

Running head: IMPROVING HEALTH LITERACY

Improving Health Literacy in Rural Populations through Clinic Staff Education

Bethany A. Ganz

Bradley University

A Directed Scholarly Project Submitted  
to the Department of Nursing in the  
Graduate School of Bradley University  
in partial fulfillment of the requirements  
for the Degree of Doctor of Nursing Practice.

Peoria, Illinois

2019

Bradley University  
Department of Nursing

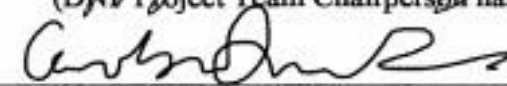
Improving Health Literacy in Rural Populations through Clinic Staff Education

By  
Bethany A. Ganz

has been approved

April 22, 2019

Approved:  4/24/19  
(DNP Project Team Chairperson name, credentials & date)

Approved:   
(DNP Project Team Member name, credentials & date)

Approved: Carol Bohanon 4/23/2019  
(DNP Project Team Member name, credentials. & date)

### **Acknowledgements**

To my husband, Michael, for staying by my side and keeping me going for four years of blood, sweat, tears, and Excel spreadsheets. I wouldn't have wanted to do this without you by my side.  
- And for going back to school too so I wouldn't be the only one doing homework.

R. and L. for always being there.

Thank you to my upper echelon for supporting me through my never-ending pursuit of higher education.

I would like to thank my professor Dr. Peggy Flannigan, Ph.D., R.N., for patiently guiding me throughout this process and helping me get over the bumps in the road.

I would also like to thank Carolyn Querales, DNP, RN, CNP, for all of the sage advice not only throughout this project but since starting on my journey as a DNP student.

**Abstract**

Health literacy is a major factor contributing to healthcare disparities in the United States. As so, the purpose of this quality improvement project was to improve health literacy in the surrounding rural communities. While considering different methods to improve health literacy, the idea of providing patient education training to clinic staff was chosen as it would have the largest impact on patient health outcomes. Prior to this project, the participating healthcare organization's formal health literacy education was comprised of a one-page online competency. The project consisted of a health literacy education session for medical staff at the health system's branch clinics. At each of the ten locations, a presentation providing information regarding inadequate health literacy and the impact on patients, methods for assessing patient's health literacy needs, appropriate methods for educating patients, and additional tools and resources for improving their own practice was offered to all staff. The participants were asked to complete a voluntary survey upon completion of the presentation regarding the training and their perception of their patient education abilities. This same survey was sent to the participants 2-3 weeks after the session to determine if the training had improved their ability to provide patient education. The results of the surveys indicated that in-person training was beneficial and brought awareness and rationale for current evidence-based education methods to a subject they have not received adequate training for.

**TABLE OF CONTENTS**

<b>Title</b>	1
<b>DNP Project Team Approval Form</b>	2
<b>Acknowledgements</b>	3
<b>Abstract</b>	4
<b>Table of Contents</b>	5
<b>Chapter I: Introduction</b>	7
a. Background and Significance	7
b. Problem Statement	9
c. Project Aims	9
d. Objectives	10
e. Clinical Question	10
f. Strategic Plan	10
g. Synthesis of Evidence	11
h. Conceptual Framework	14
<b>Chapter II: Methodology</b>	15
a. Needs Assessment	15
b. Project Design	15
c. Setting	16
d. Population	16
e. Intervention and Data Collection	17
f. Project Plan	18
g. Data Analysis	19
h. Ethical Considerations and Institutional Review Board	19

IMPROVING HEALTH LITERACY	6
<b>Chapter III: Organizational Assessment and Cost Effectiveness Analysis</b>	21
a. Organizational Assessment	21
b. Cost Effectiveness	22
<b>Chapter IV: Results</b>	23
a. Analysis of Implementation Process	23
b. Analysis of Project Outcome Data	24
<b>Chapter V: Discussion</b>	25
a. Findings	25
b. Limitations	26
c. Implications	26
<b>Chapter VI. Conclusion</b>	28
a. Value of the Project	28
b. <i>DNP Essentials</i>	28
c. Plan for Dissemination	30
d. Attainment of Personal and Professional Goals	30
<b>References</b>	32
<b>Appendices</b>	
a. Appendix A: Initial and follow-up participant survey	34
b. Appendix B: Project timeline	37
c. Appendix C: Project budget	39
d. Appendix D: CUHSR application and approval	40
e. Appendix E: Informed consent	42
f. Appendix F: Data analysis	43

## INTRODUCTION

### Chapter I

Health literacy is a major factor contributing to healthcare disparities in the United States. Current research shows that inadequate health literacy affects people from all populations, regardless of educational achievement. Nearly nine out of ten people in the United States have some level of difficulty understanding medical information (US Department of Health and Human Services, 2010). Inadequate health literacy is so pervasive in our society the U.S. Department of Health and Human Services has identified this topic as one of the indicators of health in Healthy People 2020. With only 12% adults in the United States able to understand medical information at a level in which they can make informed health care decisions or manage their health conditions, the need for improvement in patient education is undeniable. It is necessary to create awareness and foster discussion around health literacy in order to initiate change in patient education practices and policies in order to improve the health outcomes of the patient population.

#### **Background and Significance**

Health literacy has become increasingly recognized since the 1970s. It has been defined as the “ability to access information on medical or clinical issues, to understand medical information, to interpret and evaluate medical information, and to make informed decisions on medical issues and comply with medical advice” (Sorensen et al., 2012). The first researchers of this subject used the term health literacy to describe people’s ability to understand healthcare and to place “one’s own health and that of one’s family and community into context, understanding which factors are influencing it, and knowing how to address them” (Sorensen et al, 2012). This original definition considered health literacy in a literal sense: how well a person could read and understand words or information in a medical context. Over time this has changed to an active definition that implies

how well an individual is able to apply this information rather than simply understand what is being said.

The significance of health literacy extends beyond its definition as health behaviors and outcomes are closely related to an individual's ability to comprehend medical information. One study found lower health literacy rates are positively correlated with negative health behavior; including smoking or tobacco use, increased alcohol consumption, obesity, poor nutrition, and lack of exercise (Nandi, Glymour, & Subramanian, 2014). This same study found that the negative behaviors occurred at significantly higher rates among the groups with the lowest health literacy scores.

