RELATIONSHIP BETWEEN ASSISTED LIVING FACILITY FOODSERVICE THEME AND RESIDENTS' SATISFACTION AND HEALTH STATUS

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DEDICATION

Dedicated to my parents, Melanie Goodman and Carl Strohl, who always believed in the beauty of my dreams and supported me through all of my endeavors, without their support and words of encouragement I would not be where I am today.

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ABSTRACT

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Purpose was to examine the impact of demographics and factors associated with aging on resident satisfaction, perception of food and service quality, and behavioral intentions regarding foodservice in assisted living facilities. Eighty-five residents of six assisted living facilities (2 home-style, 2 medical/health, and 2 restaurant/resort) had completed surveys. Respondents included 63 females and 21 males ranging in age from 58 to 99 years. Residents of the assisted living facilities gave similar ratings for food quality and overall foodservice quality. However, residents at home-style assisted living facilities rated service quality more highly than those at restaurant/resort facilities. They also had less need for assistance with Activities of Daily Living compared to residents of restaurant/resort and medical/health facilities. Since Americans are living longer, it is important to promote a good quality of life in their later years. Future research should assess differences nationally between quality measures and types of assisted living facilities.

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CHAPTER I

INTRODUCTION

In 2007, there were approximately 37.9 million people age 65 and over in the United States, who accounted for 12.6% of the total population (Older Americans, 2008). The older population (those ages 65 and over) substantially increased from 3.8 million (in 1900) to 35 million over the 20th century. By 2030, the older population is expected to double from 35 million to 72.1 million. This segmented growth will be attributed to the Baby Boomers (those born between 1946 and 1964) who will begin reaching age 65 in 2011. The older population is both living longer and increasing in number. In order to meet the needs (particularly physical and mental needs) of the elderly population, challenges must be addressed by families, businesses, policymakers, healthcare providers, and many others.

Health status and chronic disease often increase the need for assisted living in the elderly population (Older Americans, 2008). In 2007, only 39% of elderly persons considered themselves in excellent or very good health compared to 64.8% of people aged 18-64 (Administration on Aging, 2008). Among the most frequently occurring conditions for older persons in 2004-2005 were: hypertension (48%), diagnosed arthritis (47%), all types of heart disease (32%), any cancer (20%), diabetes (16%), and sinusitis (14%). Chronic health conditions often contribute to the inability of elderly to remain in the community due to a decline in functional status.

Many long-term care options are being offered by private and public organizations to help older Americans live independently (Older Americans, 2008). These include assisted living facilities, independent living facilities, congregate housing, and continuous care retirement communities (Assisted Living Federation of America [ALFA], 2007). Assisted living facilities are part of this continuum of care.

The ALFA defines assisted living as "a special combination of housing, personalized supportive services, and health care designed to meet the needs, both scheduled and unscheduled, of those who need help with activities of daily living" (National Center for Assisted Living [NCAL], 2001). The primary benefits of assisted living are security and independence, privacy and companionship, and physical and social well-being, all of which account for its popularity among seniors and their families (NCAL, 2001). Furthermore, assisted living residents can receive supervision if needed, request personal care assistance, and obtain health care services that support independence in their lives.

Definitions of assisted living vary from state to state. Texas defines assisted living as "an establishment that provides help with activities of daily living" (Department of Aging and Disability Services [DADS], 2008). As a Texas resident, an individual has the right to "age in place," which means one can enter a facility at a relatively healthy point in life (requiring assistance with minor activities of daily living) and remain in the facility as needs increase (DADS, 2008).

One of the fastest growing segments in the foodservice industry is foodservice at assisted living facilities (Lee, Shanklin, & Huang, 2004). Various factors such as menu

design, production and delivery of food, nutritional and sensory quality, and services in a friendly dining environment can influence older adults' food intake and nutritional status (Lee et al., 2004). According to Lee et al. (2004), there is limited information available on foodservice in assisted living facilities because most research on foodservice at long-term care facilities employs indirect approaches such as plate waste studies and employee surveys.

The nutritional quality of menus is also important since elderly residents may reside in assisted living facilities for many years. Assisted living facilities are increasingly providing care for economically and medically disadvantaged elders who are the most likely to be at nutritional risk and are in dire need of nutrition services (Chao & Dwyer, 2004). According to Chao and Dwyer (2004), provisions for nutrition services are an afterthought, and there has been no agreement on what codified and uniform standards are necessary and appropriate. Some assisted living facilities bestow top priority to dining room amenities, while others stress the provision of nutrition therapy which is deemed essential to maintaining nutrition and health.

According to Chao and Dwyer (2004), food and nutrition services in assisted living facilities can be classified according to four dominant themes. The four themes are restaurant/ resort theme, medical/health theme, home-style theme, and future assisted living style or hybrid. The restaurant/resort theme allows individuals to choose food from a menu with bountiful portions offered in an attractive setting and table service. Nevertheless, unique health needs such as special diets and assistance with eating and other tasks are disregarded. The challenge that must be addressed is to recognize and

meet medical needs. Clinical dietitians and knowledgeable nurses are essential.

The medical/health theme resembles services found in nursing homes and hospital settings (Chao & Dwyer, 2004). This theme accommodates medical and therapeutic facets of individual nutrition needs such as altered portions, special snack foods, and food texture modifications. The shortcoming is there is less awareness of social and psychological aspects of food and the eating atmosphere.

The home-style theme exhibits informality, independence, and effortless socialization (Chao & Dwyer, 2004). Portion sizes vary, meals are served at any time, and there are moderate menu choices. Yet, health is typically minimized or neglected. The challenge is to preserve the positive qualities while guaranteeing food selections that are conducive to the nutritional status and health of the residents.

The future assisted living theme fosters an attractive eating environment with attention to the aesthetics of the eating milieu and social interactions of the residents (Chao & Dwyer, 2004). Waiter services and portion control are emphasized as well as scheduled meals with flexible services. Moreover, reasonable and moderate choices are available to residents along with foods providing high sensory appeal. Menus are planned and evaluated to meet nutritional requirements by a registered dietitian. Lastly, nutrition education and counseling services are part of this assisted living theme which requires a full-time, registered dietitian on site.

After surveying state licensing agencies in 50 states, one researcher concluded that very few states have comprehensive regulations and that the extent of enforcement is unknown (Chao, Hagisavas, Mollica, & Dwyer, 2003). Lack of standardized nutrition

policies in assisted living facilities can affect health outcomes of residents. Establishment of uniform criteria, standards of practice, and benchmarks for assisted living facilities would help ensure that appropriate nutrition services are provided.

Rationale

The overall quality of life and health status of the elderly is essential to the successful aging of assisted living residents. This study is being conducted to determine if foodservice themes/models within assisted living facilities have a direct relationship to the health status of the resident and perceived satisfaction and service quality. This study is important because assisted living facilities have few regulations regarding food and nutrition services. Even within states, regulations may differ, which can have a significant impact on the health status and satisfaction of the resident. Results of this study can provide background information to support policy changes and more consistent regulations regarding food and nutrition services in assisted living facilities. This will benefit both the residents and the administrators in regard to enhanced quality of life and profitable returns to the facilities.

Purpose and Hypotheses

The purpose of this study was to examine the impact of various demographic characteristics and factors associated with aging on resident satisfaction, perception of food and service quality, and behavioral intentions regarding foodservice provided in assisted living facilities. These factors included:

1. Demographic variables of age, gender, marital status, education level, health status, and length of residency.

2. Resident perceptions of overall health, sensory changes, oral function, and functional ability.

Furthermore, the relationship between the facility's dominant foodservice theme and resident perceptions of food and service quality, satisfaction, behavioral intentions, psychosocial status, functional status, and health status were investigated.

In order to accomplish the objectives of the study, the following null hypotheses were tested:

H_{01}: There will be no significant differences in resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, health status, and overall food nutritional quality based on the type of the assisted living facility in which they reside.

H_{02}: There will be no significant relationships between resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, and behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, health status, and overall food nutritional quality.

H_{03}: There will be no significant differences between resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, and behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, health status, and overall food nutritional quality based on the following variables: gender, marital status, and education level.

$H_{04:}$ There will be no significant relationships between quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, health status, and overall food nutritional quality based on the following variables: age, length of residency.

$H_{05:}$ There will be no significant relationship between ADL level and chewing ability and the following variables: type of assisted living facility, gender, marital status, and education level. There will be no differences in age and months of residency based on ADL level and chewing ability.

CHAPTER II

REVIEW OF LITERATURE

Elderly Population

In the United States in 2007, there were approximately 37.9 million people age 65 and over who accounted for 12.6% of the total population (Older Americans, 2008). The older population (those ages 65 and over) has substantially increased since 1900 when they numbered 3.8 million. By 2030, the older population is expected to become twice as large growing from 35 million (in 2000) to 72.1 million (20% of total U.S. population). The Baby Boomers (those born between 1946 and 1964) who will begin reaching age 65 in 2011 will contribute to the growth of this segment. In 2007, the 65-74 age group was over 8.8 times larger than in 1900 (19.4 million), but the 75-84 (13.0 million) and 85 + (45.5 million) age group had grown at least seventeen and forty-five times respectively larger than in 1900 (Administration on Aging [AOA], 2008). The average life expectancy of those ages 65 and over is an additional 19.0 years (20.3 for females and 17.4 for males). Many aspects of our society will be affected due to the increasing number of older individuals. Challenges must be addressed by families, businesses, policymakers, and healthcare providers in order to meet the needs (particularly physical and mental needs) of the elderly population.

In regard to gender, older women outnumber older men with the proportion increasing by age. In 2007, there were 21.9 million older women and 16.0 million older

men (Older Americans, 2008). In 2007, 19.3% of individuals 65 years or older were minority populations – 8.3% were African-Americans, 6.6% were Hispanic, 3.2% were Asian or Pacific Islander, and less than 1% were American Indian or Native Alaskan. However, the population of elderly people is becoming more diverse. In 2050, the older population is projected to be 61% Caucasian, 18% Hispanic, 12% black, and 8% Asian (fastest growth will be Hispanics).

Another important factor affecting the elderly's emotional and economic well-being is marital status (Older Americans, 2008). This strongly influences future living arrangements and caregiver availability for the elderly who may have an illness or disability whether acute or chronic. The percentage of the elderly population living alone substantially increases as age and widowhood rate increases. In 2007, about 30.2% (10.9 million) of all noninstitutionalized older persons lived alone (7.9 million women, 2.9 million men). They represented 38.6% of older women and 19.0% of older men. In 2007, over half (55.3%) of the older noninstitutionalized individuals lived with their spouse with the proportion decreasing with age most commonly for women (AOA, 2008). Approximately 11.2 million or 72.8% of older men, and 8.7 million or 42.2% of older women, lived with their spouse. The percentage of older persons living alone increased with advanced age. Furthermore, an increasing number of older individuals are living in parent-maintained households where their grandchildren are present (857,000 over 65 years of age). Lastly, older persons live in nursing homes and other self-described senior housing. The percentage of older people living in nursing homes in 2007 was 4.4% for 65+ population, 1.3% for 65-74 years, 4.1% for 75-84 years, and

15.1% for those 85 and older. Approximately 5% live in other senior housing facilities.

Health Status

Health status and chronic disease often increase the need for assisted living in the elderly population (Older Americans, 2008). In 2007, only 39% of elderly persons considered themselves in excellent or very good health compared to 64.8% of people aged 18-64 (AOA, 2008). According to a position paper by the American Dietetic Association [ADA] (2005), self-reported health status, although difficult to measure, can be a reliable indicator of one's perceived health-related quality of life. One of the main contributors to negatively affect quality of life is chronic health conditions of which heart disease, stroke, cancer, and diabetes are the most prevalent and costly. In 2004, the leading cause of death among people age 65 and over was cardiovascular disease (1,418 deaths per 100,000 people), followed by malignant neoplasms (cancer; 1,052 per 100,000), cerebrovascular diseases (stroke; 346 per 100,000), chronic lower respiratory diseases (284 per 100,000), Alzheimer's disease (171 per 100,000), diabetes mellitus (146 per 100,000), and influenza and pneumonia (139 per 100,000). According to a position paper by the American Dietetic Association [ADA] (2005), approximately 80% of all persons 65 years of age and older have at least one chronic condition and 50% have at least two chronic conditions. Chronic health conditions often contribute to the inability of the elderly to remain in the community due to a decline in functional status.

Other problems commonly faced by older Americans are vision and hearing impairments and declining oral health (Older Americans, 2008). Approximately half of older men and one-third of older women reported having hearing problems. The

percentage is higher for those 85 years of age and over (62%) when compared to those 65-74 years of age (32%). Vision problems affect 16% of older men and 18% of older women. In 2002, 16% of people age 65 and over reported ever having glaucoma/macular degeneration, and 44% reported having cataracts in the past twelve months. The prevalence of edentulism is also higher in the elderly. Thirty-two percent of those 85 and over have no natural teeth compared to 28% of those 65-74 years.

The elderly continue to face memory impairment and depressive symptoms (Older Americans, 2004). Moderate or severe memory impairment is more likely in older men (15% of men age 65 and over) when compared to women (11% of women age 65 and over). Memory impairment can affect the elderly person's day-to-day living and the ability for self-care. Depressive symptoms also have a high impact on the mental health and well-being of the older adult. Physical illness, greater functional disability, and higher healthcare resource utilization are often higher among people with depressive symptoms. As a result of illness, chronic disease or injury, many limitations, both physical and mental, are faced by the elderly population.

Assisted Living

The improvement in health of older Americans has contributed to a decline in the use of long-term care facilities and a move toward assisted living and other independent care facilities (Older Americans, 2008). Many options are now being offered by private and public organizations to help older Americans live independently. Assisted living facilities are part of this continuum of care. The Assisted Living Federation of America defines assisted living as "a special combination of housing, personalized supportive

services, and health care designed to meet the needs, both scheduled and unscheduled, of those who need help with activities of daily living" (National Center for Assisted Living [NCAL], 2007). The primary characteristics of assisted living are security and independence, privacy and companionship, and physical and social well-being all of which help to account for its popularity among seniors and their families. Furthermore, assisted living residents can receive supervision if needed, request personal care assistance, and obtain health care services that emphasize independence in their lives.

Varying definitions of assisted living facilities by state accrediting organizations, providers, consumer advocates, and researchers make it difficult to secure and interpret data on assisted living (NCAL, 2007). However, most definitions include 24-hour supervision, housekeeping, meal preparation, and activities of daily living assistance (ADLs). Assisted living facilities are also not defined or regulated by the federal government, but are regulated by state and local governments. As a result of varying state regulations, levels of service, costs, and standards of service differ among providers. Staffing at assisted living facilities varies based on state regulations, resident census, residents' needs, and whether staff is employed from an outside agency or directly by the facility. Inadequately trained staff, low staff to resident ratio, medication errors, and the admission and retention of individuals with the need for more care than facilities can provide are current staffing issues facing assisted living facilities.

Assisted living facilities have grown rapidly since their first appearance in the mid-1980s (American Association of Retired Persons [AARP], 2004). In 2001, there were 36,399 licensed assisted living facilities reported with 910,486 units or beds

nationwide (14.5% increase since 2000; Ball, Perkins, Whittington, Connell, Hollingsworth, King, Elrod, & Combs, 2004). While assisted living facilities have increased, nursing home numbers have declined somewhat (1,413,596 to 1,346,119; Ball et al., 2004). The average age of an assisted living resident is 85. Seventy-nine percent are women, 31% are male, and 99% are white (NCAL, 2007). Thirty percent of assisted living residents required full assistance with bathing followed by dressing (24%), transferring (17%), toileting (19%), and eating (10%). Many assisted living residents needed some assistance for bathing (42%), dressing (33%), transferring (19%), toileting (22%), and eating (13%).

Hawes and colleagues studied the basic characteristics of assisted living facilities in regard to services, accommodations, price, and size (Hawes, Phillips, Rose, Holan, & Sherman, 2003). To produce nationally representative estimates for the assisted living industry, the study involved a multistage sample design in which administrators of approximately 1,500 assisted living facilities were interviewed by telephone. Results showed there were approximately 11,459 assisted living facilities nationwide with 611,300 beds and 521,500 residents in 1998. Average size was 53 beds with 67% of assisted living facilities having 11-50 beds, 21% having 51-100 beds, and 12% having more than 100 beds.

Sixty percent of assisted living facilities offered a combination of low services or low or minimal privacy, whereas 11% offered high services and high privacy. Most facilities provided minimal services with ADL assistance – mostly bathing, dressing, and locomotion (Hawes et al., 2003). Most (65%) offered residents assistance with at least

two ADLs or one ADL and medications. In regard to admission, most accepted residents with moderate physical limitation [wheelchair (71%), walker (62%)], but less than half (41%) would admit residents needing assistance with transferring out of bed, chairs, or wheelchairs.

Seventy-two percent reported having discharged a resident if they required nursing care for greater than fourteen days (Hawes et al., 2003). All facilities provided twenty-four hour staff, three meals per day, and housekeeping. Ninety percent provided medication reminders or had a central area of storage for medications and assisted with the administration of medications. Lastly, 71% percent of assisted living facilities had a licensed nurse, registered nurse, or licensed vocational nurse working full- or part-time. Twenty-nine percent had no licensed nurse and staff to monitor resident need for evaluation or treatment.

In regard to price, assisted living was not considered affordable for moderate to low income residents 75 or older unless principal assets were utilized and few had enough for monthly charges (Hawes et al., 2003). In assisted living facilities, the most common monthly charge was approximately $1,600 per month (Phillips et al., 2005). The average high-service and high-privacy assisted living facility would be unaffordable for a vast majority of the elderly population due to paying for other basic needs such as supplemental insurance, out-of-pocket expenditures on health care, medications, and clothing, and any other charges for additional services (ADL assistance or transportation). Due to the diversity of assisted living facilities, residents and families will face many challenges in regard to selecting an appropriate facility and policymakers

will face tough decisions in deciding what role assisted living facilities should play in the long-term care arena.

Nutrition and Foodservice in Assisted Living Facilities

The nutritional quality of menus in assisted living facilities is important, since an increasing number of elderly residents may reside in these facilities for many years to come. According to Chao and Dwyer (2004), assisted living facilities are increasingly providing care for the economically and medically disadvantaged elders who are the most likely to be at nutritional risk and are in dire need of nutrition services. Provisions for food and nutrition services should address both the quality and safety of food and the environment in which meals are served. To identify present risks or potential problems in assisted living facilities, comprehensive nutrition monitoring should be used to screen elderly individuals, and further assessment should be performed for those at risk. A number of problems undermine the potential of assisted living facilities to improve nutrition for a better quality of life and health among the elderly. According to Chao and Dwyer (2004), provisions for services are often an afterthought, and there has been no agreement on what codified and uniform standards for nutrition services are necessary and appropriate in this setting. National surveys reveal lack of a common vision among working professionals, and assisted living operators often develop practices based on individual philosophies in regard to the purpose and role of the specific assisted living facility. Some assisted living facilities bestow top priority to dining room amenities, while others stress the provision of nutrition therapy which is deemed essential to maintaining nutrition and health.

Foodservice Models/Themes

Food and nutrition services in assisted living facilities can be classified according to a dominant theme or philosophy (Chao & Dwyer, 2004). Four themes are the restaurant/resort theme, the medical/health theme, the home-style theme, and the future assisted living style or hybrid theme. The first theme allows individuals to choose food from a menu, and bountiful portions are offered in an attractive setting and table service. However, unique health needs such as special diets and assistance with eating and other tasks are disregarded. The challenge that must be addressed in this particular theme is that medical needs are met and that clinical dietitians with specific skill sets and knowledgeable nurses are recognized as essential.

The second theme resembles that displayed in nursing homes and hospital settings (Chao & Dwyer, 2004). This theme accommodates medical and therapeutic items of individual nutrition needs such as altered portions, special snack foods, and food texture modifications. The shortcoming is that there is less attention observed to the social and psychological aspects of food and the eating atmosphere.

