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An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting

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AN EDUCATIONAL INTERVENTION TO RAISE THE AWARENESS OF LIMITED HEALTH LITERACY AND THE NEED TO UTILIZE RECOMMENDED STRATEGIES AND INTERVENTIONS AMONG HEALTHCARE CLINICIANS IN A PROGRAM OF ALL-INCLUSIVE CARE FOR THE ELDERLY SETTING

A Scholarly Project

Submitted to the

Faculty of Liberty University

In partial fulfillment of

The requirements for the degree of

Doctor of Nursing Practice

By

Esther Lorraine Carpenter, BSN, RN

July, 2018
HEALTH LITERACY STRATEGIES AND INTERVENTIONS

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Scholarly Project Chair Approval:

Dr. Dana S. Woody, DNP, RN, Associate Professor of Nursing, Chair, July 23, 2018
ABSTRACT

Health literacy is a complex, common, and challenging issue facing the United States and the world today. Occurring in the context of care delivery and significantly impacting the quality of care provided, health literacy is not simply a patient problem; but places a substantial burden on healthcare clinicians to ensure they are providing clear communication. Research suggests a lack of awareness and training among healthcare clinicians related to health literacy, resulting in clinicians being unaware of and unprepared to address this issue in practice. The purpose of this evidence-based practice project was to raise the awareness of limited health literacy among healthcare clinicians caring for participants in a Program of All-Inclusive Care for the Elderly, and to provide them with strategies and interventions they could utilize in their care delivery. A pre- and post-test was used assess the clinicians’ health literacy awareness before and after a health literacy educational intervention. A post-survey was used to assess their utilization of recommended strategies and interventions one month after the intervention. The project results suggest that the educational intervention did increase healthcare clinicians’ awareness of the challenges of limited health literacy and recommended strategies and interventions. The results also suggest that the educational intervention positively impacted the clinicians’ utilization of health literacy strategies and interventions one month after the intervention. Recommendations for practice include incorporation of the educational intervention as part of the mandatory continuing education requirements for healthcare clinicians at a Program of All-Inclusive Care for the Elderly.

**Keywords:** health literacy awareness, educational intervention, healthcare clinicians, strategies and interventions, universal precautions, Program of All-Inclusive Care for the Elderly.
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Table of Contents

ABSTRACT ........................................................................................................................................... 3
Acknowledgements ............................................................................................................................ 5
List of Tables ........................................................................................................................................ 10
List of Figures ....................................................................................................................................... 11
List of Abbreviations .......................................................................................................................... 12
SECTION ONE: INTRODUCTION ........................................................................................................ 14
  Background ......................................................................................................................................... 15
    Health Literacy Defined ...................................................................................................................... 15
    Health Literacy in the U.S. .................................................................................................................. 16
    Importance of Health Literacy ........................................................................................................ 17
    Risk Factors ...................................................................................................................................... 18
    Clinician Awareness ....................................................................................................................... 19
    The Program of All-Inclusive Care for the Elderly (PACE) .............................................................. 21
    Challenges and Opportunities .......................................................................................................... 23
    Implications for Practice .................................................................................................................. 26
  Problem Statement ............................................................................................................................ 27
  Purpose of the Project ....................................................................................................................... 27
  Significance of the Project .................................................................................................................. 28
  Clinical Question .............................................................................................................................. 28
    Population ........................................................................................................................................ 29
    Intervention ...................................................................................................................................... 29
    Comparison ...................................................................................................................................... 29
    Outcomes ........................................................................................................................................ 29
SECTION TWO: LITERATURE REVIEW AND SYNTHESIS ................................................................. 30
  Search Strategy ................................................................................................................................... 30
  Selection Criteria ............................................................................................................................... 31
  Quality of Research ............................................................................................................................ 32
  Literature Categories ......................................................................................................................... 33
  Strength and Generalizability of Evidence ....................................................................................... 41
  Conceptual Framework ..................................................................................................................... 42
SECTION THREE: METHODOLOGY .................................................................................................... 45
List of Tables

Table 1. *Paired Samples t-test* ........................................................................................................... 61
Table 2. *Paired Samples Correlations* .............................................................................................. 61
Table 3. *Paired Differences* ............................................................................................................... 61
Table 4. *Key Strategies and Interventions Noted by Healthcare Clinicians* ................................. 62
Table 5. *Clinicians’ Response to Questions 2 and 3 of the Post-Survey* ..................................... 63
List of Figures

*Figure 1.* Flow Chart Demonstrating the Phases of Project Implementation. ............................... 54

*Figure 2.* Types of Healthcare Clinicians Who Participated in the Project. ................................. 59

