

MALNUTRITION SCREENING OF PATIENTS SIXTY YEARS AND OLDER
IN PRIMARY CARE

by

Brooke Kelsey Holtzen

Copyright © Brooke Kelsey Holtzen 2020

A DNP Project Submitted to the Faculty of the

COLLEGE OF NURSING

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF NURSING PRACTICE

In the Graduate College

THE UNIVERSITY OF ARIZONA

2020

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Brooke Kelsey Holtzen, titled Malnutrition Screening of Patients Sixty Years and Older in Primary Care and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

Patricia Daly

Date: Nov 16, 2020

Patricia Daly, PhD, FNP-BC, ENP-BC, FAANP

Mary Davis, PhD, RN, CPHQ

Date: Nov 16, 2020

Mary Patricia Davis, PhD, RN, CPHQ

Allen Prettyman

Date: Nov 16, 2020

Allen Prettyman, PhD, FNP-BC, FAANP, FNAP

Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

Patricia Daly

Date: Nov 16, 2020

Patricia Daly, PhD, FNP-BC, ENP-BC, FAANP
DNP Project Committee Chair
College of Nursing

ARIZONA

ACKNOWLEDGMENTS

I would like to thank Dr. Daly for her continuous support, encouragement, and assistance throughout this entire process. Your knowledge, empathy, and words of wisdom have been heard and taken to heart. I aspire to be a provider and mentor as wonderful as you. Thank you to my committee members Dr. Davis and Dr. Prettyman for your guidance, constructive criticism, and support with my project. Also, thank you to Dr. Prettyman for helping me coordinate my project with the online learning center and facilitating a smooth process. Lastly, I would also like to thank Dr. Wells for sharing her time and knowledge with me, I have learned so much from you. Being your preceptee was an incredible experience and I am unbelievably grateful for your support, encouragement, and friendship.

DEDICATION

I would like to dedicate this project to my husband, Jason, and my entire family. Jason, this journey has been incredibly difficult, and I am unbelievably grateful for your unconditional support, love, and patience. To my mom, Wendy, thank you for inspiring me to become a nurse and to continue my education. Watching you chase your dreams, encouraged me to chase mine. Thank you to my family for always supporting my endeavors and for being my biggest fans. I would also like to dedicate this project in memory of my great-grandma Tillie, who was a nurse in the 1950s, and inspired my mom and myself to follow in her footsteps.

TABLE OF CONTENTS

| | |
|---|-----------|
| LIST OF FIGURES | 7 |
| LIST OF TABLES | 8 |
| ABSTRACT | 9 |
| INTRODUCTION | 11 |
| Background Knowledge and Significance | 11 |
| Local Problem | 13 |
| Intended Improvement | 14 |
| Project Purpose | 14 |
| Project Question | 14 |
| Project Objectives | 14 |
| Theoretical Framework | 15 |
| Unfreezing | 15 |
| Moving | 16 |
| Refreezing | 16 |
| Literature Synthesis | 17 |
| Evidence Search | 17 |
| Comprehensive Appraisal of Evidence | 19 |
| Strengths of Evidence | 20 |
| Weaknesses of Evidence, Gaps and Limitations | 20 |
| METHODS | 21 |
| Project Design | 21 |
| Model for Implementation | 21 |
| Setting and Stakeholders | 23 |
| Planning the Intervention | 23 |
| Participants and Recruitment | 24 |
| Consent and Ethical Considerations | 24 |
| Data Collection | 25 |
| Data Analysis | 26 |

TABLE OF CONTENTS - Continued

| | |
|---|----|
| RESULTS | 26 |
| Outcomes | 26 |
| DISCUSSION | 30 |
| Summary | 30 |
| Interpretation | 31 |
| Implications (Practice, Education, Research and Policy) | 33 |
| Limitations | 34 |
| DNP Essentials Addressed | 34 |
| Conclusions | 35 |
| Plan for Sustainability | 36 |
| Plan for Dissemination | 36 |
| APPENDIX A: TELEHEALTH LEARNING CENTER SITE APPROVAL / THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD DETERMINATION LETTER | 37 |
| APPENDIX B: CONSENT DOCUMENT (DISCLOSURE AND CONSENT FORM) | 40 |
| APPENDIX C: RECRUITMENT MATERIAL (RECRUITMENT EMAIL) | 42 |
| APPENDIX D: EVALUATION INSTRUMENTS (PRE-IMPLEMENTATION SURVEY/POST-IMPLEMENTATION SURVEY) | 44 |
| APPENDIX E: PARTICIPANT MATERIAL (LOCAL NUTRITION ASSISTANCE LIST) | 49 |
| APPENDIX F: MNA-SF SCREENING TOOL | 51 |
| APPENDIX G: PROJECT TIMELINE | 53 |
| APPENDIX H: LITERATURE REVIEW GRID | 55 |
| REFERENCES | 59 |

LIST OF FIGURES

| | | |
|-----------------|--|----|
| Figure 1 | <i>Illustration of the Theoretical Framework</i> | 17 |
| Figure 2 | <i>Illustration of the PDSA Cycle</i> | 22 |

LIST OF TABLES

| | | |
|----------------|--|----|
| Table 1 | <i>Diagram of Article Delineation</i> | 18 |
| Table 2 | <i>Pre-Implementation Survey Survey - Part 1</i> | 27 |
| Table 3 | <i>Pre-Implementation Survey Survey - Part 2</i> | 27 |
| Table 4 | <i>MNA-SF Screening Tool Scores</i> | 28 |
| Table 5 | <i>MNA-SF Scores</i> | 29 |
| Table 6 | <i>Post-Implementation Survey</i> | 30 |

ABSTRACT

Purpose: The purpose of this quality improvement project was to assess the feasibility of utilizing the MNA-SF screening tool to assess older adult participants' perception and knowledge of malnutrition in a virtual clinic

Background: Malnutrition is a concern for the older adult population. Lack of adequate nutrition can result in progressive decline in overall health and reduced quality of life. Routine screening of patients in primary care setting may lead to early identification of nutritional deficits; still, many practices do not routinely use screening tools, and many patients who are malnourished remain undetected.

Methods: This project used a descriptive quantitative approach to determine participant perceptions of nutrition screening practices. Ten female participants over age 60 were included. A pre-implementation survey was administered to participants immediately prior to implementing the screening tool. The MNA-SF screening tool was then implemented. Next, a post-implementation survey was completed by participants to assess the feasibility of the MNA-SF tool for future practice. Descriptive analysis was used to determine current gaps in screening and patient perceptions of nutrition. Implementation occurred in a virtual healthcare clinic in Tucson, Arizona.

Results: 100% of the participants reported they had not been screened for malnutrition with their primary providers in the past. Following implementation, the MNA-SF screening tool scores identified 30% of participants were at risk for malnutrition, and 10% were identified as malnourished. 100% of participants agreed the screening tool was easy to use, and 90% of

participants agreed they would be willing to complete the screening tool during annual wellness visits with their primary care providers.

Conclusions: The routine use of validated nutrition screening tools such as the MNA-SF can enhance detection of older adults who are at risk for malnourishment. All 10 participants in this project reported they had never been screened for malnutrition by their primary care provider, indicating the lack of current screening tool use. Most of the participants agreed the screening tool was easy to use and were willing to complete it at annual wellness visits. Further studies are warranted to determine efficacy of use in virtual environments and patient experiences with nutrition screening.

INTRODUCTION

Malnutrition in older adults has multiple causes and is associated with disability, frailty, and poor health outcomes (Volkert, 2013). These complications can significantly hinder an older adult's quality of life, making nutrition an important component of healthcare for this population. Life expectancy has drastically extended resulting in an increasing older adult population. The World Health Organization (WHO) estimates by the year 2025, there will be approximately 1.2 billion older adults worldwide (Nazan & Buket, 2018). The approximate population of adults aged 60 or older in the state of Arizona is 1,259,100 (United States Census Bureau, 2018). As this number continues to rise over time, the necessity for healthcare in this region will also increase, making this a critical patient population for primary care providers.

In 2019, approximately 9.9 million adults over age 60 were threatened by inadequate nutrient intake in the United States (U.S.) (Meals on Wheels America, 2019). Nutrition plays a vital role in the quality of life of older adult patients and should be a priority for providers when creating a plan of care. One aspect of care plans are nutritional screening tools for detecting patients who are at risk for malnourishment. Although these validated nutritional screening tools are available for primary care providers; many providers do not currently incorporate them in their practice (Craven, Pelly, Lovel, et al., 2016).