Smith, Curtis, Wardle, von Wagner, and Wolf (2013) discovered this correlation after a secondary analysis of the LitCog test. The LitCog test was used to evaluate 697 individuals aged 55-74 for health literacy and health behaviors. Similarly, Taggart et al (2012) conducted a literature review of 52 articles that assessed the association between health behaviors and health literacy rates. Once again, there was a positive correlation between negative behaviors and low literacy in nearly all of the articles. Nandi, Glymour, and Subramanian (2014) went a step further and performed a secondary analysis of the Health and Retirement Study. This study was based on 8,000 subjects and examined the correlation between health literacy, health behaviors, socio-economic status, and mortality. Limited health literacy was found to increase both morbidity and mortality rates, further illustrating its impact on patients and the need for improved patient education.

As the research began to show web of causation associated with low health literacy, other trends emerged. A study by Mehta, House, and Elliott (2015) found that people with lower incomes, the elderly, rural populations, minorities, and individuals who do not speak English as their primary language are more likely to experience health disparities and negative health



outcomes caused by low literacy levels. Rural Healthy People 2020, the counterpart to Healthy People 2020 for rural populations, found the data regarding health in rural populations are considerably less favorable than urban populations on nearly every level (Bolin et al., 2015). This is similar to the outcomes in the study by Chesser, Burke, Reyes, and Rohrberg (2016) which found that accessibility, geography, and socio-economic factors contribute to rural populations having lower levels of health literacy than urban residents. This overwhelming amount of evidence illustrates not only the impact of health literacy on patients' lives but the need for change in the medical profession.

### **Problem Statement**

In order to create change and improve health literacy at this medical center, the healthcare professionals and ancillary staff must have a thorough understanding of low health literacy and have the capacity to improve their patient education methodology. Current research is limited on healthcare worker's comprehension of health literacy and the relationship to patient education. A recent study found that half of healthcare workers are unaware of the term health literacy and only one third were able to guess the percentage of patients with limited health literacy (Coelho, 2018). Additionally, many healthcare systems lack the funding and resources to effectively educate employees. Without additional training, these staff members will lack the knowledge necessary to improve patients' health outcomes. Therefore, the central focus of the quality improvement project was to provide health literacy education sessions for clinic staff that ultimately improves health literacy within their communities.

### **Project Aims**

The National Action Plan to Improve Health Literacy is based on the principles that everyone has the right to health information in order to make informed decisions, and that health services need to be presented in ways that are understandable and beneficial to health, longevity,

and quality of life (US Department of Health and Human Services, 2010). The project aims to improve health literacy within the community by providing training on patient education for local clinic staff.

### **Objectives**

Based on these principles and the goals of the action plan, the following goals were created for this project:

- *Goal:* Disseminate three educational resources to healthcare staff that is easily accessible and provides materials that are understandable for the local rural population during the educational session to improve health literacy within their community.
- *Goal:* Improve this medical center's healthcare staff knowledge regarding health literacy as evident by 50% retention of knowledge on follow-up surveys.
- *Goal:* Have participants prove understanding health literacy through the demonstration of three evidence-based education practices.

### **Clinical Question**

Does providing health literacy education and resources improve clinic staffs' patient education abilities for rural populations as they perceive compared with their previous skills?

### **Strategic Plan**

This medical center's mission is the delivery of exceptional patient care that focuses on caring, quality, safety, and service. Along with their vision of being the healthcare provider in our area that leads in quality, access, and service, their core values are based on the concept that the patients come first. They are also dedicated to being an active, contributing partner in the communities it serves.

The health system's strategic plan includes identifying areas for greatest opportunity; improving health literacy is included on that list. Within this area for opportunity, they state that one goal is to increase the number of people with chronic conditions that can adequately self-manage their condition to prevent complications and avoid hospitalizations. In order to accomplish this goal, patients will need additional education and the medical staff will require training on providing patient education. The quality improvement project supports the goal of the strategic plan by providing the necessary education for staff.

### **Synthesis of Evidence**

In order to develop a thorough understanding of health literacy resources from Google Scholar, BioMed Central, and Semantic Scholar were utilized. Searches were limited to information that was written in 2012 or later. The key words for the searches included: health literacy, low literacy, patient education, health, information, online, literacy, improving health literacy, study, research, rural, Healthy People 2020, mortality, United States, socio-economic factors, education, data, systematic review, and under-served populations. These search terms were identified as producing the most relevant research for the quality improvement project. Additionally, Boolean searches were utilized to connect various combinations, expand searches, and increase the number of articles that met the search criteria.

Approximately 70 article abstracts were reviewed. Forty of the articles were considered irrelevant to the project. Thirty of these articles were deemed relevant to the proposed research and reviewed more thoroughly. Thirteen of the studies were noteworthy and included in the evidence evaluation table. Twelve additional articles were retained as sources of information but were not researched based and therefore are not included in the evidence evaluation table.

The summation of this research led to several concepts regarding health literacy. The first of these findings is that health literacy has more implications than any one definition can imply.

Although there is a generally accepted description, the interpretation by different researchers was extensive. Much of the current literature is aimed at developing comprehensive models of health literacy that not only includes the individual but all of the factors impacting their health.

The evidence also shows that a low level of health literacy is correlated with lower socio-economic status (Mehta et al, 2015). This article confirmed that individuals with lower levels of education, namely less than a high school degree or equivalent, are more likely to have difficulties understanding medical information. The findings were the same for people with lower incomes, elderly, minorities, and individuals who do not speak English as their primary language (Bolin et al, 2015). Tobacco use, increased alcohol consumption, obesity, poor nutrition, and lack of exercise occur at much higher rates in the groups with the lowest health literacy scores in each of these studies (Nandi et al, 2014).

The literature review also shows that only a small percent of patient education materials are written at the 6<sup>th</sup>-8<sup>th</sup> grade levels that the National Institute of Health recommends (Kapoor, George, Evans, Miller, & Liu, 2017). So, not only do the majority of people have difficulty understanding medical information but the written materials that are supposed to educate them are contributing to their misunderstanding.

