

Identifying Relative Importance of Quality Attributes of Dining Service for Older Adults Using Conjoint Analysis

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ABSTRACT

Identifying quality attributes with the greatest value to the residents is important if the Continuing Care Retirement Community (CCRC) is to increase the frequency of residents' dining. However, it is not known which specific attribute is relatively more important than others to evaluate foodservice. The purpose of this study is to identify the relative importance of food and service quality attributes in the evaluation of foodservice in CCRC. This study surveyed the independent living residents of three CCRCs in the Midwestern states. Respondents placed great importance on taste and flavor of food which has the highest percentage of utility range (28.28%) and the second greatest on appearance of the server (23.46%). The important attributes were ultimately used to predict the most preferred choice of foodservice for residents. Knowledge of the importance of the attributes would enable the foodservice managers in CCRCs to manipulate those attributes to enhance the residents' perceptions of quality and identify strategies for continuous improvement. (*J Community Nutrition* 7(1) : 58~63, 2005)

KEY WORDS : service quality attributes · food quality attributes · conjoint analysis · older adults.

Introduction

A Continuing Care Retirement Community (CCRC) is one housing option for retired older adults that combined residential care and health care services. CCRCs provide housing, health care, and activities that emphasize social involvement and community life. Older adults move in when they are healthy and able to live independently and change residence into another level of care (assisted living or nursing home care) as their health status dictates (American Association of Homes and Services for the Aging 1999). The older adults chose CCRCs because of the following reasons : guaranteed health care, convenient living accommodations, freedom from home maintenance, support services, geography (climate and proximity to family), and security of spouse (Sheehan, Karasik 1995 ; Gupta, Galanos 1996).

Today's older adults seek retirement communities where

they can enjoy an active life. They have different life styles than the CCRC residents 30 years ago and expect higher quality of service. They consider the outcome (was the meal tasty?) and the process (how's the attitude of wait staff of service delivery?) as important factors influencing their satisfaction (Richard et al. 1994).

Most previous studies in the general marketing areas have focused on the service quality defined as the difference between expectation and performance. Many quality attributes or dimensions of quality may positively influence customer satisfaction. Not all service quality attributes have the same effect on customers' perceptions of service quality. Some attributes may not be critical in creating customer satisfaction (Swan, Combs 1976). Myers, Alpert (1971) postulated that only a limited set of attributes, the "determinant attributes", play a critical role in determining choice between alternatives. Determinant attributes are those that are important to customers and are variables across alternatives. Swan, Combs (1976) stated that some customers might judge products on a limited set of attributes which were relatively important in determining satisfaction. The authors concluded that the "determinant attributes" related to dissatisfaction may not be "determinant attributes" leading to satisfaction

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(Swan, Combs 1976).

Conjoint analysis is a decompositional method that estimates the structure of a consumer's preferences given his or her overall evaluations of a set of alternatives that are pre-specified in terms of a set of different attributes. It is designed to estimate the trade-offs people make when choosing among a number of alternative products or services (Green, Srinivasan 1990). Conjoint analysis is increasingly being applied with physical products as stimuli (e.g., food products/beverages) (Green, Srinivasan 1990). Two basic assumptions are made in conjoint analysis. First, a product/service can be described as a combination of levels of a set of attributes. Second, these attribute levels determine consumers' overall judgments of the product/service. Conjoint analysis is a very powerful tool for obtaining information about the effect of different product attributes on liking and/or purchase intent of food products (Green, Srinivasan 1978 ; Louviere 1988). The result of conjoint analysis indicates the relative importance of each attribute in terms of its contribution to the overall evaluation of the product.

Koo et al. (1999) illustrated the usefulness of conjoint analysis in determining the utility values of restaurant attributes. The nine attributes used for conjoint analysis were the location, type of food, variety of food, uniqueness, car park, price, quality/taste of food, decoration, and service. The levels of quality/taste of food used were high quality/average quality/low quality in terms ; the levels of service were good service, average service, and poor service. The taste of food was most important to customers of a Hong Kong restaurant followed by service and uniqueness.