Background Knowledge and Significance

Malnutrition is defined as a lack of nutrition needed for optimal health and is characterized by an inability to consume or absorb the nutrients the body requires (Nazan & Buket, 2018). Many factors within the older adult population contribute to inadequate nutrition intake. These factors include physiological changes associated with aging, chronic health

conditions, dementia, depression, financial income, transportation, and social isolation (Mangels, 2018). Insufficient nutrition can result in progressive disability, reduced quality of life, delayed healing, decline in overall health, and an increased risk of premature mortality (Ennis, Saffel-Shrier, & Verson, 2001). In addition to poor patient outcomes and reduced quality of life, the financial burden associated with undernourished older adults is considerably high. Annually, in the U.S., disease-associated malnutrition in adults older than 60 is estimated to cost \$51.3 billion (Defeat Malnutrition Today, 2017). Associated costs impact the patient, the provider, organizations, and the country as a whole.

Malnutrition in the older adult population is often undetected as many patients do not seek medical attention specifically for this issue. Presenting symptoms of malnourishment may be vague or expressed in other organ systems, making detection difficult for providers (Ennis, Saffel-Shrier, & Verson, 2001). Precise numbers of affected individuals are unknown due to varied detection and subsequent missed diagnoses of malnutrition in older adults. According to Nestle Nutrition Institute (2015), the known prevalence of malnutrition in older adults is 22.6% however; this number is expected to be higher due to inadequate detection.

Routine nutritional screening of patients in the primary care setting may lead to early identification of nutritional deficits and increased detection of malnourished older adults. There are a multitude of screening tools available for nutrition screening. A reliable validated screening tool that has proved to be successful in identifying patients at risk for malnutrition is the mini nutritional assessment-short form (MNA-SF) (Appendix F) (Nestle Nutrition Institute, 2015). This screening tool assesses nutrition status categorizing patients as having normal nutrition status, being at risk of malnutrition, or as being currently malnourished. Compared to

similar nutrition assessment tools including the *Nutrition Risk Screening* and the *Patent Generated Subjective Global*, the MNA-SF is specifically endorsed by the National Council on Aging for use in the outpatient older adult population (National Council on Aging, 2017). The MNA-SF assesses patient information regarding food intake, mobility status, weight loss, psychological stressors, and body mass index (BMI) (Nestle Nutrition Institute, 2015). A study conducted by Ferrari Bravo et al. (2018), found the MNA-SF was adequate in identifying patients at risk for malnourishment. These patients were confirmed to be malnourished through biochemical testing. According to Ferrari Bravo et al. (2018), the MNA-SF is sufficient for general providers to use in primary care settings for identifying patients at risk for malnutrition. Despite the introduction of screening tools in the 1990s, malnutrition among this population continues to rise, and older adults at risk remain undetected.

Local Problem

Feeding America is an organization focused on improving nutritional status in underprivileged populations (Ziliak & Gundersen, 2019). This organization conducts an annual survey and produces an executive summary focused on the prevalence of food insecurity of seniors at national and local levels. This survey aims to identify factors associated with the issue and improve knowledge for efforts to reduce or eliminate malnutrition in this population. The most recent report released in 2020 used data from 2018. This report found that approximately 8.0% of older adults in Arizona were identified as being food insecure or unable to access adequate nutrition (Feeding America, 2020). These numbers are associated with several factors, including income, race, marital status, metro location, employment status, gender, and veteran status (Feeding America, 2020). Based on these findings, it is evident that

Arizona older adult residents are at risk for insufficient access to resources to help reduce or eliminate malnutrition. For these reasons, primary care providers in Arizona play a crucial role in the identification of these patients and the referral of available resources.

Intended Improvement

Project Purpose

The purpose of this quality improvement (QI) project was to assess the feasibility of utilizing the MNA-SF screening tool to assess older adult participants' perception and knowledge of malnutrition in a virtual clinic.

Project Question

Is it feasible to use the MNA-SF screening tool to identify patients over the age of 60 who are malnourished?

Project Objectives

The specific aims of the project were the following:

Aim 1: Assess participant perceptions of nutrition and primary care screening practices in the Telehealth Learning Center in October 2020.

Aim 2: Implement the MNA-SF tool and interpret clinical findings for participants 60 years of age and older in the Telehealth Learning Center and share appropriate nutritional resources for participants identified at risk.

Aim 3: Assess the feasibility of the MNA-SF screening tool following the implementation in the Telehealth Learning Center.

Theoretical Framework

The theoretical framework that guided this project is Kurt Lewin's change theory. This model focuses on human behaviors' relationship with and resistance to change (Sutherland, 2013). To achieve desired outcomes, change must be implemented effectively and adequately adopted within an institution. Developed in 1947, Lewin's theory guides innovation by analyzing driving forces promoting change and restraining oppositional forces (Hussain et al., 2018). Driving forces include the desire to identify potential tools to improve practices or internal issues within a system (Bozak, 2003). For the purpose of this project, the inadequate use of screening tools to detect malnutrition in primary care, and the complications of malnutrition in the older adult population act as the driving forces for change in practices. Restraining forces include barriers preventing the implementation from occurring and willingness to change routines (Bozak, 2003). In regard to this QI project, restraining forces are the patient's insufficient knowledge on the subject and time constraints. Testing feasibility and identifying facilitator and barriers to participant adoption of the MNA-SF are initial steps to addressing this problem. After identifying driving and restraining forces, organizations can work to curtail these forces so the implementation of new practices can successfully occur (Bozak, 2003).

In addition to focusing on human behaviors positively and negatively impacting innovation, Lewin's theory also describes change as a three-step process. These steps include *unfreezing*, *moving*, and *refreezing* (Sutherland, 2013) (Figure 1).

Unfreezing

Unfreezing involves identification of a current issue or need within an organization and may be the stage where participants feel reluctance towards the new change (Bozak, 2003). In

this stage, the facilitation of driving and reduction of restraining forces is crucial to advancing to the next step of the process. For this project, the identified need is increased detection of malnourished patients over age 60, and to provide nutritional resources for those who are at risk of malnutrition.

Moving

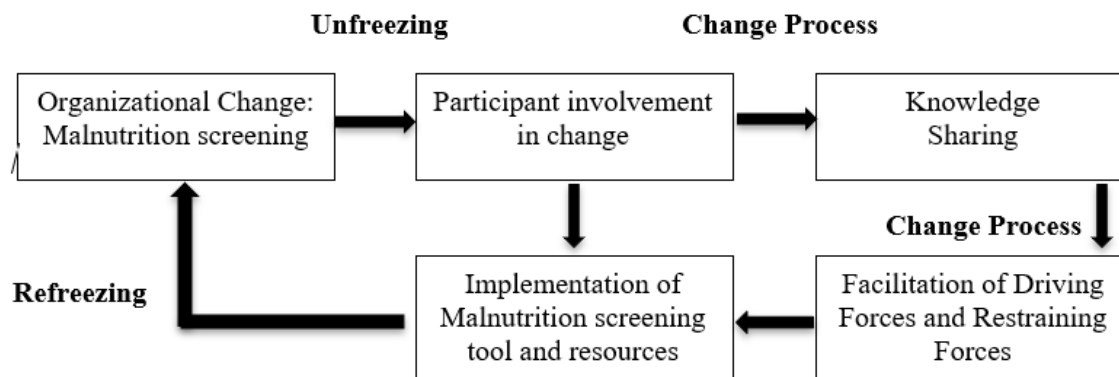
Moving into change is the second step and is where the implementation of the new practice occurs (Bozak, 2003). During this stage, the organization allows for trial and error (Manchester et al., 2014). Of importance is implementing the screening tool into patient visits of adults older than 60 years. After patients were identified as being at-risk for malnourishment, resources were then provided to the patient for enhancing current nutritional practices. To ensure restraining forces do not interfere with the progress of implementation, open communication with participants, and reiteration of driving forces is crucial during this stage. This included educating the project participants on the importance of nutrition, discussing the benefits of using screening tools, and having a general discussion that allows participants to ask questions regarding nutrition and their nutritional status.

Refreezing

The final stage in Lewin's theory of change is *refreezing*, where stabilization of the new practice is achieved within the organization (Bozak, 2003). During this step, participants evaluated the overall effectiveness of the new method for future use (Sutherland, 2013). This is achieved through the reinforcement of the malnutrition screening tool and assessment of feasibility for future use through a participant survey (Manchester et al., 2014).