Literature on healthcare in rural America found that the distribution of healthcare providers is disproportionate to the distribution of the population (Bolin et al, 2015). A 2012 study by the US Department of Health and Human Services found that for every 10,000 rural people there are 13.1 healthcare providers compared to 31.2 in the urban setting. On a national level, this equates to less than 10% of healthcare providers practicing in a rural setting despite as estimated 20% of the population living in this setting. This healthcare shortage has led to members of rural communities having less access to healthcare and medical information that would normally be provided in the primary care setting.

The strength of the evidence lies in the consistency of the study outcomes despite different methodologies and study designs. The research by Smith, Curtis, Wardle, von Wagner, and Wolf (2013), Taggert et al (2012), Nandi, Glymour, and Subramanian (2014), and Mehta, House, and Elliott (2015) looked at various socioeconomic health disparities in relation to behaviors, psychosocial dynamics, and the availability of healthcare access, all at varying locations and times. However, the aforementioned studies' findings were similar regardless of differences in study format and the populations that were studied.

There are limitations to these findings. The search methods may not have included all available research as all databases were not available at the time of the research. The selected combinations of search terms may have led to unintentional exclusion of pertinent studies or articles. Additionally, research with negative or inconclusive results frequently remains unpublished and thus unavailable for comparison to existing data.

All of the studies in the synthesis of evidence are limited by the mere definition of health literacy. In fact, the article by Sorenson et al. (2012) focused entirely on differences in the concept of health literacy amongst researchers and healthcare organizations. Because of the undefinable nature of health literacy, data measurements may have low specificity. The same can be said of the assessment tools used to gather the data. These five studies used screening questionnaires for self-reporting by participants which is known to increase the likelihood of error and did not account for all previous health habits.

At the end of the literature review it was apparent that there are large gaps in health literacy research. The number and quality of studies that was concerned with healthcare professionals' knowledge and educational abilities is quite low. The majority of the research focuses on the relationship of the patient and health literacy. Although medical professionals have a great impact their patients' health literacy, researchers have not currently studied this group on a

scale large enough to produce significant results.

### Conceptual Framework

The clinical question for the project was to determine the impact of patient education and health literacy training on rural healthcare staff and their practices. However, there are several factors that influence a healthcare professional's ability to educate patients. There is not a specific reason that has been identified as to be the cause of these limitations. Previous training on patient education, importance of health literacy at their organization, time constraints, and lack of knowledge all contribute to inadequate patient teaching by healthcare staff. The patient population also plays a role in a provider's teaching abilities. It is often difficult to provide appropriate health information for patients that do not speak English as a first language, are elderly, have cognitive or physical disabilities, or do not prioritize their health.

As both staff and patient health literacy disparities are many-sided, the web of causation framework is an ideal model to illustrate the association between health literacy levels and the challenges facing patients.



## METHODOLOGY

### Chapter II

#### Needs Assessment

The primary goal of health literacy is to improve health care consumers' ability to understand health information in order to increase their personal responsibility and capacity for self-care (Day et al, 2015). As the studies by Taggert et al. (2012), Nandi, Glymour, and Subramanian (2014), and Mehta, House, and Elliott (2015) have shown, the need for increased health literacy, for both patients and healthcare professionals, is undeniable. It is commonly known that patients lack the ability to understand and make informed decisions regarding their health. This project's goal was to address these needs by providing healthcare workers the necessary education to help prevent complications from disease or injury and to encourage healthy behaviors.

The original need of improving health literacy originated from Healthy People 2020's list of leading health indicators. Healthy People 2020 identified health literacy as a leading health disparity in the United States (U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2010). Using this information as a starting point, further investigation into the impact of health literacy, the need for improvement of patient education became clear. After compiling a synthesis of evidence, organizational assessment, and discussions with the organization's health education and literacy the need to improve staff education

#### Project Design

The quality improvement project was designed using evidence from existing research. An evaluation of participants' knowledge and beliefs has been a common and effective method to gather information regarding health literacy, this model was used to create an educational training session for healthcare staff using initial and follow-up surveys. The benefit of this design is that it

allowed for a broad view of the participants' knowledge and beliefs as well as to determine the effectiveness of the project in the clinical setting. The downfall is that the likelihood of bias is higher with this type of project than projects with more objective evaluation methods.

The educational session consisted of a PowerPoint presentation for clinic staff that provided background information on health literacy and the impact of low health literacy on the patient population. This was followed with activities that demonstrated how to evaluate patients' literacy levels and methods for providing effective patient education. Information regarding the medical center's patient education resources, additional external resources, and recommended health literacy toolkits was provided. Participants were asked to evaluate the educational session and provide feedback for improvement. This directly aligns with the three previously stated goals of the project.

### **Setting**

The health literacy sessions took place at ten of the healthcare organization's branch clinics. Located in southeastern Minnesota, the clinics are distributed in rural areas throughout three adjoining counties. The clinics are small; each of the clinics has less than ten examination rooms. Staff conference rooms were used for the presentation as projection screens and monitors were available for use and provided adequate seating for participants.

### **Population**

This project was directed primarily towards nursing staff as they provide the majority of patient education for the clinic. However, all staff members were invited to attend the session as one of the core values for the healthcare system is that all employees are caregivers. Participants of the educational sessions included middle level providers, RNs, LPNs, medical assistants, and ancillary staff. No physicians or advanced practice providers participated in the program. As the



clinics are small and have limited staff, the sessions were attended by five or less participants at each location.

### **Intervention and Data Collection**

The quality improvement project was comprised of a PowerPoint presentation that provided background information on health literacy, including the prevalence of low health literacy, at risk populations, and disparities that result from limited understanding of healthcare. The presentations were followed with a group discussion of current methods to evaluate a patient's literacy level, different methods of health literacy assessment, and a list of resources available within the organization for participants to use in their daily practices. A demonstration on how to use a formal health literacy evaluation tool was given, along with information about government approved methods for evaluating patients' health literacy levels.

At this point the presentation addressed patient education. Participants were told the importance reading levels for printed patient education materials as most printed materials are at 10<sup>th</sup> grade level, much higher than the 5<sup>th</sup>-6<sup>th</sup> grade level that is recommended by the U.S. Department of Health and Human Services. A basic method for evaluating printed material, including wording and readability, was reviewed. Employees were shown how to obtain the institutionally approved patient education materials for printing, and methods for effectively using the teach-back method to ensure understanding by the patient.

