

**Research Proposal: Evaluating Effectiveness of Process Changes in Long-Term Care
(LTC) Food Service Facilities: Improving Resident Satisfaction**

Benjamin A. Mohr, RDN, CD

Submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Dietetics
Mount Mary University

Janine M. Bamberger, MS, RDN, CD

Assistant Professor, Department of Dietetics

Megan Maritato, MS, RDN, CD, NASM-CPT

Associate Professor, Director Dietetic Internship, Department of Dietetics

December 11, 2022

© Copyright by Benjamin A. Mohr
2022

ALL RIGHTS RESERVED

Copyright Statement

The copy of this thesis is protected under the U.S. Copyright Act. This thesis may be consulted by you, provided you comply with the provisions of the Act, including those governing fair use, and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not distribute copies to others.
- Authors control the copyright of their thesis. You will recognize the author's right to be identified as the author of this thesis, and due acknowledgement will be made to the author where appropriate.

You will obtain the author's permission before publishing any material from their thesis.

Abstract

Residents of long-term care (LTC) facilities are often at an increased risk for developing malnutrition. Yet, many residents of long-term care facilities often complain about the food they receive. There are a number of ways a food service operation can influence LTC residents' satisfaction with food service. The purpose of this proposal is to recommend a study that analyzes the effect increased staff training, changes to food service, and changes to the dining environment have on LTC residents' satisfaction with food service and their risk for malnutrition. It is hypothesized that each performance improvement project will result in an improvement in overall satisfaction and decrease in risk for malnutrition. The 16-week prospective cohort study will have a maximum of 30 participants. Data will be collected from residents' electronic medical records and questionnaires. Anticipated results indicate that there would be a mild increase in food service satisfaction with each intervention; however, the only intervention to result in a significant increase in satisfaction would be changes to meal service with the addition of meal options ($p < 0.05$). We anticipate that the increase in meal options will also result in a significant decrease in risk for malnutrition ($p < 0.05$). We do not anticipate a significant difference in food service satisfaction or risk of malnutrition with the interventions for staff training or changes to the dining environment. The proposed study will provide knowledge to the LTC facilities' food service department regarding which performance improvements can result in significant increases in food service satisfaction and reduction in risk for malnutrition. Participants of this study will be able to be included in this study without any changes to their daily activities and orders in a LTC facility.

Keywords: long-term care, food service, performance improvement, satisfaction, malnutrition

Table of Contents

<i>List of Table</i>	6
Chapter 1: Introduction	7
Background	7
Problem Statement	8
Purpose of the Study	8
Research Question and Hypotheses	9
Nature of the Study	10
Definitions	11
Assumptions	12
Limitations	12
Delimitations	13
Significance	13
Summary	14
Chapter 2: Review of the Literature	15
Literature Research Strategy	15
Background	16
Literature Review	17
Food Service Satisfaction: Factors Influencing Satisfaction	17
Food Service Satisfaction: Improved Staff Training	21
Food Service Satisfaction: Changes to Food Service	25
Food Service Satisfaction: Influence of Changes to Food	26
Food Service Satisfaction: Influence of Changes to Mealtime Experience	28

Research Methodology	32
Summary.....	32
<i>Chapter 3: Design and Methodology.....</i>	<i>35</i>
Research Design	35
Data Collection Process	42
Data Analysis Plan	44
Threats to Validity	47
Ethical Procedures	47
Summary.....	48
<i>Chapter 4: Results.....</i>	<i>49</i>
Baseline Characteristics	49
Weight Changes	51
MNA-SF Scores.....	52
Meal Intake.....	53
Overall Food Service Satisfaction.....	54
Summary.....	55
<i>Chapter 5: Discussion.....</i>	<i>57</i>
Interpretation of Results	57
Characterization of the Study Population	57
Customer Service Training	58
Changes to Meal Service	58
Changes to Dining Environment	58
Comparison to Other Studies	59

Strengths and Limitations..... 60

Conclusion 61

References 62

Appendix A..... 67

Appendix B..... 69

Appendix C..... 71

Appendix D..... 72

List of Table

Table 1:	Research Questions and Variables.....	38
Table 2:	Description of Variables.....	45
Table 3:	Baseline Characteristics of Participants.....	50
Table 4:	Summary of Results	51
Table 5:	Changes in Weight	52
Table 6:	Changes in MNA-SF Scores	53
Table 7:	Changes in Meal Intake	54
Table 8:	Changes in Overall Food Service Satisfaction.....	55

Chapter 1: Introduction

Residents living within a long-term care facility often have complaints about food service and the meals provided to them. These complaints are commonly related to quality and/or variety of the foods. Although catering to each individual's food preferences is not a realistic goal there are a number of things that can be improved to also improve long-term care residents' satisfaction. It is important for a food service operation to continuously work on improvements to provide a highest quality food service possible.

Many food service operations are functioning under strict budgeting requirements with limited time to work on changes. With the number of changes that could be implemented within the operation, having a better understanding of the effectiveness of different changes can help those with limited time choose which projects to start to improve the residents' satisfaction and improve their intake at meals in long term care facilities.

Background

Food service satisfaction in a long-term care facility and resident's intake at meals is something that all long-term care facilities must be aware of. With poor intake comes the increased risk of a resident developing malnutrition. It is estimated that anywhere from 35.2 to 52.6% of residents in a long-term care facility are at risk for developing malnutrition (Komisar & Hado, 2019). Malnutrition can result in a number of issues that can be detrimental to those in long-term care facilities. A few of the consequences of poor intake that result in malnutrition include reduced muscle and tissue mass, decreased mobility, increased risk for skin breakdown, a slower immune response, and an increased risk of mortality (Contributor, 2019). These issues can greatly affect a resident's quality of life. To reduce these risks, in a long-term care facility, providing a high quality food service operation is vital. In long-term care (LTC) food service

satisfaction has been correlated with resident's perception of their own quality of life (Burack et al., 2012). To help promote resident's satisfaction and intake there are many different types of improvements that can be done within a food service operation to help promote residents' satisfaction and intake including making changes to the food that is offered, having staff with high levels of customer service skills or changing the environment where residents are eating.

In long term care there are a number of factors that contribute to how resident's meals are prepared or presented. There are also a number of factors that affect resident's perception of meal service and how much they eat at each meal. In order to provide a highly satisfactory meal service where residents are meeting their nutritional needs, it is important to know which types of interventions promote the greatest satisfaction and intake for residents while also reducing the greatest risks for malnutrition.

Problem Statement

It is estimated that 35-52% of residents within a long-term care facility are at risk of malnutrition (Evidence profile). Malnutrition and undernutrition increase the risk of mortality and overall functional decline, but these are preventable and reversible conditions that can be improved upon with nutrition interventions. To reduce these risks, it is important to understand which process improvements within a food service department are effective for influencing a resident's satisfaction and intake at meals.

Purpose of the Study

The purpose of this study is to understand how the effectiveness of process improvement changes within a long-term care facility food service operation affect resident's satisfaction, intake, and risk for malnutrition. This study will help determine which process improvements yield the greatest improvements in each category and if there is a correlation between each.

Research Question and Hypotheses

Research Question

For residents living in a long-term care facility, how does employee training, food service style, and the dining environment affect resident satisfaction with food service and risk of developing malnutrition?

Hypotheses

H₀: Changes to staff training, meal options, and the dining environment will not result in significant improvements on LTC residents' satisfaction with food service and will not impact risk of malnutrition.

H_a: Changes to staff training, meal options, and the dining environment will result in significant improvements on LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 1:

Q: Do changes to long-term care food service staff training result in a significant increase in residents' satisfaction with food service and reduce residents' risk for malnutrition?

H₀₁: Changes to staff training will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a1}: Changes to staff training will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 2:

Q: Do changes to long-term care meal options result in a significant increase in residents' satisfaction with food service and reduce residents' risk for malnutrition?

H₀₂: Changes to meal options will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a2}: Changes to meal options will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 3:

Q: Do changes to long-term care dining environment result in a significant increase in residents' satisfaction with food service and reduce residents risk for malnutrition?

H₀₃: Changes to a long-term care dining environment will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a3}: Changes to a long-term care dining environment will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Nature of the Study

To assess the effectiveness of multiple food service performance improvement plans, each performance improvement plan will be implemented one at a time. This will allow for assessing changes to residents' satisfaction with surveys before and after implementation of each improvement plan. Mini nutrition assessments will be completed for each resident in order to assess changes in their risk for malnutrition. A prospective cohort study design will be used to follow the residents over a period of time as different factors and changes are implemented by the food service operation. ANOVA tests will be used to determine if there is a statistical difference in satisfaction levels or in resident risk for developing malnutrition.

Definitions

Long Term Care – Includes Assisted Living Facilities, Skilled Nursing Facilities and Transitional Care (definitions as defined by Merriam-Webster).

Assisted Living Facilities: facilities that offer housing and limited care that is designed for senior citizens who need some assistance with daily activities

Skilled Nursing Facilities: facilities that offer 24/7 skilled nursing care and have supervision of the care of each patient by a physician

Transitional Care: short-term inpatient care often provided after a surgery or a fall where a patient can be admitted for therapy until able to safely transition home or to another facility

Significant weight loss - a weight loss 5% body weight in 30 days, 7.5% in 90 days or 10% in 180 days.

Food Service Type – patient tray service, room service, cash operations cafeteria, Restaurant style

Malnutrition – lack of proper nutrition resulting in weight loss, muscle loss, subcutaneous fat loss, and/or reduced grip strength.

Diet Quality – dietary pattern or indication of variety across key food groups recommended in dietary guidelines.

Patient satisfaction – the measure of fulfillment and appeasement a patient feels about food related issues.

Assumptions

Assumptions of this study include:

- Participants will answer surveys honestly.
- Staff will assist all residents that require assistance with answering surveys honestly.
- Staff will document meal intake accurately.
- Residents' weights will be recorded consistently and accurately.
- Menu items will be prepared using standardized recipes.

Limitations

There are a few limitations within this study. One limitation is that the number of participants in the study will be small. This research involves observing responses to changes over time as the changes are implemented in food service provided to a maximum of 30 long-term care residents. A second limitation is that residents may be admitted and/or discharged throughout the duration of the study; this makes comparing the response to food service operation changes over time difficult to capture. A third limitation is related to the fact that residents in the sample do not represent those of a general long-term care facility as these are all military veteran and males. Staffing will be a limitation as well. With staffing challenges bring float staff to the facility that may not be familiar with the study being conducted. The staff that prepare their food are also the staff that help with resident's cares and may help with residents completing their surveys. This may leave room for bias and is an additional limitation. The final limitation is that the food vendor for the facility may change products during the duration of the

study making it difficult to create meals with standardized recipes that require consistent ingredients and brands.

