals taste nice
• The meals have excellent and distinct flavours
• I like the way the vegetables are cooked
• There is enough variety for me to choose meals that I want to eat
• The meat is tough and dry
• The food has been as good as I expected
• I really enjoy eating my meals
• My meals help me to feel good
• I like the amount of food choice I have
• I like the way my meals are presented
Factor 2: AUTONOMY (α = 0.64)
• I am able to make suggestions for the menu
• I am asked about my food and drink preferences
• I am able to choose where I sit to eat my meal
Factor 3: STAFF CONSIDERATION (α = 0.79)
• I am treated with respect by the staff at mealtimes
• The staff who serve my meals are friendly and polite
Factor 4: HUNGER AND FOOD QUANTITY (α = 0.67)
• I receive enough food
• I still feel hungry after my meal
• I feel hungry in between meals
Statements analysed separately
• The dining room has a nice social atmosphere at meal times
• The hot foods are just the right temperature
• The vegetables are too soft
• The vegetables are too crisp
• I can suggest the timing of my meals
• I am able to choose the size of my meal

Table three shows that four of the items significantly associated with "meal quality and enjoyment" and two of the items significantly associated with "autonomy" did not independently load onto any one factor. These items are to be analyzed separately rather than as part of any factor. Further research with larger sample sizes should clarify the appropriate factors for these items. Items that did not load onto any of the factors were omitted.

Table 3
Correlations between items and factors of foodservice satisfaction in a sample of geriatric/rehabilitation and residential aged care clients 2003-2004 (n=248)

Items	Factors			
	Meal Quality and Enjoyment	Autonomy	Staff consideration	Hunger and Food Quantity
The meals taste nice	**0.87**	0.02	0.07	0.03
I really enjoy eating my meals	**0.81**	0.04	0.09	0.04
The meals have excellent and distinct flavors	**0.80**	0.10	0.01	0.07
The food has been as good as I expected	**0.76**	0.04	0.08	0.11
The meals help me to feel good	**0.73**	0.15	0.07	0.01
I like the way the vegetables are cooked	**0.72**	0.02	0.01	0.05
There is enough variety for me to choose meals that I want to eat	**0.72**	0.03	0.10	.13
I like the amount of food choice I have	**0.66**	0.10	0.20	0.12
I like the way my meals are presented	**0.59**	0.09	0.17	0.12
The meat is tough and dry	**0.57**	0.11	0.03	0.07
The vegetables are too crisp	**0.48***	0.01	0.11	0.04
The hot foods are just the right temperature	**0.46**†	0.04	0.01	0.25
The dining room has a nice social atmosphere at meal times	**0.46**	0.10	**0.39**	0.05
The vegetables are too soft	**0.33**‡	0.30	0.02	0.09
I am able to make suggestions for the menu	0.10	**0.73**	0.11	0.03
I am asked about my food and drink preferences	0.14	**0.69**	0.07	0.08
I am able to choose where I sit to eat my meal	0.02	**0.67**	0.11	0.08
I can suggest the timing of my meals	0.09	**0.52**§	0.08	0.10
I am able to choose the size of my meal	<0.01	**0.41**§	0.01	0.19
I am treated with respect by the staff at mealtimes	0.18	0.06	**0.84**	0.13
The staff who serve my meals are friendly and polite	0.20	0.03	**0.82**	0.06
I feel hungry before my meal	0.05	0.07	0.02	**0.78**
I still feel hungry after my meal	0.23	0.16	0.04	**0.76**
I receive enough food	0.21	0.14	0.23	**0.66**
Eigenvalues	8.22	2.81	2.22	2.05
Variance explained (%)	21.1	7.20	5.70	2.00

Notes: * highly correlated with factor 5, therefore for separate analysis; † highly correlated with factor 9, therefore for separate analysis; ‡ highly correlated with factors 5 and 11, therefore for separate analysis; § highly correlated with factors 8 and 12, therefore for separate analysis

The four factor solution (24 items) explained 40 % of the variance in overall foodservice satisfaction. This is shown by the shaded rows in Table three. As described above, six of the 24 items are to be analyzed separately. The total variance explained increased to 64 % when the "eigenvalue greater than one rule" was used, as eight further factors comprising 13 items were retained (see Table four). Although this is considered less statistically robust (31), the amount of variance in overall satisfaction explained is similar to in the acute care foodservice sector (25, 38), so the additional factors provide valuable insight into items contributing to long-term care foodservice satisfaction. The choice of whether to use the short (4 factors; 24 items) or extended version (12 factors; 37 items) of the instrument relies on professional judgment of the type and detail of information required.

Sample Size

'Loadings' are the correlation of variables with the factors (29). The statistical significance of factor loadings was assessed using the following formula:

$$CV = \frac{5.152}{\sqrt{N-2}},$$

Where CV = coefficient of variation; N = sample size

This is an appropriate method when the sample size exceeds 100 (39). Factor loadings of >0.32 were considered statistically significant and are printed in bold in Table three. Since there were a large number of high correlations (>0.80) between variables in this analysis, the modest sample size of 248 was acceptable (29).