Figure 1

Illustration of the Theoretical Framework

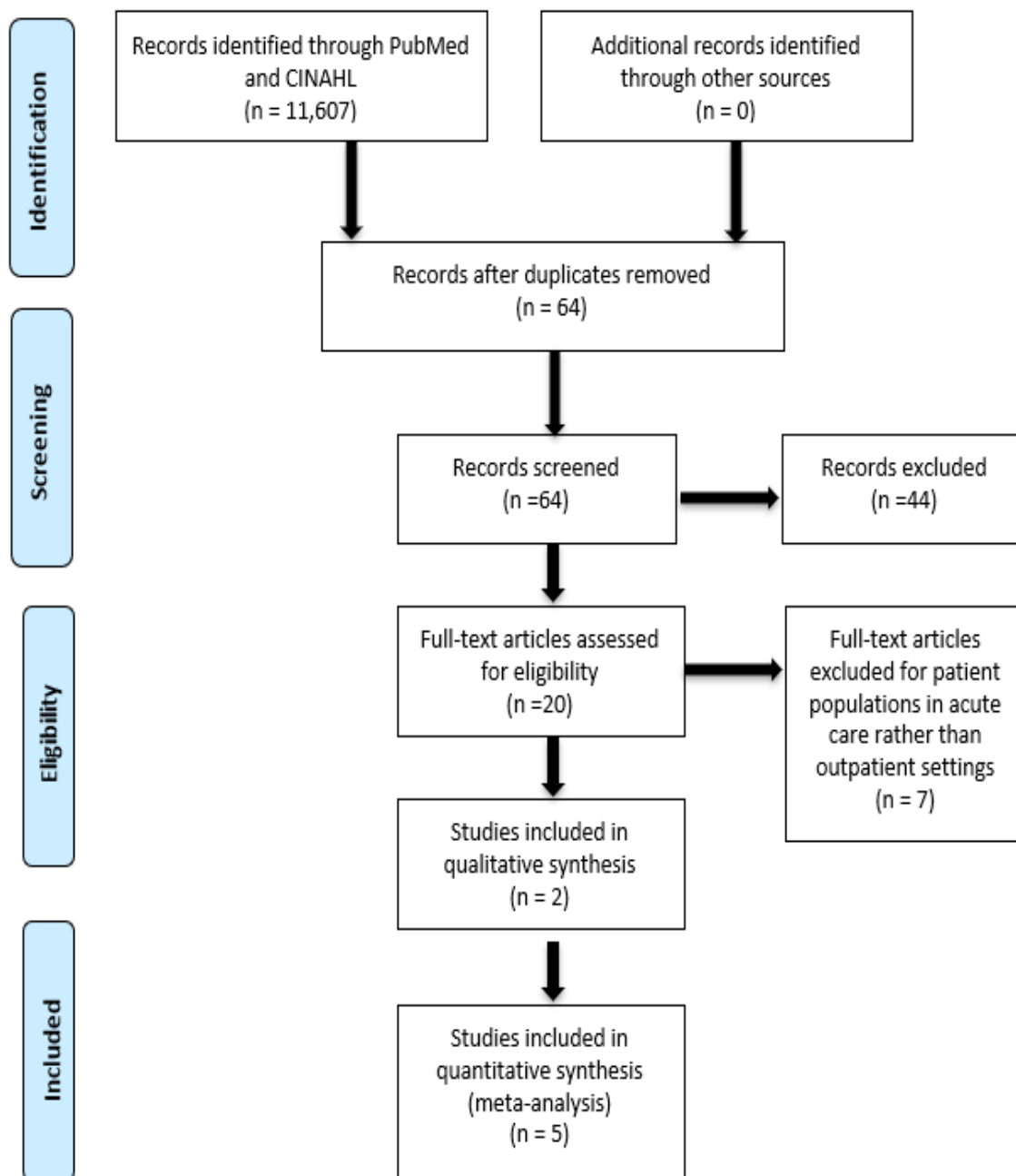


(Hussain et al., 2018)

Literature Synthesis

Evidence Search

To enhance understanding of the use of malnutrition screening tools for the older adult population in outpatient settings, a systematic review of the literature was performed. Databases for the search included PubMed and CINAHL. Key search terms included *malnutrition*, *screening*, and *older adult*. This search yielded 11,607 results. Inclusion criteria were then applied for articles published in the last five years, full text, English language, and age of 60 years and older. This narrowed the results to 64 articles. Articles were reviewed for relevance to the project, and seven articles were selected (Appendix I). Any articles that focused on inpatient settings were excluded as this QI project focuses on outpatient care. Table 1 provides a diagram of how articles were delineated for review.

Table 1*Diagram of Article Delineation*

(Moher, Liberati, & Altman, 2009)

Comprehensive Appraisal of Evidence

The literature presented common themes: malnutrition negatively affects many outcome measures, and the MNA-SF is a validated and useful tool for identifying at-risk and malnourished patients. Malnutrition in the older adult population significantly affects quality of life, overall health and wellness, and contributes to early mortality (Berggren, Strang, Orrevall, et al., 2019; Lambert, Taylor, Bowden, et al., 2019; & Wei, Nyunt, Gao, et al., 2019). Authors collectively discuss the negative impact of poor nutrition and the necessity for early detection. Additionally, the literature revealed the use of screening tools in practice varies widely in primary care (Craven, Pelly, Lovel, et al., 2016).

Another recurring theme in the literature revealed utilization of the MNA-SF as a validated and reliable tool to successfully identify at-risk and malnourished patients (Berggren, Strang, Orrevall, et al., 2019; Ferrari Bravo et al., 2018; Isautier et al., 2019; Lambert, Taylor, Bowden, et al., 2019; & Wei, Nyunt, Gao, et al., 2019). In a study conducted by Hsu et al. (2019), 53.1% of participants older than 60 years of age (n=188) were identified as at-risk for malnourishment. Authors also found those at risk were associated with cognitive and functional decline and an increased risk of mortality. While the literature revealed differences in specific populations, the general consensus demonstrated that nutrition is a crucial component in the health and wellness of the older adult population and can be easily identified with the use of a screening tool such as the MNA-SF. However, screening practices vary, and further research is warranted to identify how often the tools are used in practice.

Strengths of Evidence

A strength in the literature is the recurring associations between malnutrition and health decline (Berggren, Strang, Orrevall et al., 2019; Hsu et al., 2019, Lambert, Taylor, Bowden et al., 2019; & Wei, Nyunt, Gao et al., 2019). Authors successfully portray the clinical picture involving malnutrition, functional and cognitive decline, and poor quality of life. Another strength is the statistically significant evidence collected during the studies supporting the use of the MNA-SF screening tool for detection (Berggren, Strang, Orrevall et al., 2019; Ferrari Bravo et al., 2018; Isautier et al., 2019; Lambert, Taylor, Bowden et al., 2019; & Wei, Nyunt, Gao et al., 2019). These findings support the objectives and aims of the project to implement the use of the MNA-SF screening tool in primary care practice.

Weaknesses of Evidence, Gaps and Limitations

While the literature displays evidence of the importance of nutritional screening tools in practice, few authors discussed potential treatment after these patients are identified in the studies. The literature found does not discuss the implementation of nutrition resources or solutions. Additionally, the variation in screening practice is addressed, but the literature does not provide data to identify practitioners' current use of nutritional assessment tools. Based on the accessibility of the MNA-SF and the prevalence of malnourished patients over age 60, it is difficult to determine the origin of the lack of nutritional screening. This may be due to inconsistencies in health care provider training, access to screening, inconsistencies in resources, or other external factors. Barriers to screening and presentation of interventions differ among organizations (Craven, Pelly, Lovell et al., 2016), and there is little research to discuss the adoption of screening tools, implementation of nutritional resources in identified patients, and

the patient outcomes following the implementation. This substantial gap in the literature demonstrates the need for further research to address this critical issue.

METHODS

Project Design

This DNP project was a QI project, which focused on increasing the use of older adult screening for malnutrition in primary care. This was a quantitative project which used a pre-post survey design. Initially a pre-implementation survey was administered to participants to identify perceptions on the use of nutrition screening in primary care. Immediately following the survey completion, the MNA-SF screening tool was completed by the participants (Appendix F). Individual results of the MNA-SF were made visible to each participant, confidentially. Following the implementation of the screening tool, a post-implementation survey was completed by participants to assess the feasibility of the MNA-SF tool implementation for future practice. After the completion of the post-survey, a discussion of possible scores was done in the meeting. A list of nutrition resources was shared with all participants (Appendix G).