Delimitations

This study will be conducted in a small long-term care facility which will help allow for more control with implementation of each change. The small LTC facility is the Milwaukee Veteran Affairs Community Homes which consists of three buildings with a maximum of 10 residents in each building. To participate in this study, participants will need to be long-term care residents within the Clement J. Zablocki Veteran Affairs Community Living Centers Community Homes. The participants will also need to have been in the facility for greater than 30 days. This will allow residents to have had the opportunity to eat each food item offered on the cycle menu offered. Participants will also need to be on a regular diet with no texture modifications and be considered alert and oriented x4 (someone who is alert and oriented to person, place, time and event) by their medical provider.

New admissions to facility, or residents that are considered short term stay, will be excluded from this study. Residents with the diagnosis of dementia, altered mental status, those who their medical provider consider to be confused, or those on hospice will be excluded from this study. Additionally, any resident who is on a mechanically altered diet (National Dysphagia Diets level 1-3) will be excluded from this study.

Significance

Improving food service satisfaction is likely to result in increased intake at meals and a lower rate of malnutrition along with fewer instances of significant weight loss in a long-term care community. Maintaining adequate nutritional status will also likely result in prolonging mobility and greater quality of life, as well as lower healthcare costs. Understanding the

effectiveness of different types of process improvements that can be completed in a food service operation of a long-term care facility will help those in charge make decisions regarding improvements to invest in and implement.

Summary

Many long term care facilities receive complaints from residents related to the food service department. In addition to this, weight loss and malnutrition is a serious issue for people living in a long-term care facility. With limited time and budget restraints it is important to understand how effective different process improvements are for increasing satisfaction of food service and limiting the risk of residents developing malnutrition. Before reviewing process improvement changes, it is important to understand if changes to staff training, changes to food service operation, changes to the food, or changes to the meal-time experience result in increased resident satisfaction with food service.

Chapter 2: Review of the Literature

In 2016 the American Community Survey estimated that there were over 49.2 million Americans over the age of 65 years old. This accounted for about 16.5 percent of Americans, and this number is estimated to continue to grow. By the year 2050 it is expected that 21.4 percent of the United States population will be older than 65 years old (Roberts et al., 2018).

As people continue to age there is an increased need for skilled care facilities to assist this population with their cares and needs. In 2018, over 14 million adults in the United States required a stay in a long-term care facility (Komisar & Hado, 2019). Having a food service department that is able to help provide nutritious food, and quality care to these individuals will continue to be an important aspect of their care.

Literature Research Strategy

To initiate this literature review, articles were reviewed to ensure the research was related to changes that could be made within a food service operation to improve satisfaction of food service or improve someone's intake. The goal was to review articles that were published within the last 10 years that focused on changes in food service operations and client satisfaction. One article published outside the 10 year timeline goal was still reviewed due to the study relating very similar to the proposed research topic. The following search engines were used to find studies for this review: Google Scholar, PubMed, EBSCO search, and Science Direct. Key search terms included a combination of the following terms: food service satisfaction, long term care, nursing home, food service improvements, training methods, food quality, improved intake, perceived, dining environment changes, food delivery, satisfaction, improvements, and weight changes.

Background

In a cross-sectional analysis involving 19 long-term care institutions and 1,394 long-term care residents aged 60 years or older found the prevalence of malnutrition to be 35.2% of residents and an additional 52.6% of residents were at risk of developing malnutrition (Pezzana et al., 2015). In the study, the researchers found that the greatest risks are for those that stayed at larger facilities with 50 or more beds. According to the Academy of Nutrition and Dietetics position paper on Individualized Nutrition Approaches for Older Adults: Long-Term Care, Post-Acute Care, and Other Settings, “malnutrition, weight loss, poor food intake, food satisfaction and acceptance are serious issues in this population” (Position of the Academy, 2018). This creates the question of how can the food service operations within long-term care (LTC) facilities optimize residents’ satisfaction with food service and improve their intake at meals.

In theory, improving residents’ satisfaction with food service, would likely result in greater food intake, and may then lead to lower rates of weight loss and malnutrition. However, what is the best way to determine how, and what strategies will improve food service satisfaction is difficult to say and is likely multifactorial. There can be many different factors that influence meal satisfaction including, food quality, available menu, customer service, and dining ambience. This literature review compares different ways to assess food service in LTC facilities and different food service process changes including improved staff training, changes to food service, changes to the food, and changing the meal time experience to assess the effectiveness these changes had on LTC residents’ satisfaction with food service and their changes in intake to help prioritize improvement changes.

Literature Review

Food Service Satisfaction: Factors Influencing Satisfaction

To help improve levels of satisfaction in food service a common trend in today's LTC facilities is to offer more resident-centered approaches to their care. Burack et al. (2012) studied the quality of life of nursing home residents. To determine what mattered most to residents living in LTC facilities, Burack et al. (2012) conducted face to face surveys with the residents in the facility. To be eligible to complete the survey residents needed to have lived in the facility for a minimum of 3 months. The researchers offered the survey to all residents living in the facility who met the eligibility criteria. Of those that met the criteria, 37 residents refused to participate, 11 were unable to complete the survey resulting in a total of 62 residents completed the survey.

The researchers used the Quality of Life Scales for Nursing Home Residents survey with the residents to determine what mattered most to them (Burack et al., 2012). This survey included the following domains: autonomy, dignity, food enjoyment, functional competence, individuality, meaning activity, physical comfort, privacy, relationships, security, and spiritual well-being. From this study researchers were able to determine that dignity, spiritual well-being, and food enjoyment were amongst the highest scored quality of life measures. With higher scores in these areas it also correlated with an improved overall satisfaction of a resident's cares. This study helps show the importance food has on an individual's quality of life, and the importance of continuing to strive to optimize the food service operation within a LTC facility. Having a high-quality food service operation is also important for improving residents view of their satisfaction with the care they receive.

A study from South Africa found similar results related to inpatients' perceptions of foodservice quality (Ncube & Nesamvuni, 2019). In this study, 419 questionnaires were completed by surgical and medical inpatients at urban and rural hospitals in South Africa on their perception of foodservice quality. These questionnaires were administered randomly to inpatients that were on a normal or regular diet until the predetermined number of questionnaires were completed. The questionnaire used asked questions to determine the participants perception of food service quality, appearances of food, reliability of foodservice, staff responsiveness, empathy, staff attitude, overall foodservice quality, along with their perception of the quality of care they had received.

The researchers then used a comparative, quantitative and cross-sectional approach to provide insight on the inpatients' perception of the hospital foodservice experiences (Ncube & Nesamvuni, 2019). The researchers were able to find a direct correlation with the patient's perception of their quality of care with their satisfaction of foodservice. The most important factors found to affect the perception of foodservice were reliability and responsiveness of foodservice staff. This study helps show how food service satisfaction is also related to the perception of the overall quality of care, along with how food service satisfaction is influenced by more than the meals being served.

As discussed earlier, food enjoyment is one of the top concerns for individuals living within a LTC facility, and with the correlation shown on a patient's perception of their quality of care being related to their perception of foodservice, it is important to understand what people care about when it comes to their meal experience. To better understand this, researchers from the United Kingdom within a Food Service and Applied Nutrition Research Group developed a

survey to identify the priorities a hospitalized patient values most in their meal time experience (Hartwell et al., 2016).

Survey data was gathered from individuals hospitalized on the orthopedic ward since the duration of their admission was generally longer than that of patients with other conditions, and these patients were often on a general diet (Hartwell et al., 2016). In this study 296 participants (120 males; 176 females) completed the survey, and the mean age of the participants was 69.1 years old. The survey assessed 6 different factors that were associated with their overall meal time experience these included quality (presentation, variety, taste, food temperature and portion size), service (timing, serving appropriate meal, and friendly pleasant meal service), location (noise, room temperature, distractions, smell and odors), situation (tableware, background music, and location), social (eating alone or eating in dining room), and staffing (sufficient staffing, helpfulness or supportiveness of staff). The results of the surveys showed that food quality, followed by service quality were the most important factors that influenced patient satisfaction with their meal experience. The other factors within the survey did not result in a statistically significant association with the mealtime experience.

Poor satisfaction with the meal time experience has shown to reduce an individual's intake at a meal, but to better understand LTC resident's food intake Canadian researchers (Keller et al.) conducted a multisite cross-sectional study to find the determinants of why LTC resident had poor food intake. In this study, researchers selected 32 LTC facilities from 4 different Canadian provinces. In each facility 2 or 3 units were randomly selected for recruitment. Within each facility residents were randomly selected to provide a total of 20 residents each. To be selected for this study residents had to be a minimum of 65 years old, be

considered medically stable, regularly ate in the facility dining room, be in the facility for a minimum of 1 month, and needed to consume their food orally.

Keller et al. (2017) studied the food consumed by weighing residents' meals before and after each had eaten their meals for three nonconsecutive days. Each meal was also entered into a Food Processor Nutrition Analysis Software to obtain the average calorie and protein intake. In addition to recording meal intake the following were also completed: Mini-Nutrition Assessment-Short Form, Edinburgh-Feeding Questionnaire, Mealtime Relational Care Checklist, Dining Environment Audit Protocol, and Mealtime Scan. These were recorded to assess factors that may have influence a resident's intake.

Multiple factors reduced a resident's intake according to Keller et al. (2017). One factor that reduced intake was food textures. As food textures became more modified there was an association with consuming less. Another factor that reduced intake was age. For every year older a resident was resulted in a slightly lower intake per day by 9 calories and 0.39 grams protein. Facilities that served the largest meal in the evening versus at lunch showed a decreased intake of 137.33 calories and 23.4 g protein per day. Using the Edinburgh-Feeding Questionnaire every point increased within the questionnaire resulted in a decrease of 63 kcals and 3 grams protein per day. A few factors improved resident's intake. Facilities with a dietitian showed modest intake improvements, and for every point scored for person-centered care rating from the Mealtime Scan audit resulted in an improved intake of 307 calories per day.

The U.S. Department of Veteran Affairs defines person or patient-centered care as changing from treating just a disease or illness to working with the patient on health and wellness (Veteran Affairs, 2013). Person-centered care focuses on improving the life of the patient, not just treating a disease. With improving person-centered care resulting in the greatest

improvements on resident's intake, then working on implementing person-centered care within a facility may be beneficial to a food service operation (Keller et al., 2017). Continued research will be helpful to understand how introducing different changes to a facility may improve intake over time. Additional research may also help reduce a limitation of this study that may have resulted in bias due to requiring a number of researchers to complete subjective data such as distractions in the dining room. In addition, this study showed the importance of acknowledging an individual resident, treating them with respect, and focusing on their individual needs can have a significant improvement on their overall intake.