The objectives for this project were to improve clinic staff knowledge by 50%, distribute three educational resources for participants, and demonstrate evidence-based methods for improving patient outcomes. The introduction and background information presented in the PowerPoint corresponded to the primary goal of improving healthcare staff's awareness and knowledge of health literacy issues. Resources on patient literacy evaluation tools, educational methods, and appropriate sources of literature meet the goal of distributing educational resources.

Finally, showing staff how to use formal evaluation tools, the teach-back method, and effective methods of communication demonstrated the use of evidence-based practices.

As the intended outcome of the project was to educate the clinical and professional staff at these rural clinics, initial and follow-up surveys were administered for data collection. The initial surveys, which were completed after viewing the presentation, were comprised of three distinct sections. The first section contained seven multiple choice questions about health literacy facts to determine a baseline of the participants' knowledge on the subject. The second section included questions ranking their health literacy perceptions and practices in order to ascertain the effectiveness of the project. The final section asked opened-ended project evaluations questions that were used to improve the presentation content throughout the project. The same questionnaires, less the recommendation section, were emailed to all participants 2-3 weeks following their presentation date. This was done in order to collect data on their health literacy knowledge gained from the presentation as well as to gather evidence of improved patient education within each participant's own practice.

### **Project Plan**

After the clinical question, theoretical framework, research, and project design was finalized approval was obtained from Bradley University's Institutional Review Board (IRB) to ensure the project was conducted in accordance with all institutional and ethical guidelines. Once IRB approval was obtained the project was reviewed by the healthcare organization's health education and literacy team to verify the materials presented adhered to both the organization's standards and the educational needs of the staff.

Following the approval process, a plan for implementation was created. The proposed schedule was that one educational presentation was to be given each week during the fall semester. This allowed for completion of the project within the proposed timeframe and provided additional

time for scheduling conflicts and for post-session data collection to be obtained.

Working with the center's patient education committee, implementation of the project was straightforward. The team was enthusiastic about in-person health literacy education and encouraged staff participation as participants were given credit for the required annual on-line health literacy and patient education competency.

Upon completion of the quality improvement project, final data and all educational presentation materials were given to the health education and literacy team. This provided them with a sustainable framework on health literacy that can easily be updated or adapted to meet the organization's needs in the future.

### **Data Analysis**

Data were collected exclusively from the initial educational session and 2-3 week follow-up surveys. The total number of correct answers from the initial surveys was recorded; the same was done with the follow-up surveys. A paired t-test was then used to determine the true mean and confidence interval of the data. An analysis was also done on each question that evaluated the staffs' perception of their health literacy skills and the effectiveness of the presentation, providing information on how the project impacted the staff.

### **Ethical Considerations and Institutional Review Board**

No ethical issues were identified throughout the duration of the project. As the project did not directly involve patients, there were no concerns regarding patients' rights or welfare, consent, or confidentiality. All employees at each clinic were invited to attend the presentation on a voluntary basis without regard to completion of the surveys. Nursing staff was informed that attendance would fulfill the required patient education competency but the online training was still available should they choose not to attend. The voluntary nature of the project was clearly stated on the surveys and discussed with each participant. All data collection was completed

anonymously; this ensured that scores, responses, and feedback was confidential. Separate forms were given to receive credit for the annual competency and were given to the nurse educator at the end of the project. Everyone who completed the initial survey was offered a \$5.00 gift card as a thank you gift if they completed the follow-up survey. As previously mentioned, approval from Bradley University's Institutional Review Board for the project was obtained. A secondary approval from the organization's health education and literacy team was also obtained after a thorough review of the presentation, surveys, and project plan.

**ORGANIZATIONAL ASSESSMENT AND COST EFFECTIVENESS ANALYSIS****Chapter III****Organizational Assessment**

Prior to the development of this project the organization had no formal or required education for staff on health literacy. An annual online module consisting of a short PowerPoint presentation followed by a one-page, multiple choice quizzes were the only required training regarding patient education. Nursing staff were allowed to complete this training at their leisure during work hours and were able to use other staff members as resources. Essentially, they could bypass the presentation, complete the quiz with assistance, and receive credit for doing so.

A further assessment revealed that the center was without a nurse educator for several months in spring of 2018. Because of this, nursing staff did not have the proper resources for training and education.

The Health Education and Literacy (HEAL) team is headed by an individual that can only dedicate 20 hours out of an 40-hour work week to all patient education materials for the entire health system. Other team members attend a one-hour meeting once per month and use free time while working in their non-related positions to work on patient education needs.

While attending a HEAL team meeting, the need for in-person health literacy and patient education was identified as a goal for the branch clinics. However, the members of the team lacked the time and funding for mileage to achieve this goal.

Upon completion of the assessment, there was an obvious gap in staff education. Building the quality improvement project around this would be a beneficial and much needed service for the organization. Utilizing surveys to assess the value and effectiveness of in-person education would also provide the team the necessary data to support this practice in the future.

**Cost Effectiveness**

In the current economic environment of rural areas, many patients have limited healthcare insurance. Additionally, this is a nonprofit organization with limited means. Therefore, ensuring that the project was cost-effective, now and in the future, was essential for its success. The project was designed so that it can be modified if the funding is not available for in-person training. The presentation can be distributed to the lead nursing staff from each clinic who meet on a quarterly basis. These individuals could review the information and educate their respective staff on an annual basis, ensuring that the project is sustainable and cost effective.

Once the plan was finalized the cost effectiveness for the organization was quite evident. All travel expenses were covered by the principle investigator. At each branch location there is a designated conference room with a computer, projector, and projection screen. These items were used for the presentation. Staff was paid for the time they attended the presentation as it occurred over the lunch hour. However, this money was already allocated for the completion of the online patient education competency if the staff members choose to do the competencies outside of their regular work hours. The final cost to the organization was essentially nil; photocopies of the competency assessment was the only cost accrued for the organization.