The third theme exhibits informality, independence, and effortless socialization (Chao & Dwyer, 2004). The positives aspects of this theme are varying portion sizes, flexible meal times, and a moderate number of menu choices. Yet, health is typically minimized or neglected. The challenge for this type of theme is to preserve the positive qualities while guaranteeing that food selections are conducive to the good nutritional status and health of the residents.

The fourth theme fosters an attractive eating environment with attention to the

aesthetics of the eating milieu and social interactions of the residents (Chao & Dwyer, 2004). In addition, waiter services and portion control are proffered as well as scheduled meals with flexible services. For example, if residents have appointments they can still receive a meal when they return to the facility. Moreover, reasonable and moderate choices are extended to the residents along with food items of high sensory appeal. Menus are planned and evaluated by a registered dietitian in order to meet nutritional requirements. Lastly, nutrition education and counseling services are available.

According to Chao and Dwyer (2004), every state recognizes the importance of food safety and the prevention of food-borne illnesses in assisted living facilities. However, food and nutrition services related to improved health status and quality of life have low priority. Neglected services often include menu nutrient analysis and nutritional assessment. Chao and Dwyer recommended that a standard for food and nutrition services in assisted living facilities be implemented.

Foodservice Quality and Dining Environment of Assisted Living Facilities

To optimize independence, productivity, and quality of life, many older Americans and caregivers are demanding choices in living situations and health-related services (Lee, Shanklin, & Huang, 2004). According to Lee and colleagues, one of the fastest growing segments in the foodservice industry is foodservice at assisted living facilities. Various factors such as menu design, production and delivery of food, nutritional and sensory quality, and services in a favorable dining environment can influence older adults' food intake and nutritional status. Assisted living facilities provide the opportunity for social interaction with mealtime often being the social highlight of a

resident's day. According to an administrator's perspective, foodservice has been considered a competitive marketing tool and a driver of satisfaction in the industry. According to Lee et al. (2004), there is limited information available on foodservice in assisted living facilities because most research on foodservice at long-term care facilities employ indirect approaches such as plate waste studies and employee surveys.

Lee, Shanklin, and Huang (2004) investigated assisted living residents' perception of foodservice and dining experiences using a qualitative approach. An individual interview technique was completed with a total of 14 residents from a Midwestern state in the United States. Interview topics included residents' foodservice experience at the facility, quality of foods served, food preferences and menu planning, concerns related to meals and health, service quality and staff, and meal service time and environment. Participants included 12 females and two males age 78-100 years (mean age 87) who had resided at the facility for an average of nineteen months (range was 8-36 months). Only three residents required dietary restrictions.

With the exception of one resident, all residents enjoyed some aspects of foodservice provided at the assisted living facilities (Lee et al., 2004). The positive aspects were the dining room environment and specific menu items that residents preferred. Availability of choices, especially for entrees, beverages, ice cream, and portion sizes was liked by the residents. Furthermore, residents considered services "pleasing and satisfactory".

Overall, the residents believed there was a good variety of foods, but reported they wanted a better variety of some vegetables, potatoes, and fresh fruits (Lee et al.,

2004). In regard to food preparation, many felt there were overcooked vegetables and potatoes, a lack of variety in salads, overcooked/burnt pastries, tough pancakes, thin Cream of Wheat, tough toast, and overdone barbeque. Seasoning problems with soups and vegetables were mentioned. Six residents specified that they wanted more consistent portion control and food quality. Other residents perceived that the menus were too repetitive and those residents who were on diet restrictions noted that there were not enough choices for them. Further complaints included the problem of hot foods not always being served at appropriate temperatures and unfamiliar menu names. Lastly, residents believed it took the servers too long to describe food items due to their lack of knowledge about particular foods. Residents indicated that they preferred vegetables, fruits, chicken, shrimp, and salad menu items. In addition, residents wanted more bread items made from scratch. They also did not like food items that were served too frequently or improperly prepared.

Residents at the assisted living facility indicated overall satisfaction with the service, but felt the staff needed more training in service techniques (Lee et al., 2004). Slow service was perceived as being due to inadequate staffing. Residents also suggested that the kitchen should rotate the order of who gets served first. Residents liked the current scheduled meal times, but did not like the fact that meals were sometimes served late. Another concern was lack of space for walkers or wheelchairs in the dining room environment. Overall, the residents perceived availability of choices, variety of foods, and services positively, but indicated improvements were needed in maintaining consistency of meals and food quality (Lee et al., 2004). Lastly, it was recommended

that residents be involved in menu planning and evaluation of the foodservice on a regular basis.

Case and Gilbert (1997) conducted outcomes research from a research project that was launched in 1994 by the American Health Care Association of Washington, DC. The purpose of the project was to determine what elements of long-term care service (included nursing facility residents, assisted living facility residents, subacute facility residents, and rehabilitation subacute facility residents) were most important to residents. Over 2,000 sets of the questionnaire were distributed to long-term care facilities. According to the researchers, meals and dining services have consistently been identified as a significant aspect of quality in residential settings. Several factors such as the quality of meals, addressing individual tastes, the dining setting, and the social aspects of dining all contribute to the overall satisfaction of the resident. Quality of meals include providing highly palatable meals even for specialized diets, attractive and tasty presentation, variety and quality, recognizable foods, and special meals for holidays. Addressing individual tastes entails preparation of meals similar to what residents were familiar/comfortable with at home, favorite foods, known brands, options at each meal, and allowing residents to eat in the room if they wish. Factors in the dining setting involve having staff present in the dining room to help, not having staff constantly watching over what the resident eats, having a phone available to call for help if needed, preventing "food snatching", and a pleasant atmosphere (linen tablecloths). Lastly, the social aspects of dining embody providing the opportunity for residents to eat with people they choose, providing meals that are social occasions for all residents, and encouraging

residents to become acquainted with others at the facility.

According to Marcus and Berry (1998), an interview with 135 residents from 35 nursing homes, which is a different group of population, found that only 23% of residents were satisfied with the food and that 58% felt that choice and control over food was very important. Many times residents needed assistance or extra time to eat and shortages of staff were a problem. Interestingly, many residents rejected food to punish a staff member for unkindness or to manipulate staff for more attention. Also, residents often refused food because it was a therapeutic diet and they wanted to eat like every other resident. Lastly, the presentation and service of food influenced the desire to eat. Dishes that were monochromatic, mixed together or aesthetically displeasing, were likely to be rejected by residents.

Regulations Governing Food and Nutrition Services in Assisted Living Facilities

According to Chao and colleagues (2003), most nutrition and health authorities suggest that to "ensure the provision of quality services and to protect the health of residents, standards of care involving food, general nutrition, and therapeutic nutrition services should be defined and monitored in assisted living facilities" (p. 42). However, there is no universally approved set of standards for evaluating the components of food and nutrition services in assisted living facilities. Performance standards that influence both care and service delivery are components of state regulations that apply to assisted living facilities, but only informal benchmarks or standards exist related to nutrition.

Chao et al. (2003) conducted a survey of state regulations covering nutrition in assisted living facilities in order to represent a first-hand approximation of prevalent

benchmarks. This survey conducted by the National Academy for State Health Policy collected information on such regulations in fifty states. In conjunction with the survey information, the researchers examined relevant state websites and made follow-up phone calls. This survey included whether or not state regulations required that menus meet nutritional standards, facilities provided therapeutic meals, therapeutic menus were approved by registered dietitians, and if facilities provided nutrition screening, education, and counseling. Other areas of importance included food handling and purchasing standards and hiring qualifications for foodservice workers. Also, all possible elder care establishments (residential, supportive, intensive, nursing, rehabilitative, and skilled nursing facilities) were included since the level of care covered by the terminology of assisted living varies by state. The researchers concluded that disparate state regulations may generate different policies at the state level and increase variations in nutrition outcomes. Regulations may also vary within states depending on the services offered since food, nutrition, and medical needs of residents differ by level of care. Out of 50 states, 45 had special food and nutrition service regulations in assisted living facilities while five had no such regulations (Chao et al., 2003). Regulations were categorized into three areas: food services, general nutrition services, and therapeutic nutrition services.

Food services included food purchasing, utilization of standardized recipes, food handling and food safety including training of staff (Chao et al., 2003). General nutrition included all levels of care especially for residential care facilities where residents were mostly in good health and only a few residents required assistance in care. Examples of general nutrition criteria are menu standards in which daily menus should meet dietary

requirements, meal consumption in which nurses or aides must document in the medical record if a resident has not eaten for more than 2-3 days, and nutrition assessment and education. Therapeutic nutrition services include supportive nursing, rehabilitative care, and skilled nursing where a registered dietitian reviews menus and assesses residents who require a specialized diet to ensure nutritional needs are met.

Results showed that 45 of 50 states had regulations covering food and nutrition services in assisted living facilities, where in 1998 it was only 18 states (Chao et al., 2003). Only 14 states had regulations mentioning more than six criteria for food and nutrition services. For food services, a mean of 1.4 criteria were implemented, and the maximum score was six. Twenty-one states had no food service regulations and only six states had regulations naming more than four of the foodservice criteria. Approximately one-third of the states had regulations for food handling and food safety. Thirteen states had in-service training of foodservice workers (i.e. sanitation) and nine states had standardized food purchasing.

There were several unique regulations in various states. Some states had special regulations prohibiting the usage of certain foods that could pose safety hazards, while other states required food safety certification for employees (Chao et al., 2003). Some states required only a few hours of in-service training on sanitation, while other states only required workers to be at least 18 years of age. Other states required a registered dietitian or a person who consults with a registered dietitian in conjunction with the foodservice coordinator.

For general nutrition services, a mean of 1.4 criteria were implemented, and the

maximum score was five (Chao et al., 2003). Five states scored zero for measuring meal consumption. Thirty-eight states had menu standards, 20 states had requirements for normal nutritional needs, eight states performed nutritional assessment, and one state provided nutrition education for residents. Overall, half of the states had at least one general nutrition regulation related to meal services such as the menu meeting the Recommended Daily Allowances (RDAs) or nutritional needs ensured by a registered dietitian. For therapeutic nutrition services, a mean of 1.4 criteria were implemented, and the maximum score was two. Forty states provided a diet for the residents to follow and 30 states had a registered dietitian review menus and assess patients. Overall, most state regulations referred to various standards such as providing 100% of the RDAs and utilization of the Food Guide Pyramid, Dietary Guidelines, or the Modified Food Guide Pyramid for those individuals over 70 years of age.

According to Chao et al. (2003), efforts have been made to improve food and nutrition services. The Assisted Living Federation of America has developed a comprehensive consumer guide with a checklist to evaluate nutrition services in assisted living settings. Also, the Continuing Care Accreditation Commission and Commission for Accreditation of Rehab Facilities support the need for better standards in assisted living facilities. Moreover, the Joint Commission on Accreditation for Healthcare Organizations (JCAHO) in 2000 presented new standards for accrediting assisted living facilities. The manual stated "nutritionally balanced and varied meals" should be available two times per day and a registered dietitian should review menus for nutritional adequacy as well as ensure that the average daily number of servings of food correspond

to the United States Department of Agriculture (USDA) Food Guide Pyramid. However, except to specify a variety of choices, there are no explicit standards in the JCAHO recommendations for the special diet needs (medical nutrition therapy) of frail residents. On January 1, 2005, JCAHO's assisted living standards became effective (Joint Commission on Accreditation for Healthcare Organizations [JCAHO], 2007). However, on January 1, 2006, the assisted living accreditation program was discontinued due to the relatively small number of assisted living facilities that had pursued accreditation as a safety and quality improvement process (JCAHO, 2007). Therefore, the Joint Commission's ability to broadly impact the safety and quality of care in assisted living settings has been ineffective (JCAHO, 2007).

Chao and colleagues (2003) concluded that very few states have comprehensive regulations on food and nutrition services for assisted living facilities and the extent of enforcement is unknown. The researchers further stressed the importance of the establishment of uniform criteria, development of a standard of practice, and benchmarks to assist with ensuring that appropriate services are provided. Further evaluation of food and nutrition services should be considered due to the life safety implications among the elderly population. As a result, instilling more consistency and standardization of assisted living facilities throughout the nation will aid in providing improved food and nutrition services to the elderly population.

Broader aspects of food and nutrition services in regard to residents' health status such as general and therapeutic nutrition and quality of life have rarely been an inclusive aspect of regulation (Chao, Houser, Tennstedt, Jacques, & Dwyer, 2007). This particular

study identified best practices that might serve as key food and nutrition care indicators in assisted living facilities. The researchers obtained the views of national experts (nutrition, health, and aging services) on the food and nutrition services in assisted living facilities they deemed most significant. The researchers also inquired on the style of delivery (emphasis on health issues, amenities, or both styles) for food and nutrition services that the experts favored most.

The researchers developed an 88-item self-administered questionnaire on food and nutrition services that was derived from state regulations and other quality indicators (Chao, Houser, Tennstedt, Jacques, & Dwyer, 2007). Indicators were categorized into four domains: dining room environment, foodservice operations, general nutrition, and therapeutic nutrition services. A Likert-scale was utilized in which the respondents rated the importance of each practice on a scale from 1 (not important) to 5 (extremely important). Results indicated that 80% of experts rated the majority of indicators in each domain as highly important (dining room - 57%, foodservice - 67%, general nutrition - 65%, and therapeutic nutrition - 70%; Chao, Houser, Tennstedt, Jacques, & Dwyer, 2007). Both health (general and therapeutic) and amenities service styles were rated as highly important by most experts (89%). A checklist was developed in order to consolidate the fifty-seven items rated most important. The researchers concluded that a service model could be developed that incorporates all of these specific elements.

Another study by Chao, Dwyer, Houser, Tennstedt, and Jacques (2008), asked registered dietitians to assess the utility of a fifty-seven item checklist on food and nutrition services in assisted living facilities. The registered dietitians were members of

two practice groups of the American Dietetic Association focusing on aging and long-term care and they were also employed in assisted living facilities. The respondents rated the importance of each item and provided their opinions on the role of assisted living facilities. Registered dietitians had a level of agreement of statements in regard to the importance of residents' autonomy in making food choices and the ability to secure wise dietary choices. Indicators were categorized into four domains: dining room environment, foodservice operations, general nutrition, and therapeutic nutrition services. A Likert-scale was utilized in which the respondents rated the importance of each practice on a scale from 1 (not important) to 5 (extremely important). Service styles for food and nutrition services were classified into an "amenity style" (focused on food choices, aesthetics, attractive meals, a congenial dining room environment, and informality), a "health style" (focused on meeting elders' preventive and therapeutic health needs), and a combination emphasizing both health and amenities areas.

Results showed that registered dietitians considered all of the domains on food and nutrition quality indicators to be highly important (92% of dining room environment items, 83% of foodservice operations, 92% of general nutrition, and 89% of therapeutic nutrition items; Chao, Dwyer, Houser, Tennstedt, & Jacques, 2008). As did the national health and aging experts in a previous study, registered dietitians preferred a service style that incorporated both health and amenities. The researchers concluded that registered dietitians should collaborate with other professionals to further validate the checklist and promote its use in working toward an optimal service model in food and nutrition services in the assisted living arena.

To further determine differences among national experts and assisted living theme as described above, Chao, Dwyer, Houser, Jacques, and Tennstedt (2008) conducted another survey. The survey consisted of the four theme scenarios (home-style, restaurant/resort, medical/health, and a combination of the three) in six food and nutrition services areas. These areas included dining room environment, meal services, meal quality, nutrition services, employees' qualifications, and therapeutic nutrition services. The majority of experts favored a combined service emphasis of home-style, restaurant/resort, and medical/health style for all areas except therapeutic nutrition for which they favored a medical/health theme. Optimal care in assisted living facilities requires a change in the philosophy of care from one that is focused on service provision and meeting care needs to one that is focused on optimal health and function for each resident. The researchers concluded that experts prefer a service emphasis for optimal care that includes both amenity and health emphases for food and nutrition services in assisted living facilities.

Texas Assisted Living Facilities

The definition of assisted living varies from state to state. Texas defines assisted living as "an establishment that provides help with activities of daily living" and also describes several types of assisted living facilities (Department of Aging and Disability Services [DADS], 2008). Residents' living arrangements usually include their own rooms or apartments within a building or group of buildings. Dining is provided and residents have some or all of their meals together. Social and recreational activities are usually included and some provide on-site health services. As a Texas resident, an

individual has the right to "age in place," which means one can enter a facility at a relatively healthy point in life (requiring assistance with minor activities of daily living) and remain in the facility as needs increase. The facility or outside resources such as home and community support services agencies can help the resident meet their increasing needs.

There are four different types of assisted living facilities in Texas (NCAL, 2006). In a Type A assisted living facility, a resident must be mentally and physically capable of evacuating the facility unassisted in the event of an emergency, not require frequent assistance during sleeping hours, and be able to understand directions. In a Type B assisted living facility, a resident may require staff assistance to exit the building, be incapable of following directions during emergency situations, and require attendance during sleeping hours. A resident must not be permanently bedridden, but may need assistance during transferring. A Type C assisted living facility is a contracted facility, four-bed, adult foster care design that must fulfill the requirements of the contractor. Lastly, in a Type E assisted living facility, a resident must be physically and mentally capable of evacuating the facility unassisted within three minutes without assistance from staff, must not need routine attention during sleeping hours, and must be able to follow directions.

In regard to scope of care, Texas facilities may provide assistance with ADLs, assist with the administration and management of medication, and occasional nursing care within the scope of practice of the licensed employee and in accord with Assisted Living Federation (ALF) regulations (NCAL, 2006). In addition, the state of Texas

regulates assisted living facilities in several ways such as resident assessments, medication management, Alzheimer's unit requirements, facility design requirements, staff training and requirements, administrator education and training, and continuing education components.

Resident Satisfaction and Quality of Care

Lowe and colleagues examined state satisfaction initiatives in nursing homes and assisted living facilities (Lowe, Lucas, Castle, Robinson, & Crystal, 2003). Mailed questionnaires were sent to the director of health and human services (title differed by state) in all fifty states in March 2000 and information was updated through follow-up phone calls in September 2002. The questionnaire covered the use of satisfaction surveys in nursing homes or assisted living facilities, persons to contact regarding instrument development and implementation, the frequency and method of administration, and how the information could be used. The researchers concluded that consumer satisfaction is a significant indicator of quality of care in nursing homes and assisted living facilities despite differences in definition and services.

According to Lowe and colleagues (2003), a trend toward consumer involvement in health care is occurring. This movement was supported by the nursing home reform legislation included in the Omnibus Budget Reconciliation Act of 1987. Health care quality has shifted its focus from structure and process criteria to clinical outcomes, resident satisfaction, and quality of life. For example, health care providers have adopted the W. Edwards Deming technique of continuous quality improvement and quality assurance techniques for a more customer-centered service model. Recently there has

been a wave of federal reports of quality problems in both nursing homes and assisted living facilities. According to Lowe et al., state legislation was being written, survey instruments were being designed, and public funds directed toward the inclusion of consumer satisfaction data in institutional long-term care licensure and certification inspections and consumer information systems.

According to Lowe et al. (2003), satisfaction in assisted living facilities is very indicative of resident and family behavior. For example, in 24.1% of study cases, dissatisfaction with quality of care has resulted in residents leaving a particular facility. Based on the study, the researchers concluded that there is a lack of precision or inconsistency in the instrument development (i.e. few instruments have been evaluated for psychometric properties) and a lack of consensus of who are the consumers (family, residents, and/or staff). Also, there is no consensus on how frequently satisfaction should be measured and what criteria should be used to select residents for satisfaction studies in order to guard against bias. In addition, states primarily seek to measure resident satisfaction with little attention to family satisfaction which was often viewed as a proxy for resident perceptions and not a reflection of a separate viewpoint. Other deterrents to developing a standard measure of satisfaction are the high cost and complexity of measuring resident and family satisfaction and the lack of uniformity between satisfaction survey instruments used in various states. Furthermore, most long-term care satisfaction data focus on facility benchmarking and consumer information and not quality improvement. Lastly, the researchers' findings highlight the importance of utilizing standard data collection instruments and techniques in order to compare

facilities within and across states. Quality care measurement will provide facilities, residents, families, and state administrators, and regulators with the tools to select, monitor, and improve the delivery of service in assisted living facilities. Setting standards for quality indicators could foster a substantially greater cooperative effort as well as improve the quality of resident care and the residents' quality of life.