Food Service Satisfaction: Improved Staff Training

Soneff et al. (1994), are researchers took a group of community-based adult facilities that did not require staff to have any formal food service training, and studied the effectiveness of different training methods. In this study, 46 community-based adult facilities were randomly assigned to receive a type of food service training. Training methods included having a training workshop with a training manual, training manual only, or no training as the control group. For the study, facilities were required to complete a pre and post-test along with audits on their performance in food purchasing, menu planning, food safety and food storage. 5 months after the 1-day workshop was completed facilities were reassessed. The facilities that had the training manual and had completed the workshop showed significant improvements in menu planning and food safety compared to the other two groups. However, there were no significant differences between the three groups on food purchasing or food storage. Although these results are from a dated study the results show the importance of hands on and direct training employees to help with making improvements in the food service operation. Today a common practice is to

complete training with online training modules, and a future study observing the effectiveness of these online training modules compared to in person training would be beneficial.

When staff provide more respect and focus on an individual resident's needs, it can help increase a residents' satisfaction with food service. This shows having staff with specialized training or implementing this within their orientation can be beneficial for food service.

Researchers at Los Angeles County and University of Southern California Medical Center also saw improved patient satisfaction scores for their overall meal experience after the implementation of a training regimen for hospitality assistants (Nowinski et al., 2010).

Researchers used a survey software company, Press Ganey, to assess patient satisfaction before and after a five-to-six hour training program was completed. Training was completed over a one-month period with training topics consisting of hospitality training guide, Health Insurance Portability and Accountability Act (HIPAA), patient safety, and general customer service. For the study, researchers collected survey results for 11 months prior to the training implementation and then again for 11 months after the training was implemented.

With the implementation of the training program to provide more respect and focus on individual resident's needs there were multiple improvements shown with the patient's hospital dining satisfaction. After employees had completed the training the overall meal ratings at the facility had improved from the 62nd percentile rank to 84th percentile rank. Food temperature scores also improved from the 66th percentile to the 84th percentile. Food quality improved from 63rd percentile to 81st percentile and finally, courtesy of the server improved from 50th percentile to 81st percentile (Nowinski et al., 2010). This study shows that improving staff training alone can improve food service satisfaction.

Having a strong orientation and training program is essential for the success of a food service operation. In a study published in the *Journal of Hospitality Marketing and Management* (Kim, 2011), researchers used questionnaires to compare the relationship of how staff perceive their orientation with service quality, customer satisfaction, and customer loyalty. Researchers had frontline workers complete questionnaires to assess their perception of their overall orientation. The researchers also had customers at the restaurants completed questionnaires on their service quality, satisfaction and overall loyalty of returning to the restaurant. In total, seven restaurants participated in the study, and 169 surveys were completed by employees. Customer surveys were coded to correspond with the employee they had worked with, and in total 508 surveys were completed and used in the study (Kim, 2011). The researchers of this study found a correlation between how frontline workers perceived their orientation directly influenced the perception customers had on the quality of the service they had received, along with their overall satisfaction, and loyalty to the restaurant (Kim, 2011).

Having a high-quality orientation can directly influence how the customer perceives their mealtime experience. In a meta-analysis including 36 research studies reviewed the effectiveness of different mealtime interventions. This meta-analysis grouped interventions into 5 different categories including: changes to food service, food improvements, dining environment alteration, staff training and feeding assistance (Abbott et al., 2013).

In the meta-analysis completed by Abbott et al. (2013) there showed to be inconsistent results on interventions effectiveness for influencing body weight changes. Observational studies generally showed favorable effectiveness on resident's intake at meals. One intervention that showed favorable results for LTC resident's nutritional outcomes included offering education and training programs on the nutrition care process for nursing staff. Offering this

education to staff outside of the food service department resulted in improved intake for residents in LTC facilities. The analysis also found positive results for offering scheduled snacks and increase choices at meals (Abbott et al., 2013). In theory, the improvements seen on food intake by residents in these studies would likely also correlate with an increase in meal service satisfaction.

Training and education can also play a factor in staff understanding of their role in delivering nutrition interventions. In a study at a public hospital in Australia researchers, Collins et al. (2017), looked at factors that influenced the food service staff from delivering nutrition interventions. For this study the food service department created an intervention menu with a higher calorie and protein content to also study the effectiveness of offering a high calorie high protein menu to patients on wards participating in a pilot study. Food service staff were able to provide the regular menu or the high calorie menus to patients (Collins et al., 2017).

Collins et al. observed the progress and effectiveness of providing patients with an increased calorie and protein menu. However, during the study there was a discrepancy observed between the anticipated, and actual intake of the higher calorie menus by patients. Working with the food service staff researchers were able to find factors that influenced staff's decision on delivering the intervention menu. Researchers found that staff perceived time pressures of delivering the food items, perceived sustainability of the new menu, and hearing patients disliked the food all resulted in staff being less likely to deliver the intervention menu. Staff's knowledge, beliefs, and perceptions of the diet had a potential to influence staff's decision on offering the menu. It was determined that food service staff's ability to deliver the intervention was greatly affected by their knowledge of the intervention. It was concluded that having food service supervisors addressing the challenges staff perceived was vital to the success

of making a process change within the department. This study also helps show the importance of proper training to provide staff with the knowledge to buy into a process improvement when there are perceived barriers (Collins et al., 2017).

Food Service Satisfaction: Changes to Food Service

In addition to training staff, making direct changes to the food service can be beneficial as well. Changes can include how the meals are served, changing the names of the meal being served, or changes to where the residents eat their meals. In a study on an Iowa LTC facility with 26 residents participating in the study, researchers compared meal intake and weight changes of residents when being served their meals from a traditional tray service for 10 weeks compared to being served restaurant style for 10 weeks. For the 10 weeks of the study the lunch meal was served restaurant style. Intake was recorded by percentage of food consumed at the meals, and residents were weighed prior to the 10 weeks of being served traditional style meals, at 10 weeks and prior to being served restaurant style meals for 10 weeks. The researchers did not find a significant change in resident's body weight; however, residents did have a significant improvement on their intake scores. Average intake at the meals increased from 62% of the meal to 75% of the meal with restaurant style. The residents also reported higher satisfaction levels with the restaurant style meal service. It was suggested that this was possibly related to being offered more choices at the meals (Murphy et al., 2009).

Researchers Divert et al. (2015) found similar results to Murphy et al. (2019) in French nursing homes when altering the menu served in LTC. The researchers served 12 experimental meals to 42 nursing home residents. With each meal researchers compared a control meal with changing a factor during meal service. Changes included the way the main course was named on the menu, the portion size and variety of vegetables, have condiments in the middle of the table

or not, and changes to the dining room such as decorative objects or background music. Intake was recorded by weighing the resident's meals before and after eating, and the residents perceived enjoyment of the meal was recorded using a 7-point scale (Divert et al., 2015).

Researchers found no significant changes to intake or meal enjoyment when the name of the meal being served was changed or from changing the décor. However, residents did have improved satisfaction, and consumed more on the test meals which included increasing the quantity of meats and vegetables. Residents also consumed more when the same quantity of vegetables were served, but were given two vegetables instead of one. When condiments were on the table residents rated meal enjoyment higher, but did not have an effect on overall meal intake (Divert et al., 2015). This study shows easy and inexpensive ways a LTC facility is able to make changes to a resident's dining experience to improve their satisfaction and improve their intake at meals.

Food Service Satisfaction: Influence of Changes to Food

When residents move into a skilled nursing facility, they lose the ability to go into their kitchen and look for a food item they may want to eat. Many facilities utilize cycle menus for meal planning. To improve foods offered menus can be updated however having the ability to offer more food choices at meals has also been shown to improve LTC residents' satisfaction with meal service and improve their nutritional status. In a study comparing two nursing homes in the Eastern Washington State area, with one facility acted as the control group while the other facility acted as the intervention group researchers recorded resident's weight, food enjoyment, and overall food service satisfaction. For this 6-month study menu changes and additional options were offered to the intervention facility and in total 61 residents were followed (Crogan et al., 2013).

Residents at the Eastern Washington State facilities rated menu items on a 1 to 5 scale (Crogan et al., 2013). Items that were well liked remained on the menu, but disliked items were replaced with items from resident council meetings. Additionally, choices are added to the menu and residents are able to pick their menu option the day prior in the intervention facility. After the 6-month trial, residents completed a survey based on their experience with the menus. The intervention group had reported significant improvements on enjoying food, and overall food service satisfaction. The intervention group also saw an average weight gain of 7 pounds throughout the 6-month study whereas the control group saw an average loss of 1 pound. The results of this study suggest offering more options to residents' in LTC greatly improve residents' satisfaction and help reduce the risks of weight loss.

Diet quality can also be an important factor to help reduce the risk of malnutrition. In a study conducted in Canadian LTC facilities found that diet quality was associated with malnutrition and low calf circumference. The study used a cross-sectional design with 32 LTC facilities. Residents at the facilities were randomly selected and mini nutritional assessments were completed on each resident (Carrier et al., 2019).

Carrier et al. (2019) recorded a 3-day food record for residents and entered into a nutritional analysis software. Researchers of this study based the resident's diet quality on meeting the Recommended Dietary Allowance for 17 different vitamins and minerals. A mean adequacy ratio was then completed for each nutrient with scores closer to 1.0 indicating meeting nutrient levels and thus indicating a higher diet quality. The diet quality scores were then compared to mini nutrition assessment scores for risk of malnutrition. Researchers were then able to see an inverse relationship between the two scores. As diet quality improved there was a correlation to a lower risk of malnutrition from the mini nutrition assessment (Carrier et al.,

2019). This study suggests that providing nutritious meals is also an effective improvement that can be made within LTC food service facilities.

In addition to Carrier et al. (2019), Van Wymelbeke et al. (2020) conducted a study in France where researchers observed how making changes to the food would influence LTC resident's intake at meals. Changes included improving the recipe for the entrée and dessert, increasing the variety of the sides offered at the meal and being offered condiments throughout the meal. To conduct this experiment, researchers used the same meal for all the changes, and offered each meal 2 times to the residents. This meal was then offered to the residents every three weeks. Meal intake was recorded by weighing the food before and after residents consumed the meal, and meal enjoyment was rated on a 7-point scale. To participate in the study, residents had to be a minimum of 65 years old, could not have any food allergies, and could not have texture modifications or be on a therapeutic diet. In total 89 residents participated in the study across six different nursing homes, and 82 residents completed the study (Van Wymelbeke et al., 2020).

With the changes to the meals the calories ranged from 806-810 calories, and protein ranged from 56.3-58.2 grams. With each experimental conditional change residents consumed an average of 5-7% more calories at the meal. Meal enjoyment was also significantly improved with each experimental meal change (Van Wymelbeke et al., 2020). These results suggest that making minor changes to recipes and offering condiments with the meals can help improve LTC residents' satisfaction with food service and improve their overall meal intake.

Food Service Satisfaction: Influence of Changes to Mealtime Experience

Other than making changes to the food being served, enhancing the mealtime experience is an important part for increasing residents' satisfaction with food service. In a study conducted

in Queensland Australia researchers used questionnaires to quantify LTC residents' relationship with food service satisfaction and food service characteristics. The questionnaire used, contained 37 questions related demographics and food service to determine if different residents had different perspectives of food service. The questionnaire used a 5-point Likert Scale to collect data. The questionnaire was completed by 103 residents from 2 rehabilitation units and 210 residents in LTC facilities (Wright et al., 2013).