Sweeney et al. (1992) investigated the important cues (attributes) on both the expected level of service and the choice of service using conjoint analysis. They selected price of meal, past experience with similar types of restaurants, reputation of restaurant, advertisement, appearance of other customers, appearance of employees, manner of employees, and premises as the cues. The most important cues in selecting a restaurant were the manners of employees and the word-of-mouth.

A number of conceptual and empirical studies have attempted to address the key attributes of food and service quality that are related to customers' satisfaction.

However, it is not known which specific attribute is relatively more important than others to evaluate foodservice. The quality attributes with the greatest value to the customer

must be identified. Their preference patterns to achieve customer satisfaction in an economic way need to be determined. The quality attributes or dimensions of greatest importance to the residents need to be emphasized. The foodservice then should be designed based on the quality dimension most important to the residents if the CCRC is to increase the frequency residents' dining. The purpose of this study is to identify the relative importance of food and service quality attributes in the evaluation of foodservice in CCRC.

Subjects and Methods

1. Subjects

Subjects were the residents of independent living units of CCRCs located in the Midwest of the States. The Consumers' Directory of Continuing Care Retirement Communities : 1999 - 2000 (1999) published by American Association of Homes and Services for the Aging (AAHSA) was used for the sampling frame. The CCRCs with less than 50 residents in their independent living units were excluded because limited foodservice is often offered in these facilities. Three CCRCs in three different cities were randomly selected. Randomization was done by numbering all facilities and selecting numbers by means of a random number table.

2. Instrument developments

The contents of the survey (dining room profiles) were developed based on the results of the focus group (Seo, Shanklin 2003) to determine the relative importance of each attribute related to food and service quality. A total of 45 residents volunteered to participate in eight focus groups. Residents were asked to identify the most important attributes of both food and service quality that influenced their perception of dining experience. The attributes identified by most of the focus group participants were included in the dining room profiles. All attributes included in the profiles are those that can be manipulated by foodservice directors.

The following attributes were selected as most important from the focus groups : attentiveness of server, clean appearance of server, taste/flavor of food, temperature of food, and tenderness of meat. A different combination of attribute levels was included on each profile. The number of attributes was reduced to five due to a possible limitation of cognitive ability of adults over age 65. Additional attributes would substantially increase the number of profiles needed for com-

Table 1. Attributes and level of attributes used

Attributes	Level of Attributes
Taste and flavor of food	Food is tasty and flavorful Food is not tasty and flavorful
Temperature of food	Hot food is hot, cold food is cold Hot food is warm, cold food is not cold
Tenderness of meat	Meat is tender Meat is not tender
Attentiveness of server	Server is attentive Server is not attentive
Appearance of server	Server has clean appearance Service has dirty appearance

parison and would therefore cause data collection difficulties (Green, Srinivasan 1990). Table 1 presents attributes and levels of attributes used in this study. The five attributes selected have two levels. Each attribute was presented at either of two extremes within a given dining room profile. The possible combination of all attribute levels is $2^5 = 32$. However, this study used 8 combinations using a fractional factorial design (Addelman 1962). Fractional factorial designs are usually utilized in order to reduce the number of evaluations collected while still maintaining orthogonality among the levels and subsequent part-worth estimated. However, the use of fractional factorial designs limits or excludes measurements of interaction effects (Gustafsson et al. 1999). The Statistical Analysis System (SAS) 8.2 (Cary, NC) conjoint procedure can specify an orthogonal array of 8 profiles (combinations of quality attributes) that present a complete concept. The researchers carefully selected the sequence of attributes and their wording to reflect actual dining experiences. All respondents were presented eight dining room profiles. They were asked to rank each dining room profile in terms of their preference. An 8-point scale was used to rank the meal service. The best meal service was ranked as "1" and the worst meal service as "8".