Table 4
Total variance in foodservice satisfaction explained by factors generated in a sample of geriatric/rehabilitation patients and residential aged care clients 2003-2004 (n=248)

Factor	Number of items	Factor interpretation	EIGENVALUES*	Percentage variance	Cumulative percentage explained
1	14*	Meal quality & enjoyment	8.219	21.075	21.075
2	5†	Autonomy	2.813	7.212	28.287
3	2	Staff consideration	2.216	5.681	33.969
4	3	Hunger & food quantity	2.047	5.248	39.216
5	2	Chewing & swallowing ability	1.446	3.707	42.923
6	2	Physical environment	1.441	3.696	46.619
7	2	Presentation of the staff	1.341	3.438	50.057
8	2	Adequacy of dining aids and knives	1.210	3.103	53.160
9	2	Timing of meal service and choice	1.159	2.971	56.131
10	1	Access to snack preparation facilities	1.093	2.804	58.935
11	1	Meal time suitability	1.044	2.676	61.611
12	1	Availability of the option to season meals	1.018	2.610	64.221

Notes: All factors with eigenvalues greater than 1 are presented here; *4 items for separate analysis are included in this factor; †2 items for separate analysis are included in this factor

Discussion

Moderators of food intake and quality of life in long-term care settings include the provision of adequate staff assistance at meal times; social-psychological aspects of the dining experience; the option to choose meals and express personal preferences; appetite; sensory ability and dissatisfaction with the institutional diet and food (40, 41). It is well documented in studies of acute care hospital clients that taste, flavor, temperature, variety and presentation are the main determinants

of food quality, and that food quality is the most salient influence of overall foodservice satisfaction (38, 42-44). These findings were confirmed for the long-term care sector in this study, as the "meal quality and enjoyment" factor of the Resident Foodservice Satisfaction Questionnaire accounted for over one third of the total variance in resident foodservice satisfaction. In addition, this factor contained an item about meal enjoyment, which relates to the importance of quality of life in this setting.

Resident satisfaction ratings allow service providers to demonstrate and monitor the provision of appropriate quality services for their clients. The Resident Foodservice Satisfaction Questionnaire can be used as a comprehensive assessment tool or as a foodservice satisfaction "screener", depending on the detail needed and time available. It is appropriate to use the shorter version: four factors (24 items) with 40 % statistical variance explained (Table two and three) or the extended version: 12 factors (37 items) with 64 % statistical variance explained (Table four). The factors may be administered at separate times due to their moderate to high internal reliability. This is practical in long-term care where residents may experience respondent fatigue and is time efficient if residents require assistance.

The items within each factor of the Resident Foodservice Satisfaction Questionnaire are combined using a formula to derive a score between one and five (the scoring template is available on request). Overall satisfaction scores are also computed. When the survey is administered at regular intervals (e.g. twice yearly), food and nutrition service managers can monitor scores over time to detect changes in resident satisfaction with food quality, food quantity, autonomy and the eating environment provided by the current service, or in relation to service changes, for example, the introduction of a different menu or style of service delivery (i.e. plated to bulk, hostess style). Previous studies have shown that a difference of 0.5 between satisfaction scores is statistically significant (25).

Given the importance of food quality to overall foodservice satisfaction and food intake, menus should focus on maximizing flavor and minimizing nutrient restrictions and texture modifications that almost always limit the provision and enjoyment of flavorsome foods, for example, crumbed fish and/or chips; bacon and eggs; egg and/or cheese-based dishes; gravy; sauces; creamy desserts. Although intended to prevent aspiration and asphyxiation in residents with dysphagia or impaired swallowing, texture modified diets have reduced sensory qualities, reduced palatability, and lower nutritional quality than regular diets and are associated with reduced food intake, malnutrition and dehydration (45, 46). These effects are heightened when the food/meal is unidentifiable. This is a serious issue for a group where 30-65% is already malnourished therefore these diets should only be used when absolutely critical. A very small proportion of the study sample required pureed (1.9%) or texture modified soft (2.9%) diets. Professional judgment considering residents' age, level of dependency, life expectancy, food preferences and the impact of meals on quality of life is essential to determine appropriate nutritional care. Residents in low care (hostel or independent living) accommodation who have good physical functioning and 10-20 years life expectancy may benefit from certain therapeutic diets; however, frail residents in high care (nursing homes) should not have dietary restrictions imposed as they reduce quality of life and food intake through reduced meal palatability (48). When the Resident Foodservice Satisfaction Survey factors are interpreted alongside food intake data and results of a nutritional assessment, dietitians can use professional judgment to justify their recommendations to cease restrictive diets in long-term care, if they are negatively affecting food consumption and the enjoyment of meals.

Limitations

Measurement of foodservice satisfaction is a subjective process. The instrument quantified 64 % of the variance in foodservice satisfaction in long-term care, suggesting that other variables (e.g. social interaction, mood, and pain) may influence resident satisfaction in this setting. Criterion validity could not be assessed due to the absence of a "gold standard" measure of foodservice satisfaction. Although the new instrument and methods of analysis may be relevant to the wider population, the results of their application are likely to be context-specific, particularly as the sample was a convenience sample.

Conclusions

The study developed a foodservice satisfaction survey that encompasses the multidimensional nature of foodservice satisfaction. Published research shows that food quality is the most salient predictor of overall meal satisfaction. More specifically, this study showed that meal taste, the distinction of flavors and the enjoyment of meals are very important. The detailed exploration of foodservice satisfaction issues within this study is novel and substantially augments the current approaches in long-term care settings. The instrument incorporates components unique to the geriatric, rehabilitation and aged care settings, namely autonomy, choice and hunger, which are essential for monitoring residents' risk of malnutrition. Furthermore, scores for each of the factors and overall satisfaction can be monitored over time to detect changes, particularly in response to service or menu changes, for example. This provides evidence for the need for quality improvement programs and specific recommendations for managers on how to evaluate and improve the foodservice.

Older adults, in general, are becoming more focused towards maximizing their independence, quality of life and personal autonomy (49). A short measure of residents' perceived foodservice autonomy is a valuable first step towards obtaining information for service planning to meet and/or exceed resident expectations. The instrument can be used to monitor the effect of foodservice satisfaction on food intake, to assist in the prevention and/or alleviation of this modifiable antecedent of malnutrition. Several avenues for further research investigating hypotheses documented in the current foodservice and

nutritional literature are now possible due to this new foodservice satisfaction instrument.

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