The results from the questionnaire showed that having a decentralized food service delivery compared to a centralized kitchen resulted in a 69.5% increased chance the resident rated their overall food service satisfaction as very good. Being able to choose their meal in advance also improved satisfaction. With facilities allowing residents to choose meals 3-days prior to the meal being served were 73.5% more likely to rate food service as very good compared to those that chose their meal same day rating food service satisfaction very good 47% of the time. The results of this study suggest that using a decentralized kitchen dining approach, and allowing residents more choice can help with improving their satisfaction (Wright et al., 2013).

In a LTC facility meal time can be a social time for many residents. This is commonly why a family style and buffet style dining have shown promising results for improving intake in many studies related to LTC dining services, according to researchers from the University of Alabama. In a meta-analysis published in the Journal of the Academy of Nutrition and Dietetics, researchers noticed that small changes to the dining environment can improve, and optimize the dining experience. These changes included adequate lighting, using high-contrast dishes, and providing soft music in the dining room to create a calming environment. One article within the study also found that having the smell of bread cooking increased meal intake by 7% overall in a

LTC facility. Researchers also found that there are many studies that have correlated having adequate assistance with meals also increases resident's intake (Douglas & Lawrence, 2015).

Changes to the lighting or the addition of a tablecloth can influence how someone may perceive their meal. In a study using changes to the lighting and adding a tablecloth to tables researchers had participants complete questionnaires to rate a tomato soup they were given. Questionnaires included questions for rating the taste, appearance, smell, consistency and perceived quality of a tomato soup. Researchers weighed the tomato soup before and after participants completed the study to record their intake, and recorded the length of time participants spent eating. To assess if the lighting or a tablecloth influenced these factors researchers completed 2 studies. The first study only the lighting was changed from high and low illuminance, and in the second study a tablecloth was added and lighting was changed from high and low illuminance (Bschaden et al., 2020).

In the first study conducted by Bschaden et al. (2020) a total of 66 participants completed questionnaires on their perception of tomato soup under bright and dim lighting. Researchers also monitored participants intake and time spent eating. Participants rated the bright room as being more pleasant. However, participants consumed an average of 26.7 grams more of the soup, and spent an average of 16.5 seconds longer eating the soup than when in low illuminance. There were no significant differences in participants ratings for appearance, smell, consistency, or perceived product quality (Bschaden et al., 2020).

In the second study conducted by Bschaden et al. (2020) a total of 159 participants completed questionnaires on their perception of tomato soup with and without a tablecloth while researchers also monitored their intake and time spent eating. In this study the dimmed lighting was rated as more pleasurable, but overall both bright and dim lighting were rated as more

pleasurable when there was a tablecloth than the study without. Participants also ate more and stayed longer when a tablecloth was present, and overall ate more and stayed the longest with a tablecloth under dimmed lighting. Overall, the soup was perceived to be better quality and tasting better when the tablecloth was present, and again participants rated these higher under dimmed lighting with the tablecloth. Overall the soup was rated better with the dimmed lighting, but there were no significant differences for the bright lighting when compared to the study without a tablecloth. This study suggests that making a small change such as adding tablecloths to dining rooms can help improve satisfaction and perceived quality of a meal (Bschaden et al., 2020).

In LTC, making sure there is adequate assistance available is important to help with residents eating. One way to help with adequate assistance is to allow family members to help feed residents. This can also improve the meal time experience by having a family member present. A study, conducted in Canada, compared food intake of residents who required assistance when being fed by staff compared to being fed by a family member. In total 147 residents were observed in the study that required assistance with eating. 56 of those residents had a family member feed them for a minimum of 1 out of 9 meals that researchers observed. During the study meals were weighed before and after meal service to assess overall intake (Wu et al., 2020).

Researchers Wu et al. (2020) found that protein and energy intake were significantly improved when family members provided the feeding assistance. Residents consumed an average of 50 kcals and 2.7 grams of protein more per meal when being fed by a family member. This study helps show another improvement that can be used within a LTC facility to help improve residents meal intake (Wu et al., 2020).

Wu et al. (2020) study on observing family members presence had its limitations since those that required assistance with eating often required a mechanically altered diet where foods would mix together making it difficult to determine to exact amount of each food that was consumed (Wu et al., 2020). It also has its limitations since this was conducted over a small time period, and it is possible that the residents preferred the meal options that were being served more when being fed by a family member. Additional research on family members influence may prove to be beneficial to if family member can influence a LTC residents' satisfaction with food service as well as improve their intake.

Research Methodology

In a future study, it would be helpful to see how multiple process improvement changes compare to one another in a LTC facility. Assessing LTC residents' satisfaction with food service and their intake before and after each process improvement change may be most beneficial to understand which change has the greatest impact. Making changes one at a time, including changing the staff training process, changes to the food quality, the way food is presented, and changing how the dining room is set up, while also assessing food satisfaction and food intake before, during and after each change will help determine which change results in the greatest intake improvements and greatest satisfaction improvements. To date there is no study that observes making different types of changes to the food services changes to assess which results in the greatest improvements.

Summary

Throughout this literature review, it is clear that maintaining a high level of satisfaction with foodservice is not only important for improved quality of life, but also for helping to improve a resident's perceived quality of care. There are many different determinants that LTC

residents view as concerns with food service and a few that staff see as concerns with making changes to food service.

A number of studies, including those from Keller et al. (2017), Murphy et al. (2019), Wright et al. (2013), and Bschaten et al. (2020) show how different process improvements to food service that can significantly improve both LTC residents' food service satisfaction, and their intake at meals. It is still difficult to say exactly what is the most effect food service process changes to make that will result in the greatest improvements for satisfaction and intake, but there are many different routes that can be taken. Having a highly effective orientation process for staff can result in greater perceived service quality, and when training is provided directly to staff it can result in perceived service improvements as well. Food service departments can change food processes from offering more varieties of foods and giving residents more independence on their meal choices has been shown to be effective. Improving recipes has shown mixed results along with making changes to the dining environment.

Improving residents' satisfaction will continue to be important for LTC facilities not just for improving residents' quality of life, but also due to the correlation that an improved satisfaction has on a resident's intake. Having an improved intake at meals may lead to lower rates of malnutrition, and this is an important quality measure used for LTC institutes. Throughout the research there were often two common factors that helped improve residents' satisfaction with their meals these were improved training for better customer service, and providing residents with more independence in choose their meals or providing residents with options for eating. Changing menus helped when this resulted in more options being provided to the residents. There were also mixed reviews on changing the atmosphere of the dining service.

Some facilities noted that changing the atmosphere improved residents' satisfaction while others noted no changes.

In the future, comparing residents' satisfaction, average intake, and average weight changes over time while making individual changes to a facility may help determine which changes show more benefits than others. Continuing to observe meal service and using different audit tools may help determine where to start for improving meal service satisfaction. As the number of Americans over the age of 65 years old continues to increase, and a large number of people require a stay at a LTC facility it will continue to be important to address the concerns residents have. This will become especially important as residents are discharged and admitted to facilities to ensure their individual needs are being met. Performance improvement within a food service department in a LTC facility will continue to be an ongoing process to ensure the highest satisfaction possible. To better understand which type of performance improvement results in the greatest increase in satisfaction scores having one facility compare resident satisfaction scores after complete multiple changes one at a time will be beneficial.

Chapter 3: Design and Methodology

Food service operations and the food that is served to long-term care residents both play important roles in resident's treatment plan and quality of life. By having a high-quality food service operation with which residents are satisfied, and by whom nutritional needs are met, helps reduce the risk of weight loss and malnutrition. There are a number of ways that food service operations can improve service including improving staff training, changing food being served, changing the way food is served, or enhancing the environment of where the residents are eating. However, each of these changes can take extensive time and manpower to implement. This chapter will review the methodology for researching each area of improvement regarding how each corresponds to changes in resident satisfaction with food service, resident's overall intake at meals, and resident risk for developing malnutrition.

Research Design

For this research proposal, I hypothesize that changes to staff training, food service style and specific foods offered will provide moderate, but not offer clinically significant, improvements in LTC residents' satisfaction with food service and will not promote significant improvements on intake. The greatest improvements in intake and satisfaction will result from offering a larger number of options and choices at each meal for residents to choose from.

Research Question

For residents living in a long-term care facility, how do employee training, food service style, and the dining environment affect resident satisfaction with food service and risk of developing malnutrition?

Hypotheses

H₀: Changes to staff training, meal options, and changes to the dining environment will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk of malnutrition.

H_a: Changes to staff training, meal options, and changes to the dining environment will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 1:

Q: Do changes to long-term care food service staff training result in a significant increase in residents' satisfaction with food service and reduce residents' risk for malnutrition?

H₀₁: Changes to staff training will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a1}: Changes to staff training will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 2:

Q: Do changes to long-term care meal options result in a significant increase in residents' satisfaction with food service and reduce residents' risk for malnutrition?

H₀₂: Changes to meal options will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a2}: Changes to meal options will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Sub Question 3:

Q: Do changes to long-term care dining environment result in a significant increase in residents' satisfaction with food service and reduce residents risk for malnutrition?

H₀₃: Changes to a long-term care dining environment will not result in significant improvements in LTC residents' satisfaction with food service and will not impact risk for malnutrition.

H_{a3}: Changes to a long-term care dining environment will result in significant improvements in LTC residents' satisfaction with food service and will reduce the risk of malnutrition.

Table 1

Research Questions and Variables

Research Question	Independent Variables	Dependent Variables	Confounding Variables
For residents living in a long-term care facility, how do employee training, food service style, and the dining environment affect resident satisfaction with food service and risk of developing malnutrition?	<ul style="list-style-type: none"> • Training on Customer Service • Menu Changes (Increased entrée options and changes to menu options) • Enhancing dining room environment (using table clothes and having soft music playing) 	<ul style="list-style-type: none"> • Food Service Satisfaction • Risk for Malnutrition 	<ul style="list-style-type: none"> • Staff preparing food for LTC residents. • Baseline weight/BMI • Living arrangement

Research Question	Independent Variables	Dependent Variables	Confounding Variables
<p>Do changes to long-term care food service staff training result in a significant increase in residents' satisfaction with food service and reduce residents risk for malnutrition?</p>	<ul style="list-style-type: none"> • Staff training on customer service 	<ul style="list-style-type: none"> • Food service satisfaction • Risk for malnutrition 	<ul style="list-style-type: none"> • Staff preparing food for LTC residents. • Baseline weight/BMI • Living arrangement
<p>Do changes to long-term care meal options result in a significant increase in residents' satisfaction with food service and reduce residents risk for malnutrition?</p>	<ul style="list-style-type: none"> • Meal options 	<ul style="list-style-type: none"> • Food service satisfaction • Risk for malnutrition 	<ul style="list-style-type: none"> • Staff preparing food for LTC residents. • Baseline weight/BMI • Living arrangement

Research Question	Independent Variables	Dependent Variables	Confounding Variables
<p>Do changes to long-term care dining environment result in a significant increase in residents' satisfaction with food service and reduce residents risk for malnutrition?</p>	<ul style="list-style-type: none"> • Dining environment 	<ul style="list-style-type: none"> • Food service satisfaction • Risk for malnutrition 	<ul style="list-style-type: none"> • Staff preparing food for LTC residents. • Baseline weight/BMI • Living arrangement

For this study, a prospective cohort study will be used to follow the residents over a 16-week period of time as each change is implemented within the food service operation. Prior to and after implementation of each change to the food service operation, satisfaction scores, resident intake, and risks for malnutrition will be assessed.