## **RESULTS**

### **Chapter IV**

#### **Analysis of Implementation Process**

Overall, the implementation process was successful. The HEAL team had clear expectations for educational requirements and the competency assessment. Project expectations, goals, and objectives were identified early on and agreed upon by the stakeholders. Costs to the organization and the use of resources at the clinic locations were presented prior to implementation. The stakeholders supported the project as it aligned with the organization's goals, the health literacy and education team's goals, and achieved objectives that the team did not have funding for.

No resistance to the project was met by the stakeholders or participants. The stakeholders were directly benefiting from the project and participants were completing a required annual competency. There were no barriers with the organization or staff members as the principle investigator is both employed and a clinical student within the healthcare system.

Timing was the barrier for the implementation of the project. In the initial planning stage implementation was to begin in July/August 2018. This timeframe was rebuffed by the stakeholders as a new electronic medical record system was going to be launched at the end of September or early October 2018. Staff was required to work additional hours throughout August and September 2018 in order to complete the necessary training. Stakeholders decided that the project should not begin until after the launch, leading to a delay in the project for two months.

The time frame also impacted the follow-up by participants. At this time the organization was experiencing obstacles and technical difficulties as there is with any large-scale operational changes. Staff members were stressed and were unable to perform their duties efficiently.

Understandably, few participants prioritized responding to the surveys. A modification to the IRB

proposal was needed to approve a \$5.00 gift card for any staff that responded as a thank you for taking the time for following up.

### **Analysis of Project Outcome Data**

The first section of the survey consisted of seven multiple choice questions about health literacy information. Questions were based on data or facts presented during the educational session. This section of the survey correlated with the project's goal of determining if staffs' knowledge of health literacy improved by 50% after attending the educational session.

Section two of the survey consisted of ten statements about the participant's perception of health literacy. They were asked to rate each question on a scale of one to five based on their own practice and experience. On this scale, a response of one indicated that they do not agree at all and a response of five indicated they completely agree.



## DISCUSSION

### Chapter V

#### Findings

Section one of the surveys was comprised of seven multiple choice questions. Each participant's survey was graded and the number of correct answers was recorded as their score. An analysis of the total scores was performed, rather than an analysis of each individual question, as section one was intended to evaluate their general knowledge of health literacy. This method was used to assess if the goal of having participants improve their subject knowledge by 50% was met. Analysis of individual questions was inconsequential for the evaluation of this goal.

A paired-sample t-test was used to determine the mean difference between the participants' original scores and their score on the follow-up survey. The paired sample t-test data set was created using each participant's original score paired with their follow-up score. The difference between the initial survey scores ( $M = 6.3$ ,  $SD = .46$ ) and the follow-up scores ( $M = 4.5$ ,  $SD = 1.61$ ) was found to be statistically significant ( $t = 4.3$ ,  $p = .002$ ).

Section two was comprised of ten statements about participants' perceptions of health literacy and patient education. A Likert scale was used for the responses in which a response of one indicated they do not agree with the statement at all to five, which indicated they completely agree with the statement. The response sets were analyzed individually to provide more specific feedback on the impact of the quality improvement project. Paired-sample t-tests were used to determine the mean differences between the two sets of scores. The original and follow-up score for each participant was paired to create the data sets for the t-tests.

Of the ten statements, three (# 2, 4, & 6) were found to have significant differences between the means. Statement two asked if the participant was able to tell when patients have difficulty understanding information. The initial survey ( $M = 4$ ,  $SD = .33$ ) was surprisingly higher

than the follow-up survey ( $M = 3.6$ ,  $SD = .5$ ) with a statistical significance ( $t = 2.5$ ,  $p = .035$ ), indicating that participants were less confident in their ability to evaluate patients in the weeks following the presentation.

Statement four asked if the participant is able to determine the grade level of patient education material. From the initial survey ( $M = 2.9$ ,  $SD = .78$ ) to the follow-up survey ( $M = 3.3$ ,  $SD = .71$ ) a statistically significant increase ( $t = -1.8$ ,  $p = .104$ ) suggesting that participants were more aware of patient education materials readability.

Statement six asked if the participant spoke slowly and used simple words when educating patients. The follow-up survey ( $M = 4.3$ ,  $SD = .6$ ) was found to be significantly higher ( $t = -2.5$ ,  $p = .035$ ) than the initial survey ( $M = 3.9$ ,  $SD = .5$ ), signifying that participants were using this evidence-based teaching practice more frequently following the presentation.

The remaining seven statements did not show significant differences in the participants' perceptions between the initial and follow-up surveys. Overall, this indicates that the quality improvement project did not impact the staffs' perceptions of health literacy and patient education.

### **Limitations**

The first limitation of this project is the small sample size. At implementation, 22 participants completed the initial survey; only nine participants completed the follow-up survey. This negatively impacts the accuracy and significance of the project's finding. The project is also limited in that the questions were answered through self-reporting and were subject to interpretation by the participants. Population selection may possibly have limited the outcome as well. Registered nurses, licensed practical nurses, and medical assistants were the only participants; no physicians, mid-level providers, or ancillary staff attended the sessions.

Secondly, the reliability and validity of the surveys is unknown. It was developed by the

primary investigator after researching and combining ideas from several other projects that focused on health literacy and patient education

### **Implications**

In its entirety, the findings imply that the in-person health literacy training was moderately beneficial for the nursing staff at the branch clinics. Although specific facts and figures may not have been remembered at the time of follow, participants reported that they had a better understanding of how health literacy and their patient education practices impact the health outcomes of their patients. The data also indicate that the goal of providing staff with health literacy resources was achieved as there was an increase in participants' access to health literacy resources. Outcomes also suggest that nursing staff are largely under-educated on the topic of health literacy. It is probable that participants were unaware of the impact on patient health outcomes and the financial burden on the organization and thus felt under-trained when using these skills in actual practice.

In the future, materials from the project can be updated and modified to reflect changes in evidence based practice or to meet the needs of the staff. Due to financial limitations, the lead registered nurse at each location could be educated on the content of the educational session and provide in-person education to increase staff knowledge and reinforce recommended patient education methods.

## CONCLUSION

### Chapter VI

#### **Value of the Project**

Although the impact of the project may not have been to the extent that was anticipated, the project was valuable to the organization. There was a reasonable improvement in staff use of the teach-back method, speaking slowly and asking open-ended questions while doing patient education. The final goal of the project was to increase the use of three evidence-based education methods in daily practice. Even a small improvement in patient education can increase the health outcomes in the rural communities.