Just under half of assisted living residents move from home. Twenty percent come from other assisted living facilities, 14% from hospitals, and 10% from nursing homes (NCAL, 2007). When leaving an assisted living facility, one of the most common places that residents move to due to changing needs is the nursing home (33%). Other reasons for moving out include death (28%), moving back home (12%), another assisted living center (14%), and hospitals (11%). These moves may occur because residents need more care, wish to live closer to loved ones, are dissatisfied with care and/or price, or lack of funds (AARP, 2004). Often low to moderate income older Americans cannot afford to live in an assisted living facility.

Characteristics of an assisted living center can have an immense impact on resident satisfaction of assisted living facilities (Phillips et al., 2003). Phillips and colleagues studied 1,483 residents in a nationwide representative sample of 278 assisted living facilities. Earlier studies found that 98% of residents expected to age in place and live in the facility where they currently resided for as long as they wished (Phillips, Rose, & Hawes, 2000). Furthermore, 20% to 43% of residents depart from assisted living facilities due to the need for more care, usually to a nursing home setting. Data from 1998 and 1999 focused on those residents who departed from the facility between

baseline and follow-up periods. The researchers investigated the impact of facility characteristics and individual factors on residents' status during the follow-up period. Results of Phillips and colleagues' study indicated that over three-fourths of residents departed from their original assisted living facility due in part to the need for more care (hospital, nursing home, rehabilitation, or sub-acute setting), and the average length of stay in the assisted living facility was 19.6 months. Further analyses indicated that a decline in functional status and change in marital status affected odds of death among residents of assisted living facilities. Lastly, functional status, cognitive status, and whether there were full-time registered nurses present at the assisted living facility affected the decisions of residents to move to a nursing home. Therefore, the researchers concluded that both facility characteristics and individual factors affect the decisions of a resident to depart from an assisted living facility.

The next most common reason for leaving an assisted living facility was a 31% dissatisfaction rate with quality of care, price, or some other aspect of the facility (Phillips et al., 2003). However, it is important to note that departing from an assisted living facility is often a mutual agreement between both parties (resident/family and facility). Phillips et al. (2003) stressed the importance of providing higher levels of nursing service to help reduce nursing home costs and also reduce resident departure from assisted living facilities. Furthermore, providing more care when declination of status occurs would aid the goal of aging in place which often does not presently occur in for-profit organizations. Lastly, Phillips and colleagues emphasized the need for ADL assistance and caring for those with cognitive impairments.

As previously stated, the assisted living philosophy to age in place is to provide independence and services tailored to the residents' changing needs. According to Ball et al. (2004), 28 states include this in their philosophy. However, most assisted living facilities do not ultimately provide the resident the opportunity to stay until death. The researchers studied five assisted living facilities for one year utilizing qualitative methods such as participant observation, informal and in-depth interviewing of providers, residents, and residents' families, and review of resident and family records. Ball and colleagues found that out of 366 assisted living facilities, only 65% allowed hospice services. Most facilities did not provide consumers with enough information to ascertain whether residents' needs can be met or for how long. Ball and colleagues (2004) found that aging in place had positive and negative outcomes. For the most part, residents were satisfied with the facility and the care received and most preferred assisted living rather than a nursing home. Low turnover benefited the facilities by reducing discharge and admission costs. On the other hand, with increasing need for care, some residents may not receive needed services.

Ball and colleagues' (2004) stated that by managing decline, residents can be assisted to "age in place." The researchers found assisted living facilities managed decline by prevention and response. Prevention strategies included education on exercise and nutrition, and response strategies included balancing needs with resources and overextending resources (increased fees, hiring additional workers, and expansion of the family care role) to meet needs. However, in reality, residents' needs will be unmet frequently. In addition, making these provisions increased the risk for both residents and

the facility. For example, residents' fees would be increased and additional workers would need to be hired if the resident's needs increased, or the facility would have to send the resident to a skilled facility temporarily or discharge the resident. Furthermore, resident and family could make the decision to hire additional services, seek further medical treatment, or expand the family care role. However, in some situations, a facility and the resident cannot balance these needs and, as a result, overextending of resources occurs or the resident's needs are unmet. Assisted living facilities have no single definition or guidelines on how to operationally distinguish them from other forms of healthcare such as nursing homes (Zimmerman et al., 2003). A lack of long-standing state regulation and federal oversight has permitted significant variability in the characteristics of assisted living facilities and the residents they serve. Although there is less privacy in a nursing home setting, there are no differences found between nursing homes and larger residential care/assisted living facilities in regard to policy clarity or resident control. According to Zimmerman et al., resident impairment was found in both settings with more ADL assistance needed in the nursing home. However, cognitive impairment and behavioral problems were similar in both facilities. Lastly, the differences found within residential care/assisted living was that smaller and for-profit facilities scored lower than other facilities across multiple measures (i.e. individual freedom and institutional order).

Factors that Affect Food Consumption and Nutritional Status of the Elderly

Difficulty Chewing

Older adults commonly face nutritional deficiency, mostly protein-energy malnutrition, and about 60% are malnourished in long-term care facilities (Mojon, Budtz-Jorgensen, & Rapin, 1999). Furthermore, edentulous individuals with poor masticatory function may consume an unbalanced diet because they may only select certain foods that they can chew. Other oral conditions including mucosal disorders, oral dryness, and periodontal disease/caries can also cause difficulty in chewing. Mojon et al. (1999) evaluated the relationship between oral health status and nutritional deficiency for 324 institutionalized frail older adults by a cross-sectional clinical study. Researchers performed an oral examination, assessed nutritional status using serum albumin concentration and body mass index, and assessed physical dependence using the Barthel index. Mojon and colleagues found that dependency on dentures (age the covariate) and dental status was significantly associated with serum albumin levels but not body mass index. A body mass index of less than 21 was found more often in non-denture wearers than in those using one or two dentures. Oral functional status was a significant factor interfering with body mass index and albumin while dependence (physical disability in regard to feeding) was only significantly associated with albumin. Albumin and body mass index were also lower in dependent than semi-dependent subjects. The researchers concluded that specific detrimental oral conditions are associated with nutritional deficiency in very old people.

Promoting Healthy Habits in the Elderly

McPhee and colleagues' (2004) study examined the relationship between seven healthy habits (from Healthy Generation Survey) and the health status of assisted living residents. Using secondary data analysis, a total of 1,079 residents from several LifeTrust America, Inc. assisted living facilities across the southeastern United States completed the survey. Healthy habits in assisted living facilities, which were included in the survey, were drinking the daily recommended amount of water, proper nutrition (breakfast, healthy snacks), no cigarette or tobacco smoking/chewing, moderate alcohol consumption, seven to eight hours of sleep, and regular physical activity. According to McPhee et al., the quality of life during extended years can be improved by promoting healthy habits. Older adults were more likely to incorporate healthy behaviors, and the prevalence increased with increasing age.

In the older adult population, dehydration was found to be responsible for confusion, renal failure, infection, pressure sores, and constipation (McPhee et al., 2004). Less fluid causes less oxygen to travel to the brain which results in confusion, falls, decreased ability with ADLs, and a decrease in cognitive abilities. According to McPhee and colleagues, the older adult should consume 1.5 liters of water per day. A fluid and electrolyte imbalance in the older adult is due to a loss of lean body mass which leads to an increase in fat (decrease in body water from 70-60%), inefficiency of the kidney to hold water (increased urination), and lastly diminishing of the thirst response. Older adults often experience reduced food intake due to poor appetite related to a lack of taste/smell perception and decreased enjoyment of food (McPhee et al., 2004).

Furthermore, polypharmacy among the elderly population causes side effects that affect appetite as well with the average long-term care resident using eight medications per day. Elders who are malnourished get more infections, require longer healing periods, and have an increased risk of surgery. According to McPhee et al. (2004), 85% of older people have chronic conditions that have been documented to benefit from nutritional interventions. Elders in the hospital who had below a 50% daily nutrient intake for maintenance energy needs were eight times more likely to die than elders with higher intakes.

Proper nutrition can help prevent disease and improve the health of people with diabetes, hypertension, and dyslipidemias which affect 85% of the older population (McPhee et al., 2004). Exercise and sleep are also keys to a better healthy lifestyle for the elderly to help control blood lipid abnormalities, diabetes, and obesity. Regular exercise can help improve balance, reduce the risk of falls, improve muscle tone, enhance quality and quantity of sleep, stimulate appetite, improve eating habits, digestion, and improve circulation. In addition, increased muscle coordination and strength enhances the ability of the older person to perform ADLs.

Unintentional Weight Loss

Another problem faced by the elderly population is unintentional weight loss which occurs in up to 8% of all adult outpatients and 27% of frail people age 65 years and older (Alibhai, Greenwood, & Payette, 2005). Weight loss of 4% to 5% or more of body weight within one year or 10% or more over five to ten years or longer is associated with increased mortality or morbidity or both. Unintentional weight loss can also result

in an increased risk of in-hospital complications, a decline in ADLs and physical function, higher admission rates to institutions, and a poorer quality of life. Furthermore, unintentional weight loss may reflect disease severity or an undiagnosed illness.

Age-associated physiological changes in weight loss can be due to decreased chemosensory function, reduced efficiency of chewing, decreased gastric emptying, or alterations to the neuroendocrine axis (Alibhai et al., 2005). The neuroendocrine axis refers to changes in levels of leptin, cholescystokinin, neuropeptide Y, and other hormones and peptides which are associated with early satiety and a decline in both appetite and hedonistic appreciation of food ("anorexia of aging"). According to Alibhai and colleagues, elderly people are less likely to adapt to periods of over- and undereating and less likely to return to their usual body weight after such periods. Furthermore, the elderly are often at increased risk of malnutrition due to insufficient food intake (quantity) rather than inappropriate selection of food (quality).

Many factors that are often not under the elderly person's control are associated with unintentional weight loss. Such factors include poverty, poor dental health, difficulty in chewing or swallowing, vision/hearing loss, arthritis, stress, illness/death of a loved one, and unhappiness associated with poor diet quality (Alibhai et al., 2005). Primary malnutrition must be considered the contributor when weight loss is apparent in the elderly patient with finding null evidence of an organic disorder. Treatment of unintentional weight loss requires enabling access to good nutrition and several nonpharmacologic strategies to prevent or treat malnutrition and enhance food intake. It is important to involve dietitians, speech pathologists, and social workers to assist with

the assessment and management of weight loss when an obvious organic cause is not identified.

There are many ways to increase food intake and/or increase weight in the elderly which include minimizing dietary restrictions, offering high-energy foods during the best meal of the day, eating smaller meals more often, eating favorite foods and snacks, providing finger foods, optimizing and varying dietary texture, avoiding gas-producing foods, and ensuring adequate oral health. Furthermore, including high-energy nutritionally-dense supplements or adding fats/oils to food, eating in the company of others or having assistance, flavor enhancers, and regular exercise can also help increase food intake and/or weight in the elderly (Alibhai et al., 2005).

According to Murden and Ainslie (1994), nursing home patients had a significantly higher mortality rate in six months after losing 10% of body weight irrespective of diagnosis or cause of death. Another study has further revealed that institutional elderly patients who lost 5% of body weight in one month were four times more likely to die within one year (Ryan, Bryant, Eleazer, Rhodes, & Guest, 1995). Assessment should be performed to determine what may cause unintentional weight loss in patients including anthropometric measurements (Huffman, 2002). A body mass index of less than 22 kg/m^2 in elderly women and less than 23.5 kg/m^2 in elderly men is associated with increased mortality. Studies have found that the optimal body mass index in the elderly person should be between 24-29 kg/m^2.

Severe nutritional problems are often found in residents of assisted living facilities which may cause transfer to a long-term care facility. According to Huffman

(2002), the dietary staff should have a good grasp of the patient's ability to chew foods of various consistencies, feed him- or herself, and attend to various tasks involved in eating. Many assisted living facilities experience high staff turnover and mealtimes could be affected. The pressure of short staffing and the stress of trying to feed residents within a certain amount of time often result in compromising the total caloric intake of the residents.

Energy Regulation

Roberts (2000) studied 35 healthy younger men and 35 older men who were fed during an under-and overfeeding period as well as a period where they were allowed to regulate their own food intake. Both groups gained a similar amount of weight and fat during the overfeeding period, but the older men retained the weight and the younger group lost the weight. The young men decreased their voluntary energy intake, whereas the older men did not decrease energy intake and it remained elevated. For the underfeeding period, both groups lost weight but the younger men were able to gain the weight back while the older group did not. The researchers found a significant difference between age groups rather than a difference explained by environmental factors. It was also found that elderly men and women experience less frequent hunger during negative energy balance than do young individuals. Roberts (2000) concluded that a lack of the normal ability to regulate energy intake contributes to impaired energy regulation and weight loss/gain in old age.

Social Factors

Social isolation and reduced dietary variety may contribute to low energy intake

in the elderly individual. Roberts (2000) found that elderly individuals consume less energy at meals when alone than during meals with company with a 30% difference in energy intake. Even after exclusion of individuals who ate alone, the number of individuals present at a meal correlate with energy intake – the more people at a meal, the more individuals ate. Bereavement and functional disabilities tend to limit social contact for elderly people and result in them eating alone when most humans tend to eat in social groups.

Social factors that affect eating habits include friendship, marital status, and companionship (Marcus & Berry, 1998). Widowed persons often enjoy meals less, have poorer appetites, and lose more weight than married individuals. Eating is not just a biological factor, but it is also social, cultural, and symbolic. Foods that people eat and when, where, and how are all individual choices and habits and often nursing homes and assisted living facilities can limit this choice.

Failure to Thrive and Decline in Functional Ability

Declining health in the elderly population often does not have an identifiable cause and may be irreversible. Even if an elderly person does not have an acute or chronic disease/illness, they eventually undergo a process of functional decline (Robertson & Montagnini, 2004). The elderly may begin to experience progressive apathy and a loss in the desire to eat or drink which can result in a "failure to thrive". The Institute of Medicine defines "failure to thrive" late in life as a "syndrome manifested by weight loss greater than 5% of baseline, decreased appetite, poor nutrition, and inactivity often accompanied by dehydration, depressive symptoms, impaired

immune function, and low cholesterol levels" (Robertson & Montagnini, 2004, p. 343). This poses a problem in the hospital and long-term care setting. Failure to thrive affects 25% to 40% of nursing home residents. The prevalence of failure to thrive increases with age and is associated with increased costs of medical care and high morbidity and mortality rates. Failure to thrive is also associated with increased infection rates, diminished cell-mediated immunity, hip fractures, decubitus ulcers, and an increase in surgical mortality rates.

Assessment of functional ability (ADLs and IADLs) should be performed for residents of assisted living facilities and nursing homes. The Katz ADL scale assesses the individual's ability to perform six related functions: bathing, dressing, toileting, transferring, continence, and eating (Robertson & Montagnini, 2004). The Lawton IADL scale examines a patient's ability in such tasks as telephone use, shopping, transportation, budget management, adhering to medication regimens, cooking, housekeeping, and laundry. For the Up and Go test, a patient is asked to rise from the sitting position, walk ten feet, turn and return to his/her chair to sit. The test demonstrates the functional mobility skills and ability to leave a place unattended for less than twenty seconds. If the time reaches greater than thirty seconds, the resident is considered more dependent and at higher risk for falls.

Mental Status and Well Being of the Elderly

Differentiation between refusal to eat and a lack of ability to eat such as dysphagia should be assessed by medical professionals (Marcus & Berry, 1998). In addition, it may be difficult for patients to express their wishes as well as eat due to

conditions such as stroke, dementia, or Parkinson's disease. In fact, more and more Alzheimer's patients are being found in assisted living facilities. According to Marcus and Berry, many mid-stage Alzheimer's patients are distracted during meal time and some verbally refuse to eat. Some residents have agnosia which is difficulty in interpreting vision, taste, smell, and touch – they cannot recognize objects such as food. Others experience apraxia of eating where they intend to eat and open their mouths but cannot. Meanwhile, some residents are depressed which decreases the desire to eat. According to Marcus and Berry, elderly individuals can exhibit what is referred to as "indirect self-destructive behavior". The term is described as an "act of omission or commission that causes self-harm that leads indirectly and over time to the patient's death" (Marcus & Berry, 1998, p. 165). The individual will omit behaviors that would sustain life and health such as prescribed treatments, medical aid, medications or food. Without reservation, studies support the finding that an elderly person will decrease food intake in the few months prior to death.

According to a position paper by the American Dietetic Association [ADA] (2005), nutritional well being contributes to the health, productivity, self-sufficiency, and quality of life of the older adult. Medical and supportive services with the inclusion of culturally sensitive food and nutrition services that are appropriate to levels of independence, diseases, conditions, and functional ability are key components to the continuum of care. The enjoyment of food along with the social and nurturing aspects contribute to the quality of life of the older person, which further minimizes the risk of weight loss and undernutrition. Scientific evidence increasingly substantiates the

relationship nutrition has with health, independence, and well being for the older patient. Therefore, dietetics professionals and other healthcare members can incorporate appropriate dietary and health recommendations, physical activities, and social interactions in programs to sustain levels of independence.

Taste Perceptions

Older individuals typically have a decline in sensory perceptions of sweet, sour, salty, bitter, and umami taste perceptions (Popper & Kroll, 2003). However, it is important to note that losses in sensitivity are not uniform across the basic tastes. Bitterness perception decreases most with age and sweetness the least. Changes in taste perception are most noticeable in the elderly who are taking medications because medications can modify the taste mechanism or introduce a new taste. The ability to detect odor is also affected in the elderly. Peak performance in odor identification occurs between the ages of 20 and 40, but there is a sharp decline after the age of sixty. According to a position paper by the American Dietetic Association [ADA] (2005), older women with reduced olfaction have a lack of interest in cooking and consuming a variety of foods. Furthermore, it has been found that flavor-enhanced foods have been preferred by older persons due to decline in taste sensitivity. In research, it has been shown that retirement home residents consume more food when given flavor-enhanced foods. Furthermore, flavor-enhanced foods have been found to enhance immune function and increase grip strength.

Due to sensory dysfunction, decreasing perception of flavors may impact food enjoyment for the elderly. However, the elderly may also show desire to compensate for

sensory losses by eating more sweets and fatty foods to incorporate the sense of sweet and a creamy mouth-feel (Popper & Kroll, 2003). Increasing the food appeal such as altering the appearance, texture, or temperature may need to be considered in order to satisfy the palate of the elderly and maintain nutritional status. The elderly often prefer textures that are easy to chew and swallow due to dentures and age-related reduction in salivary flow which impedes the swallowing process.

Sensory perceptions and preferences for taste, aroma, and texture of foods affect not only food preferences but eating habits as well. Unlike children, adults do not equate good taste with sweetness and taste preferences, and aversions are not always direct predictors of food consumption (Drewnowski, 1997). For children, food preferences are guided by taste alone, and for adults, they are influenced by nutritional beliefs and attitudes toward weight and dieting.

Polypharmacy has significant effects on the sensory perceptions of elderly. Over 250 drugs have been clinically reported to alter taste and/or smell (Donini, Savina, & Cannella, 2003). Compared to younger individuals, the average detection thresholds for elderly individuals with one or more medical conditions taking an average of 3.4 medications were 11.6 times higher for sodium salts, 4.3 times higher for acids, 7.0 times higher for bitter compounds, and 2.7 times higher for sweetness.