*Figure 3.* Healthcare Clinicians’ Responses to Questions 1, 2, and 3 of the Post Survey. ............ 63
List of Abbreviations

Agency for Healthcare Research and Quality (AHRQ)
Centers for Disease Control and Prevention (CDC)
Centers for Medicaid and Medicare Services (CMS)
Certified Occupational Therapy Assistant (CTOA)
Collaborative Institutional Training Initiative (CITI)
Doctor of Nursing Practice (DNP)
Evidence-Based Practice (EBP)
Health Literacy (HL)
Health Literacy Universal Precautions Toolkit (HLUP Toolkit)
Institute of Medicine (IOM)
Institutional Review Board (IRB)
Iowa Model Collaborative (IMC)
Joint Commission (JC)
Level of Evidence (LOE)
License Practical Nurse (LPN)
Medical Doctor (MD)
Nurse Practitioner (NP)
Master’s Prepared Social Worker (MSW)
National Assessment of Adult Literacy (NAAL)
National PACE Association (NPA)
Occupational Therapist (OT)
Physical Therapist (PT)
Physical Therapy Assistant (PTA)

Public Health Training Center (PHTC)

Program of All-Inclusive Care for the Elderly (PACE)

Registered Dietitian (RD)

Registered Nurse (RN)

Registered Nurses’ Association of Ontario (RNAO)

Statistical Package for the Social Sciences (SPSS)

United States (U.S.)

United States Department of Health and Human Services (USHHS)

World Health Organization (WHO)
SECTION ONE: INTRODUCTION

Health Literacy (HL) is a significant issue facing the United States (U.S.) and the world today. The term relates to an individual’s ability to meet the complex demands of health in a modern society (Sorenson et al., 2012). According to the National Assessment of Adult Literacy (NAAL), only 12 percent of adults in the U.S. have proficient HL (Kutner, Greenberg, Jin, & Paulsen, 2006; U.S. Department of Health and Human Services [USHHS], n.d.). This is very concerning as Weiss (2007) notes that HL is a major predictor of an individual’s health: more than age, income, employment status, educational level, race, or ethnic group. Furthermore, research has demonstrated that healthcare clinicians are unaware of the HL level of their patients and the impact this has on their patient’s health (Coleman, 2011; Dickens, Bruce, Cromwell, & Piano, 2013; Hersh, Salzman, & Snyderman, 2015; Sorensen et al., 2012; Welch, Van Geest, & Caskey, 2011).

The elderly and those with chronic diseases are at increased risk for low HL and having negative outcomes related to low HL. The Program of All-Inclusive Care for the Elderly (PACE) aims to enable older adults with chronic diseases to continue to live in their homes and communities as long as these are medically and socially safe (Centra Health, n.d.). To meet this goal, issues of limited HL must be addressed by healthcare clinicians, as HL is a vital component of self-management skills, effective communication, and patient-centered care (Mitchell, Sadikova, Jack, & Paasche-Orlow, 2012; Sorensen et al., 2012). Current evidence suggests that there is a lack of awareness and training related to the limitations associated with low HL among healthcare clinicians (Coleman, 2011; Sand-Jecklin, Murray, Summers, & Watson, 2010). There is a pressing need to educate clinicians about this issue, to raise their awareness and enable them to utilize recommended strategies and interventions. This scholarly project is an evidence-based
practice project that aimed to increase healthcare clinicians’ awareness of limited HL and the recommended strategies and interventions to ensure optimal outcomes within the PACE environment.

**Background**

**Health Literacy Defined**

In the 1970s, the term HL was introduced and since then has become increasingly recognized as playing an important role in public health and healthcare (Sorensen et al., 2012). There are many complex definitions of HL: in fact, there are 17 documented definitions and 12 conceptual models for HL (Sorensen et al., 2012). The complexity of HL makes it a challenging issue to address. The Centers for Disease Control and Prevention (CDC) (2016) presents one of the most understandable and concise definitions of HL, explaining that it is “the degree to which an individual has the capacity to obtain, communicate, process, and understand basic health information and services to make appropriate health decisions.” The Agency for Healthcare Research and Quality (AHRQ) (2010) also explains that HL includes a patient’s ability to read and write, understand numbers, and effectively speak and listen in the healthcare environment. A more comprehensive, definition by Sorensen and his colleagues (2012) explains that:

> Health literacy is linked to literacy and entails people’s knowledge, motivation and competencies to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course. (Sorensen et al., 2012, p. 3)

This definition highlights the fact that HL has multiple dimensions and encompasses many different components (Sorensen et al., 2012).
Health Literacy in the U.S.