The project also provided a service to the health education and literacy team; they are without funding and necessary staff they would not have been able to complete their goal of provide in-person training to the staff at the branch clinics. At the conclusion of the educational sessions, the general message from participants, in person and feedback from the surveys, was that staff thought the training was helpful. It was stated that project provided them with an understanding of the wide-spread impact of health literacy, the rationale behind the recommended education methods, and knowledge of the educational resources available to them that they previously unaware of.

#### ***DNP Essentials***

The *DNP Essentials* provides a list of competencies that all DNP graduates require for nursing practicing at this level. These competencies do not simply indicate expertise in subject matter, but the requirements to be a leader, educator, and scientist that the DNP needs to be in order to improve nursing practice as a whole.

This quality improvement project directly relates to *Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking* (AACN, 2006). Essential II

describes the DNP using his or her skills and knowledge to reduce health disparities and improve patient outcomes; the fundamental goal of this project was to improve healthcare staffs' knowledge and skills to reduce health disparities caused by low health literacy.

*Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice* requires the DNP to integrate knowledge from various sources and disciplines to solve practice problems and improve health outcomes (AACN, 2006). Utilizing research on health literacy and identifying the lack of information on healthcare staffs' impact on patient education led to the development of this project. In practice, patients ultimately learn from the healthcare staff and the materials they use for education. Knowing that health literacy is at its core a practice issue, the project aimed to close this gap and advance health literacy within the community.

Additionally, the project reflects the goals outlined in *Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health* and *Essential V: Health Care Policy for Advocacy in Health Care*. Essential VII addresses the role of the DNP in prevention and improvement of public health through the use of evidence-based practices (AACN, 2006). The project specifically recognized the increased risk of health disparities and low health literacy rates in rural counties. And because the project found that healthcare staff found the educational session to be helpful, the recommendation for increased staff education will hopefully become an institutional policy, as described in Essential V.

### **Plan for Dissemination**

Dissemination of the project will consist of three parts. Initial dissemination will entail a 50-minute online presentation that will be scheduled through the university's web site. The presentation will include a live meeting with a PowerPoint that reviews the project, outcomes, and significance of the work. Secondly, the scholarly paper will be deposited in the DNP repository for use by students and all APRNs. Finally, a brief presentation of the project's outcome will be

given to the organization's health education and literacy team. Results of the project will provide them with the strengths and weaknesses nursing staff have regarding health literacy and patient education. These data can help them develop future training and additional education materials.

### **Attainment of Personal and Professional Goals**

My professional goals for the project were to improve the health literacy with the rural communities in my area and to help the organization where I am both an employee and a student. Based on the feedback from the participants, the majority had positive comments about the education that was provided and stated that they were unaware of the limitations of the average patient. If they are able to apply this new knowledge to their daily practice, the patients they care for will have a greater understanding about their health and management of their conditions. And I will have accomplished what I set out to do.

On a personal level, completion of the project was my ultimate goal. I always knew that I could complete the requirements of the project; I also knew that the process would change the core of who I am. At one point in the project I recognized a change in how I thought about the project and becoming a DNP. I truly felt as if I had shifted from being a nurse to being something more, like someone who has recognized her potential. Ultimately, I do think that I have achieved the goal of completing the project, academically and personally.

### **Conclusion**

Health literacy will continue to have a significant impact on the health outcomes of people of all race, gender, and socioeconomic status. But for disadvantaged populations, the impact on their morbidity and mortality will continue to be significantly higher.

As a DNP, I have the ability to create positive changes in the health status of underserved areas.

Doctoral level education is designed to promote health and eliminate disparities while focusing on the needs of patients, populations, and communities.

Through the development and implementation of the scholarly project I was able to evaluate patient education practices in rural clinics and educate staff in order to meet the needs of their patient and provide continuing education on the topic of health literacy. The findings of this project suggest that in-person training is helpful for staff and increases the use of evidence-based patient education methods in daily practice.

### References

- American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice*. Washington, D.C.
- Bolin, J. N., Bellamy, G. R., Ferdinand, A. O., Vuong, A. M., Kash, B., Schulze, A., & Helduser, J. W. (2015). Rural Healthy People 2020: New decade, same challenges. *The Journal of Rural Health, 31*: 326–333. doi:10.1111/jrh.12116
- Chesser, A., Burke, A., Reyes, J., & Rohrberg, T. (2016). Navigating the digital divide: A systematic review of eHealth literacy in underserved populations in the United States. *Informatics for Health and Social Care, 41*(1), 1-19.
- Coelho, R. (2018). Perceptions and knowledge of health literacy among healthcare providers in a community based cancer centre. *Journal of medical imaging and radiation sciences, 49*(1), S11-S12.
- Day, M., Dollar, S., & Kaf, W. (2015). Rural older adults and functional health literacy: Testing self-efficacy, knowledge and skills resulting from hands-on health promotion. *Contemporary Rural Social Work, 7*(2), 100-114.
- Kapoor, K., George, P., Evans, M. C., Miller, W. J., & Liu, S. S. (2017). Health literacy: Readability of ACC/AHA online patient education material. *Cardiology, 138*(1), 36-40. Retrieved from <https://www.karger.com/Article/Abstract/475881>
- Mehta, N. K., House, J. S., & Elliott, M. R. (2015). Dynamics of health behaviors and socioeconomic differences in mortality in the United States. *Journal of Epidemiology and Community Health, 69*(5), 416–422. <http://doi.org/10.1136/jech-2014-204248>
- Nandi, A., Glymour, M. M., & Subramanian, S. V. (2014). Association among socioeconomic status, health behaviors, and all-cause mortality in the United States. *Epidemiology (Cambridge, Mass.)*, 25(2), 170.