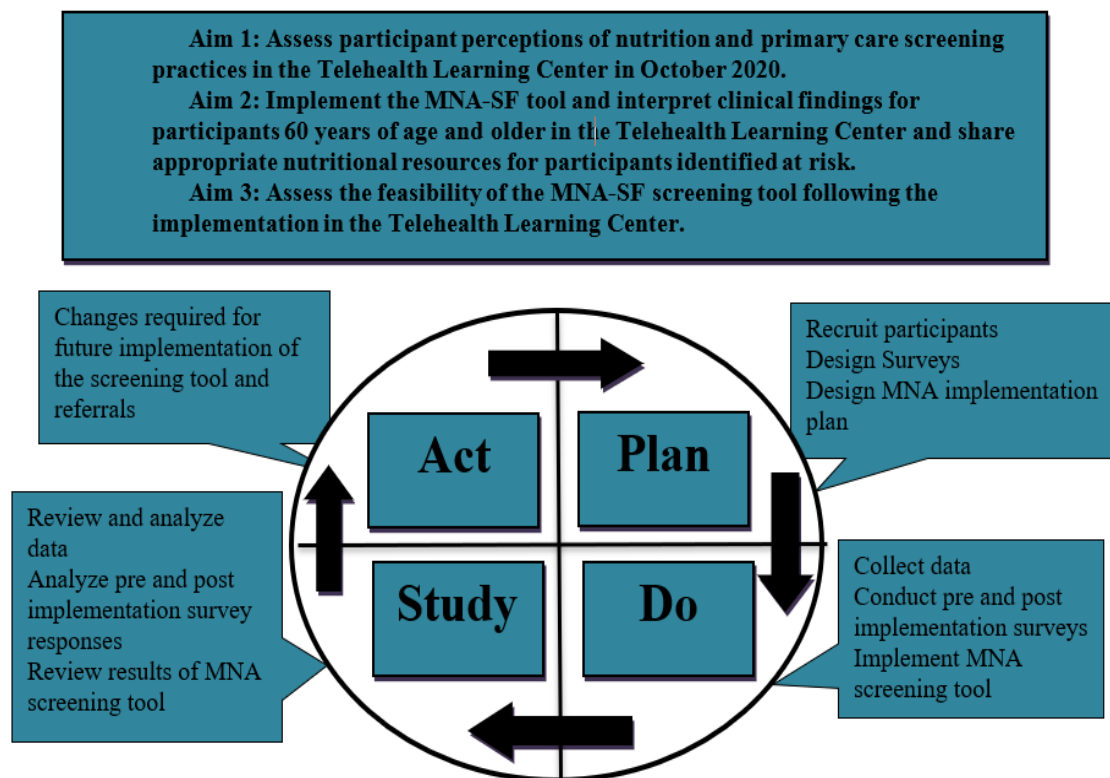
Model for Implementation

This project was implemented by using the plan-do-study-act (PDSA) cycles, a component of the Model for Improvement (Figure 2). The PDSA cycles can be utilized for testing the impact of change (Langley et al., 2009). The purpose of this quality improvement project was to assess the feasibility of utilizing the MNA-SF screening tool to assess older adult participants' perception and knowledge of malnutrition in a virtual clinic. This was measured by evaluating survey responses including identifying the number of participants who have not received screening in the past. The first part of the PDSA cycle is to create the "Plan" for the

change. This included identifying participants, creating the survey, and developing the implementation of the MNA-SF tool. In the “Do” phase of the cycle, pre-implementation survey data was collected, the MNA-SF was implemented, and the post-implementation survey data was collected. Next, in the “Study” part of the PDSA cycle, collected data was analyzed. Pre-implementation surveys were reviewed to identify current gaps in screening practices within primary care. Post-implementation surveys were reviewed to assess the feasibility of the tool in practice. Finally, in the “Act” phase, the need for further change was identified to facilitate implementation for future use of the screening tool. If changes are necessary for future implementation, the PDSA cycle is used again.

Figure 2

Illustration of the PDSA Cycle



Setting and Stakeholders

This project was implemented with participants in a virtual clinic, the Telehealth Learning Center (TLC), in Tucson, Arizona. Participation was voluntary within the TLC and ages varied from 60 years of age and above. Tucson currently has a population of approximately 545,987 residents (DataUSA, 2020). Of these residents, approximately 21% are over the age of 60 (Census Reporter, 2018). Stakeholders included participants, director of the TLC, and healthcare providers.

Planning the Intervention

This project used a pre-implementation Likert-scale survey to identify current use of nutrition screening in the participant population (Appendix D). The survey was presented in a Google Form. The link to the form was provided to participants within the video chat using a group chat box. The survey was accessed by participants when instructed within the meeting. After survey completion, the MNA-SF screening tool was provided to the participants via a Jotform. The Jotform hyperlink was provided within the group chat box for the participants once the pre-implementation survey was completed. Once completed, the results of the MNA-SF were delivered to the individual participants via private chat boxes. The participants then completed a brief post survey via Google Forms to assess the user experience (Appendix D). The hyperlink was entered into the group chat box for the participants. After this survey was completed, a general discussion of possible scores occurred within the video chat. Individual scores were not discussed with the group and remained confidential. Finally, a list of local and national nutrition resources was shared with each participant (Appendix E). Project timeline is presented in Appendix G.

Participants and Recruitment

The desired sample size was a minimum of 10 participants. Participants who were included in the project were those over age 60 who were capable of completing the form without assistance and were able to use a computer. The pre-implementation survey and screening tool were provided to participants in English (Appendix D). Those whose primary language is not English were excluded from the study. Participants were not excluded due to presence or absence of comorbidities, due to the fact that nutrition maintenance is essential for health and wellness as well as improving current conditions like heart disease, diabetes, and wound healing. Participation was voluntary and participants were ensured that privacy would be maintained (Appendix B). Recruitment of participants occurred within the virtual clinic with a brief overview of the project by the TLC director to potential participants (Appendix C)

Consent and Ethical Considerations

The participants gave verbal agreements to participate with the QI project thus, participation indicated consent (Appendix B). Participants benefited from the project due to the ease of the screening tool, and assessment of nutritional status at no cost to the participant. Those identified as being at-risk or malnourished also benefited from receiving resources that could improve their nutritional status. Risks of the project were patient confidentiality. Participant names were not required for the surveys and individual results were not provided to other group members. Risks of breaching confidentiality were also combated by use of protected participant information accessible only by the DNP project coordinator. Information was kept on a password protected computer accessed only by the DNP project coordinator. Prior to implementing this QI

project, IRB determination of non-human subject research was obtained (Appendix A). Approval through the Telehealth Learning Center (TLC) was also obtained (Appendix A).

Data Collection

Collection of the data included using pre- and post-implementation Likert Scale surveys on Google Forms (Appendix D) and the MNA-SF screening tool on Jotform (Appendix F). The pre-implementation survey was provided to the participants via the group chat box in the TLC. This five-question survey addressed participant perception of malnutrition and current screening practices. One question asked participants if they have been screened for malnutrition in the past. The possible answers included 'no,' 'unsure,' and 'yes.' Another question on the pre-implementation survey asked participants if they believe nutrition is important to their health. The possible answers included 'strongly disagree,' 'disagree,' 'neutral,' 'agree,' and 'strongly agree.' The post-implementation survey consisted of three questions and addressed ease and efficacy of the screening tool (Appendix D). An example question from this survey asked participants if they would be willing to complete this form with their primary care provider at annual wellness visits. The possible answers for this question include 'strongly disagree,' 'disagree,' 'neutral,' 'agree,' and 'strongly agree.' The online Jotform contained the questions that are found on the MNA-SF screening tool. Six questions were on the Jotform for participants to answer. The first question asked participants if they have experienced a decline in food intake over the last three months due to loss of appetite, digestive problems, or chewing or swallowing difficulties. Possible answers included 'severe decrease in food intake,' 'moderate decrease in food intake,' or 'no decrease in food intake.' Additional questions in the MNA-SF Jotform

focused on BMI, recent weight loss, mobility, and neuropsychological problems. After completion of each survey and Jotform, data was exported into an Excel spreadsheet for analysis.

Data Analysis

Data analysis was done using Excel to provide descriptive statistics. The pre- and post-implementation surveys provide ordinal data, which are presented in tables. The numerical scores of the MNA-SF form are presented in a bar graph (Table 4). The analysis includes identifying participant perceptions on nutritional status and current screening practices, feasibility of the tool, willingness to participate in malnutrition screening in their future, and overall scores of malnutrition screening with the MNA-SF tool.

RESULTS

Outcomes

Participants of the TLC implementation of this QI project consisted of 10 females 60 years of age or older. All 10 participants completed each part of the pre- and post-implementation survey and the MNA-SF form. Implementation was completed in one hour with group participation during an online meeting. To meet Aim 1 of this project, the pre-survey assessed participant perception of and assessment of their personal nutrition status. Participant responses to the pre-survey are presented in Tables 2 and 3. Item number 1 requested participants to estimate their risk for malnutrition. Participants indicated that 30% ‘strongly disagreed,’ 40% ‘disagreed,’ and 30% were ‘unsure or neutral’ of their nutrition risk. These responses indicated none of the participants self-determined they were at risk for malnutrition. Item number 2 assessed participants’ access to food. Participants reported 10% ‘strongly disagreed’ and 90% ‘strongly agreed,’ indicating that 90% of participants assessed they had adequate access to food.