3. Pilot test and survey administration

The instruments were pilot-tested with 10 residents at one CCRC located in a Midwestern state. The survey was administered to residents in three CCRCs between December 2003 and March 2004. A total of 184 independent living residents in CCRC A were telephoned to introduce the study and were then asked to participate. The researchers were unable to contact 49 residents. Fifty-three residents decided not to participate due to medical conditions, hearing problems, or lack of interest, and nine residents failed to participate due

to schedule conflicts. Appointments were scheduled with the 73 residents who agreed to participate and complete the in-home survey. Because of administrator concerns for residents' privacy, surveys were administered in small group meetings at CCRCs B and C. The directors of these two CCRCs helped to recruit participants. A total of 67 residents from CCRC B and C completed the survey during small group meetings. However, 17 residents failed to complete the survey due to difficulty in ranking of dining room profiles. Thus, a total of 123 respondents (61 residents from CCRC A, 32 residents from CCRC B, and 30 residents from CCRC C) completed ranking the dining room profiles. Though the facilities were randomly selected, this study used convenience sample for the subjects of survey.

4. Data analysis

Statistical analyses were performed using SPSS for Windows (Version 11.5, 2002, SPSS Inc., Chicago, IL) and SAS 8.2 (Cary, NC). Descriptive analysis and frequency analysis were performed to identify the demographic profile of the residents. Conjoint analysis was conducted to identify the relative importance of quality attributes of both food and service. The relative importance of each attribute can be calculated as the utility range (i.e. difference between the highest and the lowest utility for that attribute) divided by the sum of utility ranges of all attributes (Hair et al. 1998). Conjoint analysis produces 1) utility of attribute and 2) importance of attribute. Utility of attribute represents the relative "worth" of the attribute. Low utility indicates less value; high utility indicates more value. The importance of an attribute can be calculated by examining the difference between the lowest and the highest utilities across the levels of attributes (Levy 1995).

Results and Discussion

1. Profile of respondents

A total of the 123 respondents completed ranking the dining room profiles. Eighty four were females and 38 were males (1 respondent did not indicate gender); all were Caucasian except 1 respondent. The average age was 84 years old with a range of 59 - 97. On average, the participants have resided in a selected CCRC for five years. Most participants (52%) reported an annual household income \$ 40,000. Approximately 57% of participants had completed at least one college

degree. Most(89%) did not eat breakfast in the dining room ; 55% of residents did not eat their evening meal in the dining room. Forty-nine residents ate lunch more than 3 times per week in the dining room. Forty five percent of participants were frequent dinners who ate at least 3 or 4 times/ week in the dining room. Table 2 presents the description of demographics in three CCRCs.

2. Results of conjoint analysis

The relative importance of each attribute is the percentage of utility range in relation to the total variation. The total variation is the sum of score ranges of each attribute. The results of conjoint analysis are presented in Table 3. When data from three CCRCs were congregated for conjoint analysis, respondents placed great importance on taste and

Table 2. Description of the respondents

	Total(N = 123)	CCRC A(N = 61)	CCRC B(N = 32)	CCRC C(N = 30)
	Number(%)	Number(%)	Number(%)	Number(%)
Gender				
Females	84(68.3)	39(63.9)	25(78.1)	20(66.7)
Males	38(31.1)	22(36.1)	6(18.8)	10(33.3)
No response	1(0.8)	0(0)	1(3.1)	0(0)
Marital Status				
Single	11(8.9)	6(9.8)	2(6.3)	3(10.0)
Married	56(45.5)	34(55.7)	7(21.9)	15(50.0)
Widowed	51(41.5)	19(31.1)	22(68.8)	10(33.3)
Divorced	2(1.6)	0(0)	0(0)	2(6.7)
No response	3(2.4)	2(3.3)	1(3.1)	0(0)
Education				
Less than high school degree	2(1.6)	1(1.6)	1(3.1)	0(0)
High school degree	17(13.8)	4(6.6)	6(18.8)	7(23.3)
Some college	33(26.8)	12(19.7)	12(37.5)	9(30.0)
Undergraduate degree	16(13)	13(21.3)	1(3.1)	2(6.7)
Some graduate work	11(8.9)	9(14.8)	1(3.1)	1(3.3)
Graduate Degree	41(33.3)	22(36.1)	9(28.1)	10(33.3)
No response	3(2.4)	0(0)	2(6.3)	1(3.3)
Age	83.74 ± 6.90	84.15 ± 5.90	85.61 ± 4.25	80.68 ± 10.08
Length of residency(year)	5.15 ± 5.21	4.75 ± 5.08	4.81 ± 4.22	6.24 ± 6.26
Frequency of dining in CCRC(per month)				
Breakfast	0.89 ± 4.39	0.13 ± 1.02	0.38 ± 0.79	2.97 ± 8.50
Lunch	11.20 ± 12.35	5.13 ± 8.51	20.06 ± 11.40	14.08 ± 13.41
Dinner	2.55 ± 6.05	3.28 ± 5.74	1.25 ± 4.94	2.47 ± 7.53