Research demonstrates that HL is a significant issue facing the U.S. today. In 2003, the NAAL assessed the English literacy of over 19,000 adults, 16 years and older, in the U.S. (Kutner et al., 2006). The assessment measured literacy directly through tasks that adults completed and was the first to include a component to measure the HL of the population (Kutner et al., 2006). The assessment found that only 12 percent of the population had proficient levels of HL, with 53 percent having intermediate HL, 22 percent having basic HL, and 14 percent having below basic HL (Kutner et al., 2006). It is also estimated that more than one-third of adults in the U.S., about 80 million people, have limited HL with nine out of 10 adults finding it hard to understand health information when it is unfamiliar, complex, or filled with medical jargon; thus, the need to address this issue is pressing (CDC, 2016; Hersh et al., 2015).

There has been a call to action to make HL a priority for healthcare organizations, increase the awareness of HL, create HL policies, and utilize interventions to improve HL by many governing bodies including: The Institute of Medicine (IOM), the United States Department of Health and Human Services (USHHS), and the Joint Commission (JC) (CDC, 2016; Dennis et al., 2012; IOM, 2004; JC, 2007; Poureslami, Nimmon, Rootman, & Fitzgerald, 2017; USHHS, 2010; Yin, Jay, Maness, Zabar, & Kalet, 2015). The IOM’s (2004) report, *Health Literacy: A Prescription to End Confusion*, calls for public health and healthcare systems, the education system, media, and consumers of health to focus on improving HL. The United States Department of Health and Human Services (2010) also published *The National Action Plan to Improve Health Literacy* to address limited HL and notes that addressing this issue is critical to achieving the *Healthy People 2020* goals and ensuring the success of the health agenda in the U.S. The Joint Commission’s (2007) report, “*What Did the Doctor Say?: Improving*
Health Literacy to Protect Patient Safety, explains that all staff must be trained to recognize and respond appropriately to individuals with limited literacy and language skills. This call to action highlights the need for healthcare organizations and clinicians to make HL their top priority, as it is critical to patient quality and safety (USHHS, 2010).

**Importance of Health Literacy**

As healthcare becomes more consumer-driven, there is an increased emphasis on ensuring that patients can manage their own health in partnership with healthcare providers (USHHS, 2010). To do this, patients must have adequate HL skills. These skills ensure that patients can make appropriate healthcare decisions, as they enable them to locate, evaluate, and analyze health information (USHHS, 2010). Issues with HL present a barrier for patients managing their own health, as low levels of HL are associated with many negative consequences and health outcomes including poor medication adherence, lack of understanding of disease, and lack of self-care skills (Sorensen et al., 2012). Individuals with limited HL may have difficulty completing tasks such as reading and understanding instructions on a prescription medication bottle, or completing an insurance form (AHRQ, 2010).

Health literacy not only impacts the individual, but also their family and their community. Sorensen and colleagues (2012) explain that if an individual has an adequate level of HL, they will be able to take responsibility for their own health, their family’s health, and their community’s health. Low HL has been associated with higher mortality, higher hospitalization rates, and poor self-management skills for chronic disease (Mitchell et al., 2012). Individuals with low HL also have difficulty reading, understanding, and applying health information; which presents a significant barrier to their ability to care for themselves, and prevent disease (Hersh et al., 2015). These patients often misunderstand the health information they are given and have a
shorter life expectancy (Dickens et al., 2013). Low HL is also a risk factor for underuse of preventive services, poor patient participation in medical decisions, poor adherence to plans of care, delayed presentation and diagnosis, and increased hospitalizations (Welch et al., 2011).

**Risk Factors**

Research suggests that poor HL is more common among specific groups of people including minorities, the elderly, Medicaid recipients, and individuals who have not completed high school (AHRQ, 2010). Populations at risk for low HL include older adults, racial and ethnic minorities, individuals who do not have a high school degree or GED certificate, those with low income levels, individuals whose health status is compromised, and those whose first language is not English (USHHS, n.d.).