Decline in Food Intake in the Elderly

Decline in food intake may be caused by socioeconomic factors, psychological, physiological, and pathological factors (Donini et al., 2003). Donini and colleagues found energy intake to be greater when a variety of food was provided than when only a

single food item was available. In fact, dietary variety has been shown to decline as age increases accompanied by sensory impairment, poverty, loneliness, and widowhood. Availability of a variety of food is positively correlated with nutritional quality and has been associated with health outcomes.

An earlier and greater degree of relaxation of the antrum occurs with aging due to food passing more rapidly from the fundus portion of the stomach (Donini et al., 2003). The "degree of antral relaxation is directly proportional to the development of satiation" after consuming a meal (Donini et al., 2003, p. 78). Therefore, the elderly have increased fullness and early satiation due to a slower rate of gastric emptying.

The nutritional status and food intake of older patients should be evaluated to determine nutritional risk (Donini et al., 2003). Utilization of specific methods to identify and treat underlying diseases, provide nutrition rehabilitation and education, and establish environmental and behavioral modifications may help enhance the nutritional status of the elderly. Lastly, increasing staffing levels at nursing homes and providing higher quality feeding assistance might improve food intake and nutritional status of residents.

Zinc deficiency may also play a role in the elevation of the taste threshold in aging (Morley, 2001). Pathological alterations of decreased taste sensation have been associated with iron deficiency anemia, oral candidiasis, xerostomia, and depression. In addition, older adults have delayed gastric emptying for large (greater than 500 kcals), but not smaller meals.

Research has also shown that individuals eat less with age (Drewnowski &

Shultz, 2001). According to Drewnowski and Shultz, men 20 to 29 years of age experience a calorie decline from 3,100 kilocalories per day to 1,900 kilocalories per day at the age of 70 to 79. For women, a similar decline occurs from 1,900 kilocalories to 1,400 kilocalories per day. While the consumption of carbohydrates, protein, and fat decline with age, the percentage of energy from macronutrients remains relatively unchanged. Age is associated with declining consumption of calcium, iron, and zinc for both men and women with lower intakes also found for B vitamins and vitamin E in men. The researchers also found that carbohydrate consumption was high for both men and women, protein consumption was constant, and the percentage of energy from fat declined after the age of 60 with the lowest numbers in the oldest age groups. Furthermore, the elderly consumed less than one-third of the RDAs for key micronutrients and minerals. However, fiber and vitamins and minerals from vegetables and fruits increased with age especially in women. Drewnowski and Shultz (2001) concluded that the nutrient density of diets should be higher with increasing age due to the decline in absorptive capacity and metabolic function. Also, the nutrient needs of the elderly may be increased, especially for those 85 and older, due to increasing polypharmacy and chronic diseases that interfere with the utilization of nutrients.

To conclude, the elderly population is both living longer and increasing in population. According to a position paper by the American Dietetic Association [ADA] (2005), there were 48,000 individuals who were 100 years of age or older and nutrition remains one of the major determinants of successful aging. In order to maintain independence, functional ability, chronic disease management, and quality of life,

national, state, and local policies that promote the coordination and integration of food and nutritional services into health and supportive systems are pertinent.

CHAPTER III

METHODOLOGY

All methods used in this study were approved by the Institutional Review Board of Texas Woman's University. Written permission to conduct the study was secured from administrators at six assisted living facilities in the north Texas area.

Subjects

The study population consisted of elderly residents from six assisted living facilities (two from each theme) that fit the following assisted living themes: restaurant/resort, medical/health, and home-style. The facilities chosen were licensed and closely matched the descriptions of Type A and Type B assisted living facilities in Texas (Department of Aging and Disability Services [DADS], 2008). Researchers attempted to choose facilities with an occupancy of 70 or higher in order to obtain sufficient sample sizes. All facilities were located within a 50 mile radius from Texas Woman's University. Facilities were selected using Assisted Living Info (2008), an online guide that described assisted living facilities in the North Texas region and their assisted living foodservice models/themes. In addition, the Texas Department of Aging and Disability Services website was utilized to closely match facilities that were Type A or Type B. All residents of the selected assisted living facilities were eligible to participate in the study and were expected to be age 65 and over and from various ethnic backgrounds, races, gender, marital status, and educational levels. The researcher's goal was to obtain a

minimum sample size of 150 residents to ensure accurate and significant results.

Instruments

Permission was received to use a questionnaire previously developed and validated by Hui-Chun Huang that measured perceived food quality, service quality, overall satisfaction, and behavioral intentions (loyalty and food consumption) for foodservice (Huang, 2004). The questionnaire was developed and validated through a pilot study that was conducted qualitatively and through a cross-sectional study conducted quantitatively. In Huang's survey, the researcher did a pilot study at two assisted living facilities to evaluate the reliability of the instruments and increase the validity using Cronbach's alpha scores. The scores for the five constructs were .71 to .91, which were higher than the recommended .70. These scores indicated the instrument had good internal consistency. Based on Seo and Shanklin (2003), perceived quality measurement consists of service quality and food quality. Based on Huang's study (2004), perceived quality measurement consists of fourteen measurement items with seven items measuring food quality and seven items measuring service quality (see Appendix I, pages 141-142). Residents' satisfaction with food, service, and overall dining experience are the items being measured for satisfaction (see Appendix I, pages 143-144). Perceived quality and satisfaction with foodservice were measured utilizing a 5-point Likert scale ranging from 1 (strongly disagree/very dissatisfied) to 5 (strongly agree/very satisfied). Behavioral intentions were measured with a 5-point Likert scale (extremely unlikely to extremely likely). Loyalty intentions were measured as positive word of mouth, recommendations to others, and family and friend invitations. Food

consumption intentions were measured as intentions to eat more food or more often in the dining room.

The resident self assessment portion of the survey measured physical constraints in order to evaluate health status, oral function, sensory change, and functional ability (see Appendix I, pages 145-146). Using a 5-point Likert scale, health status was measured with 1 being very bad and 5 being excellent. Chewing ability was measured the aforementioned way with 0 representing inability to chew five foods (fresh lettuce; a piece of fresh carrot; steaks, chops, or firm meats; and a whole fresh apple without being cut) and 5 representing ability to chew all five foods. Chewing ability was assessed using a previously validated chewing ability index which is included in this questionnaire (Leake, 1990). Residents' recognition of sensory changes (taste and smell) was measured with a 5-point Likert scale ranging from 1 (very bad) to 5 (excellent). Functional disability was measured by the ADL scale with 0 representing dependence in six functions of daily living and 6 representing independence in all six functions (bathing, dressing, toileting, transferring, continence, and feeding; Phillips et al., 2003). Psychosocial factors were measured by the three statements using a 5-point Likert scale ranging from 1 (never) to 5 (always; see Appendix I, page 147).

The "More About Yourself" section (see Appendix I, page 148) included questions about age, gender, marital status, education level, health status, and length of residency. In addition to the questions previously developed and validated by Huang, the researcher for this study added questions that measured perceived nutritional quality of food offered at the assisted living facility and asked if residents felt they needed

assistance in selecting healthy foods (see Appendix I, pages 149-150). Another additional question asked if residents would be interested in nutrition services, and two open-ended questions requested additional feedback in regard to likes and dislikes of meals offered at each assisted living facility.

Variables

The independent variable for the study was the type of assisted living facility and the dependent variables were as follows: food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, functional status, and overall nutritional quality. The following demographic variables were measured: age, gender, marital status, education level, health status, and length of residency.

Data Collection

The researcher gained the cooperation of the administrators and/or dietary managers at each assisted living facility by scheduling an appointment to discuss the purpose of the study and protocol and the most convenient time and method of securing resident participation in surveys. The researcher and a research assistant arrived at each assisted living facility at the scheduled time and date. The researcher discussed the purpose of the study, benefits, and instructions for completing the questionnaire with the residents. Residents were informed of full confidentiality as many expressed concern of fear that the administrator would review the results. In order to gain the cooperation of the participants, a gift bottle of body lotion was offered as an incentive. After meeting with the residents, questionnaires were distributed during mealtime, in the common areas,

or personal mailboxes. Assistance was provided to the residents if they required help in reading and/or understanding the survey questions.

Data Analysis

Statistical analyses were performed using SPSS for Windows 15.0 (SPSS Inc., Chicago). Significance levels will be set at .05; however, results will be reported at the smallest appropriate *p*-value using the conventions of .05, .01, and .001. In other words, in the event, that a *p*-value is less than .01 but greater than .001, the value will be reported as $p < .01$. Crosstab analyses using Pearson's chi-square test were used to examine relationships between categorical variables (ADL and chewing ability). Pearson's product moment correlations were conducted to examine the relationships between continuous variables measured on interval or ratio scales. The continuous measures included composite ratings for food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. Correlation coefficients can range between -1.00 and +1.00. A positive correlation indicates that increases in one variable are associated with increases in the other variable. A negative correlation, on the other hand, indicates that decreases in one variable are associated with increases in the other variable. Correlation coefficients close to 0 indicate a weak relationship or a lack of a relationship between variables. In general, correlation coefficients ranging from -.2 to -.4 or .2 to .4 are considered "weak" relationships, those ranging from -.5 to -.7 or .5 to .7 are considered "moderate" relationships, and those ranging from -.8 to -1.0 or .8 to 1.0 are considered

"strong" relationships.

Independent samples *t*-tests, analysis of variance (ANOVA), and multivariate analysis of variance (MANOVA) were conducted to examine differences in the dependent variables based on the demographic variables. Independent samples t-tests are used to determine differences between two groups on a continuous (i.e., interval or ratio scaled) dependent variable. Analysis of variance (ANOVA) is used to determine the differences between more than two groups on a continuous (i.e., interval or ratio scaled) dependent variable. A significant main effect indicates that the independent variable has a direct effect on the dependent variable. Finally, multivariate analyses of variance (MANOVAs) were conducted to examine the effects of the categorical demographic variables on the continuous dependent measures (behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functioning, psychosocial status, and overall food nutritional quality). The ANOVA and MANOVA used *F*-tests in order to determine if the groups were significantly different from each other. If the test revealed that the groups were significantly different from each other (i.e., a significant *F*-test), and the independent variable had more than two groups, Tukey's HSD post hoc comparison tests were used in order to determine which values of the independent variable differ from each other.

The dependent measures that were highly correlated with each other ($r > .60$ or $r < -.60$) were analyzed separately using independent samples *t*-tests for the independent variables with two levels and ANOVAs for the independent variables with more than two levels. The dependent measures with correlations less than .60 (or greater than -.60) were

grouped together into MANOVAs in order to evaluate differences based on the demographic variables.

CHAPTER IV

RESULTS AND DISCUSSION

The six assisted living facilities in the North Texas region used for this study, were chosen based on convenience, as many assisted living administrators refused to participate in the research project. The six facilities included two with a restaurant/resort theme, two with a medical/health theme, and two with a home-style theme; they ranged in size from 30 to 70 residents. Assisted living facilities closely matched either a Type A or Type B facility. In a Type A assisted living facility, residents must be mentally and physically capable of performing daily activities on their own and understanding directions, whereas in a Type B assisted living facility, a resident may require more staff assistance (Department of Aging and Disability Services [DADS], 2008). For facilities classified as Type A facilities there were the following: one medical/health theme and one home-style theme. For facilities classified as Type B facilities there were the following: one medical/health theme, two restaurant themes, and one home-style theme. All of the assisted living facilities were apartment style residences where each resident had a living room, bedroom, small kitchenette, and bathroom. Residents either lived alone or with a spouse.

Demographic Characteristics of Assisted Living Residents

Eighty-five elderly residents living in six assisted living facilities in north Texas participated in the survey. Categorical demographic variables for assisted living residents

are displayed in Table 1. A majority of the participants were female (n = 63), which is not surprising since American females tend to live longer than males (Older Americans, 2008).

Table 1

Categorical Demographic Characteristics of Assisted Living Residents (N = 84)

	n [a]
Gender	
Female	63
Male	21
Marital Status	
Single	3
Married	16
Widowed	63
Divorced	2
Living Status	
Living alone	70
Living with spouse	14
Education Level	
Elementary school	1
High school	48
Bachelor degree	23
Master degree	8
PhD	3
Need help in selecting foods for good health	8
Would be interested in nutrition counseling and education from a registered dietician	36

[a] Frequencies not adding to 84 reflect missing data.

Table 1, continued

Categorical Demographic Characteristics of Assisted Living Residents (N = 84)

	n [a]
Hypertension	30
Cardiovascular disease	17
Osteoporosis	17
Diabetes mellitus	16
Obesity	8
Cancer	4

[a] Frequencies not adding to 84 reflect missing data.

In terms of marital status, 63 of the participants were widows, 16 were married, 3 were single, and 2 divorced. Seventy participants resided alone whereas 14 resided with their spouses. These results appear to be consistent with previous findings that as widowhood increases, the rate of older persons living alone increases (Older Americans, 2008). More than half of the participants reported that high school was their highest level of completed education (n = 48) and 23 had completed a bachelor's degree. Eleven respondents had graduate degrees, 8 had master's degrees, and 3 had a doctoral degree. This also supports research that the educational levels of older individuals are increasing in the elderly population (Older Americans, 2008). Between 1970 and 2007, the

percentage of elderly individuals who had completed high school increased from 28% to 76.1%, and in 2007 approximately 19.2% had a bachelor's degree or higher (Older Americans, 2008). Residents in the current study were asked whether or not they felt they needed help in selecting foods for good health. The majority of the residents indicated that they did not need help ($n = 77$), with only 8 residents reporting that they felt they needed help selecting foods. However, when asked whether or not they would be interested in nutrition counseling and education from a registered dietician, almost half of the residents in the current sample indicated that they would like nutrition counseling and education ($n = 36$).

In terms of diagnoses, 17 of the participants reported that they had cardiovascular disease, 16 reported diabetes mellitus, and 17 reported having osteoporosis. A greater number reported that they had hypertension ($n = 30$). Only 8 indicated that they suffered from obesity and 4 reported that they had cancer. Chronic health conditions often contribute to functional decline and the incapability of the older individual to remain in the community (Older Americans, 2008). Elderly who have chronic disease conditions require more assistance whether it is medication assistance or counseling in regard to a special diet.

Continuous demographic variables are displayed in Table 2. The average age was 84 years ($M = 84.58$, $SD = 7.58$) and ranged from 58 to 99 years. Participants had an average length of residency of 32 months with a range from one month to 288 months. In terms of eating meals in the dining room, participants ate breakfast in the dining room an average of nearly 6 times a week ($M = 5.99$, $SD = 2.11$).

Table 2

Continuous Demographic Characteristics of Assisted Living Residents

	n[a]	Mean	*SD*	Min	Max
Age	80	84.58	7.58	58	99
Length of residency (months)	79	32.87	40.39	1	288
Number of times breakfast eaten in dining room (per week)	76	5.99	2.11	0	7
Number of times lunch eaten in dining room (per week)	82	6.28	1.38	0	7
Number of times dinner eaten in dining room (per week)	78	6.19	1.57	0	7

[a] Total sample varies due to missing data.

Likewise, participants reported that they ate both lunch and dinner in the dining room an average of slightly over 6 times a week. Reasons that residents may eat more frequently in the dining room include inability or lack of desire to prepare meals, less expense than purchasing and preparing food items, difficulty in finding transportation to travel to a grocery store, and desire for companionship and socialism. As the above results indicate, residents in the study utilized the dining room for most or all of their meals.

In research by Roberts (2000), lack of socialization and minimal food variety contributed to declining food intake in the elderly population with a difference of 30% when comparing individuals who dined alone to individuals who dined with company. Furthermore, declining functional ability and loss of a loved one have been found to have impact on the elderly's food consumption and socialism (Roberts, 2000). Food choices and variety and the surrounding environment in assisted living facilities and nursing homes can limit individual choices of the elderly (Marcus & Berry, 1998.). Therefore, it is important for administrators and foodservice managers to provide an environment in the dining room that provides the opportunity for socialism and companionship while also providing a variety of food choices for the elderly.

When asked what they enjoyed most about their dining experience, several respondents reported that they liked the dining service itself. Some reported that the food was "always on time" and very available (n = 3) whereas other respondents focused on the choice of the food (n = 3). Several people stated that the food was "good all of the time" or "tasty" (n =24). Two people stated that the food was "designed for my current health condition" (3.33%) whereas some respondents commented on the fact that they did not have to clean up after being served. Some of those comments were "no dishes or cooking" and "I don't have to prepare it." (n = 6). Finally, several respondents commented on how the food was served, saying that the food was "very attractively served, usually with a nice salad" or the food was "served in good fashion" (n = 3). When asked about what they enjoyed most about the meals at their facility, some

respondents stated "companionship," "getting together with friends" and "fellowship with others." (n = 3).

Finally, many respondents gave specific comments about the quality of the food, saying "the soups have a wonderful flavor," "enjoy the stuffed baked potato because you can build it your own way," "too much good food which I can't resist," or "well seasoned, warm" (n = 7). Some people reported that they liked breakfast (8.33% or n = 5) whereas others reported they liked the desserts (n = 3).

When asked what they liked least about their dining service, several respondents stated that the food was cold when it was served (n = 4), giving comments such as "the food, especially the rolls are cold," "not hot," and "mostly cold, it could be good if it were prepared better." Others stated that the food was not served on time (n = 2) whereas other reported that the dining services was of poor quality or had poor sanitation, saying "poor quality all on one plate," "poor sanitation practices," and "quality of food and how it is cooked" (n = 3). Finally, one person commented on the noise level of the dining facility, reporting "noise it's hard to enjoy when you have hearing aids and there are 40-50 people talking all at once.

Other respondents gave specific comments about the food being served. Four respondents stated that the food was too spicy, saying there was "too much spicy food" (n = 4). Others stated that there was too much fried food, reporting that there was "too much fried food and heavy," or "everything is fried especially on Friday" (n = 4). Some respondents stated that the food lacked good food preparation, giving statements such as "vegetables too hard and meat is tough," "vegetables boiled to death," "vegetables are not

soft and potatoes have skin on them," "sometimes the vegetables are overcooked" or that the food is "tasteless, dry and tough" (n = 10). Finally, others spoke of the lack of variety of the food, stating that there was "not enough fresh foods" or "no creativity". So much of the same" or "sometimes variety rather poor" (n = 8). When asked about what they liked least about the dining service, only two respondents commented on the social aspects of their dining experience, saying that there was "bad talk" or there was "no company."

Descriptive Statistics for Dependent Measures

The composite means and standard deviations for the assisted living residents' perceptions of quality variables are displayed in Table 3. The quality items were assessed using a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree; see Appendix A for item means). The average rating for food quality was 3.81 (SD = .72) and for service quality was 3.92 (SD = .84). Respondents were also asked to rate the overall foodservice quality using a scale from 1 (very poor) to 5 (very good; see Appendix A for item means). The average overall quality was good, with an average of 3.96 (SD = .99). Similarly, respondents were asked to indicate their overall foodservice satisfaction using a scale from 1 (very dissatisfied) to 5 (very satisfied; see Appendix A for item means).

The average satisfaction rating was 3.93 (SD = .78) indicating they were "satisfied". Finally, respondents rated the overall nutritional quality using a scale from 1 (strongly disagree) to 5 (strongly agree; see Appendix B for item means). The results

revealed that respondents agreed that nutritional quality of the food was "excellent" (M = 3.98, SD = .90).