Setting and Sample Size

Participants in this study will be a United States military veteran that residents of the Community Homes within the Community Living Center (CLC) division at the Clement J. Zablocki Veteran Affairs Medical Center (VAMC). The CLC is the Zablocki VAMC long-term care division, and the Community Homes is a specific unit within the division. The residents residing on this unit of the CLC were identified as potential subjects for this study as direct oversight and management of the food service operation on this unit is a recently created position. This unit of the CLC was also selected due to the staff not having prior formal food service training, and the unit having limited changes to the menu provided. With the lack of formal food service training and limited menu changes this will provide an optimal opportunity to observe how staff and foods may influence a resident's intake and satisfaction with food service.

Sample Size

A convenience sample of 30 participants was selected for this study. This is the maximum census of residents that are able to be housed within the Community Homes of the Zablocki VAMC at one time.

Recruitment

Residents will be invited to participate in this study following a description of the study at a monthly Resident Counsel meeting. The residents that will be included within this study

will need to be admitted to the Community Homes long-term care unit greater than four weeks prior to the start of the study. This ensures residents will have been through the cycle menu, and changes to their satisfaction and that intake will be consistent to test with the meals offered. In order to participate in this study, the resident will need to be on a regular diet with no texture modifications, and be considered alert and oriented x4 by a medical provider. Reasons for exclusion from this study will include any of the following: new admission to facility, residents admitted under short-stay rehabilitation or respite care, residents on texture modified diets, being signed onto hospice care, and residents with the diagnosis of dementia, mild cognitive deficient, altered mental status or deemed confused by their medical provider. Screen for recruiting for this study will include a review of resident's medical records using the computer software Computerized Patient Record System (CPRS). This review of resident's medical records will include their medical diagnosis, and their diet order. Participation in the study will be voluntary for those that meet the required criteria. Each resident that meets the required criteria will be notified through a letter addressed to themselves with a section for accepting or declining participation (Appendix A).

Data Collection Process

Instrumentation

The questionnaire that will be used to assess resident's satisfaction with food service is found in Appendix B. This questionnaire is validated and contains four categories for satisfaction including food quality, meal service quality, staff or service issues and physical environment. Welch Allyn Tronix 6702 Oversized Wheelchair Scales and Welch Allyn Tronix 5002 Mobile Stand on Scales will be used to collect resident's weight which is then documented in the resident's medical record. Scales are calibrated per medical center policy and as needed

by the Facility Management Department. Residents are weighed a minimum of monthly to track any weight changes. Weights are collected by VAMC staff in the first week of each month on the residents scheduled bath day. Each staff member completes initial and annual competencies to ensure they are using equipment accurately. The Mini Nutrition Assessment-Short Form (MNA-SF) (see Appendix C) will also be used to assess risk for malnutrition. This assessment is a validated nutrition screening and assessment tool that can identify geriatric patients age 65 and above who are malnourished or at risk of malnutrition (Nestle Nutrition Institution).

Intervention

Data will be collected prior to the implementation of any changes within the food service operation to collect baseline data from each participant. Data collected will include satisfaction scores from VA Form 10-5387 Customer Satisfaction Survey for Nutrition and Food Service (Appendix B). Data will also be collected from the resident's medical records to obtain their body weight, and meal intake. At the end of each intervention, weights of the long-term care residents will be collected from the electronic medical record. Meal intake data will be collected from the electronic medical record, as well, for the four weeks previous to the end of each intervention. Values will be averaged for each resident. The average values will be analyzed using a MONVA to determine significance. A Mini Nutrition Assessments (Appendix C) will also be conducted by a Registered Dietitian before and after the implementation of each nutrition process change. Mini Nutrition Assessments are standardized and validated assessment to identify an individual's nutritional status. This information will be used to assess the resident's risk for developing malnutrition. Performance improvement interventions will be implemented one at a time with four weeks between each intervention. The order of performance improvement interventions will be increased training on customer service with staff, menu

changes with increase meal options to two entrée choices per meal, and finally enhancing the dining environment with the addition of a table cloth on the dining tables and addition to soft music played during meal time.

Data Analysis Plan

Descriptive Statistics

Descriptive statistics of the sample group include: intake at meals, weight changes, responses to satisfaction questionnaires, and results from MNA-SF. A MANOVA test will be used to analyze if there is a significant difference between the intervention and the baseline data collected.

Inferential Statistics

As depicted in table 2, the proposed study will contain 3 independent variables and 3 dependent variables.

Table 2:*Description of Variables*

Independent Variable	Potential Responses	Level of Measurement	Dependent Variable	Potential Responses	Level of Measurement	Test of Significance
Staffing customer service training	Intervention	Categorical	Overall meal service satisfaction	0-5	Numerical	MANOVA
			Average daily meal intake	0-100%	Numerical	
			Risk of malnutrition	0-14	Numerical	
Changes to meal service	Intervention	Categorical	Overall meal service satisfaction	0-5	Numerical	MANOVA
			Average daily meal intake	0-100%	Numerical	
			Risk of malnutrition	0-14	Numerical	

Independent Variable	Potential Responses	Level of Measurement	Dependent Variable	Potential Responses	Level of Measurement	Test of Significance
Changes to dining environment	Intervention	Categorical	Overall meal service satisfaction	0-5	Numerical	MANOVA
			Average daily meal intake	0-100%	Numerical	
			Risk of malnutrition	0-14	Numerical	

Threats to Validity

Threats to validity for this study include the length of time it will take to implement each process change within a food service organization. With an extended length of time it is very possible that some residents may discharge from the facility or pass away before the study ends. An additional threat includes having floating staff from other departments that are not familiar with the study design but may work with the residents during the time period. Due to the small sample size and the fact that residents living together, it is possible that residents will discuss their meals and change their perspective on meal service based on what they hear from their peers. Having multiple changes that are being assessed there will be repeated testing and repeated surveys to completed. Finally, it is possible there is bias with the survey completion as those that prepare the meals are also in a small area and may influence resident's answers.

Ethical Procedures

The procedures for this study will follow the regulations of the Institutional Review Board (IRB) as well as the regulations of the Veteran Affairs Medical Center. See Appendix D for IRB application. Approval of this study will be obtained from both parties prior to the implementation of the study. Participants will be informed of the data being collected and written consent will be obtained prior to collecting data. Information will remain confidential. Any information with has patient identifiers on it will not leave the medical center grounds, and be shredded after data is collected. No data will not be collected for the purpose of this study on any resident who wishes to not participate. All participation will remain voluntary and participants will be able to withdraw from the study at any point if they wish.

Summary

In summary, the goal of this study is to evaluate the effectiveness of different food service process improvements and to assess how these changes influence satisfaction, intake and risk for malnutrition within long-term care residents. Resident's information will remain confidential and participation will be voluntary. Over a period of time, different process improvements will be implemented for a food service operation including enhancing training procedures, offering different menu options, changing the way food is presented to residents, and changes to the dining environment itself. By analyzing these changes over time with changes in satisfaction scores and risk for malnutrition it will help determine which process improvements are more helpful than others.

Chapter 4: Results

The participants in the study will be recruited from the Community Homes at the Clement J. Zablocki Veteran Affairs Medical Center (VAMC) in Milwaukee, WI. The residents that reside on this unit are considered long-term care residents. This unit has a maximum census of 30 residents that may live within the buildings for long-term care. However, due to staffing shortages caused during COVID-19, four rooms that would have normally held residents were closed due to help create safe staffing levels throughout the Community Living Center (CLC) of the Zablocki VAMC. With the reduced census capacity of 26 residents living within the Community Homes at the Zablocki VAMC there are also residents who are anticipated to not meet the criteria for the study. Two residents were anticipated to discharge from the facility, four are anticipated to be ineligible due cognitive impairment, and one resident is anticipated to refused to participate. In total, data will be used for 19 long-term care residents to complete the prospective study.

Baseline Characteristics

Anticipated baseline characteristics of the study group are represented in Table 3. The population includes only males due to the current population at the Community Homes at the Clement J. Zablocki Medical Center.

Table 3*Baseline characteristics of participants*

Variable	
Demographics	
Gender	
Male % (number)	100 (19)
Age, mean (SD)	82.21 (6.85)
Health Measures	
Weight (lb), mean (SD)	219.68 (44.48)
MNA-SF, mean (SD)	11.79 (1.27)
Meal Service	
Meal Intake, mean (SD)	80.05% (24.2)
Overall Satisfaction, mean (SD)	3.79 (1.05)

Table 4 summarizes the anticipated baseline data, and the data collected after each intervention has been completed. Each data items includes the mean and standard deviation of each result from the estimated population.

Table 4*Summary of Results*

	Baseline	Intervention 1	Intervention 2	Intervention 3
Health Measures				
Weight (lb), mean (SD)	219.68 (44.48)	221.32 (45.45)	219.58 (47.11)	219.74 (43.61)
MNA-SF, mean (SD)	11.79 (1.27)	11.89 (1.24)	11.95 (1.13)	11.74 (1.37)
Meal Service				
Meal Intake (%), mean (SD)	80.05 (24.20)	81.47 (23.81)	82.58 (21.52)	82.21 (23.44)
Overall	3.79 (1.05)	3.68 (1.06)	4.21 (0.92)	3.84 (0.90)
Satisfaction, mean (SD)				

Note: M=Mean; SD=Standard Deviation

Intervention 1=changes to staff training on customer service

Intervention 2=changes to meals by changing quantity of options of vegetables and starch at each meal

Intervention 3=addition of table cloth on dining table and addition of soft music

Weight Changes

Table 5 summarizes the anticipated changes in weight after each intervention and the P-value that compares the LTC residents' weight with their baseline data. After each intervention when comparing data with baseline data there is no significant difference in weight changes throughout the study interventions.