- Smith, S. G., Curtis, L. M., Wardle, J., von Wagner, C., & Wolf, M. S. (2013). Skill set or mind set? Associations between health literacy, patient activation and health. *PloS one*, 8(9), e74373. Retrieved from <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0074373>
- Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., & Brand, H. (2012). Health literacy and public health: A systematic review and integration of definitions and models. *BMC public health*, 12(1), 80. Retrieved from <https://bmcpublichealth.biomedcentral.com/track/pdf/10.1186/1471-2458-12-80?site=bmcpublichealth>
- Taggart, J., Williams, A., Dennis, S., Newall, A., Shortus, T., Zwar, N., ... & Harris, M. F. (2012). A systematic review of interventions in primary care to improve health literacy for chronic disease behavioral risk factors. *BMC family practice*, 13(1), 49. Retrieved from <https://bmcfampract.biomedcentral.com/articles/10.1186/1471-2296-13-49>
- U.S. Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *National Action Plan to Improve Health Literacy*. Washington, DC. Retrieved from <https://health.gov/communication/initiatives/health-literacy-action-plan.asp>

## Appendix A

## Initial survey/follow-up survey

Health Literacy Self-Assessment Questions- this survey is voluntary.

Please circle the correct answer.

1. What percentage of American adults has at least some difficulty understanding medical information?  
A. 10% B. 28% C. 54% D. 72% E. 88%
2. You can tell how health literate a person is by knowing what grade he or she completed in school.  
A. True B. False
3. What percentage of American adults are considered to be illiterate?  
A. 2% B. 7% C. 14% D. 20% E. 28%
4. Low health literacy costs the U.S. economy an estimated \_\_\_\_ each year.  
A. \$50 million B. \$ 500 million C. \$5 billion D. \$ 50 billion E. \$500 billion
5. Typical patient education materials are written at a 10-12<sup>th</sup> grade reading level. However, the average American adult reads at the \_\_\_\_ grade level.  
A. 3<sup>rd</sup> B. 5<sup>th</sup> C. 7<sup>th</sup> D. 9<sup>th</sup>
6. Which of the following does NOT indicate limited health literacy?  
A. Frequently missed appointments  
B. Incomplete medical and registration forms  
C. Bringing a list of questions for the provider to appointments  
D. Lack of follow through for referrals and/or testing  
E. Identifying medications by sight not by label information
7. What method can health care staff use to improve patient outcomes?  
A. Speaking slowly  
B. Avoiding medical jargon  
C. Utilizing the teach back or show back method  
D. Using pictures or demonstrations to educate  
E. All of the above

Complete the follow questions using the following scale.

1- Do not agree at all 2-Somewhat agree 3- Moderately agree 4- Mostly agree 5- Completely agree

Please circle the number that best describes you:

1. I have an understanding of what health literacy entails.  
1            2            3            4            5
2. I am able to tell when patients have difficulty understanding information.  
1            2            3            4            5
3. I have had adequate education on health literacy.  
1            2            3            4            5
4. I am able to evaluate the grade level of patient education material.  
1            2            3            4            5
5. I use the teach-back method when educating patients.  
1            2            3            4            5
6. I speak slowly and use simple words or pictures when educating patients.  
1            2            3            4            5
7. I ask open ended questions so patients feel comfortable asking for clarification.  
1            2            3            4            5
8. I do a good job educating patients.  
1            2            3            4            5
9. I have access to health literacy resources at my job.  
1            2            3            4            5
10. I am aware of the impact that low health literacy has on patients.  
1            2            3            4            5

Evaluation- Initial Survey Only

*Please rate the following statements:*

As a result of this educational activity, I:	Strongly Agree	Agree	Disagree	Strongly Disagree
Have a better understanding of health literacy				
Can identify at risk patient populations				
Understand the implications of low health literacy on health outcomes and cost				
Can evaluate patients and educational materials for literacy levels				
Can demonstrate evidence-based educational practices				
What was most/least useful with regards to this training?				
How will you apply this training to your daily practice?				
Comments:				

Appendix B

Project Timeline

September 2017

Identified project topic and need

Literature review

Synthesis of evidence

Identified scholarly preceptor

October 2017

CITI Training

November 2017

Initial synthesis of evidence

Evidence evaluation table

January 2018

Project plan proposal

Practicum plan of activities

Competency assessment for practicum design

February 2018

Project proposal

Project proposal II

April 2018

Scholarly project dissertation defense

CUHSR application

May 2018

Practicum plan of activities

July 2018

Dissertation defense II

Project proposal III

CUHSR approval

August 2018

Development of project content

October 2018

Implementation of project

November 2018

Implementation of project

December 2018

Final collection of surveys

January 2019

Typhon portfolio completion

February 2019

Final scholarly project paper submission

April 2019

Scholarly project oral presentation and PowerPoint, dissemination

Scholarly project eRepository

Appendix C

Project Budget

<b>Items</b>	<b>Quantity</b>	<b>Cost</b>	<b>Subtotal</b>	<b>Total</b>
<b>Personnel</b>				
Patient education committee members	8	N/A	N/A	\$0
<b>Non-Personnel</b>				
Education Session Supplies	10 classes	Negligible	\$0	\$0
Education Session Equipment	10 classes	\$0	\$0	\$0
Computer	1	\$0	\$0	\$0
Projector	1	\$0	\$0	\$0
Facilities	0	\$0	\$0	\$0
Travel*	10	N/A	N/A	<u>\$0</u>

**Project Total = \$0.00**

\* Travel provided by project administrator, therefore no cost to the organization.

## Appendix D

## CUHSR application and approval

July 30, 2018

Committee on the Use of Human Subjects in Research  
Bradley University  
1501 W Bradley Avenue  
Peoria, IL 61625

Dear CUHSR Committee,

As a requirement for the Doctor of Nursing Practice Degree at Bradley University, I am submitting the following research proposal for CUHSR approval: Improving Health Literacy in Rural Populations through Clinic Staff Education. Health literacy is a factor contributing to health disparities across the nation and disproportionately impacts disadvantaged populations including rural areas. However, there is evidence to show that many health care workers have limited awareness and education regarding low health literacy and the impact on patient outcomes.

I believe this research will be exempt based on a category 3 exemption. The research surveys will ask for the participant's name for the purpose of delivering a follow-up survey and so that they may receive credit for their medical organization's required annual health literacy education. Only the researcher will have access to the responses provided by the participants and any personal identifiers will remain confidential throughout the research period and thereafter.

All educational materials and surveys will be approved by the healthcare organization's health education and literacy team to ensure the content meets their requirements. I do believe this educational session will improve patient outcomes and will contribute to the body of knowledge regarding health care employees' understanding of health literacy.