Item number 3 addressed nutrition importance to health. Participants reported 10% ‘strongly disagreed’ and 90% ‘strongly agreed,’ indicating 90% of participants perceive nutrition as an important aspect of their health. Item number 4 on the pre-survey (Table 3) asked patients if they had discussed nutrition with their primary care providers, 60% of participants selected ‘no,’ 10% selected ‘unsure,’ and 30% selected ‘yes.’ These findings indicated only a third of participants reported discussing nutrition with their providers. The final item for the pre-survey asked participants if they had been screened for malnutrition in the past, 100% of participants selected ‘no.’

Table 2

Pre-Implementation Survey - Part 1

| | N = 10 | Strongly Disagree | Disagree Neutral | Unsure/ Agree | Strongly Agree |
|-------------------------------------|---------------|--------------------------|-------------------------|----------------------|-----------------------|
| I am at risk for malnutrition | 3/10= 30% | 4/10= 40% | 3/10= 30% | 0/10= 0% | 0/10= 0% |
| I have adequate access to food | 1/10= 10% | 0/10= 0% | 0/10= 0% | 0/10= 0% | 9/10= 90% |
| Nutrition is important to my health | 1/10= 10% | 0/10= 0% | 0/10= 0% | 0/10= 0% | 9/10= 90% |

Table 3

Pre-Implementation Survey - Part 2

| N = 10 | No | Unsure | Yes |
|--|-------------|---------------|------------|
| I have discussed nutrition with my primary care provider | 6/10= 60% | 1/10= 10% | 3/10= 30% |
| I have been screened for malnutrition in the past | 10/10= 100% | 0/10= 0% | 0/10= 0% |

To meet Aim 2 of this QI project, the MNA-SF screening tool was implemented with the 10 participants. The individual scores of each participant are displayed in Table 4. A score of 12-14 on the screening tool indicates the participant likely has normal nutritional status (Nestle Nutrition Institute, 2015). A score 8-11 indicates the participant may be at risk for malnutrition, and a score of 0-7 indicates the participant may likely be malnourished (Nestle Nutrition Institute, 2015). Of the 10 participants, 60% were identified as having normal nutrition status based on their MNA-SF scores (Table 5). Additional findings identified 30% of participants as being at risk for malnutrition, and 10% as being malnourished (Table 5). These findings indicated that 40% of participants were assessed to not have normal nutritional status according to the MNA-SF screening tool.

Table 4

MNA-SF Screening Tool Scores

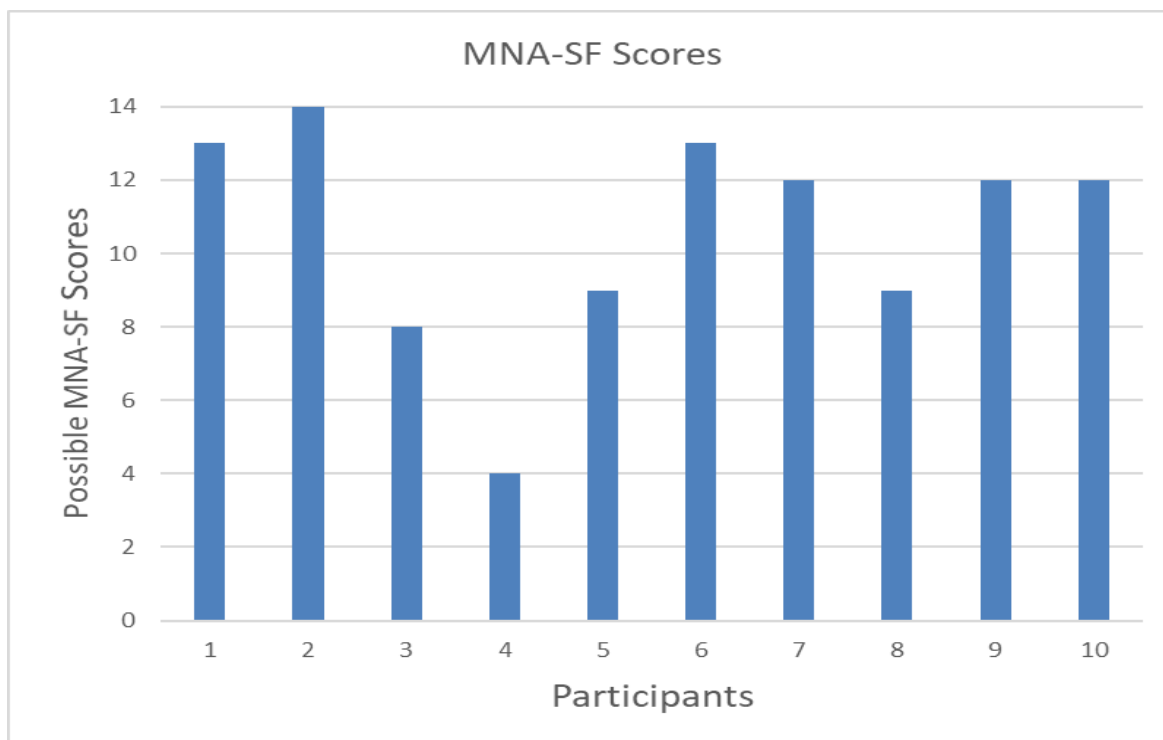


Table 5*MNA-SF Scores*

| N = 10 | 12-14 Normal Nutritional Status | 8-11 At risk for malnutrition | 0-7 Malnourished |
|--------------------|--|--|-------------------------|
| Participant Scores | 6/10= 60% | 3/10= 30% | 1/10= 10% |

To meet Aim 3 of this QI project, the feasibility of the MNA-SF screening tool was assessed through use of a post-survey. Participant responses to the post-survey are presented in Table 6. The item 1 assessed ease of use of the screening tool, 20% of participants selected 'agree' and 80% selected 'strongly agree.' These findings indicate all participants agreed the screening tool was easy to use. Item number 2 asked participants if they would be willing to complete this screening tool at their annual wellness visits with their primary care providers. Ten percent of participants selected 'strongly disagree,' 20% selected 'agree,' and 70% selected 'strongly agree.' The final item asked participants if they learned more about their nutritional status after completing the MNA-SF screening tool. Some 20% of participants selected 'strongly disagree,' 40% selected 'unsure/neutral,' and 40% selected 'agree.' These findings indicate that the amount of knowledge gained by participants after completing the screening tool regarding their nutrition status varied.

Table 6*Post-Implementation Survey*

| | N = 10 | Strongly Disagree | Disagree | Unsure/ Agree Neutral | Strongly Agree |
|---|---------------|--------------------------|-----------------|------------------------------|-----------------------|
| This screening tool was easy to use | 0/10= 0% | 0/10= 0% | 0/10= 0% | 2/10= 20% | 8/10= 80% |
| I would be willing to complete this screening tool at my annual wellness visits with my primary care provider | 1/10= 10% | 0/10= 0% | 0/10= 0% | 2/10= 20% | 7/10= 70% |
| I learned more information about my nutritional status after using this screening tool | 2/10= 20% | 0/10= 10% | 4/10= 40% | 4/10= 40% | 0/10= 0% |

DISCUSSION**Summary**

Malnutrition is prevalent in the older adult population and can be associated with functional decline, poor health outcomes, and premature mortality (Volkert, 2012). Factors associated with poor nutritional status in this population include chronic disease, psychological impairment, finances, and functional ability (Mangels, 2018). Adequately identifying these at-risk patients and creating a plan of care that combats malnutrition is crucial to improving patient outcomes and quality of life. Time constraints and under diagnosis of malnutrition can be easily overlooked in busy primary care clinics. Many patients do not seek medical attention for this issue, which can be difficult to detect due to the vague presentation in the earlier stages of malnutrition (Ennis, Saffel-Shrier, & Verson, 2001).

There are many validated screening tools available for use in primary care that can assist with detecting malnutrition in the older adult population. Routine screening in primary care could result in early identification of malnourishment. The MNA-SF screening tool is a validated and reliable tool recommended in the *Validated Malnutrition Screening and Assessment Tools: Comparison Guide* authored by the National Council on Aging (2017). Ferrari Bravo et al. (2018), conducted a study and found that the MNA-SF was a reliable tool for malnutrition screening. Patients identified as malnourished in this study were confirmed to have malnourishment with biochemical testing, indicating the ability of the MNA-SF to accurately identify these patients. Despite the reliability of screening tools such as the MNA-SF, screening practices for malnutrition in older adults varies widely in primary care (Craven, Pelly, Lovel et al., 2016). Although the exact prevalence of nutrition screening tool use in primary care practice is not reported, the use of nutritional assessment tools for older adults is not widely adopted. Barriers to routine implementation of screening tools were attributed to time constraints and lack of provider education (Fleurke, Voskuil, & Beneken genaamd Kolmer, 2019).