Table 5*Average Weight*

	Weight (lb)	<i>p</i> Value
Baseline, mean (SD)	219.68 (44.48)	
Intervention 1, mean (SD)	221.32 (45.45)	0.1589
Intervention 2, mean (SD)	219.58 (47.11)	0.0879
Intervention 3, mean (SD)	219.74 (43.61)	0.4559

Note: *p* value <0.05 is considered significant

Intervention 1=changes to staff training on customer service

Intervention 2=changes to meals by changing quantity of options of vegetables and starch at each meal

Intervention 3=addition of table cloth on dining table and addition of soft music

MNA-SF Scores

Table 6 summarizes the anticipated changes in MNA-SF after each intervention and the P-value that compares each LTC resident's weight with their baseline data. Following intervention 1 and 3 there were no significant changes in the MNA-SF scores. Following intervention two with the changes to meal service, there was a significant change with an increase in MNA-SF score when compared to baseline scores.

Table 6*Changes in MNA-SF Scores*

	MNA-SF score	<i>p</i> Value
Baseline, mean (SD)	11.79 (1.27)	
Intervention 1, mean (SD)	11.84 (1.34)	0.3334
Intervention 2, mean (SD)	12.21 (1.08)	0.0009
Intervention 3, mean (SD)	11.79 (1.23)	0.5

Note: p value <0.05 is considered significant

Intervention 1=changes to staff training on customer service

Intervention 2=changes to meals by changing quantity of options of vegetables and starch at each meal

Intervention 3=addition of table cloth on dining table and addition of soft music

Meal Intake

Table 7 summarizes the anticipated changes in meal intake after each intervention and the P-value that compares the LTC resident's weight with the data from their baseline data.

Following intervention 1 and 3 there were no significant changes in meal intake throughout the 4-week time period when compared to baseline intake. Following intervention 2 there was a significant increase in meal intake when compared to baseline meal intake going from an average meal intake of 80.05% to 82.58%.

Table 7*Changes in Meal Intake*

	Meal Intake (%)	<i>p</i> Value
Baseline, mean (SD)	80.05 (24.20)	
Intervention 1, mean (SD)	81.47 (23.81)	0.0345
Intervention 2, mean (SD)	82.58 (21.52)	0.0035
Intervention 3, mean (SD)	82.21 (23.44)	0.0328

Note: *p* value <0.05 is considered significant

Intervention 1=changes to staff training on customer service

Intervention 2=changes to meals by changing quantity of options of vegetables and starch at each meal

Intervention 3=addition of table cloth on dining table and addition of soft music

Overall Food Service Satisfaction

Table 8 summarizes the anticipated changes in overall food service satisfaction after each intervention and the *p* value depicts the level of significance of those results. Following intervention 1 and 3 there were no significant changes with overall food service satisfaction when compared to baseline. Average satisfaction scores did increase from 3.79 at baseline to 4.21 following intervention 2.

Table 8*Changes in Overall Food Service Satisfaction*

	Food Service Satisfaction	<i>p</i> Value
Baseline, mean (SD)	3.79 (1.36)	
Intervention 1, mean (SD)	3.68 (1.06)	0.2472
Intervention 2, mean (SD)	4.21 (0.92)	0.0209
Intervention 3, mean (SD)	3.84 (0.90)	0.3581

Note: *p*-value <0.05 is considered significant

Intervention 1=changes to staff training on customer service

Intervention 2=changes to meals by changing quantity of options of vegetables and starch at each meal

Intervention 3=addition of table cloth on dining table and addition of soft music

Summary

Anticipated results of the 3 food service performance improvement interventions to be implemented in this study are shown in Tables 4-8. Intervention 1, which would include the change to staff training for improving customer service, is anticipated to have no significant change for changes to body weight, risk of malnutrition or overall meal service satisfaction.

Intervention 1 would however result in an increase in % meal intake from an average intake of 80.05% to 81.47% (*p* value of 0.0345). Intervention 2, where meal service is changed from a mixed menu to allowing choices at meals, is anticipated to result in a significant improvement for reducing the risk for malnutrition, improving meal intake, and improving the overall food

service satisfaction scores. Intervention 2 is not anticipated to have a significant effect on body weight changes. Intervention 3, with the addition of a tablecloth and soft music during meals, is anticipated to result in a significant improvement of meal intake when compared to baseline, but would not have a significant change on resident's weight, risk for malnutrition or overall meal service satisfaction.

Chapter 5 will discuss the anticipated results and how they relate to the existing literature. The strengths and weaknesses of the proposed study will also be discussed, as well as anticipated needs for future research.

Chapter 5: Discussion

Residents in long-term care facilities often have complaints related to food service or the meals that are provided to them. There have been a number of studies that have shown different ways to increase resident satisfaction however, currently there is not a best practice approach for addressing food service complaints in order to generate significant improvements in overall satisfaction. This chapter will discuss the anticipated results of the proposed study and compare them with results from previous studies conducted by Abbott et al (2013), Wright et al. (2013) and Keller et al. (2017). It will also discuss the proposed study's strengths and limitations followed by suggestions for future research.

Interpretation of Results

This 16-week prospective cohort study will evaluate the effectiveness of three different performance improvement projects as it relates to LTC residents' satisfaction with food service, and residents' risk for malnutrition. The performance improvement projects, we predict, will result in varying levels of improved satisfaction among LTC residents, and result in a lower risk for developing malnutrition when compared to residents' baseline information.

Characterization of the Study Population

For the proposed study, participants will include residents at a Veteran Affairs Medical Center long-term care facility. Similar to Abbott et al. (2013), Wright et al. (2013), and Keller et al. (2017) the study population will live in a long term care facility, and will be provided with the majority of their meals from the facility's food service operation. However, unlike Abbott et al. (2013), Wright et al. (2013), and Keller et al. (2017) participants will be mostly male residents as this is the current population that is at the Clement J. Zablocki Veteran Affairs-Community Homes.

Customer Service Training

Improving the staff training related to customer service, we anticipate, will increase LTC residents' overall food service satisfaction scores. Furthermore, we expect that residents' meal intake will improve, and risk for developing malnutrition based on their MNA-SF scores will decrease. Although, satisfaction scores and MNA-SF scores are anticipated to improve. The MNA-SF scores are not anticipated to be significant improvements.

Changes to Meal Service

We anticipate that changes to meal service, with additional meal options being available will result in the greatest improvements for overall satisfaction scores. We would also anticipate this change resulting in the greatest reduction in risk for residents developing malnutrition based off of their MNA-SF scores. The additional meal options are anticipated to result in residents eating more at meal times once they are able to choose items they like and want to eat. We anticipate that there will be a significant improvement in overall food service satisfaction scores, and a significant reduction in risk for residents to develop malnutrition.

Changes to Dining Environment

With changes to the dining environment being after a 4-week cycle of LTC residents having additional meal options we would anticipate this having an effect on the satisfaction results. Changes to the dining environment may have lower satisfaction scores as a result of no longer having the additional meal options. We anticipate that this will result in a higher risk for developing malnutrition as meal intake is likely to decreased. The results from this portion of the study may reflect more on the removal of the additional meal options than the actual change of the dining environment with the addition of soft music and table cloths. We anticipate that the

overall food service satisfaction and risk for residents to develop malnutrition will be comparable to their baseline data.

Comparison to Other Studies

The anticipated results of the proposed study are consistent with the studies conducted by Abbott et al. (2013), Wright et al. (2013), and Keller et al. (2017). In the study conducted by Keller et al. which looked at changes to food service, dining environment alterations, staff training, and feeding assistance there was inconsistent data that these changes resulted in any differences to the LTC residents body weight similar to the proposed study. Keller et al. observed a decrease in risk for developing malnutrition after staff participated in a training on nutrition care and feeding assistance just as the proposed study is anticipated to result. Similar to the anticipated results of the proposed study; Abbott et al. found that offering residents additional food choices resulted in a significant increase to a resident's caloric intake or percentages of meals consumed. When changes were made in the dining environment, Abbott et al. found mixed results this had on weight changes and intake at meals.

Wright et al. (2013) also found that giving residents in a LTC facility choices at meals resulted in a significant improvement in food service satisfaction. Wright et al. found that when residents were able to choose their meal 3-days in advance to when the meal would be served resulted in the greatest food service satisfaction scores. The concept behind allowing LTC residents the option to choose their meal gives the residents more of a "say" in what they are receiving. This then provides the residents a form of independence and greatly improves their satisfaction.

In the proposed research study, it is anticipated that there will be an improvement in intake and with satisfaction with training on customer service. Keller et al., found that LTC

facilities utilizing person-centered care had residents with the greatest intake at meals. Although the proposed research study does not include participants on texture modified diets as did Keller et al. it should be noted that those on a pureed diet, or those who required assistance with eating when offered person-centered care had the greatest improvements in food intake. Having staff trained in person-centered care, or improving their customer service skills may likely have similar results.

Strengths and Limitations

There are several strengths to this study. First the interventions will take place to a captive group of participants as they will all be LTC residents at the facility collecting the data. Second, the interventions will be monitored by the management of the facility. The third strength is that the facility has an onsite dietitian to conduct MNA-SF examinations on residents' and determine their risk for developing malnutrition. Being able to complete this study using staff with limited food service knowledge and experience can be both a strength and limitation as it helps to see the effect training has on food service satisfaction, but it can also be a limitation as this may affect the quality of meals.

An additional limitation of this study design is that the population at a Veteran Affairs long-term care facility does not reflect the population at other LTC facilities as VA LTC facilities will include mostly male residents. A third limitation is the number of available participants. Since the study takes place on a LTC unit at the VA with a maximum census of 30 residents this is the limit of participants. After the removal of those that are not eligible for the study or do not wish to participate, the study is left with a small group of participants data can be collected from. The food ordering process at this VA LTC unit is an additional limitation since meal ingredients can be substituted by the grocery vendor without the knowledge of the nutrition

department that is creating the recipes or menus. This makes following a standardized recipe difficult, and makes it difficult to keep meals consistent throughout the study.

Conclusion

Long-term care residents often have complaints about the food they are served or the overall food service they are provided. If residents have poor satisfaction with food service this can greatly affect the residents' intake at meals, and it may increase their risk for developing malnutrition. The proposed research study will look at how different performance improvement projects affect a LTC residents' satisfaction with food service and their risk for developing malnutrition. Having the knowledge to know which performance improvements can result in the greatest improvements for satisfaction, and reduction in risk for malnutrition can help food service operation leaders know what projects to work on for improving service. Additional research on ways food service satisfaction can be improved, and the significance of the improvements will help determine future trends in LTC food service.