Table 3

Assisted Living Residents' Perceptions of Food, Service, Overall Foodservice Quality, Overall Foodservice Satisfaction, and Nutritional Quality Variables (N = 85)

	N	Mean	*SD*	Min	Max
Food quality[a]	85	3.81	.72	2	5
Service quality[a]	85	3.92	.84	1	5
Overall foodservice quality[a]	85	3.96	.99	1	5
Overall foodservice satisfaction[b]	85	3.93	.78	2	5
Overall food nutritional quality[a]	85	3.98	.90	1	5

[a] Scaled from 1 (strongly disagree) to 5 (strongly agree); [b] Scaled from 1 (very dissatisfied) to 5 (very satisfied); Individual item descriptives are included in Appendix A.

Results indicate that residents in the facilities were generally satisfied regarding the quality variables. Lee, Shanklin, and Huang (2004) investigated assisted living residents' perception of foodservice and dining experiences using a qualitative approach. Overall, the residents' perceived availability of choices, variety of foods, and services

positively, but indicated improvements were needed in maintaining consistency of meals and food quality (Lee et al., 2004).

Assisted living residents' perceptions of sensory and health variables are displayed in Table 4. Taste functions were measured using two items assessing ability to taste food, using five-point scales ranging from 1 (very bad) to 5 (excellent; see Appendix D for item means). The results revealed an average taste function of 4.19 (*SD* = .75).

Table 4

Assisted Living Residents' Perceptions of Sensory and Health Variables (N =85)

	n	Mean	*SD*	Min	Max
Taste[a]	85	4.19	0.75	1.5	5
Smell[a]	85	4.01	0.80	2	5
Comparative taste[b]	85	3.36	0.78	2	5
Comparative smell[b]	85	3.22	0.62	2	5
Health status[a]	85	3.91	0.57	2.3	5
Psychosocial status[c]	85	3.43	1.07	1	5

[a] Scaled from 1 (very bad) to 5 (excellent); [b] Scaled from 1 (much worse) to 5 (much better); [c] Scaled from 1 (never) to 5 (always); Individual item descriptives are included in Appendix C and D.

Respondents were also asked to compare their current tasting ability to their previous tasting ability, using a five-point scale ranging from 1 (much worse) to 5 (much better; see Appendix D for item means). The results indicated an average comparative

taste of 3.36 (*SD* = .78) or approximately the same. Similarly, respondents were asked to rate their smell functioning using two items measuring their smelling ability, assessed with a five-point scale ranging from 1 (very bad) to 5 (excellent; see Appendix D for item means). The results revealed an average smell function of 4.01 (*SD* = .80). Finally, respondents were asked to compare their current smelling ability to their previous smelling ability. The results revealed an average comparative smell of 3.22 (*SD* = .62) or approximately the same.

Health status was measured using three items scaled from 1 (very bad) to 5 (excellent; see Appendix C for item means). The items included: *How would you rate your health in general?*; *For your age, would you say that your health status is?*; and *Compared to other people of your age, how would you rate your health status at the present time*? As shown in Table 4, the average health status was 3.91 (*SD* = .57). Finally, psychosocial status was measured using four items scaled from 1 (never) to 5 (always; see Appendix D for item means). The psychosocial status items included: *How often has someone been right there with you in a stressful situation?*; *How often has someone comforted you by showing you physical affection?*; *How often has someone listened to you talk about your private feeling?*; and *How often has someone expressed interest and concern in your well-being*? The average for psychosocial status was 3.43 (*SD* = 1.07) which ranged between "sometimes" and "often".

As part of the survey, respondents were asked to indicate whether or not they needed assistance with activities of daily living (ADL), including bathing, getting dressed, going to the toilet, eating, and moving in and out of bed. As shown in Table 5,

about one-fourth of the respondents reported that they needed assistance with bathing and that they were unable to control their urination and defecation. Slightly fewer reported that they needed help getting dressed (n = 12) or getting in and out of bed or a chair (n = 9). Finally, four respondents indicated that they needed assistance in going to the toilet and one respondent reported needing help with eating.

Table 5

Assisted Living Residents' Activities of Daily Living (N = 85)

	n	%
Need assistance bathing	22	25.9
Cannot control urination and defecation	21	24.7
Need assistance getting dressed	12	14.1
Need assistance moving in and out of bed/chair	9	10.6
Need assistance going to toilet	4	4.7
Need assistance feeding yourself	1	1.2
Total Functional Ability (ADL)		
Need no help with tasks	46	54.1
Need help with 1 task	23	27.1
Need help with 2 tasks	8	9.4
Need help with 3 tasks	4	4.7
Need help with 4 tasks	2	2.4
Need help with 5 tasks	2	2.4
ADL level		
Need help with 0-1 tasks	69	81.2
Need help with 2 or more tasks	16	18.8

The total ADL score was calculated by summing the number of tasks that required assistance. Thus, respondents that reported needing help with all six tasks would have a total ADL score of 6 and respondents that did not need help with any tasks would have a total ADL score of 0. The majority of the respondents in the current study had a score of 0 (n = 46) or 1 (n = 23), with 16 respondents reporting that they needed assistance with two or more tasks. Due to the skewed distribution, the total score was recoded into two different groups reflecting those that need assistance with 0 or 1 task (n = 69) and those that need assistance with two or more tasks (n = 16).

Respondents were also asked to report on their ability to chew different types of food, including fresh carrots, fresh lettuce, boiled peas, fresh apples and firm meats (see Table 6). All of the respondents indicated that they were able to chew boiled peas or beans (n = 85). A majority of the respondents were also able to chew fresh carrots (n = 74) and fresh lettuce (n = 74). Similarly, most of the respondents reported that they were able to chew steaks, chops, or firm meats (n = 70). Finally, more than half of the respondents were able to bite a whole fresh apple without cutting (n = 52).

The total chewing ability score was computed by summing the number of items that the respondents were able to chew. Residents who reported that they could eat all five items received a total chewing ability score of 5 and those who indicated that they were unable to chew any of the items received a score of 0. More than half of the respondents were able to chew all five items (n = 48) and 17 were able to chew three or fewer items. Thus, the total chewing ability score was recoded into three groups

reflecting the ability to chew all five items (n = 48), ability to chew four items (n = 20), and ability to chew three or fewer items (n = 17).

Table 6

Assisted Living Residents' Chewing Ability Items (N = 85)

	n	%
Able to chew boiled peas or beans	85	100.00
Able to chew fresh lettuce	74	87.06
Able to chew steaks, chops, firm meats	70	82.35
Able to bite a whole fresh apple without cutting	52	61.18
Total chewing ability		
Able to chew 1 item	6	7.06
Able to chew 2 items	4	4.71
Able to chew 3 items	7	8.24
Able to chew 4 items	20	23.53
Able to chew 5 items	48	56.47
Level of chewing ability		
Able to chew all 5 items	48	56.47
Able to chew 4 items	20	23.53
Able to chew 3 or fewer items	17	20.00

The survey also assessed residents' behavioral intentions regarding loyalty to the dining service and loyalty to food consumption. Loyalty was assessed using three items scaled from 1 (extremely unlikely) to 5 (extremely likely; see Appendix C for item means). Food consumption was also assessed using three items scaled from 1 (extremely

unlikely) to 5 (extremely likely; see Appendix C for item means). The results revealed similar scores for both behavioral intention measures. The average loyalty score was 3.85 (*SD* = 1.04) and the average food consumption score was 3.87 (*SD* = 1.05; see Table 7). For assisted living facilities in this study, all residents were provided with their meals as part of monthly fees, so whether they intended to eat more or not in the facility may not have mattered because the foodservice/meals were all inclusive. For future research, examining the cost differences per diem for each theme may provide valuable results as well. Residents usually intend to eat as often as possible in the dining room due to the convenience of eating prepared meals in the dining room and due to lack of other resources to prepare meals.

Table 7

Assisted Living Residents' Behavioral Intentions

	n [a]	Mean [b]	*SD*	Min	Max
Behavioral intention loyalty [c]	85	3.85	1.04	1.00	5.00
Behavioral intention food consumption [c]	84	3.87	1.05	1.00	5.00

[a] Total sample varies due to missing data; [b] Means reflect composite scores; [c] Scaled from 1 (extremely unlikely) to 5 (extremely likely); see Appendix C for individual item means.

Relationships among Dependent Measures

Pearson's product moment correlations were conducted to examine the relationships between continuous variables measured on interval or ratio scales. The continuous measures included composite ratings for food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. As shown in Table 8, the results revealed several significant correlations. For instance, food quality was significantly positively related to all of the other measures except for psychosocial status. In other words, greater food quality scores were associated with higher ratings of service quality, overall foodservice quality, and overall foodservice satisfaction. Not surprisingly, greater food quality scores were also related to greater behavioral intention loyalty and behavioral intention food consumption scores. This indicates that high food quality influences residents to have more positive perceptions of health and other related functions. Finally, as food quality scores increased so did perceptions of health status, taste functioning, comparative taste functioning, and overall food nutritional quality. Health status may influence patient's satisfaction as suggested in research in health care settings (Huang & Shanklin, 2008). Therefore, the more positively patients perceived their own health status, the more satisfied they were towards their health care providers. As for functional status, the greater the functional ability, the more positively residents evaluated the facilities' services. Administrators and foodservice managers can work to

improve resident perceptions of food quality by holding daily or monthly meetings in order to receive residents' comments on menu items and areas that require improvements.

Similarly, service quality was significantly positively correlated with all but two of the other measures (see Table 8). Greater ratings of service quality were related to greater overall foodservice quality scores and greater foodservice satisfaction ratings. In addition, higher ratings of service quality were associated with greater behavioral intention loyalty and behavioral intention food consumption scores. Finally, greater service quality scores were related to greater taste functioning, comparative taste functioning, and greater overall food nutritional quality.

These results suggest that residents perceive service skills as very important to their dining experience. Poor quality of service is related to less satisfaction and a less enjoyable dining experience. When visiting with residents and staff members, many stated that their meals are an enjoyable event they look forward to throughout the day. The results also revealed that overall foodservice quality was significantly positively correlated with five of the other measures (see Table 8). Greater scores for overall foodservice quality were associated with greater overall foodservice satisfaction. In addition, higher ratings of overall foodservice quality were related to greater behavioral intention loyalty and behavioral intention food consumption. Finally, greater overall foodservice quality scores were associated with greater ratings of overall food nutritional quality, as well as greater comparative taste functioning.

Table 8

Pearson Correlation Coefficients between Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, Overall Foodservice Satisfaction, Behavioral Intention Loyalty, Behavioral Intention Food Consumption, Health Status, Psychosocial Status, Overall Food Nutritional Quality, Taste, and Smell (N = 85)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	-												
2	0.661**	-											
3	0.591**	0.546**	-										
4	0.726**	0.734**	0.773**	-									
5	0.531**	0.498**	0.706**	0.802**	-								
6	0.469**	0.383**	0.620**	0.551**	0.512**	-							
7	0.214*	0.167	0.093	0.238*	0.169	0.087	-						

** $p < .01$, * $p < .05$; 1 = Food Quality; 2 = Service Quality; 3 = Overall Foodservice Quality; 4 = Overall Foodservice Satisfaction; 5 = Behavioral Intention Loyalty; 6 = Behavioral Intention Food Consumption; 7 = Health Status; 8 = Psychosocial Status; 9 = Overall Food Nutritional Quality; 10 = Taste; 11 = Smell; 12 = Comparative Taste; 13 = Comparative Smell

Table 8, continued

Pearson Correlation Coefficients between Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, Overall Foodservice Satisfaction, Behavioral Intention Loyalty, Behavioral Intention Food Consumption, Health Status, Psychosocial Status, Overall Food Nutritional Quality, Taste, and Smell (N = 85)

	1	2	3	4	5	6	7	8	9	10	11	12	13
8	0.192	0.018	0.190	0.185	0.227*	0.206	0.024	-					
9	0.543**	0.378**	0.319**	0.415**	0.319**	0.255*	0.151	0.128	-				
10	0.281**	0.331**	0.129	0.285**	0.152	0.046	0.441**	0.019	0.219*	-			
11	0.154	0.125	-0.059	0.083	-0.065	0.139	0.142	0.079	0.091	0.444**	-		
12	0.303**	0.236*	0.383**	0.459**	0.473**	0.338**	0.224*	0.165	0.181	0.257*	-0.013	-	
13	-0.019	0.071	0.032	0.164	0.139	0.168	0.067	0.045	0.094	0.138	0.424**	0.342**	-

** $p < .01$, * $p < .05$; 1 = Food Quality; 2 = Service Quality; 3 = Overall Foodservice Quality; 4 = Overall Foodservice Satisfaction; 5 = Behavioral Intention Loyalty; 6 = Behavioral Intention Food Consumption; 7 = Health Status; 8 = Psychosocial Status; 9 = Overall Food Nutritional Quality; 10 = Taste; 11 = Smell; 12 = Comparative Taste; 13 = Comparative Smell

These findings suggest that residents who are more satisfied with service may be more likely to dine in the dining room, to recommend the dining services to others who seek assisted living facilities, and to invite family and friends to dine more often. Furthermore, the more residents perceived the nutritional quality of food to be greater as well as having better taste function; residents were overall satisfied with the foodservice quality.

Overall foodservice satisfaction scores were significantly correlated with all but three of the other measures (see Table 8). Greater scores for overall satisfaction were associated with greater loyalty and greater food consumption scores. Similarly, higher satisfaction scores were related to residents' perceptions of better health status, better taste functioning, better comparative taste functioning, and higher ratings of overall food nutritional quality. Greater levels of overall foodservice satisfaction were also related to greater intentions of eating in the dining room in the future.

In terms of behavioral intentions, behavioral intention loyalty scores were significantly positively correlated with behavioral intention food consumption scores, psychosocial status, overall food nutritional quality, and comparative taste functioning (see Table 8). Behavioral intention food consumption scores were significantly positively related to overall food nutritional quality and comparative taste functioning. In a study by Huang and Shanklin (2008), actual food consumption was measured by plate waste. The researchers found that service management was associated with residents' food consumption. The more satisfied residents were with the quality and service, the

more food they consumed. Foodservice that provided high quality service and food resulted in a higher consumption in food intake. Higher food acceptability was found when the quality of service and foodservice was perceived higher. Customer satisfaction with service management in regard to food and service quality can have a significant influence on resident food intakes.

Health status was also significantly positively correlated with taste functioning and comparative taste functioning (see Table 8). Greater health status scores were associated with higher scores for taste and smell functioning. In addition, the results revealed a significant correlation between taste functioning and overall food nutritional quality. In other words, higher scores for taste and smell functioning were associated with higher ratings of overall food nutritional quality. There were significant positive relationships between taste functioning and smell functioning and comparative taste functioning. Finally, smell functioning was significantly positively related to comparative smell functioning and comparative taste functioning was related to comparative smell functioning.

As the above results suggest, when residents perceived their health to be better, they perceived higher food quality and reported more satisfaction with the overall food/sensory experience. The above results further support that residents perceive higher quality in regard to foodservice and service skills when taste function is optimal. If their taste function is diminished, their perceptions of the quality of food and service can be significantly impacted. Previous studies have shown that taste function has a significant

impact on the enjoyment of food (Huang & Shanklin, 2008). Older residents have reduced taste sensation and often feel that food is not flavored to their satisfaction. Administrators and foodservice managers could work together on improving food palatability (i.e. flavor-enhanced foods) to promote further acceptance by the residents. Furthermore, residents could be involved when the facility develops or searches for new recipes. Food taste tests could also be conducted periodically allowing residents to voice their opinions and/or concerns.

Study results suggest that as residents perceive their taste function to be adequate, they tended to be more satisfied. Therefore, residents may be more likely to recommend the dining services to outside sources, as well as invite their friends and family to dine with them more often. These results will benefit the administrators in promoting more business for their facilities. Furthermore, this would benefit the residents in that they would have more meals with outside family and friends, thereby potentially improving their psychosocial health status.

As ratings of the nutritional quality of food increased, so did the ratings of overall foodservice quality. These findings are important as many elderly individuals seek food that promotes health to improve and/or reduce the risk associated with chronic disease conditions and their functional status. As McPhee and colleagues (2004) concluded, older adults were more likely to incorporate healthy behaviors, and the prevalence increased with increasing age. In discussions with residents during the survey process, many mentioned that the facilities offered too many fried items and they would note this

concern in the open-ended questions of survey. Therefore, foodservice managers/chef should focus on using healthy food preparation methods such as baking, broiling, steam, or grilling that would add less fat to foods and preserve more of the vitamins and minerals contained within the food items.

Residents who felt that foods were of higher nutritional quality were more likely to recommend the facility and dining services to others. Furthermore, the residents were more likely to dine in the dining room as well as to invite family and friends. Lastly, if individuals had more social support from family, friends, or facility staff (psychosocial status), they were more likely to recommend the assisted living facility to other parties. All of these areas can be significant to the improvement and development of higher quality of care and social support in the assisted living spectrum.

Many older individuals can experience dramatic physical effects associated with the aging process that can ultimately impact their dietary intakes and nutritional status. Physical constraints (i.e. decline in health status, sensory change, poor dentition, decrease in ADL's) can have direct effects on the elderly person's health status and quality of life. These physical constraints can also influence overall satisfaction and perceptions of foodservice quality in an assisted living facility. According to Huang and Shanklin (2008), the more positively individuals perceived their actual health status, the more satisfied they were in regard to health care. This was also found in regard to functional ability. When residents perceived higher functional ability, they more positively evaluated services (Huang & Shanklin, 2008).

Primary Analysis: Relationships among Dependent Measures and Demographics

Pearson's Product Moment correlations were used to evaluate the relationships among the continuous demographic variables (age, length of residency) and the dependent measures. Crosstab analyses with Pearson's chi-square test were conducted to determine the relationships between the categorical demographic variables and the categorical dependent measures (ADL level, chewing ability). Due to significant correlations ($r > .60$) between ratings of food quality, service quality, overall foodservice quality, and overall foodservice satisfaction, separate analyses were conducted to examine effects on these measures (e.g., separate t-tests or ANOVAs). Independent samples t-tests were used to determine differences between two groups on a continuous (i.e., interval or ratio scaled) dependent variable. Analysis of variance (ANOVA) was used to determine the differences between more than two groups on a continuous (i.e., interval or ratio scaled) dependent variable. Finally, multivariate analyses of variance (MANOVAs) were conducted to examine the effects of the categorical demographic variables on the continuous dependent measures (behavioral intentions loyalty, behavioral intentions food consumption, health status, taste and smell functioning, psychosocial status, and overall food nutritional quality). The ANOVA and MANOVA use *F*-tests in order to determine if the groups are significantly different from each other. If the test revealed that the groups were significantly different from each other (i.e., a significant *F*-test), and the independent variable had more than two groups, Tukey's HSD

post hoc comparison tests were used in order to determine which values of the independent variable differed from each other.

Facility Type

Crosstab analyses using Pearson's chi-square test were conducted to examine the relationships between chewing ability, ADL level, and facility type (see Table 9). There was a significant relationship between facility type and ADL level, χ^2 (2) = 6.01, $p < .05$, Cramer's $V = .27$. A greater proportion of residents who lived in home-style facilities needed assistance with only 0 – 1 tasks (93.5%) compared to those who resided in restaurant/resort style facilities (68.0%) or medical health facilities (79.3%). In addition, a greater proportion of residents who lived in restaurant resort facilities reported needing help with 2 or more tasks (32.0%) compared to those who resided in home-style (6.5%) or medical health facilities (20.7%). Results failed to reveal a significant relationship between chewing ability and facility type, *ns*.

Table 9

Assisted Living Residents' Perceptions of Activities of Daily Living Level by Facility Type [a] *(N = 85)*

	Restaurant resort		Home-style		Medical health			
	n	%	*n*	%	*N*	%	χ^2	*p*
ADL level							6.01	0.049
Need help with 0-1 tasks	17 (20.3)	68.0	29 (25.2)	93.5	23 (23.5)	79.3		
Need help with 2 or more tasks	8 (4.7)	32.0	2 (5.8)	6.5	6 (5.5)	20.7		
Chewing ability							3.07	0.546
Able to chew all 5 Items	15 (14.1)	60.0	19 (17.5)	61.3	14 (16.3)	48.3		
Able to chew 4 Items	5 (5.9)	20.0	5 (7.3)	16.1	10 (6.8)	34.5		
Able to chew 3 or fewer Items	5 (5)	20.0	7 (6.2)	22.6	5 (5.8)	17.2		

[a] Crosstab analyses using Pearson's chi-square test. Expected frequencies are in parentheses.