With the accessibility and reliability of screening tools such as the MNA-SF, and the continued under detection of malnutrition in patients over age 60, further studies are warranted. Therefore, the purpose of this QI project was to assess the feasibility of utilizing the MNA-SF screening tool to assess older adult participants' perception and knowledge of malnutrition in a virtual clinic

Interpretation

The results of this QI project support the aims and purposes previously discussed. During the pre-implementation survey (Table 2 & 3), all (100%) did not agree they had risks for

malnourishment. The participants' MNA-SF scores revealed that 40% of the participants were at risk for malnourishment or currently malnourished. These findings suggest patients may not be aware of their malnutrition risk, therefore are unlikely to seek a nutrition evaluation by a provider. Most participants strongly agreed that they had adequate access to food and that nutrition was important to their health however, four were identified as being at risk for malnourishment or malnourished. Additionally, 60% of participants had not discussed nutrition with their primary care providers, and none of the participants reported ever being screened for malnutrition in the past. These findings are similar to findings from the literature search that suggested the use of screening tools in primary care varies widely (Craven, Pelly, Lovel et al., 2016). These findings also support the gap in the literature regarding nutrition screening and discussion of nutrition in primary care. Additionally, almost all participants reported nutrition was important to their health yet only 30% had discussed it with their providers, highlighting the issue of under-detection in primary care and inadequate focus on nutrition in older adults.

Of the 10 participants, three were identified as 'being at risk' and one was identified as 'currently malnourished.' In this small sample of virtual clinic participants, the prevalence of participants who did not have normal nutrition status was 40%, supporting literature findings that malnutrition often goes undetected in primary care. When assessing the ease of use of the MNA-SF screening tool (Appendix F), all participants agreed that the tool was easy to use, and 90% revealed that they were willing to complete this screening tool during annual wellness visits. These findings support the ease of screening tool implementation and the willingness of patients to participate in their healthcare regarding nutrition. Only 40% of participants reported they learned more about their nutrition status after completing the MNA-SF form. This may be

attributed to the group discussion of potential results of the MNA-SF form occurring after the post-survey was completed.

Implications (Practice, Education, Research and Policy)

This project's findings have the potential to inform current primary care providers. The project identifies a lack of nutrition screening of participants, and participant desire to discuss nutrition with their providers. The project also addresses patient positive perceptions of nutritional health as well as willingness to complete nutrition screening tools during annual wellness visits with their primary care providers. The project supports the use of screening tools, such as the MNA-SF, in routine practice for enhanced detection of older adult patients who are malnourished. Findings indicated participant perceptions of their own nutrition status were not congruent with the results of the MNA-SF scores highlighting the need for nutrition screening and patient education on adequate nutrition. Implementing the MNA-SF screening tool in practice, allows providers to initiate conversations with their patients, and provide education to them regarding nutrition.

Participants reported the screening tool was easy to use within the virtual clinic indicating that further research may be warranted on using virtual medicine for patient measures in future practice. This project demonstrates this screening tool may be easily implemented in a virtual environment and further studies of screening tool use through virtual clinics should be considered. Additionally, this QI project can influence policy changes to incorporate routine nutrition screening of older adults in primary care. Guidelines mandating implementation of the MNA-SF screening tool could lead to improved detection of malnourished patients and improved older adult patient outcomes.

Limitations

As planned, the project sample size was small (n=10), and findings were not generalizable and do not accurately reflect the MNA-SF screening tool's ability to detect malnourished patients. Furthermore, sample selection was limited to those selected by the TLC director based on availability, willingness to participate, and access and ability to use a computer. Participants were experienced in being "patients" for nursing and medical students, which does not accurately represent the general population of older adults and represents bias. Additionally, questions included in the pre- and post-implementation surveys were closed/ended, allowing for mixed interpretations by the participants.

The MNA-SF screening tool asked participants to estimate their BMI to determine a score, which may have also affected their overall score, reducing the validity of the MNA-SF score findings. The post-implementation survey was conducted prior to discussing potential results of the MNA-SF screening tool (Appendix D). Overall patients did not indicate learning more about their nutrition status after completing the implementation however, in the subsequent interactive discussion of nutrition following survey completion a multitude of nutrition questions were addressed. Finally, the reliability of data in the surveys and screening tools was dependent on the participant's responses self-report.

DNP Essentials Addressed

DNP essentials were addressed in this QI project. The first DNP essential addressed was *DNP Essential I: Scientific Underpinnings for Practice*. This essential focuses on using science-based theories to determine the significance of healthcare delivery and healthcare, describing the actions and strategies to enhance healthcare, and evaluating outcomes (American Association of

Colleges of Nursing [AACN], 2006). DNP Essential I also aims to develop new practices based on theory. These aims were met through this project by determining a scientific-based issue, malnutrition, and the lack of detection and patient screening. By providing a solution, the MNA form, this project created a strategy that could further enhance healthcare and improve patient outcomes. This project also used Kurt Lewin's theory of change to support the process in which change occurs for future implementation of the MNA-SF screening tool in practice.

The second DNP essential addressed in this project is *DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking*. This essential focuses on preparing advanced practice registered nurses for assessing organizations, identifying issues, facilitating changes in practice delivery, developing approaches that meet future needs of specific populations, and focusing on the needs of select populations or communities (AACN, 2006). This DNP project identified a need within the selected population of older adults. The need being increased detection of malnutrition. Additionally, the approach to use the MNA-SF screening tool in routine primary care practice, incorporated facilitation of organizational change and anticipation of future needs for the population.

Conclusions

Under-detection of malnutrition in the older adult population can be debilitating to their health and overall outcomes. The routine use of validated nutrition screening tools such as the MNA-SF can enhance detection of older adults who are at risk for malnourishment. All 10 participants in this project revealed they had never been screened for malnutrition by their primary care provider, indicating the lack of current screening tool use. The majority of participants agreed the screening tool was easy to use and were willing to complete this at annual

wellness visits, indicating patient participation may not be a barrier to conducting malnutrition screening in primary care. Further studies are warranted to determine the efficacy of use in virtual environments and patient experiences with nutrition screening.

Plan for Sustainability

Due to the fact that the implementation of this project occurred within the TLC, which is not a clinic where providers practice, sustainability of the project is limited. Project findings will be shared with local providers during my clinical rotations. Implementation of the MNA-SF screening tool at annual visits will be encouraged at the DNP project coordinator's future sites of employment as an APRN. Additionally, the DNP project coordinator aims to conduct further studies within a practicing clinic.

Plan for Dissemination

The project and poster will be disseminated to the College of Nursing during a public final defense and be accessible in the University of Arizona repository. Additional dissemination will occur via e-mail to colleagues and providers that the DNP project coordinator knows, based on availability and coordinator discretion.

APPENDIX A:

TELEHEALTH LEARNING CENTER SITE APPROVAL / THE UNIVERSITY OF
ARIZONA INSTITUTIONAL REVIEW BOARD DETERMINATION LETTER

Telehealth Learning Center

1305 N Martin Ave
Tucson, AZ 85721-0203
520-626-3808

August 13, 2020

University of Arizona Institutional Review Board
c/o Office of Human Subjects
1618 E Helen St
Tucson, AZ 85721

Brooke Holtzen, UA Doctor of Nursing Practice student, has permission of the Telehealth Learning Center to conduct a quality improvement project at our facility for her project, "Malnutrition Screening of Patients Sixty Years and Older in Primary Care".

Ms. Holtzen will conduct a survey of health care patients at the Telehealth Learning Center. She will recruit participants through email. The email will provide a description of the project, what they will be asked to do, and the time involved. Ms. Holtzen's activities will be completed by October 1st, 2020.

Ms. Holtzen has agreed to provide to my office a copy of the University of Arizona Determination of Research document before she recruits participants. She will also present results and a complete report with associated recommendations to the Telehealth Learning Center's administrative team.

If there are any questions, please contact my office.

Allen Prettyman

Allen Prettyman, PhD, FNP-BC, FAANP, FNAP
Clinical Professor
Director DNP Program
University of Arizona College of Nursing
520-621-1995|302-379-0470 Cell [lapretty@email.arizona.edu](mailto:apretty@email.arizona.edu)



Human Subjects
Protection Program

1618 E. Helen St.
P.O.Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>

Date: September 01, 2020
Principal Investigator: Brooke Kelsey Holtzen

Protocol Number: 2008003087
Protocol Title: Malnutrition Screening of Patients Sixty Years and Older in Primary Care

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:
HSPP Forms/Correspondence: *Holtzen_IRBDetermination08252020.pdf*

Regulatory Determinations/Comments:

- Not Research as defined by 45 CFR 46.102(l): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means 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. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX B:
CONSENT DOCUMENT (DISCLOSURE AND CONSENT FORM)

Malnutrition Screening of Patients Sixty Years and Older in Primary Care
Brooke Holtzen, DNP student

The purpose of this project is to determine the feasibility and effectiveness of a nutritional screening tool within the University of Arizona College of Nursing Telehealth Learning Center.