References

- Abbott, R. A., Whear, R., Thompson-Coon, J., Ukoumunne, O. C., Rogers, M., Bethel, A., Hemsley, A., & Stein, K. (2013). Effectiveness of mealtime interventions on nutritional outcomes for the elderly living in residential care: A systematic review and meta-analysis. *Ageing Research Reviews, 12*(4), 967–981.
<https://doi.org/10.1016/j.arr.2013.06.002>
- Bschaden, A., Dörsam, A. F., Cvetko, K., Kalamala, T., & Stroebele-Benschop, N. (2020). The impact of lighting and table linen as ambient factors on meal intake and taste perception. *Food Quality and Preference, 79*, 103797.
<https://doi.org/10.1016/j.foodqual.2019.103797>
- Burack, O. R., Weiner, A. S., Reinhardt, J. P., & Annunziato, R. A. (2012). What matters most to nursing home elders: Quality of life in the nursing home. *Journal of the American Medical Directors Association, 13*(1), 48–53. <https://doi.org/10.1016/j.jamda.2010.08.002>
- Carrier, N., Villalon, L., Lengyel, C., Slaughter, S. E., Duizer, L., Morrison-Koechl, J., & Keller, H. (2019). Diet quality is associated with malnutrition and low calf circumference in Canadian long-term care residents. *BMC Nutrition, 5*(1). <https://doi.org/10.1186/s40795-019-0314-7>
- Collins, J., Huggins, C. E., Porter, J., & Palermo, C. (2017). Factors influencing hospital foodservice staff's capacity to deliver a nutrition intervention. *Nutrition & Dietetics, 74*(2), 129–137. <https://doi.org/10.1111/1747-0080.12344>
- Contributor, N. T. (2019, November 27). *Malnutrition: Symptoms, causes, treatment*. Nursing Times. <https://www.nursingtimes.net/archive/malnutrition-20-05-2009/>

Crogan, N. L., Dupler, A. E., Short, R., & Heaton, G. (2013). Food choice can improve nursing home resident meal service satisfaction and nutritional status. *Journal of Gerontological Nursing, 39*(5), 38–45. <https://doi.org/10.3928/00989134-20130313-02>

Divert, C., Laghmaoui, R., Crema, C., Issanchou, S., Wymelbeke, V. V., & Sulmont-Rossé, C. (2015). Improving meal context in nursing homes. impact of four strategies on food intake and meal pleasure. *Appetite, 84*, 139–147. <https://doi.org/10.1016/j.appet.2014.09.027>

Douglas, J. W., & Lawrence, J. C. (2015). Environmental considerations for improving nutritional status in older adults with dementia: A narrative review. *Journal of the Academy of Nutrition and Dietetics, 115*(11), 1815–1831. <https://doi.org/10.1016/j.jand.2015.06.376>

Evidence profile: Malnutrition (n.d.). *World Health Organization*.

<https://www.who.int/ageing/health-systems/icope/evidence-centre/ICOPE-evidence-profile-malnutrition.pdf?ua=1>

Hartwell, H. J., Shepherd, P. A., Edwards, J. S. A., & Johns, N. (2016). What do patients value in the hospital meal experience? *Appetite, 96*, 293–298. <https://doi.org/10.1016/j.appet.2015.09.023>

Keller, H. H., Carrier, N., Slaughter, S. E., Lengyel, C., Steele, C. M., Duizer, L., Morrison, J., Brown, K. S., Chaudhury, H., Yoon, M. N., Duncan, A. M., Boscart, V., Heckman, G., & Villalon, L. (2017). Prevalence and determinants of poor food intake of residents living in long-term care. *Journal of the American Medical Directors Association, 18*(11), 941–947. <https://doi.org/10.1016/j.jamda.2017.05.003>

- Kim, H. J. (2011). Service orientation, service quality, customer satisfaction, and customer loyalty: Testing a structural model. *Journal of Hospitality Marketing & Management*, 20(6), 619–637. <https://doi.org/10.1080/19368623.2011.577698>
- Komisar, H., & Hado, E. (2019, August). Long-term services and supports. *AARP*. <https://www.aarp.org/content/dam/aarp/ppi/2019/08/long-term-services-and-supports.doi.10.26419-2Fppi.00079.001.pdf&lang=en>.
- Merriam-Webster. (n.d.). *Assisted living definition & meaning*. Merriam-Webster. Retrieved September 4, 2022, from <https://www.merriam-webster.com/dictionary/assisted%20living>
- Murphy, D. R., Brooks, J. T., & Rainville, A. J. (2009). Comparison of long-term care residents' food intake, body weight, and food costs between two meal service styles. *Journal of the American Dietetic Association*, 109(9). <https://doi.org/10.1016/j.jada.2009.06.211>
- Ncube, L. J., & Nesamvuni, A. E. (2019). South African foodservice quality: Inpatient's perceptions. *International Journal of Health Care Quality Assurance*, 32(2), 447–458. <https://doi.org/10.1108/ijhcqa-01-2018-0021>
- Nestle Nutrition Institution. (n.d.). *Www.mna-elderly.com*. A guide to completing the Mini Nutritional Assessment – Short Form. <https://www.mna-elderly.com/publications/default.html>
- Nowinski, R., Pascual, R., & Trombley, L. (2010). Implementation of training regimen for hospitality assistants increases patient satisfaction scores for overall meal experience. *Journal of the American Dietetic Association*, 110(9), A66–A66. <https://doi.org/10.1016/j.jada.2010.06.248>
- Pezzana, A., Cereda, E., Avagnina, P., Malfi, G., Paiola, E., Frighi, Z., Capizzi, I., Sgnaolin, E., & Amerio, M. L. (2015). Nutritional care needs in elderly residents of long-term care

institutions: Potential implications for policies. *The Journal of Nutrition, Health & Aging*, 19(9), 947–954. <https://doi.org/10.1007/s12603-015-0537-5>

Position of the Academy of Nutrition and Dietetics: Individualized Nutrition Approaches for Older Adults: Long-Term Care, Post-Acute Care, and Other Settings. Eat Right. (2018, April). <https://www.eatrightpro.org/-/media/eatrightpro-files/practice/position-and-practice-papers/position-papers/individualizednutritionapproachesforolderadults.pdf>.

Roberts, A., Rabe, M., Blakeslee, L., & Ogunwole, S. (2018, October). *The population 65 years and older in the United States: 2016*.

<https://shutdown.census.gov/content/dam/Census/library/publications/2018/acs/ACS-38.pdf>.

Soneff, R., McGeachy, F., Davison, K., McCargar, L., & Thérien, G. (1994). Effectiveness of two training methods to improve the quality of foodservice in small facilities for adult care. *Journal of the American Dietetic Association*, 94(8), 869–873.

[https://doi.org/10.1016/0002-8223\(94\)92366-3](https://doi.org/10.1016/0002-8223(94)92366-3)

Van Wymelbeke, V., Sulmont-Rossé, C., Feyen, V., Issanchou, S., Manckoundia, P., & Maître, I. (2020). Optimizing sensory quality and variety: An effective strategy for increasing meal enjoyment and food intake in older nursing home residents. *Appetite*, 153, 104749.

<https://doi.org/10.1016/j.appet.2020.104749>

Veterans Affairs. (2013, September 9). *Patient Centered Care*.

<https://www.va.gov/QUALITYOFCARE/initiatives/patient-centered-care.asp>

Wright, O. R., Connelly, L. B., Capra, S., & Hendrikz, J. (2013). Determinants of foodservice satisfaction for patients in geriatrics/rehabilitation and residents in residential aged

care. *Health Expectations*, 16(3), 251–265. <https://doi.org/10.1111/j.1369-7625.2011.00711.x>

Wu, S. A., Morrison-Koechl, J., Slaughter, S. E., Middleton, L. E., Carrier, N., McAiney, C., Lengyel, C., & Keller, H. (2020). Family member eating assistance and food intake in long-term care: A secondary data analysis of the M3 study. *Journal of Advanced Nursing*, 76(11), 2933–2944. <https://doi.org/10.1111/jan.14480>

Appendix A

Letter to Potential Subjects

Dear (Veteran),

My name is Ben Mohr. I am a Graduate Student at Mount Mary University in Milwaukee, WI and am studying the effectiveness of changes to a food service operation. Throughout September 2022 to December 2022 multiple changes will occur in the food service operation of this unit including training, changes to menu options and changes to the dining room. To better understand the effectiveness of each change you are invited to participate in this study.

Your participation in the research is voluntary. If, at any time, you would like to stop participating in the research, you may do so. All information collected will remain confidential with any paper forms shredded at the end of the study. Responses to surveys will remain anonymous.

Feel free to contact me in-person or by email at Benjamin.Mohr2@VA.gov with any questions you might have. You may also contact Mount Mary University for concerns about privacy and rights or Supervising Faculty Member Janine Bamberger at bambergj@mtmary.edu

Please indicate if you would like to participate in this study, and return to any Community Home employee.

- Yes – please include me
- No – I wish to decline participation at this time.

Signature of Participant

Respectfully,

Ben Mohr, RD

Clement J. Zablocki VA Medical Center Building 148 Room 104

Appendix B



OMB 2900-0770
Estimated Burden: 2 min.

Nutrition & Food Services Satisfaction Survey “Because We Care”



The Paperwork Reduction Act of 1995 requires us to notify you that this information collection is in accordance with the clearance requirements of section 3507 of this Act. We may not conduct or sponsor, and you are not required to respond to, a collection of information unless it displays a valid OMB number. We anticipate that the time expended by all individuals who must complete this form will average 2 minutes. This includes the time it will take to read instructions, gather the necessary facts and fill out the form. The purpose of this data collection is to determine the level of patient satisfaction and quality of service. Response to this survey is voluntary and failure to participate will not affect any benefits to which you may be entitled.