Table 3. Conjoint summary results compared by CCRCs

Attributes	Total(n = 123)		CCRC A(n = 61)		CCRC B(n = 32)		CCRC C(n = 30)	
	Utility	Importance	Utility	Importance	Utility	Importance	Utility	Importance
Taste and flavor of food	1.0333	28.280	1.0286	27.610	0.8060	23.172	1.2617	34.620
	-1.0333		-1.0286		-0.8060		-1.2617	
Appearance of server	0.8570	23.455	0.8361	22.444	0.9267	26.642	0.7930	21.758
	-0.8570		-0.8361		-0.9267		-0.7930	
Tenderness of meat	0.7128	19.059	0.7366	19.772	0.8233	23.668	0.5273	14.469
	-0.7128		-0.7366		-0.8233		-0.5273	
Temperature of food	0.5643	15.444	0.6681	17.934	0.4181	12.020	0.4883	13.398
	-0.5643		-0.6681		-0.4181		-0.4883	
Attentiveness of server	0.4864	13.312	0.4560	12.240	0.5043	14.498	0.5742	15.756
	-0.4864		-0.4560		-0.5043		-0.5742	

flavor of food which has the highest percentage of utility range (28.28%) and second greatest on appearance of server (23.46%). Residents in CCRC A and C indicated that taste and flavor of food (27.61% ; 34.62%) were the most important attributes when they evaluate the dining service and appearance of server (22.44% ; 21.76%) was the second most important. However, residents in CCRC B had different preferences of quality attributes. They indicated that appearance of server (26.64%) and tenderness of meat (23.67%) were more important than taste and flavor of food (23.17%).

The results of this study is consistent with Koo et al. (1999)'s study. They found that taste of food was the most important factors for Hong Kong restaurant customers among location, type of food, variety of food, uniqueness, car park, price, quality/taste of food, decoration, and service. According to Sweeney et al. (1992), the manner of employees had great influence on the selection of restaurant. However, their study did not include the food quality attributes such as taste and flavor of food and tenderness of meat.

Knowledge of the importance of the attributes would enable the foodservice managers in CCRCs to manipulate those attributes to enhance the residents' perception of quality and identify strategies for continuous improvement. The managers needed to concentrate on taste and flavor of food and tenderness of meat. The results suggested that foodservice managers should establish minimum quality standards in their specifications to be used when purchasing and receiving ingredients, especially meat purchased and preparation methods. Standardized recipe and other production controls should be used. The residents also indicated the importance of appearance of server. In addition, foodservice managers should implement staff training on proper appearance and cleanliness (e.g. dress code).

Summary and Conclusion

The results of this study indicated the relative importance of each of quality attributes of three CCRCs residents. The conjoint analysis results showed taste and flavor of food were relatively important than appearance of server, tenderness of meat, attentiveness of server, and temperature of food. A conjoint analysis of attributes of food and service quality help providing direction for a foodservice manager to increase the residents' satisfactions.

By knowing which attributes are most important to resi-

dents with specific characteristics, the foodservice managers can determine what features to promote to increase the frequency residents eat in the dining room. CCRC foodservice operators need to enhance food and service quality attributes based on the specific needs of residents' characteristics or of different situations. The important attributes were ultimately used to predict the most preferred choice of dining service for residents. Since each service attribute carries a different weight in the preference decision, conjoint analysis can reveal what kind of tradeoffs the customer will accept. For example, will a customer accept a reduction in menu variety in exchange for food tastiness?

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