If you choose to participate in this project, you will be asked to complete a pre-implementation survey, a malnutrition screening tool questionnaire, and a post-implementation survey. This will occur during a group meeting over a password protected video-chat. Individual results from the screening tool will be provided in individual private chats and possible general scores will be explained to the group as a whole. A list of nutritional resources will be provided for participants who are interested. It will take approximately 30 to 60 minutes to complete the surveys and video-chat. There are no anticipated risks associated with participating in this project and you will receive no immediate benefit from your participation.

If you choose to participate, participation is voluntary; refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. You may skip any question that you choose not to answer.

For questions or concerns about the project, you may e-mail Brooke Holtzen, RN DNP-FNP student at brookekw@email.arizona.edu

APPENDIX C:
RECRUITMENT MATERIAL (RECRUITMENT EMAIL)

To whom it may concern,

My name is Brooke Holtzen and I am a student in the Doctorate of Nursing Practice (DNP) Family Nurse Practitioner program at the University of Arizona. Part of my education requirement includes completing a DNP quality improvement project with participants. I am asking for approximately 10 participants age 60 or older to take part in a one-time group online video-chat. This discussion will focus on risk factors, dangers of, and screening of malnutrition. The video chat should take approximately 30 to 60 minutes to complete. Participation would require you to connect to the video chat with a web cam and take 2 brief surveys (five questions or less) and one questionnaire (a screening tool that assesses for malnutrition). All surveys will be anonymous to protect your privacy. The results of the questionnaire will be provided to you individually and privately. I will also provide a brief general discussion regarding nutrition status and its relevance to health.

The group discussion will occur online in a password protected video chat so you must have a computer with internet access. Please consider participating to offer your input and possibly learn something about your own health. If you are interested in participating, please reply to this e-mail. The video chat will occur on October 14th, 2020 at 3:00 PM.

Thank you for your time,

Brooke Holtzen, RN

APPENDIX D:
EVALUATION INSTRUMENTS (PRE-IMPLEMENTATION SURVEY/POST-
IMPLEMENTATION SURVEY)

PRE-IMPLEMENTATION SURVEY

Pre-Implementation Survey

I am at risk for malnutrition

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly Agree

I have discussed nutrition with my primary care provider

- 1- No
- 2- Unsure
- 3- Yes

I have been screened for malnutrition in the past

- 1- No
- 2- Unsure
- 3- Yes

I have adequate access to food

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly agree

Nutrition is important to my health

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly Agree

POST-IMPLEMENTATION SURVEY

Post-implementation Survey

The screening tool was easy to use

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly Agree

I would be willing to complete this screening tool at my annual wellness visits with my primary care provider

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly Agree

I learned more information about my nutrition status after using this screening tool

- 1- Strongly Disagree
- 2- Disagree
- 3- Neutral/Unsure
- 4- Agree
- 5- Strongly Agree

APPENDIX E:
PARTICIPANT MATERIAL (LOCAL NUTRITION ASSISTANCE LIST)

Nutrition Assistance in Tucson, Arizona

- **Caridad Community Kitchen**
(520)-882-5641 www.communityfoodbank.org
845 N. Main Ave Tucson, AZ 85705
- **Catholic Community Services of Southern Arizona**
(520) 623-0344 <https://www.ccs-soaz.org/>
140 W. Speedway Blvd., Ste 230 Tucson, AZ 85705
- **Fred Archer Center**
(520) 791-4353 <https://www.tucsonaz.gov/parks/FredArcherCenter>
1665 S. La Cholla Blvd Tucson, AZ 85713
- **House of Neighborly Services**
(520) 884-7810 <http://www.ywcatucson.org>
243 W. 33rd St. Tucson, AZ 85713
- **Lend A Hand**
(520) 248-6882 <https://www.lahseniorhelp.org/>
P.O. Box 41323 Tucson, AZ 85717-1323
- **Pima Council on Aging**
<https://www.pcoa.org/>
- **US Department of Agriculture- Nutrition**
<https://www.nutrition.gov/>

APPENDIX F:
MNA-SF SCREENING TOOL

Has your 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

Weight loss during the last 3 months

- 0= weight loss greater than 3kg (6.6lbs)
- 1= does not know
- 2= weight loss between 1 and 3kg (2.2 and 6.6 lbs)
- 3= no weight loss

Mobility

- 0 = bed or chair bound
- 1 = able to get out of bed / chair but does not go out
- 2 = goes out

Has suffered psychological stress or acute disease in the past 3 months?

- 0= yes
- 2= no

Neuropsychological problems

- 0 = severe dementia or depression
- 1 = mild dementia
- 2 = no psychological problems

Body Mass Index (BMI) = weight in kg / (height in m)²

- 0 = BMI less than 19
- 1 = BMI 19 to less than 21
- 2 = BMI 21 to less than 23
- 3 = BMI 23 or greater

Total Score

Submit

APPENDIX G:
PROJECT TIMELINE

Project Timeline

| Completion Date | Planning | Pre-Implementation | Implementation | Evaluation |
|-----------------|---|--------------------|--|---|
| 08/13/2020 | Obtain Authorization through site | | | |
| 9/28/2020 | Schedule online implementation within TLC | | | |
| 10/14/2020 | | | Conduct Zoom Meeting with surveys and MNA screening tool | |
| 10/21/2020 | | | | Data analysis and evaluation of methods |

APPENDIX H:
LITERATURE REVIEW GRID

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|--|--|-----------------------|--|--|
| Berggren, E., Strang, P., Orrevall, Y., Ödlund Olin, A., & Törnkvist, L. (2019) | Symptom burden in patients with home care who are at risk for malnutrition: A cross-sectional study | Cross-sectional study | <p>Forty-two percent of the patients were at risk for malnutrition (MNA-SF). Appetite ($P = .012$), tiredness ($P = .003$), and anxiety ($P = .008$) were worse in these patients than in those without risk (ESAS; significance level, $P \leq .015$)</p> <p>Participants who were at risk of malnutrition had higher symptom burden ($P=0.005$) had lower physical activity ($P = .000$), and more lost weight over time ($P = .032$; PG-SGA; significance level, $P \leq .040$)</p> | <p>Link to background, poor quality of life for patients. Symptom burden and functional decline are associated with poor nutrition.</p> <p>MNA-SF screening tool was used to identify patients at risk for malnutrition.</p> |
| Craven, D. L., Pelly, F. E., Lovell, G. P., Ferguson, M., & Isenring, E. (2016) | Malnutrition screening of older adults in the community setting: Practices reported by Australian dietitians | Cross-sectional study | <p>92% of Community dietitians (n=133) agreed/strongly agreed there was a need for routine screening of all community clients aged ≥ 65 years.</p> <p>96% (n=133) of dietitians agreed that malnutrition screening of the elderly in the community setting was very important/important</p> | Support for screening of older adults in the community setting. |
| Ferri Bravo, M., Gallo, F., Marchello, C., Boicelli, R., Lupi, S., Aztei, M., ... Brunetti, F. (2018). | Assessment of malnutrition in community-dwelling elderly people: | Cohort study | MNA-SF showed that 21% (n=1039) of older adults living in the community were in a situation of risk of malnutrition | The MNA-SF successfully identified participants who were at risk of malnourishment. This was confirmed by biochemical testing. Supporting the |

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|---|---|-------------------------------------|--|---|
| | Cooperation among general practitioners and public health. | | Biochemical tests confirmed a malnutrition prevalence of 3.5% | use of the MNA-SF to screen for malnutrition in older adults. |
| Hsu, Y., Chou, M., Chu, C., Liao, M., Wang, Y., Lin, Y., ... Liang, C. (2019). | Predictive effect of malnutrition on long-term clinical outcomes among older men: A prospectively observational cohort study. | Cohort study | MNA-SF identified the prevalence of risk of malnutrition was 53.1% (n=354) of older adults in the study. Risk of malnutrition was significantly associated with 3-year cognitive decline (95% Confidence Interval [CI] 1.05–4.08, P =0.036) and functional decline (95% CI 1.01–3.34, P =0.047) | Supports the use of the MNA-SF for screening participants. Associates the risk of malnutrition and cognitive and functional decline in older adults. |
| Isautier, J. M., Bosnić, M., Yeung, S. S., Trappenburg, M. C., Meskers, C. G., Whittaker, A. C., & Maier, A. B. (2019). | Validity of nutritional screening tools for community-dwelling older adults: A systematic review and meta-analysis. | Systematic review and meta-analysis | The meta-analyses showed average sensitivities and specificities of 0.95 (95% confidence interval [CI] 0.75-0.99) and 0.95 (95% CI 0.85-0.99) for the Mini Nutritional Assessment Short Form (MNA-SF). | Supports the validity of the MNA-SF as a reliable screening tool for detecting malnutrition in the older adult population. |
| Lambert, K., Taylor, E., Bowden, S., & Charlton, K. (2019) | Nutritional status according to the Mini Nutritional Assessment predicts speed and degree of functional improvement and discharge outcomes in rehabilitation patients | Retrospective observational study | Poor nutritional status was associated with reduced functional, motor, cognitive and feeding scores ($P < 0.05$). Malnutrition at admission was associated with significantly higher odds of a decline in functional ability during | Malnutrition in the older adult population is associated with functional, cognitive, and motor decline. Supports use of MNA-SF to identify older adults at risk of malnutrition. |