VA Form 10-0498
NOV 2012

Great Nutrition.....America's Healthy Choice

Nutrition & Food Services					
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
My meals taste good.	5	4	3	2	1
My meals look good.	5	4	3	2	1
My meals offer variety.	5	4	3	2	1
Cold food is served cold enough.	5	4	3	2	1
Hot food is served hot enough.	5	4	3	2	1
My meals are served in a timely manner.	5	4	3	2	1
Nutrition employees are polite and courteous.	5	4	3	2	1
I understand my prescribed diet.	5	4	3	2	1
My overall satisfaction rating of Nutrition and Food Services is excellent.	5	4	3	2	1
Comments or Suggestions?					
<small>(optional information)</small>					
Name:			Room#		

Appendix C

Mini Nutritional Assessment



Last name:	<input type="text"/>	First name:	<input type="text"/>
Sex:	<input type="text"/>	Age:	<input type="text"/>
Weight, kg:	<input type="text"/>	Height, cm:	<input type="text"/>
Date:	<input type="text"/>		

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening	
A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties? 0 = severe decrease in food intake 1 = moderate decrease in food intake 2 = no decrease in food intake	<input type="checkbox"/>
B Weight loss during the last 3 months 0 = weight loss greater than 3 kg (6.6 lbs) 1 = does not know 2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs) 3 = no weight loss	<input type="checkbox"/>
C Mobility 0 = bed or chair bound 1 = able to get out of bed / chair but does not go out 2 = goes out	<input type="checkbox"/>
D Has suffered psychological stress or acute disease in the past 3 months? 0 = yes 2 = no	<input type="checkbox"/>
E Neuropsychological problems 0 = severe dementia or depression 1 = mild dementia 2 = no psychological problems	<input type="checkbox"/>
F1 Body Mass Index (BMI) (weight in kg) / (height in m)² <input type="checkbox"/> 0 = BMI less than 19 1 = BMI 19 to less than 21 2 = BMI 21 to less than 23 3 = BMI 23 or greater	<input type="checkbox"/>

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm 0 = CC less than 31 3 = CC 31 or greater	<input type="checkbox"/>
--	--------------------------

Screening score (max. 14 points)	<input type="checkbox"/> <input type="checkbox"/>
12-14 points: <input type="checkbox"/> Normal nutritional status	<input type="button" value="Save"/>
8-11 points: <input type="checkbox"/> At risk of malnutrition	<input type="button" value="Print"/>
0-7 points: <input type="checkbox"/> Malnourished	<input type="button" value="Reset"/>

Ref. Vellas B, Villars H, Abellan G, et al. *Overview of the MNA® - Its History and Challenges*. J Nutr Health Aging 2006;10:456-465.
 Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF)*. J. Geront 2001;56A: M366-377.
 Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.
 Kaiser MJ, Bauer JM, Ramsch C, et al. *Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status*. J Nutr Health Aging 2009; 13:782-788.
 © Société des Produits Nestlé SA, Trademark Owners.
 © Société des Produits Nestlé SA 1994, Revision 2009.
 For more information: www.mna-elderly.com

Appendix D



Mount Mary University Institutional Review Board (IRB) for the Protection of Human Subjects

Application for IRB Review

**DATA COLLECTION CANNOT BEGIN
UNTIL THE IRB HAS APPROVED THIS PROJECT**

Directions:

- Faculty and student researchers, as well as student research advisors, should **read all relevant information on the University IRB page in My Mount Mary before initiating an application**. This includes full knowledge of the US Department of Health and Human Services Code of Federal Regulations Title 45 (Public Welfare), Part 46 (Protection of Human Subjects). <http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html>.
- All applicants must verify completion of Human Subjects Training. See <http://www.citiprogram.org>.
- The IRB application must be filed and approved by the IRB prior to any Mount Mary University faculty, staff, or student (undergraduate or graduate), initiating a research project/study.
- If there is a cooperating institution, attach a copy of their IRB approval.
- In the case of a student research project, the student may complete the IRB application but the student's research advisor must sign and submit the application to the IRB for approval. It is the responsibility of the faculty research advisor to ensure that student applications and all attachments (e.g., informed consent forms and survey instruments) are in their final edited form. Even though a student research project may qualify as exempt from full IRB review, the research advisor may request the student to complete and submit a full IRB application.
- Complete this application using your word processing program (e.g. Word), then send it on or print it out and obtain signatures from all investigators and advisors. (Handwritten applications will not be accepted.) For your benefit, save the completed application on your computer in case it needs to be revised and resubmitted.
- This is a professional document; please check spelling, grammar and punctuation.
- Submit an electronic copy, via email, of the completed application with required signatures and attachments, in a single pdf, to Tammy Scheidegger, IRB Chair, scheidet@mtmary.edu. You will receive an email verifying receipt of the application.
- Allow a minimum of 30 working days to process your application. Make sure this timeframe is accounted for when considering initiation of data collection and due dates for student projects. Please be aware that if, upon completion of the application, you find that no exemptions apply to your research, your application will need to go through a full IRB Committee review which can take as many as 60 days to be completed.
- For class projects you must submit IRB applications to the IRB Chair by October 31st of the fall semester and March 31st for the spring semester. For summer classes, please consult with the IRB Chair.
- Upon receipt of the IRB letter of approval, data collection may begin.

I. **Required Documentation** - *No action will be taken without these attachments.*

Are the following attached to the IRB application?

- | | | |
|---|---|--|
| Informed Consent Document | <input checked="" type="checkbox"/> Yes | Informed Consent Documents should include an explanation of procedures, risk, safeguards, freedom to withdraw, confidentiality, offer to answer inquiries, third party referral for concerns, signature and date. See Appendix A and use the MMU Informed Consent Template to avoid delays in the process. |
| Survey/Interview Instrument(s) | <input checked="" type="checkbox"/> Yes | If a survey is being administered in any written format (e.g., Google Forms, Survey Monkey, Qualtrics), a copy of that survey must accompany this application. If a survey/interview is being conducted verbally, a copy of the introductory protocol/comments and survey questions being asked must be attached to this application. If survey/interview includes focus group questions, a complete list of the question must be attached. For research using a published/purchased instrument, a photocopy of the instrument will suffice. |
| Verification of Human Subjects Training | <input checked="" type="checkbox"/> Yes | Copy of transcript, certificate or other evidence that ALL members of the research team have completed the required training. |
| Copy of cooperating institution's IRB approval. | <input checked="" type="checkbox"/> Yes | Not required if there is no cooperating institution. |

II. Investigator(s):

Name: Phone:

Affiliation with Mount Mary University (e.g. faculty, student, etc.):
 Email:

Signature: Date:

Name: Phone:

Affiliation with Mount Mary University:
 Email:

Signature: Date:

If student, list Research Advisor and complete the application. Research Advisor must provide requested information and verify.

Research Advisor's Name: Department:
 Email: Phone:

Research Advisor: Have you completed Human Subject's Training? Yes No

Research advisor's signature indicates responsibility for student compliance with all IRB requirements.

Signature: Date:
 Research Advisor

Individuals who participate in research play an important and active role in the advancement of knowledge. In recognition of their important contributions to research, humans will be referred to as "participants" rather than "subjects."

III. Project Description – Required by all applicants

Instructions: Briefly describe the proposed project including the sample and methodology (e.g. human subjects, data collection, data analysis and instruments).

- 1) Objectives (purpose of project):
 Evaluating effectiveness of process changes in long-term care food service operations to improving resident satisfaction.

- 2) Relevance to practice/body of knowledge:
 Understanding which changes within a food service operation results in the greatest improvement in resident satisfactions.

- 3) Describe the research design (e.g. subject/participant selection and assignment, design, intervention, data analysis):
 Participants from a Veteran Affairs long-term care unit were selected as optimal participants to implement changes within the food service operation to understand how the changes impact their satisfaction with food service. Study will follow a prospective cohort design. Interventions will include changes to food
- 4) What measurement/data collection tools are being used?
 Electronic health records and surveys

IV. Additional Project Information – Required by all applicants

- 1) What human subjects training has the researcher completed (e.g. course work, online certification)?
 Online certification
- 2) What process is used for obtaining informed consent? See Appendix A for consent content requirements and use the template, available on the MMU IRB webpage, when constructing your informed consent form.
- 3) Does the research include special populations?
- Minors under 18 years of age? Yes No
 - Persons legally incompetent? Yes No
 - Prisoners? Yes No
 - Pregnant women, if affected by research? Yes No
 - Persons institutionalized? Yes No
 - Persons mentally incapacitated? Yes No

If YES, describe additional precautions included in the research procedures.

- 4) Does the research involve any of the following procedures?
- False or misleading information to subjects? Yes No
 - Withholds information such that their informed consent might be questioned? Yes No
 - Uses procedures designed to modify the thinking, attitudes, feelings, or other aspects of the behavior of the subjects? Yes No

If YES, describe the rationale for using procedures, how the human subjects will be protected and what debriefing procedures are used.

5) Does the research involve measurement in any of the following areas?

- Sexual behaviors?
- Drug use?
- Illegal conduct?
- Use of alcohol?

- Yes No
- Yes No
- Yes No
- Yes No

If YES, describe additional precautions included in the research procedures.

6) Are any portions of the research being conducted online?

- Survey posted on a website?
- URL for survey includes information that could identify participants?
- Invitation to participate sent by email?
- Items use drop-down box?
If yes, assure that items allow choice of “no response”
- Will you be recording virtual interviews?

- Yes No

Audio only Video only Audio & Video

If video recording is being used, assure anonymity by only recording audio unless the research necessitates visual recording.

If YES, to any of the above items, describe additional procedures.

7) Describe the methods used to ensure confidentiality of data obtained.

HIPPA followed with accessing personal health information through Veteran Affairs electronic health records.
No names will be used throughout the results and information will be shredded at the end of the study.

Risks and Benefits

1) Describe risks to the subjects and the precautions that will be taken to minimize them. (Risk includes any potential or actual physical risk of discomfort, harassment, invasion of privacy, risk of physical activity, risk to dignity and self-respect, and psychological, emotional or behavioral risk.)

Minimal risks as the long-term care residents are already being provided meals through the food service operation.

2) Describe the benefits to subjects and/or society. (These will be balanced against risk.)

Better understanding of which changes within a food service operation may be best to focus on for improving long-term care resident's satisfaction with the overall food service provided.

V. Is the proposed project “research” as defined by Institutional Review Board requirements? - Required by all applicants

Per 45 CFR 46.102: “Research is defined as a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes.”

Per HHS.gov and the Office for Human Subjects Research (<https://www.hhs.gov/ohrp/regulations-and-policy/requests-for-comments/draft-guidance-activities-deemed-not-be-research-public-health-surveillance/index.html#:~:text=For%20purposes%20of%20the%202018.by%20a%20public%20health%20authority>), the following activities are deemed **not** to be research:

- Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected.
- Public health surveillance activities, including the collection and testing of information or biospecimens, conducted, supported, requested, ordered, required, or authorized by a public health authority. Such activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate potential public health signals, onsets of disease outbreaks, or conditions of public health importance (including trends, signals, risk factors, patterns in diseases, or increases in injuries from using consumer products). Such activities include those associated with providing timely situational awareness and priority setting during the course of an event or crisis that threatens public health (including natural or man-made disasters).
- Collection and analysis of information, biospecimens, or records by or for a criminal justice agency for activities authorized by law or court order solely for criminal justice or criminal investigative purposes.
- Authorized operational activities (as determined by each agency) in support of intelligence, homeland security, defense, or other national security missions.

A human subject is defined as a living individual about whom an investigator obtains either 1) data through intervention or interaction with the individual; or 2) identifiable private information. In social science research, human subjects may be referred to as research subjects or research participants.

Does the research involve human subjects/participants or official records about human subjects/participants?

Yes No

If “no”, STOP here, and submit application.

If the results will be available in the library, presented at a professional conference (includes any presentation to group(s) outside of the classroom), or published, please check the Yes box:

Yes No

If “yes”, proceed to SECTION VI.

If “no”, STOP here, and submit application.

VI. Exemptions - Required by all applicants

Are you requesting exemption from IRB review in one of the federally approved categories?

Yes No

If yes, please reference OHRP website <http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html> and continue with application.

- 1) Does the research meet the criteria for exempt category 1 (education)? [45 CFR 46.104(d)(1)]? Is the research conducted in established or commonly accepted educational settings (e.g. schools, Universities, or other sites where educational activities regularly occur)?

Yes No