Separate one-way (facility type: restaurant/resort, medical, home-style) ANOVAs were conducted to determine the effects of facility type on food quality, service quality, overall foodservice quality, and overall foodservice satisfaction (see Table 10). Results revealed a significant effect for facility type on service quality, F (2, 82) = 4.66, $p < .05$. According to Tukey's post hoc comparisons, those who were in a home-style facility rated the service quality as better ($M = 4.25$, $SD = .72$) than those who were in a restaurant resort facility ($M = 3.61$, $SD = .97$, $p < .05$). In addition, there was a significant effect for facility type on satisfaction, F (2, 82) = 3.55, $p < .05$. Post hoc comparisons using Tukey's test revealed that home-style residents (M = 4.22, SD = .75) were *marginally* more satisfied ($p = .058$) than medical health residents (M = 3.76, SD = .73, $p = .058$). Results failed to reveal significant effects for facility type on food quality or overall foodservice quality ratings, all *ns*. Therefore, higher ratings for service quality and foodservice satisfaction can be due in part to characteristics of this theme exhibiting informality, independence, and socialization opportunities. Also in the home-style theme, the portion sizes vary, meals are served at any time, and there are moderate menu choices (Chao & Dwyer, 2004).

Table 10

Comparison of Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, and Overall Foodservice Satisfaction by Facility Type[a] *(N = 85)*

	n	Mean	*SD*	*F*	*p*
Food quality				2.54	0.085
Home-style	31	4.03 [a]	0.72		
Medical health	29	3.75 [a]	0.70		
Restaurant resort	25	3.61 [a]	0.70		
Service quality				4.66	0.012
Home-style	31	4.25[a]	0.72		
Medical health	29	3.85[ab]	0.73		
Restaurant resort	25	3.61[b]	0.97		
Overall foodservice quality				0.76	0.472
Home-style	31	4.03 [a]	1.05		
Medical health	29	4.07 [a]	0.70		
Restaurant resort	25	3.76 [a]	1.20		
Overall foodservice satisfaction				3.54	0.033
Home-style	31	4.22 [a†]	0.75		
Medical health	29	3.76 [a†]	0.73		
Restaurant resort	25	3.83 [a]	0.72		

[a] Separate one-way ANOVAs were used to compare means for the three different types of assisted living facilities. Means with differing superscripts were significantly different based on Tukey's HSD ($p < .05$). [†] Means were marginally different based on Tukey's HSD ($p = .058$).

A one-way (facility type: restaurant/resort, medical, home-style) MANOVA was conducted to examine group differences in facility type on the behavioral intentions loyalty, behavioral intentions food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. The overall multivariate effect was not significant, F (18, 148) = 1.22, p = .255. Similarly, the results failed to reveal any significant univariate effects for facility type; all *ns* (see Table 11).

Table 11

Comparison of Assisted Living Residents' Perceptions of Behavioral Intention Loyalty, Behavioral Intention Food Consumption, Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Facility Type[a] *(N = 84)*

	n	Mean	*SD*	*F*	*p*
Behavioral intention – loyalty				0.72	0.490
Home-style	31	4.03	1.17		
Medical health	29	3.76	1.06		
Restaurant resort	24	3.74	0.84		
Behavioral intention – food consumption				1.63	0.203
Home-style	31	3.60	1.30		
Medical health	29	3.98	0.90		
Restaurant resort	24	4.07	0.79		
Health status				1.57	0.214
Home-style	31	3.94	0.53		
Medical health	29	3.77	0.60		
Restaurant resort	24	4.04	0.57		

Table 11, continued

Comparison of Assisted Living Residents' Perceptions of Behavioral Intention Loyalty, Behavioral Intention Food Consumption, Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Facility Type[a] *(N = 84)*

	n	Mean	*SD*	*F*	*p*
Taste				0.23	0.793
Home-style	31	4.24	0.78		
Medical health	29	4.21	0.79		
Restaurant resort	24	4.10	0.69		
Smell				0.85	0.430
Home-style	31	3.92	0.91		
Medical health	29	3.95	0.74		
Restaurant resort	24	4.19	0.75		
Comparative taste				0.47	0.624
Home-style	31	3.42	0.89		
Medical health	29	3.24	0.64		
Restaurant resort	24	3.42	0.83		
Comparative smell				2.58	0.082
Home-style	31	3.23	0.67		
Medical health	29	3.03	0.42		
Restaurant resort	24	3.42	0.72		
Psychosocial status				0.42	0.658
Home-style	31	3.41	1.11		
Medical health	29	3.31	0.99		
Restaurant resort	24	3.58	1.16		
Overall food nutritional quality				0.23	0.794
Home-style	31	4.06	0.93		
Medical health	29	3.93	0.88		
Restaurant resort	24	3.92	0.93		

[a] A one-way MANOVA was used to compare means for three different types of assisted living facilities.

Length of Residency

Pearson's Product Moment Correlations were conducted to examine the relationships between the length of residency (in months) and the other continuous measures (food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality). As shown in Table 12, the results revealed a significant positive correlation between length of residency and taste functioning, $r(83) = .222$, $p < .05$, indicating that longer length of residency was associated with greater taste functioning. The results, however, failed to reveal any significant relationships between length of residency and the other measures, all *ns*.

An independent samples t-test was conducted to determine whether residents differed in their length of residency based on their level of ADL functioning (see Table 13). The results failed to reveal significant differences, $t(77) = 1.29$, $p = .202$. A one-way ANOVA (chewing ability: 5 items vs. 4 items vs. 3 or less) also failed to reveal a significant effect for chewing ability on length of residency, *ns* (see Table 14).

Table 12

Pearson's Product Moment Correlations between Assisted Living Residents' Perceptions of Dependent Measures and Months of Residency

	Length of residency (months)
Overall foodservice quality	0.031
Overall foodservice satisfaction	0.086
Overall quality	0.018
Satisfaction	0.102
Behavioral intention – loyalty	0.048
Behavioral intention – food consumption	0.042
Health status	0.191
Taste	0.222*
Smell	0.031
Comparative taste	0.057
Comparative smell	0.000
Psychosocial status	-0.099
Overall food nutritional quality	0.032

Table 13

Months of Residency by Activities of Daily Living Level [a] *(N = 79)*

	n	Mean	*SD*	*t*	*p*
Length of residency (months)				1.29	0.202
Need help with 0-1 tasks	63	35.81	44.12		
Need help with 2 or more tasks	16	21.31	16.06		

[a] An independent samples *t*-test was used to compare means of the two groups.

Conversations between the researcher and the participants helped to shed some light on the reasons for the lack of differences based on length of residency. Residents of one particular facility noted that there had been no changes in the chef position, and therefore, there was no reason to expect any differences in food or foodservice quality based on a participant's length of residency. Also, residents may not be aware their sensory function has declined over a period of time. Also, at most assisted living facilities, residents may choose to eat in the dining room regardless of length of residency due to limited access to their own food and the need for socialism (Huang & Shanklin, 2008). Therefore, it may be important to take these factors (i.e. changes in staffing, sensory function perception) into consideration for further research.

Table 14

Months of Residency by Chewing Ability[a] *(N = 79)*

	n	Mean	*SD*	*F*	*p*
Length of residency (months)				0.79	0.459
Able to chew all 5 items	45	29.84	44.02		
Able to chew 4 items	18	43.39	44.69		
Able to chew 3 or fewer items	16	29.56	19.06		

[a] A one-way ANOVA was used to compare length of residency by chewing ability.

Gender

Crosstab analyses using Pearson's chi-square test were conducted to examine the relationships between chewing ability, ADL level, and gender (see Table 15). Results failed to reveal significant relationships between gender, chewing ability, and ADL level, all *ns*. Independent samples t-tests were conducted to examine gender differences on food quality, service quality, overall foodservice quality, and overall foodservice satisfaction (see Table 16). The results failed to reveal significant differences between males and females on the quality and satisfaction measures.

Table 15

Assisted Living Residents' Activities of Daily Living Level and Chewing Ability by Gender [a] *(N = 84)*

	Male		Female			
	n	%	*n*	%	χ^2	*p*
ADL level					0.00	1.000
Need help with 0-1 tasks	17 (17.0)	90.0	51 (51.0)	90.0		
Need help with 2 or more tasks	4 (4.0)	19.0	12 (12.0)	19.0		
Chewing ability					1.04	0.309
Able to chew all 5 items	14 (12.0)	66.7	34 (36)	54.0		
Able to chew 4 or fewer items	7 (9.0)	33.3	29 (27)	46.0		

[a] Crosstab analysis with Pearson's chi-square test was used to compare ADL level and chewing ability by gender. Expected frequencies are in parentheses.

A one-way (gender: male vs. female) MANOVA was conducted to examine gender differences on behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. The overall multivariate effect was significant, F (9, 73) = 3.47, $p < .01$ (see Table 17). Results revealed a significant univariate effect for gender on behavioral intentions of food consumption, F (1, 81) = 4.66, $p < .05$. Females indicated greater intent to eat in the dining room (M = 4.03, SD = .94) than males (M = 3.48, SD = 1.20). The results failed to reveal significant univariate effects for gender on behavioral

intention loyalty, health status, the sensory functions of taste and smell, psychosocial status, overall food nutritional quality, all *ns.*

Table 16

Comparison of Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, and Overall Foodservice Satisfaction by Gender[a] *(N = 84)*

	n	Mean	*SD*	*t*	*p*
Food quality				1.51	0.134
Male	21	4.02	0.78		
Female	63	3.75	0.70		
Service quality				0.82	0.416
Male	21	4.05	0.69		
Female	63	3.88	0.89		
Overall foodservice quality				0.44	0.662
Male	21	4.05	1.07		
Female	63	3.94	0.98		
Overall foodservice satisfaction				0.61	0.543
Male	21	4.02	0.73		
Female	63	3.89	0.81		

[a] Separate independent samples *t*-tests were used to compare composite means by gender.

Perhaps females were more likely to eat in the dining room because their spouses had passed away and they desired the opportunity for socialization. In discussion with residents during the present study, many females reported that they were more likely to eat in the dining room because they were lonely. Many reported they did not enjoy

eating alone in their rooms. According to a position paper by the American Dietetic Association [ADA] (2005), eating with others has been found to increase social interaction as well as food consumption. Both women and men consume more (23%) when dining with family and friends, and women also eat more (13%) when men are present.

Table 17

Comparison of Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Gender[a] *(N = 83)*

	n	Mean	*SD*	*F*	*p*
Behavioral intention – loyalty				0.51	0.479
Male	21	3.98	1.24		
Female	62	3.80	0.98		
Behavioral intention – food consumption				4.66	0.034
Male	21	3.48	1.20		
Female	62	4.03	0.94		
Health status				2.71	0.103
Male	21	4.08	0.60		
Female	62	3.84	0.56		
Taste				0.00	0.987
Male	21	4.19	0.98		
Female	62	4.19	0.67		
Smell				1.24	0.269
Male	21	3.86	0.99		
Female	62	4.08	0.72		

Table 17, continued

Comparison of Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Gender[a] *(N = 83)*

	n	Mean	*SD*	*F*	*p*
Comparative taste				0.59	0.445
Male	21	3.48	0.98		
Female	62	3.32	0.72		
Comparative smell				3.48	0.066
Male	21	3.00	0.45		
Female	62	3.29	0.66		
Psychosocial status				1.06	0.306
Male	21	3.23	1.15		
Female	62	3.51	1.05		
Overall food nutritional quality				2.37	0.127
Male	21	4.24	0.77		
Female	62	3.89	0.94		

[a] A one-way MANOVA was used to compare assisted living resident perceptions by gender.

Marital Status

Crosstab analyses using Pearson's chi-square test were conducted to examine the relationships between chewing ability, ADL level, and marital status (see Table 18). Results revealed a significant relationship between marital status and chewing ability, χ^2 (1) = 5.82, $p < .05$, Cramer's $V = .27$. A greater proportion of married residents indicated

that they were able to chew all 5 items (81.3%) compared to widowed residents (47.6%). In particular, there were only a few married residents (3) who were able to chew 4 items or fewer when compared to widowed residents (33). Thus, although not part of the planned analysis, a one-way ANOVA (marital status: married vs. widowed) was conducted on age to determine whether widowed residents were older than married residents. The results revealed a significant effect for marital status, $F(1, 74) = 4.31$, $p < .05$. Widowed residents were significantly older ($M = 85.95$, $SD = 6.36$) than married residents ($M = 81.71$, $SD = 9.03$). These findings suggest that age may be influencing the relationship between marital status and chewing ability. The relationship between marital status and ADL level was not significant, *ns*.

Table 18

Assisted Living Residents' Perceptions of Activities of Daily Living Level and Chewing Ability by Marital Status[a] *(N = 79)*

	Married		Widowed			
	n	%	*n*	%	χ^2	*p*
ADL level					2.44	0.119
Need help with 0-1 tasks	15 (12.8)	93.8	48 (50.2)	76.2		
Need help with 2 or more tasks	1 (3.2)	6.3	15 (12.8)	23.8		
Chewing ability					5.82	0.016
Able to chew all 5 items	13 (8.7)	81.3	30 (34.3)	47.6		
Able to chew 4 or fewer items	3 (7.3)	18.8	33 (28.7)	52.4		

[a] Crosstab analysis with Pearson's chi-square tests were used to compare ADL level and chewing ability by marital status. Expected frequencies are in parentheses. Single and divorced respondents were not included in this analysis.

Independent samples t-tests were conducted to examine differences between married and widowed residents on ratings of food quality, service quality, overall foodservice quality, and overall foodservice satisfaction (see Table 19). Results failed to reveal significant differences between married and widowed residents on the quality and satisfaction measures.

Table 19

Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, and Overall Foodservice Satisfaction by Marital Status[a] *(N = 79)*

	n	Mean	*SD*	*t*	*p*
Food quality				0.94	0.350
Married	16	3.98	0.81		
Widowed	63	3.79	0.69		
Service quality				0.01	0.989
Married	16	3.95	1.03		
Widowed	63	3.94	0.78		
Overall foodservice quality				-1.78	0.079
Married	16	3.56	1.50		
Widowed	63	4.05	0.79		
Overall foodservice satisfaction				-0.28	0.778
Married	16	3.88	0.93		
Widowed	63	3.94	0.74		

[a] Separate independent samples *t*-tests were used to compare composite means for each measure. Single and divorced respondents were not included in this analysis.

A one-way (marital status: married vs. widowed) MANOVA was conducted to examine differences on behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. The overall multivariate effect was significant, F (9, 68) = 2.82, $p < .01$ (see Table 20). Results revealed a significant univariate effect for marital status on food consumption, F (1, 76) = 9.78, $p < .05$. Widowed residents indicated greater intent to eat in the dining room (M = 4.06, SD = .85) than married residents (M = 3.18, SD = 1.43). The results also revealed a significant univariate effect for marital status on taste functioning, F (1, 76) = 4.26, $p < .05$. Married respondents had greater average taste functioning (M = 4.53, SD = .55) compared to widowed respondents (M = 4.09, SD = .79). In addition, marital status had a significant effect on ratings of overall food nutritional quality, F (1, 76) = 5.13, $p < .05$. Married residents rated the overall food nutritional quality as higher (M = 4.47, SD = .64) than widowed residents (M = 3.89, SD = .94). Results failed to reveal significant univariate effects for marital status on behavioral intention loyalty, health status, smell functioning, comparative taste functioning, and psychosocial status, all *ns.*

One explanation for these findings could be that widowed individuals seek company and socialization during dining time, whereas married couples may either go out to eat more often or prepare more meals in their apartments/units. Previous research has also found that social factors including friendship, marital status, and companionship affect eating habits (Marcus & Berry, 1998). Less enjoyment of meals, poor appetites, and weight loss are often present in widowed individuals when compared to married

persons. Eating is not just for our functional stability; it also provides for socialism (time spent with family) and allows for individuals to celebrate unique walks of life, provide for memories, and practice individual cultures. It is often the one aspect of life that brings enjoyment to the elderly individual.

Table 20

Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Marital Status [a] *(N = 78)*

	n	Mean	*SD*	*F*	*p*
Behavioral intention – loyalty				0.01	0.911
Married	15	3.84	1.45		
Widowed	63	3.88	0.94		
Behavioral intention – food consumption				9.78	0.003
Married	15	3.18	1.43		
Widowed	63	4.06	0.85		
Health status				0.54	0.464
Married	15	4.00	0.60		
Widowed	63	3.88	0.57		
Taste				4.26	0.042
Married	15	4.53	0.55		
Widowed	63	4.09	0.79		
Smell				0.08	0.773
Married	15	4.07	1.05		
Widowed	63	4.00	0.74		
Comparative taste				0.02	0.892
Married	15	3.33	0.98		
Widowed	63	3.37	0.77		

Table 20, continued

Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Marital Status [a] *(N = 78)*

	n	Mean	*SD*	*F*	*p*
Comparative smell				0.45	0.504
Married	15	3.13	0.52		
Widowed	63	3.25	0.65		
Psychosocial status				0.22	0.642
Married	15	3.33	0.98		
Widowed	63	3.48	1.13		
Overall food nutritional quality				5.13	0.026
Married	15	4.47	0.64		
Widowed	63	3.89	0.94		

[a] A one-way MANOVA was used to compare composite means for each measure. Single and divorced respondents were not included in this analysis.

Education Level

Crosstab analyses using Pearson's chi-square test were conducted to examine the relationships between chewing ability, ADL level, and education level (see Table 21). Results revealed a significant relationship between education level and chewing ability, χ^2 (2) = 8.79, $p < .05$, Cramer's $V = .33$.

Table 21

Assisted Living Residents' Perceptions of Activities of Daily Living Level and Chewing Ability by Education Level[a] *(N = 83)*

	High school or less		Bachelor's degree or higher			
	n	%	*n*	%	χ^2	*p*
ADL level					0.67	0.413
Need help with 0-1 tasks	41 (39.6)	83.7	26 (27.4)	76.5		
Need help with 2 or more tasks	8 (9.4)	16.3	8 (6.6)	23.5		
Level of chewing ability					8.79	0.012
Able to chew all 5 items	22 (28.3)	44.9	26 (19.7)	76.5		
Able to chew 4 items	15 (10.6)	30.6	3 (7.4)	8.8		
Able to chew 3 or fewer items	12 (10.0)	24.5	5 (7.0)	14.7		

[a] Crosstab analysis with Pearson's chi-square test was used to compare ADL level and chewing ability by education level. Expected frequencies are in parentheses.

As shown in Table 21, a greater proportion of residents with a bachelor's degree or higher indicated that they were able to chew all 5 items (76.5%) compared to residents with a high school education or less (44.9%). The results may be due to the residents with higher education levels having more income and thus more access to dental insurance and care than those of lower education levels. The relationship between education level and ADL level, however, was not significant, *ns*.

Independent samples t-tests were conducted to examine differences between education levels on ratings of food quality, service quality, overall foodservice quality, and overall foodservice satisfaction (see Table 22). An independent sample *t*-test was conducted to examine the effect of education on perceived food quality, perceived service quality, overall foodservice quality and overall foodservice satisfaction. Results indicated that education had a marginally significant effect on overall foodservice satisfaction, t (81) = 1.95, p = .054. Those who had a high school degree or less were marginally more satisfied (M = 4.08, SD = .74) than those with a bachelor's degree or higher (M = 3.75, SD = .77). Results failed to reveal significant differences between education levels on the other measures, including food quality, service quality, and overall foodservice quality, all *ns*.