| Pub. Year; Author's Last Name | Title of Publication | Type of Study | Main Outcomes of Findings | Support for and or Link to Project |
|--|--|----------------------|---|---|
| | | | admission (95% CI: 2.14–7.27), and almost three times greater odds of additional care requirements on discharge (95% CI: 1.02–8.3) | |
| Wei, K., Nyunt, M. S., Gao, Q., Wee, S. L., & Ng, T. P. (2019) | Long-term changes in nutritional status are associated with functional and mortality outcomes among community-living older adults. | Cohort study | Nutritional deterioration was associated with increased incident activities of daily living disability (MNA-SF: 95% CI, 1.13-9.16), poor quality of life (MNA-SF: 95% CI 2.13-9.64), and mortality (MNA-SF: 95% CI, 2.82-8.03). | Supports the use of the MNA-SF for detecting nutrition status in the older adult population. Associates poor nutrition status with decreased quality of life, disability, and increased risk of mortality in older adults. |

REFERENCES

- American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice*. The American Association of Colleges of Nursing (AACN). <https://www.aacnnursing.org/Portals/42/Publications/DNPEssentials.pdf>
- Berggren, E., Strang, P., Orrevall, Y., Ödlund Olin, A., & Törnkvist, L. (2019). Symptom burden in patients with home care who are at risk for malnutrition: A cross-sectional study. *Journal of Palliative Care*. doi:10.1177/0825859719887240
- Bozak, M. (2003). Using Lewin's force field analysis in implementing a nursing information system. *CIN: Computers, Informatics, Nursing*, 21(2), 80-85. doi:10.1097/00024665-200303000-00008
- Census Reporter. (2018). *Census profile: Tucson, AZ*. Retrieved May 7, 2020, from <https://censusreporter.org/profiles/16000US0477000-tucson-az/>
- Craven, D. L., Pelly, F. E., Lovell, G. P., Ferguson, M., & Isenring, E. (2016). Malnutrition screening of older adults in the community setting: Practices reported by Australian dietitians. *Nutrition & Dietetics*, 73(4), 383-388. doi:10.1111/1747-0080.12269
- DataUSA. (2020). *Tucson, AZ*. Retrieved April 22, 2020 from <https://datausa.io/profile/geo/tucson-az>
- Defeat Malnutrition Today. (2017). *Malnutrition and older adults: Review of the U.S. federal health policy landscape*. Retrieved from <https://www.defeatmalnutrition.today/sites/default/files/documents/Review%20Article%20DMT%20January%202017.pdf>
- Ennis, B. W., Saffel-Shrier, S., & Verson, H. (2001). Diagnosing malnutrition in the elderly. *The Nurse Practitioner*, 26(3), 52-54, 56, 61, 62, 65
- Feeding America. (2020). *The state of senior hunger*. U.S. Hunger Relief Organization | Feeding America. Retrieved August 13, 2020, from <https://www.feedingamerica.org/research/senior-hunger-research/senior>
- Ferarri Bravo, M., Gallo, F., Marchello, C., Boicelli, R., Lupi, S., Aztei, M., ... Brunetti, F. (2018). Assessment of malnutrition in community-dwelling elderly people: Cooperation among general practitioners and public health. *Iran J Public Health*, 47(5), 633-640. Retrieved from https://search-proquest-com.ezproxy2.library.arizona.edu/docview/2085863968?accountid=8360&rfr_id=info%3Axri%2Fsid%3Aprimo

- Fleurke, M., Voskuil, D. W., & Beneken genaamd Kolmer, D. M. (2019). The role of the dietitian in the management of malnutrition in the elderly: A systematic review of current practices. *Nutrition & Dietetics*, 77(1), 60-75. doi:10.1111/1747-0080.12546
- Hamirudin, A. H., Charlton, K., Walton, K., Bonney, A., Potter, J., Milosavljevic, M., ... Dalley, A. (2014). Feasibility of implementing routine nutritional screening for older adults in Australian general practices: A mixed-methods study. *BMC Family Practice*, 15(1). doi:10.1186/s12875-014-0186-5
- Hsu, Y., Chou, M., Chu, C., Liao, M., Wang, Y., Lin, Y., ... Liang, C. (2019). Predictive effect of malnutrition on long-term clinical outcomes among older men: A prospectively observational cohort study. *The Journal of Nutrition, Health & Aging*, 23(9), 876-882. doi:10.1007/s12603-019-1246-2
- Hussain, S., Lei, S., Akram, T., Haider, M., Hussain, S., & Ali, M. (2018). Kurt Lewin's change model: A critical review of the role of leadership and employee involvement in organizational change. *Journal of Innovation & Knowledge*, 3(3), 123-127. doi:10.1016/j.jik.2016.07.002
- Isautier, J. M., Bosnić, M., Yeung, S. S., Trappenburg, M. C., Meskers, C. G., Whittaker, A. C., & Maier, A. B. (2019). Validity of nutritional screening tools for community-dwelling older adults: A systematic review and meta-analysis. *Journal of the American Medical Directors Association*, 20(10), 1351.e13-1351.e25. doi:10.1016/j.jamda.2019.06.024
- Lambert, K., Taylor, E., Bowden, S., & Charlton, K. (2019). Nutritional status according to the mini nutritional assessment predicts speed and degree of functional improvement and discharge outcomes in rehabilitation patients. *Journal of Nutrition in Gerontology and Geriatrics*, 39(1), 16-29. doi:10.1080/21551197.2019.1689882
- Langley, G., Moen, R., Nolan, K., Norman, C., & Provost, L. (2009). *How to improve | IHI - Institute for Healthcare Improvement*. Improving Health and Health Care Worldwide | IHI - Institute for Healthcare Improvement. <https://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>
- Manchester, J., Gray-Miceli, D., Metcalf, J., Paolini, C., Napier, A., Coogle, C., & Owens, M. (2014). Facilitating Lewin's change model with collaborative evaluation in promoting evidence based practices of health professionals. *Evaluation and Program Planning*, 47, 82-90. doi:10.1016/j.evalprogplan.2014.08.007
- Mangels, A. (2018). Malnutrition in older adults. *American Journal of Nursing*, 118(3), 34-41. doi:10.1097/01.NAJ.0000530915.26091.be
- Meals on Wheels America. (2019). *The issue*. Retrieved November 26, 2019, from <https://www.mealsonwheelsamerica.org/learn-more/the-issue>

- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(6), e1000097. doi:10.1371/journal.pmed1000097
- National Council on Aging. (2017). *Malnutrition screening and assessment tools*. NCOA. <https://www.ncoa.org/assessments-tools/malnutrition-screening-assessment-tools/>
- Nazan, S. & Buket, K. (2018). Evaluation of nutritional status of elderly patients presenting to the family health center. *Pakistan Journal of Medical Sciences*, 34(2). doi:10.12669/pjms.342.14936
- Nestle Nutrition Institute. (2015). Nestlé Nutrition Institute - the problem - malnutrition. Retrieved November 26, 2019 from https://www.mna-elderly.com/the_problem_malnutrition.html
- Sutherland, K. (2013). Applying Lewin's change management theory to the implementation of bar-coded medication administration. *Canadian Journal of Nursing Informatics*, 8(1). Retrieved from <https://cjni.net/journal/?p=2888>
- United States Census Bureau. (2018). United States census bureau. Retrieved November 26, 2019 from https://data.census.gov/cedsci/table?q=&table=S0101&tid=ACSST1Y2018.S0101&g=0100000US_0400000US04&lastDisplayedRow=41&vintage=2017&layer=state&cid=DP05_0001E
- Volkert, D. (2013). Malnutrition in older adults - urgent need for action: A plea for improving the nutritional situation of older adults. *Gerontology*, 59(4), 328-333. doi:10.1159/000346142
- Wei, K., Nyunt, M. S., Gao, Q., Wee, S. L., & Ng, T. P. (2019). Long-term changes in nutritional status are associated with functional and mortality outcomes among community-living older adults. *Nutrition*, 66, 180-186. doi:10.1016/j.nut.2019.05.006
- Ziliak, J. & Gundersen, C. (2019). *The state of senior hunger in America 2017: An annual report*. Retrieved from https://www.feedingamerica.org/sites/default/files/2019-06/The%20State%20of%20Senior%20Hunger%20in%202017_F2.pdf