Thank you and the committee for your time and consideration of our request. I look forward to your response.

Very Respectfully, *Bethany Ganz, RN, BSN*

Dear Investigators:



Your proposed study (CUHSR 57e-18) *Improving health literacy in rural populations through clinic staff education* has been reviewed and was found to be exempt from full review under Category 2.

Your vita and ethics certificates are on file.

Be aware that future changes to the protocols must first be approved by the Committee on the Use of Human Subjects in Research (CUHSR) prior to implementation and that substantial changes may result in the need for further review.

While no untoward effects are anticipated, should they arise, please report any untoward effects to CUHSR promptly (within 3 days).

As this study was reviewed as exempt, no further reporting is required unless you change the protocol or personnel involved.

This email will serve as notice that your study has been reviewed unless a more formal letter is needed. Please let me know, and I will provide the letter.

Ross L. Fink, Ph.D.  
Chairperson, CUHSR

## Appendix E

## Implied Consent

## Improving Health Literacy in Rural Populations through Staff Education

Dear Staff,

You are invited to participate in a quality improvement project. The purpose of this project is to educate staff about health literacy and to evaluate the perceived impact on their patient education. This project consists of answering questions on a survey, once today and again in 3-4 weeks. Your participation in this project will take approximately 5-10 minutes. All of your answers will remain confidential. Your name will not be recorded or associated to the project. Taking part in this project is voluntary. You may choose not to take part or may leave the project at any time. You may also skip any question(s).

Questions about this project may be directed to Bethany Ganz at bganz @olmmed.org.

If you have general questions about being a quality improvement participant, you may contact the Bradley University CUHSR office at (309) 677- 3877. You are voluntarily making a decision to participate in this project. Your completion of the surveys means that you have read and understood the information presented and have decided to participate. Your participation also means that all of your questions have been answered to your satisfaction. You may contact the project director at any time with questions.

If you have any questions, please do not hesitate to ask.

Bethany Ganz  
bganz@olmmed.org

Thank you for your time.

Sincerely,

Bethany Ganz, RN, BSN

## Appendix F

## Data Analysis

## T-Test Comparison of Responses on Initial and Follow-up Surveys, Section

Table 1

*Results of t-test for Comparison of Total Scores on Initial and Follow-up Surveys, Section 1*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	1.8 (.97)	[85, 2.74]	4.3	9	.002

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were significantly higher on the initial survey (M = 6.30, SD = 6.75) than for the follow-up survey (M = 4.5, SD = 1.27),  $p < .05$ .

## T-Test Comparison of Likert Scale Responses on Initial and Follow-up Surveys, Section 2

Table 2

*Differences between survey scores*

*Question 1. I have an understanding of what health literacy entails.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.22 (.27)	[-.29, .74]	1	8	.35

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly higher on the initial survey (M = 4.44, SD = .88) than for the follow-up survey (M = 4.22, SD = .66),  $p < .05$ .

Table 3

*Differences between survey scores*

*Question 2. I am able to tell when patients have difficulty understanding information.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.44 (.42)	[-.04, .85]	2.53	8	.035

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were significantly higher on the initial survey (M = 4.11, SD = .33) than for the follow-up survey (M = 3.67, SD = .50),  $p < .05$ .

Table 4

*Differences between survey scores*

*Question 3. I have had adequate education about health literacy.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.22 (.76)	[-.29, .73]	1	8	.35

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly higher on the initial survey (M = 4.44, SD = .88) than for the follow-up survey (M = 4.22, SD = .67),  $p < .05$ .

Table 5

*Differences between survey scores*

*Question 4. I am able to determine the grade level of patient education material.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.44 (.75)	[-1.0, .11]	-1.83	8	.1

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were significantly lower on the initial survey (M = 2.89, SD = .78) than for the follow-up survey (M = 3.33, SD = .71),  $p < .05$ .

Table 6

*Differences between survey scores*

*Question 5. I use the teach-back method when educating patients.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.22 (.47)	[-.73, .29]	1	8	.35

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly lower on the initial survey (M = 4.0, SD = .50) than for the follow-up survey (M = 4.22, SD = .44),  $p < .05$ .

Table 7

*Differences between survey scores*

*Question 6. I speak slowly and use simple words when educating patients.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.44 (.55)	[-.85, -.39]	-2.53	8	.035

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were significantly lower on the initial survey (M = 3.89, SD = .60) than for the follow-up survey (M = 4.33, SD = .50),  $p < .05$ .

Table 8

*Differences between survey scores*

*Question 7. I ask opened ended questions so patients feel comfortable asking for clarification.*

Pair 1	Paired Differences		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.22 (.69)	[-.86, .42]	1	8	.35

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly lower on the initial survey (M = 4.0, SD = .71) than for the follow-up survey (M = 4.22, SD = .67),  $p < .05$ .

Table 9

*Differences between survey scores**Question 8. I do a good job educating patients.*

Pair 1	<u>Paired Differences</u>		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.22(.77)	[-.29, .79]	1	8	.35

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly higher on the initial survey (M = 4.0, SD = .86) than for the follow-up survey (M = 3.78, SD = .67),  $p < .05$ .

Table 10

*Differences between survey scores**Question 9. I have access to health literacy resources at my job.*

Pair 1	<u>Paired Differences</u>		t	df	Sig. (2-tailed)
	M (SD)	95% CI			
Initial-Follow-up	.11(.72)	[-.71, .49]	-.43	8	.68

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly lower on the initial survey (M = 4.33, SD = .71) than for the follow-up survey (M = 4.44, SD = .73),  $p < .05$ .

Table 11

*Differences between survey scores*

*Question 10. I am aware of the impact that low health literacy has on patients.*

Pair 1	<u>Paired Differences</u>				
	M (SD)	95% CI	t	df	Sig. (2-tailed)
Initial-Follow-up	.11(.62)	[-.57, .35]	-.56	8	.59

*Note.* Standard deviation = SD; Confidence interval = CI; Degrees of freedom = df; Significance = Sig.

A paired-samples t-test indicated that scores were not significantly lower on the initial survey (M = 4.33, SD = .71) than for the follow-up survey (M = 4.44, SD = .53),  $p < .05$ .