A one-way (education level: high school or less vs. bachelor's or higher) MANOVA was conducted to examine differences on behavioral intention loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality. The overall multivariate effect was significant, F (9, 73) = 2.98, $p < .01$. Examination of the univariate effects revealed a significant effect for education on psychosocial status, F (1, 81) = 4.06, $p < .05$ (see Table 23). Residents with a high school degree or less had significantly higher psychosocial status (M = 3.63, SD = 1.02) compared to residents with a bachelor's degree or higher (M = 3.15, SD = 1.11).

Table 22

Assisted Living Residents' Perceptions of Food Quality, Service Quality, Overall Foodservice Quality, and Overall Foodservice Satisfaction by Education Level[a] *(N = 83)*

	n	Mean	*SD*	*t*	*p*
Food quality				0.20	0.840
High school or less	49	3.84	0.69		
Bachelor's degree or higher	34	3.81	0.77		
Service quality				1.12	0.264
High school or less	49	4.03	0.86		
Bachelor's degree or higher	34	3.83	0.72		
Overall foodservice quality				1.28	0.206
High school or less	49	4.10	0.82		
Bachelor's degree or higher	34	3.82	1.17		
Overall foodservice satisfaction				1.95	0.054
High school or less	49	4.08	0.74		
Bachelor's degree or higher	34	3.75	0.77		

[a] Separate independent samples *t*-tests were used to compare composite means for each measure.

There was also a significant effect for education on comparative taste functioning, $F(1, 81) = 9.31$, $p < .01$. Respondents with a high school education or less had greater comparative taste functioning ($M = 3.57$, $SD = .82$) compared to respondents with a bachelor's degree or higher ($M = 3.06$, $SD = .65$).

Table 23

Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Education Level[a] *(N = 83)*

	n	Mean	*SD*	*F*	*p*
Behavioral intention – loyalty				2.50	0.118
High school or less	49	3.99	0.82		
Bachelor's degree or higher	34	3.63	1.29		
Behavioral intention – food consumption				3.21	0.077
High school or less	49	4.05	0.81		
Bachelor's degree or higher	34	3.65	1.26		
Health status				0.79	0.377
High school or less	49	3.86	0.63		
Bachelor's degree or higher	34	3.97	0.47		
Taste				0.33	0.569
High school or less	49	4.15	0.69		
Bachelor's degree or higher	34	4.25	0.85		
Smell				1.38	0.243
High school or less	49	3.94	0.78		
Bachelor's degree or higher	34	4.15	0.81		
Comparative taste				9.31	0.003
High school or less	49	3.57	0.82		
Bachelor's degree or higher	34	3.06	0.65		
Comparative smell				5.45	0.022
High school or less	49	3.35	0.69		
Bachelor's degree or higher	34	3.03	0.46		
Psychosocial status				4.06	0.047
High school or less	49	3.63	1.02		
Bachelor's degree or higher	34	3.15	1.11		

Table 23, continued

Assisted Living Residents' Perceptions of Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality by Education Level[a] *(N = 83)*

	n	Mean	*SD*	*F*	*p*
Overall food nutritional quality				0.88	0.352
High school or less	49	3.90	0.87		
Bachelor's degree or higher	34	4.09	0.97		

[a] A one-way MANOVA was used to compare composite means between groups.

Finally, the results revealed a significant effect for education on comparative smell functioning, F (1, 81) = 4.06, $p < .05$. Respondents with a high school education or less had greater comparative smell functioning (M = 3.35, SD = .69) compared to respondents with a bachelor's degree or higher (M = 3.03, SD = .46). Results failed to reveal significant effects for education level on the other measures, including behavioral intention loyalty, behavioral intention food consumption, health status, current taste and smell functions, and overall food nutritional quality, all *ns*.

Age

Pearson product moment correlations were conducted to examine the relationships between age and the other continuous measures (food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intention

loyalty, behavioral intention food consumption, health status, taste and smell functions, psychosocial status, and overall food nutritional quality). As shown in Table 24, results failed to reveal any significant relationships between age and the other measures, all *ns*. An independent samples t-test was also conducted to determine whether residents differed in level of ADL functioning based on age (see Table 25). Results failed to reveal significant differences, t (78) = -1.83, p = .072. A one-way (chewing ability: 5 items vs. 4 items vs. 3 or less) ANOVA based on age also failed to reveal a significant effect for chewing ability, *ns* (see Table 26).

Table 24

Pearson's Correlation Coefficients between Age and Foodservice Quality, Service Quality, Overall Foodservice Quality, Overall Foodservice Satisfaction, Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality (N = 85)

	Age
Food quality	0.044
Service quality	0.121
Overall foodservice quality	0.180
Overall foodservice satisfaction	0.151
Behavioral intention – loyalty	0.145
Behavioral intention – food consumption	0.172
Health status	0.133

Table 24, continued

Pearson's Correlation Coefficients between Age and Foodservice Quality, Service Quality, Overall Foodservice Quality, Overall Foodservice Satisfaction, Behavioral Intention (Loyalty and Food Consumption), Health Status, Taste and Smell Functioning, Psychosocial Status, and Overall Food Nutritional Quality (N = 85)

	Age
Taste	-0.116
Smell	-0.179
Comparative taste	-0.033
Comparative smell	-0.067
Psychosocial status	0.039
Overall food nutritional quality	0.039

Table 25

Comparison of Age by Assisted Living Resident Activities of Daily Living Level[a] *(N = 80)*

	n	Mean	*SD*	*t*	*p*
ADL Level				-1.83	0.072
Need help with 0-1 tasks	64	83.81	7.67		
Need help with 2 or more tasks	16	87.63	6.54		

[a] An independent samples *t*-test was used to compare age for each group.

Table 26

Comparison of Age by Assisted Living Residents' Chewing Ability[a] *(N = 80)*

	n	Mean	*SD*	*F*	*p*
Age				0.53	0.590
Able to chew all 5 items	45	84.33	8.18		
Able to chew 4 items	18	86.11	5.74		
Able to chew 3 or fewer items	17	83.59	7.79		

[a] A one-way ANOVA was used to compare age between groups.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was to examine the impact of various demographic characteristics and factors associated with aging on resident satisfaction, perception of food and service quality, and behavioral intentions regarding foodservice provided in assisted living facilities. These factors included: (1) demographic variables of age, gender, marital status, education level, health status, and length of residency, (2) resident perceptions of overall health, sensory changes, oral function, and functional ability. In addition, the relationship between the facility's dominant foodservice theme and resident perceptions of quality, satisfaction, behavioral intentions, psychosocial status, functional status, and health status were investigated.

Eighty-five residents in six assisted living facilities participated in the current study. These included two facilities with a restaurant/resort theme, two with a medical/health theme, and two with a home-style theme.

Hypotheses Testing

Results of null hypotheses tested for this study are as follows:

H_{01}: There will be no significant differences in resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, health status, and overall food nutritional quality based on the type of the assisted living

facility in which they reside. This hypothesis was rejected for relationships between service quality and overall foodservice satisfaction based on type of assisted living facility. However, results failed to reject the hypotheses regarding relationships between food quality, overall foodservice quality, overall foodservice satisfaction, behavioral intention (loyalty and food consumption), psychosocial status, health status, and overall food nutritional quality related to type of assisted living facility.

H_{02}: There will be no significant relationships between resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, health status, taste, smell, and overall food nutritional quality. This hypothesis was rejected for most of the relationships between food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), health status, taste, comparative taste, and overall food nutritional quality. However, results failed to reject this hypothesis for relationships between service quality and psychosocial status; overall foodservice quality and health status, behavioral intentions (food consumption) and taste; health status and psychosocial status; psychosocial status and taste; and comparative taste and smell. Results also failed to reject the hypotheses for relationships between smell and overall foodservice quality, overall foodservice satisfaction, behavioral intention loyalty, psychosocial status, and overall food nutritional quality. In addition, results failed to reject the hypotheses for relationships between comparative smell and food quality, service quality, overall foodservice quality, health status, psychosocial status, and overall food nutritional quality.

H_{03}: There will be no significant differences between resident perceptions of food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, health status, and overall food nutritional quality based on the following variables: gender, marital status, and education level. This hypothesis was rejected for differences in behavioral intention food consumption based on gender. It was also rejected for behavioral intention food consumption and overall food nutritional quality based on martial status and for comparative taste, comparative smell, and psychosocial status based on education. Results failed to reject this hypothesis for the other variables.

H_{04}: There will be no significant relationships between food quality, service quality, overall foodservice quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), psychosocial status, taste, smell, and health status based on the following variables: age, length of residency.

Results failed to reject this hypothesis based on age. Results did reject this hypothesis for the relationship between taste and length of residency, but failed to reject the hypothesis for relationships between the other variables and length of residency.

H_{05}: There will be no significant differences in ADL level and chewing ability based on the following variables: type of assisted living facility, gender, marital status, education level, age, and length of residency.

This hypothesis was rejected regarding differences in ADL level based on type of assisted living facility. However, results failed to reject this hypothesis regarding differences in ADL level based on gender, marital status, education level, age, and length

of residency. This hypothesis was rejected regarding differences in chewing ability based on marital status and education level. However, results failed to reject H_{05} regarding differences in chewing ability based on type of assisted living facility, gender, age, and length of residency.

Summary

Type of Assisted Living Facility

The current findings revealed that respondents from different themes of facilities differed significantly in their ratings of service quality and that residents at home-style assisted living facilities rated service quality more highly than those at restaurant/resort facilities. Those residing in home-style theme facilities also had higher levels of overall foodservice satisfaction when compared to residents of medical/health theme facilities. In terms of activities of daily living, functional status of residents was higher in home-style theme facilities than the restaurant/resort theme facilities. A greater percentage (93.5%) of residents in home-style facilities needed help with only zero or one ADL tasks, and only 6.5% needed help with two or more tasks. Overall, it appears that in all other areas, residents of the three types of assisted living facilities had similar levels of satisfaction with the food and service.

Relationships between Resident Perceptions

Furthermore, ratings of higher food quality were related to higher service quality ratings, higher overall foodservice quality, higher overall foodservice satisfaction, and higher behavioral intentions (loyalty and food consumption). Furthermore, higher service quality ratings were associated with higher overall service quality satisfaction and overall

foodservice satisfaction. Lastly, higher service quality ratings were related to higher behavioral intentions (loyalty and food consumption). Therefore, overall food and service quality could significantly impact residents' satisfaction regarding the food and services provided.

As for overall health and sensory changes, residents who rated health status higher also rated their tasting and smell ability higher. In addition, if residents rated their tasting and smell ability higher, they also rated their comparative tasting ability higher. Furthermore, if residents rated their tasting ability higher, their smelling ability was higher as well. Better tasting ability was also related to higher ratings of food nutritional quality. Lastly, residents who perceived better health status and sensory function also perceived food and service quality to be higher.

Effect of Demographic Variables

Gender. In regard to gender, females had significantly higher behavioral intentions regarding food consumption in the dining facility compared to males. As previously discussed, many females who are widowed often expressed their intentions of eating in the dining room more rather than preparing their own meals.

Marital status. Furthermore, widowed individuals also intended to eat more frequently in the dining room most likely due to the companionship and socialization aspect of dining. However, married couples had significantly higher perceptions of taste and overall food nutritional quality compared to widowed individuals. Also, a significantly greater proportion of those who were married perceived ability to chew all five items on the chewing ability scale compared to those who were widowed.

Education level. In this study, 49 participants had a high school education or less while 34 had a Bachelor's degree or higher. Residents who had high school or less education had significantly higher perceptions of comparative taste, comparative smell, and psychosocial status compared to those residents with a Bachelor's degree or higher.

Age. Respondents in this study ranged in age from 58 to 99 years. Statistical analyses revealed no significant relationships between resident age and ADL level or chewing ability. There were also no significant correlations between age and resident perceptions of food and service quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), health status, taste and smell, psychosocial status, and overall food nutritional quality.

Length of residency. Length of residency for the 85 study participants ranged from one month to 24 years with a mean of 2 years and 8 months. There was no significant relationship between length of residency at an assisted living facility and ADL level or chewing ability. There were also no significant correlations between length of residency and resident perceptions of food and service quality, overall foodservice satisfaction, behavioral intentions (loyalty and food consumption), health status, taste and smell, psychosocial status, and overall food nutritional quality.

Conclusions

Satisfaction in assisted living facilities in regard to food and service quality may be a significant predictor of residents' intentions to dine in the dining room. Also, functional, sensory, and health status have significant relationships with perceived quality. Furthermore, overall satisfaction was related to the residents' health status.

As results revealed, more satisfaction was found with the home-style theme in the current study. Incorporating the aspects of the home-style theme into today's assisted living may ultimately increase customer satisfaction. The home-style theme may provide more satisfaction ratings among elderly individuals due to the autonomy they experience in regard to mealtimes and the menus are more tailored to individual preference. This particular theme creates an environment almost like that individuals experienced when they lived in their own homes.

A previous study by Chao, Dwyer, Houser, Tennstedt, and Jacques (2008), showed that a majority of experts favored a combined service emphasis of home-style, restaurant/resort, and medical/health style for assisted living facilities for areas of dining room environment, meal services, meal quality, nutrition services, employees' qualifications. However, they favored a medical/health theme for therapeutic nutrition. Optimal care in assisted living facilities requires a change in the philosophy of care from one that is focused on service provision and meeting care needs to one that is focused on optimal health and function for each resident.

Limitations

The results of the present study should be interpreted with caution. The study was conducted in the north Texas region with participants from six assisted living facilities (two per foodservice theme); therefore, the sample may not be representative nationally. Further research will be needed to determine significant trends in assisted living facilities nationally and to study assisted living facilities based on themes.

Another limitation was the sample size. Although the goal was to obtain

approximately 150 respondents, only 85 usable responses were obtained. One reason for the lack of participation and completed surveys could be due to the short attention span and patience of most assisted living residents. Many residents felt the survey was too time consuming and lengthy. A third limitation was that some of the rating scales did not print consecutively on all of the pages for the resident to refer to the rating scale for each question. As a result, residents often had to flip back to the previous page to refer to the ratings for each specific question and some were confused and frustrated. Another limitation was that residents may not have understood all of the questions and terminology. For example, several residents reported that they did not understand the term "hypertension". For future reference, the term should be changed from "hypertension" to "high blood pressure" for simplicity and better comprehension in appropriately filling in the responses referring to chronic diseases. Lastly, another limitation is self-reported data.

Another limitation was that a pilot test was not performed for the additional survey questions to test the reliability of questions. The survey questions were included to provide background information on the residents' responses regarding the nutritional quality of food and whether they needed assistance in selecting foods for good health. Furthermore, the section of the survey inquired on whether a resident would be interested in nutrition counseling and education if a registered dietitian were available. Lastly, open-ended questions were included to inquire on what residents liked or disliked about the meals at their particular assisted living facility.

Recommendations

As a result of the current research, significant differences were found between the foodservice assisted living theme and resident perceptions of quality variables and functional status. Further research needs to be performed assessing differences nationally between quality measures and health status based on assisted living themes.

A future, proposed theme that fosters an attractive eating environment with attention to the aesthetics of the eating milieu and social interactions of the residents is a consistent goal among the majority of experts (from nutrition, health, and aging services disciplines; Chao & Dwyer, 2004). In addition, the combined theme has waiter services and portion control as well as scheduled meals with flexible services. For example, if residents have appointments they can still receive a meal when they return to the facility. Moreover, reasonable and moderate choices are extended to the residents along with food items of high sensory appeal. Menus are planned and evaluated by a registered dietitian in order to meet nutritional requirements. Lastly, nutrition education and counseling services are available. The ultimate goal would be for policymakers, administrators, foodservice managers, and healthcare professionals to combine all three of the assisted living themes into the fourth theme discussed in the review of literature which is the future assisted living or hybrid theme.

The overall quality of life and health status of the elderly is essential to the successful aging of assisted living residents. Improving the nutrition services would benefit both residents and administrators in regard to enhanced quality of life and profitable returns to the facilities. Improving satisfaction and health and nutritional status

may prolong residents' independence. Furthermore, if administrators, policymakers, foodservice directors, and healthcare professionals (particularly registered dietitians) collaborated to design assisted living facilities that incorporated all aspects of the restaurant/resort theme, the medical/health theme, and the home-style theme, overall quality of life may significantly increase. In addition, more standard regulations may ensure improved quality and consistency throughout the assisted living spectrum of care. In today's assisted living facilities, there are few regulations concerning food and nutrition services. Furthermore, the regulations differ even within states. It could be an improvement to have regulations implemented nationally that are consistent across the board. Lastly, having a registered dietitian employed on-site or as a consultant can ensure that residents of assisted living facilities are aging in place with appropriate nutritional assessment and care that will enhance overall quality of life. Older individuals are living longer, and therefore, it is imperative to promote a good quality of life in their later years.

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APPENDIX A

Means and Standard Deviations for Individual Items for the Food Quality, Service Quality, and Overall Quality Scales

Means and Standard Deviations for Individual Items for the Food Quality, Service Quality, and Overall Quality Scales

	N	Mean	*SD*	Min.	Max.
Food Quality					
Foods taste good.	85	3.87	1.03	1	5
Foods are served at the appropriate temperature.	85	3.71	1.00	1	5
A variety of foods are offered.	85	3.94	0.82	1	5
The quality of food is consistent each time it is served.	85	3.73	1.08	1	5
The texture and tenderness of foods are appropriate.	85	3.69	0.99	1	5
The foods are served attractively.	85	3.88	0.88	1	5
The menu provides choices.	85	3.86	0.93	1	5
Service Quality					
The employees' appearances are neat.	84	3.93	1.00	1	5
The employees are well trained and competent in service skills.	85	3.66	1.15	1	5
The employees in the dining room are attentive to my needs.	85	3.79	1.01	1	5
The employees treat me with respect.	85	4.21	0.83	1	5
The employees use safe food handling practices.	84	4.00	0.98	1	5
The foods are served in the time promised.	85	3.85	1.02	1	5
The dining room is comfortable and easy to move around in.	85	4.05	0.90	1	5
Overall Quality					
Overall, the quality of food service is...	85	3.96	0.99	1	5

APPENDIX B

Means and Standard Deviations for Individual Items for the Satisfaction Scale

Means and Standard Deviations for Individual Items for the Satisfaction Scale

	N	Mean	*SD*	Min.	Max.
Satisfaction					
With the foods served, I feel…	85	3.95	0.84	2	5
With the service provided, I feel…	85	3.89	0.86	2	5
With the overall dining experience, I feel…	85	3.93	0.88	1	5

APPENDIX C

Means and Standard Deviations for Individual Items for the Behavioral Intention (Loyalty and Food Consumption) and Health Status Scales

Means and Standard Deviations for Individual Items for the Behavioral Intention (Loyalty and Food Consumption) and Health Status Scales

	N	Mean	*SD*	Min.	Max.
Loyalty					
I will say positive things about the dining services to others.	85	3.86	1.06	1	5
I will invite my friends and family to dine with me when they visit the next time.	84	3.83	1.21	1	5
I will recommend the dining service to my friends if they seek an assisted living facility with good foodservice.	85	3.85	1.16	1	5
Food Consumption					
I intend to eat more of the food served in the dining room in the next three weeks.	84	3.83	1.12	1	5
I intend to eat lunch in the dining room more often in the next three weeks.	84	3.99	1.06	1	5
I intend to eat dinner in the dining room more often in the next three weeks.	84	3.77	1.19	1	5
Health					
How would you rate your health in general?	84	3.81	0.63	2	5
For your age, would you say that your health status is:	85	3.93	0.67	2	5
Compared to other people of your age, how would you rate your health status at the present time?	84	3.98	0.74	1	5

APPENDIX D

Means and Standard Deviations for Individual Items for the Taste Functioning, Smell Functioning, and Psychosocial Status Scales

Means and Standard Deviations for Individual Items for the Taste Functioning, Smell Functioning, and Psychosocial Status Scales

	N	Mean	*SD*	Min.	Max.
Smell					
How would you rate your present sense of smell?	85	3.93	0.88	2	5
Are you satisfied with your present smell function?	85	4.08	0.79	2	5
Compared with before, your sense of smell is:	85	3.22	0.62	2	5
Taste					
How would you rate your present ability to taste food?	85	4.19	0.81	2	5
Are you satisfied with your present taste function?	85	4.19	0.76	1	5
Compared with before, your sense of taste is:	85	3.36	0.78	2	5
Psychosocial					
How often has someone been right there with you in a stressful situation?	85	3.40	1.35	1	5
How often has someone comforted you by showing you physical affection?	83	3.40	1.34	1	5
How often has someone listened to you talk about your private feelings?	84	3.20	1.39	1	5
How often has someone expressed interest and concern in your well-being?	85	3.73	1.18	1	5

APPENDIX E

TWU Institutional Review Board Approval Letter

TWU
TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail: IRB@twu.edu

February 4, 2009

Ms. Melissa A. Strohl
1902 South Highway 121, Apt. 1007
Lewisville, TX 75067

Dear Ms. Strohl:

Re: Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and appears to meet our requirements for the protection of individuals' rights.

If applicable, agency approval letters must be submitted to the IRB upon receipt PRIOR to any data collection at that agency. A copy of the approved consent form with the IRB approval stamp and a copy of the annual/final report are enclosed. Please use the consent form with the most recent approval date stamp when obtaining consent from your participants. The signed consent forms and final report must be filed with the Institutional Review Board at the completion of the study.

This approval is valid one year from February 4, 2009. According to regulations from the Department of Health and Human Services, another review by the IRB is required if your project changes in any way, and the IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board.

Sincerely,

Dr. David Nichols, Chair
Institutional Review Board - Denton

enc.

cc. Dr. Chandan Prasad, Department of Nutrition & Food Sciences
Dr. Carolyn M. Bednar, Department of Nutrition & Food Sciences
Graduate School

APPENDIX F

Administrator Cover Letter

Dear Administrator:

A research team from the Department of Nutrition and Food Sciences at Texas Woman's University is conducting a survey in order to evaluate service quality and satisfaction of foodservice in assisted living facilities. As an administrator of (Name of Assisted Living Facility), you have been invited to participate in this study. The purpose of our study is to examine various physiological/psychosocial factors associated with the aging process and their impact on residents' service quality evaluations and satisfaction with the dining experience and residents' and nutritional status. Furthermore, we would like to determine whether the service model of food and nutrition services has a significant effect on resident satisfaction, quality of service, functional status, and nutritional status of the resident. Results of this study will further assist (Name of Assisted Living Facility) in improving food and service quality and enhancing the quality of life of residents in assisted living facilities.

A survey will be presented to all residents of the facility of which the completion of the survey is voluntary. I, Melissa A. Strohl, will be present if residents require assistance in recording responses or reading questions. All responses will remain confidential and completed surveys will be returned to myself, (Name of Director), or the specified collection box by (Date). I will also obtain information from the administrator to determine the characteristics/descriptors of the dining room amenities; foodservice operation; general nutrition services; and if there are clinical/therapeutic nutrition services as well as regulations governing food and nutrition services.

Your permission to conduct this survey will be valuable to the success of this study. If you have any questions or concerns regarding this study, please feel free to contact Dr. Carolyn M. Bednar at 940-898-2658 or CBednar@mail.twu.edu, or Ms. Melissa A. Strohl at 940-395-7427 or MStrohl@mail.twu.edu.

Thank you for your time and assistance towards the completion of this study!

Sincerely,

Melissa A. Strohl, R.D., L.D.
Graduate Student
Sciences

Carolyn M. Bednar, Ph.D., R.D., C.F.C.S.
Professor, Department of Nutrition & Food

TWU Graduate School

For questions regarding your rights as a participant or the manner of how the study is conducted, you may contact, the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

APPENDIX G

Resident Cover Letter

Dear Resident,

A research team from the Department of Nutrition and Food Sciences at Texas Woman's University is conducting a survey in order to evaluate service quality and satisfaction with foodservice in assisted living facilities. As a resident in (Name of Assisted Living Facility), you are being invited to participate in this study. The purpose of our study is to examine various physiological/psychosocial factors associated with the aging process and their impact on residents' service quality evaluations and satisfaction with the dining experience and residents' nutritional status. Results of this study will further assist (Name of Assisted Living Facility) in improving food and service quality and enhancing the quality of life of residents in assisted living facilities.

Your completion of this questionnaire will be valuable to the success of this study. Please take a few minutes to complete this questionnaire. However, your participation is voluntary and your response will remain confidential. A summary of results will be reported at the conclusion of the study. I, Melissa A. Strohl, will be present if you require assistance in recording responses or reading questions. Return of completed questionnaires indicates your voluntary participation. This letter does not need to be returned with the questionnaire, but you may keep it for your records. **PLEASE RETURN THE QUESTIONNAIRE TO MYSELF, MELISSA A. STROHL, (Name of Director), OR IN THE SPECIFIED COLLECTION BOX BY (Date).**

If you have any questions or concerns regarding this study, please feel free to contact Dr. Carolyn M. Bednar at 940-898-2658 or CBednar@mail.twu.edu, or Ms. Melissa A. Strohl at 940-395-7427 or MStrohl@mail.twu.edu.

Thank you for your time and assistance towards the completion of this study!

Sincerely,

Melissa A. Strohl, R.D., L.D.
Graduate Student
Sciences

Carolyn M. Bednar, Ph.D., R.D., C.F.C.S.
Professor, Department of Nutrition & Food

TWU Graduate School

For questions regarding your rights as a participant or the manner of how the study is conducted, you may contact, the Texas Woman's University Office of Research and Sponsored Programs at 940-898-3378 or via e-mail at IRB@twu.edu.

APPENDIX H

TWU Consent Form

TEXAS WOMAN'S UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH

Title: Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status

Investigator: Melissa Strohl, R.D., L.D.....940/395-7427

Advisor: Carolyn Bednar, Ph.D., R.D, L.D.....940/898-2658

Explanation and Purpose of the Research

You are being asked to participate in a research study for Ms. Strohl's thesis at Texas Woman's University. The purpose of this research is to examine the impact of various demographic characteristics and factors associated with aging on resident satisfaction, perception of food and service quality, and behavioral intentions regarding foodservice provided in assisted living facilities.

Research Procedures

The investigator will discuss the purpose of the study, benefits, and instructions for completing the questionnaire with assisted living residents as a group. Questionnaires will be distributed and assistance will be provided to those who require help in reading and/or understanding the survey questions. You may complete the questionnaire at this time or at a later time. A collection box will be placed in the facility where you can return completed questionnaires. Your maximum total time commitment in the study is approximately forty-five minutes to one hour.

Potential Risks

A potential risks related to your participation in the study is release of confidential information. However, confidentiality will be protected to the extent that is allowed by law. To avoid this risk, all questionnaires will be labeled by numbers. Names will not be requested. Only the investigator and her advisor will have access to data, which will be stored in a locked file cabinet in Dr. Bednar's office. Data will be stored until study results have been presented and published. It is anticipated that the results of this study will be published in the investigator's thesis as well as in other research publications. However, no names or other identifying information will be included in any publication. Data will be shredded with the use of a paper shredder. Identifiable data stored on or in computer files will be deleted from main folders and the recycle bin to ensure all data is no longer retrievable.

Participant Initials

Another possible risk to you as a result of your participation in this study is the potential to experience emotional discomfort or coercion when answering survey questions. If you feel that you would be affected, you can choose not to participate. If you choose to participate, you will indicate that you are aware of these circumstances and still agree to voluntary fill out the survey.

The researchers will try to prevent any problem that could happen because of this research. You should let the researchers know at once if there is a problem and they will help you. However, TWU does not provide medical services or financial assistance for injuries that might happen because you are taking part in this research.

Participation and Benefits

Your involvement in this research is completely voluntary, and you may discontinue your participation in the study at any time without penalty. This study will benefit you because it will offer additional information in regard to enhancing your quality of life and the overall satisfaction you have with the current assisted living facility with which you reside in. Furthermore, you will receive a gift bottle of body lotion for participating in the study. At the conclusion of Ms. Strohl's thesis (Spring/Summer 2008), Ms. Strohl will go to the facilities to explain the results of the study. You will be provided with the results of the study through a handout that summarizes the main points in addition to Ms. Strohl's verbal presentation.

Questions Regarding the Study

During the study, you will be given the opportunity to ask any questions or concerns that you may have. If you have questions outside the scheduled appointment, you can contact Ms. Strohl or Dr. Bednar by calling the telephone numbers provided to you at the top of this form. If you have questions about your rights as a participant in this research or the way this study has been conducted, you may contact the Texas Woman's University Office of Research and Sponsored Programs at 940 898-3378 or via e-mail at IRB@twu.edu. You will be given a copy of this signed and dated consent form to keep.

Signature of Participant _____ Date _____

Participant Initials _____

APPENDIX I

Assisted Living Resident Questionnaire

EVALUATION OF SERVICE QUALITY

INSTRUCTIONS: The following set of statements asks for your opinion regarding the foodservice at (Name of Assisted Living). Using the scale below, please indicate the extent to which you agree with the statement as it pertains to the foodservice at (Name of Assisted Living). Please circle your response using the scale indicated. There are no right or wrong answers. Feel free to honestly express your opinions. Your participation is appreciated. The return of your completed questionnaire constitutes your informed consent to act as a participant in this research.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Foods taste good.	1	2	3	4	5
2. Foods are served at the appropriate temperature (hot food is hot, cold food is cold).	1	2	3	4	5
3. A variety of foods are offered.	1	2	3	4	5
4. The quality of food is consistent each time it is served.	1	2	3	4	5
5. The texture and tenderness of foods are appropriate.	1	2	3	4	5
6. The foods are served attractively.	1	2	3	4	5
7. The menu provides choices.	1	2	3	4	5

1

8. The employees' appearances are neat.	1	2	3	4	5
9. The employees are well trained and competent in service skills.	1	2	3	4	5
10. The employees in the dining room are attentive to my needs.	1	2	3	4	5
11. The employees treat me with respect.	1	2	3	4	5
12. The employees use safe food handling practices.	1	2	3	4	5
13. The foods are served in the time promised.	1	2	3	4	5
14. The dining room is comfortable and easy to move around in.	1	2	3	4	5

2

OVERALL PERCEPTION OF FOODSERVICE

	Very Poor	Poor	Neutral	Good	Very Good
1. Overall, the quality of foodservice is	1	2	3	4	5
	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
2. With the foods served, I feel	1	2	3	4	5
3. With the service provided, I feel	1	2	3	4	5
4. With the overall dining experience, I feel	1	2	3	4	5
	Extremely Unlikely	Unlikely	Neutral	Likely	Extremely Likely
5. I will say positive things about the dining services to others.	1	2	3	4	5
6. I will invite my friends and family to dine with me when	1	2	3	4	5

they visit the next time.					
7. I will recommend the dining service to my friends if they seek an assisted living facility with good foodservice.	1	2	3	4	5
8. I intend to eat more of the food served in the dining room in the next three weeks.	1	2	3	4	5
9. I intend to eat lunch in the dining room more often in the next three weeks.	1	2	3	4	5
10. I intend to eat dinner in the dining room more often in the next three weeks.	1	2	3	4	5

4

ABOUT YOURSELF

INSTRUCTIONS: The following set of statements asks for information about your physical status and health status related to food intake. The information will be used to identify how those factors impact your evaluation. Using the scale below, please indicate the extent to which you perceived of the statement. The information will be kept confidential. No individual information will be reported.

	Very Bad	Bad	Fair	Good	Excellent
1. How would you rate your health in general?	1	2	3	4	5
2. For your age, would you say that your health status is:	1	2	3	4	5
3. Compared to other people of your age, how would you rate your health status at the present time?	1	2	3	4	5
4. How would you rate your present ability to taste food?	1	2	3	4	5
5. Are you satisfied with your present taste function?	1	2	3	4	5
	Much Worse	Worse	The Same	Better	Much Better
6. Compared with before, the taste of food currently is:	1	2	3	4	5

	Very Bad	Bad	Fair	Good	Excellent
7. How would you rate your present sense of smell?	1	2	3	4	5
8. Are you satisfied with your present smell function?	1	2	3	4	5
	Much Worse	Worse	The Same	Better	Much Better
9. Compared with before, your sense of smell is:	1	2	3	4	5
10. Are you able to chew a piece of fresh carrot?				Yes	No
11. Are you able to chew fresh lettuce?				Yes	No
12. Are you able to chew boiled peas or beans?				Yes	No
13. Are you able to chew steaks, chops, or firm meats?				Yes	No
14. Are you able to bite a whole fresh apple without cutting?				Yes	No
15. Do you need assistance in bathing?				Yes	No
16. Do you need assistance in getting dressed?				Yes	No
17. Do you need assistance in going to the toilet?				Yes	No
18. Do you need assistance in feeding yourself (except pre-cutting meats and preparing foods)?				Yes	No
19. Can you control your urination and defecation?				Yes	No
20. Do you need assistance in moving in and out of bed/chair?				Yes	No

	Never	Seldom	Sometimes	Often	Always
21. How often has someone been right there with you in a stressful situation?	1	2	3	4	5
22. How often has someone comforted you by showing you physical affection?	1	2	3	4	5
23. How often has someone listened to you talk about your private feeling?	1	2	3	4	5
24. How often has someone expressed interest and concern in your well-being?	1	2	3	4	5

MORE ABOUT YOURSELF

1. What is your gender? _____ Male _____ Female
2. What is your marital status? _____ Single _____ Married
   _____ Widowed _____ Divorced
3. What is your living status? _____ Living alone
   _____ Living with your spouse
4. What year were you born? _____
5. What date did you move into (Name of Assisted Living)?
   _____ (Year) _____ (Month)
6. What is your highest education level?
   _____ Elementary School _____ High School _____ Bachelor Degree
   _____ Master Degree _____ PhD
7. How often do you eat in the dining room provided at (Name of Assisted Living)?
   Breakfast: _____times/per week Lunch: _____ times/per week
   Dinner: _____ times/per week Other: Please specify: _____
8. If you have one or more of the following chronic disease (s)/condition (s), please check all that apply below:
   ____ Cardiovascular Disease ____ Diabetes Mellitus
   ____ Hypertension ____ Obesity
   ____ Osteoporosis ____ Cancer

ADDITIONAL SURVEY QUESTIONS

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Foods have excellent nutritional quality	1	2	3	4	5
2. Do you feel you need some help in selecting foods for good health?				Yes	No
3. If a registered dietitian were available, would you be interested in nutrition counseling and education?				Yes	No

4. What do you like best about the meals at (Name of Assisted Living)?

_____

_____

5. What do you like least about the meals at (Name of Assisted Living)?

_____

_____

* "A registered dietitian is a healthcare professional who has completed a nutrition-related degree which includes a rigorous course of study in the scientific areas of biochemistry, human anatomy and physiology, and nutrition classes. They

also must complete an internship or supervised practice experience and pass a national board examination in order to earn the credentials R.D. (registered dietitian)."

APPENDIX J

Assisted Living Administrator Approval Letters

Hearthstone
ASSISTED LIVING
At Vista Ridge

February 11, 2008

Jennifer Anderson
Hearthstone @ Vista Ridge
400 Highland Drive
Lewisville, TX 75067

Dear Human Subject Review Committee:

It is my understanding that Melissa A. Strohl will be conducting a research study at Hearthstone @ Vista Ridge on "Relationship between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status."
Ms Strohl has informed me of the design of the study as well as the targeted population.

I support this effort and will provide any assistance necessary for the successful implementation of this study. If you have any questions, please do not hesitate to call. I can be reached at (972) 315-1532.

Sincerely,

Jennifer Anderson

Jennifer Anderson
General Manager
Hearthstone @ Vista Ridge

November 26, 2008

Dear Human Subjects Review Committee:

It is my understanding that Melissa A. Strohl will be conducting a research study at Lakewood Village Assisted Living on "Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status". Ms. Strohl has informed me of the design of the study as well as the targeted population.

I support this effort and will provide any assistance necessary for the successful implementation of this study. If you have any questions, please do not hesitate to call. I can be reached at (817)451-8001.

Sincerely,

Laura Myles
Assisted Living Director

APPROVED
12/10/2008

MERRILL GARDENS

AT NORTH RICHLAND HILLS

June 13, 2008

Institutional Review Board
Texas Woman's University

Dear Committee Members:

This is to verify that we will allow Melissa A. Strohl to conduct a research study at Merrill Gardens at North Richland Hills on "Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status". Ms. Strohl has informed us of the purpose and design of the study as well as the targeted population. We understand that our residents will be asked to voluntarily complete a questionnaire that includes information on demographics and resident perceptions of satisfaction and health status.

We support Melissa's effort and will provide any assistance that we can, however, our staff will not be responsible for any part of the survey. If you have any questions, please do not hesitate to contact me at 817-577-3337.

Sincerely,

Martha A. Mattison
Executive Director

APPROVED

6/19/2008

MIRABELLA
ASSISTED LIVING

May 20, 2008

Institutional Review Board
Texas Woman's University

Dear Committee Members:

This is to verify that we will allow Melissa A. Strohl to conduct a research study at Mirabella Assisted Living on "Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status". Ms. Strohl has informed us of the purpose and design of the study as well as the targeted population. We understand that our residents will be asked to voluntarily complete a questionnaire that includes information on demographics and resident perceptions of satisfaction and health status.

We support this effort and will provide any assistance necessary for the successful implementation of this study. If you have any questions, please do not hesitate to contact me at 817-763-0088

Sincerely,

Rachel Randle

Rachel Randle
Mirabella Assisted Living

APPROVED
6/19/2008

4242 BRYANT IRVIN ROAD • BENBROOK TEXAS 76109 • 817 763 0088 FAX 817 763 8411 • WWW.MIRABELLAASSISTEDLIVING.C

STERLING HOUSE
BROOKDALE SENIOR LIVING

March 14, 2008

Institutional Review Board
Texas Woman's University

Dear Committee Members:

This is to verify that we will allow Melissa A. Strohl to conduct a research Study at Sterling house on the Parkway on "Relationship Between Assisted Living Facility Food service Theme and Residents' Satisfaction and Health Status". Ms. Strohl has informed us of the purpose and design of the study as well as the targeted population. We understand that our residents will be asked to voluntarily complete a questionnaire that includes information on demographics and resident perceptions of satisfaction and health status without disclosure of The facilities identification. Each resident and/or responsible party will provide write consent to taking part in the study and the facility will be provided a copy of each consent form.

We support this effort and will provide any assistance necessary for the successful Implementation of this study. If you have any questions, please do not hesitate to contact me at 940-320-1926.

Sincerely,

Clay Stephenson

Clay Stephenson

Executive Director

Sterling House on the Parkway

Sterling House on Parkway · 2525 Lillian Miller Parkway, Denton, Texas 76210
Telephone 940·320·1926 Fax 940·566·1360
License # 30309

January 30, 2009
Institutional Review Board
Texas Woman's University

Dear Committee Members:

This is to verify that we will allow Melissa A. Strohl to conduct a research study at the Veranda Preston Hollow on "Relationship Between Assisted Living Facility Foodservice Theme and Residents' Satisfaction and Health Status". Ms. Strohl has informed us of the purpose and design of the study as well as the targeted population. We understand that our residents will be asked to voluntarily complete a questionnaire that includes information on demographics and resident perceptions of satisfaction and health status.

We support this effort and will provide any assistance necessary for the successful implementation of this study. If you have any questions, please do not hesitate to contact me at 214-239-5735.

Sincerely,

Carolyn Cooper

Carolyn Cooper
Director of Assisted Living

Veranda Preston Hollow

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