**Elderly.** The prevalence of limited HL is higher among the elderly/older adults, placing them at increased risk for having negative health consequences due to limited HL (AHRQ, 2010; Berkman et al., 2011; Lee, Yu, You, & Son, 2015; Poureslami et al., 2017; Smith et al., 2015; Sequeira et al., 2013). Older adults with limited HL experience more difficulties with activities of daily living, are more likely to have limited physical function, are more likely to have poorer overall physical health, have difficulty taking their medications, find it hard to understand health messages, and are at increased risk for having a faster physical decline over time (Berkman et al., 2011; Smith et al., 2015). Older adults with limited HL are also more likely to have a faster decline in executive function and have higher morbidity and mortality rates (Berkman et al., 2011; Sequeira et al., 2013). It is vital that healthcare clinicians are aware of and able to address the issue of limited HL among the elderly/older adults, to promote quality care, improve health outcomes, and empower them to appropriately manage their chronic conditions (Cormier & Kotrlik, 2009; Lee et al., 2015; Mullen, 2013; Smith et al., 2015).
**Chronic disease.** Individuals whose health status is compromised by chronic diseases are also at increased risk for having poor HL (USHHS, n.d.). Chronic diseases are some of the most common, costly, and preventable health problems facing the U.S. today, and affect over 117 million adults (CDC, 2017). Healthcare clinicians must be aware of and consider HL when communicating and educating patients about their chronic diseases to ensure that quality care is being provided.

**Clinician Awareness**

The issue of HL is not simply a patient problem, but one that is shared by providers and healthcare systems, as it impacts quality care (CDC, 2016; JC, 2007; Poureslami et al., 2017; Welch et al., 2011). Health literacy occurs in the context of care delivery, placing a greater burden on healthcare clinicians to improve their communication and ensure that patients with low HL understand what they are being told (Welch et al., 2011). Despite the significant impact that low HL has on patients, research demonstrates that healthcare clinicians are unaware of the challenges of limited HL and often overestimate or misjudge the HL level of their patients, resulting in decreased understanding by patients (Coleman, 2011; Dickens et al., 2013; Hersh et al., 2015; JC, 2007; Koster, Philbert, Blom, & Bouvy, 2016; Lambert et al., 2014; Lee et al., 2015; Mackert, Ball & Lopez, 2011; Poureslami et al., 2017; Smith et al., 2015; Welch et al., 2011). Also, clinicians are often unable to recognize low HL in their patients and assume that patients understand the information and instructions they are given (Coleman, 2011; Hersh et al., 2015). This is concerning as most patients do not identify that they have HL issues and may not ask questions about the information they receive (Hersh et al., 2015). Increasing healthcare clinician awareness related to the challenges and prevalence of limited HL is vital to ensuring
that safe, efficient, and quality care is provided to patients (Heinrich, 2012; Smith et al., 2015; Welch et al., 2011; Yin et al., 2015).

**Universal precautions.** Research has shown that HL is important and applicable to every clinical encounter and impacts all communication that takes place between healthcare clinicians and their patients (Coleman, 2011). Limited HL is also common and hard to recognize, which has led to a call for healthcare clinicians to utilize a ‘universal precautions’ approach to impact patients with limited HL (Brega et al., 2015b; Coleman, 2011; DeWalt et al., 2011; Heinrich, 2012; Hersh et al., 2015; Koster et al., 2016; Lambert et al., 2014; USHHS, 2010; Weiss, 2007; Yin et al., 2015). Utilizing a universal precautions approach means that healthcare clinicians should assume that all individuals have difficulty understanding health information and should utilize recommended strategies and interventions for limited HL with everyone, regardless of their HL levels (Brega et al., 2015a). While strategies and interventions that address low HL have a greater impact on people with low HL, many of those with higher HL levels also prefer and benefit from them (Brega et al., 2015b; USHHS, 2010). These strategies and interventions include: simplifying communication, confirming comprehension, making the office environment and healthcare system easier to navigate, and supporting patients’ efforts to improve their health (Brega et al., 2015b). Unfortunately, many healthcare clinicians do not utilize these strategies and interventions in their practice due to various barriers including decreased knowledge and awareness, lack of training, time restraints, and poor support by healthcare organizations (Dennis et al., 2012; Koster et al., 2016; Lambert et al., 2014; Pagels et al., 2015; Welch et al., 2011). Educating healthcare clinicians about strategies and interventions to promote HL in their practice is vital to increasing clinicians’ ability to provide clear communication and quality care to patients.
Health literacy universal precautions toolkit. One way to increase healthcare clinicians’ utilization of recommended strategies and interventions to promote HL is by utilizing the Health Literacy Universal Precautions (HLUP) Toolkit (Brega et al., 2015a; DeWalt et al., 2011; Dickens et al., 2013; Hersh et al., 2015; Mitchell et al., 2012;). This Toolkit was developed by the AHRQ and provides evidence-based guidance to help healthcare clinicians and organizations overcome HL barriers and address HL in practice (Brega et al., 2015a; Mitchell et al., 2012). There are 21 tools and over 30 resources in the Toolkit including sample forms, PowerPoint presentations, and worksheets to help healthcare organizations address HL (Brega et al., 2015a). It is recommended that only one or two tools be implemented at a time, to ensure that lasting change is created in practice (DeWalt et al., 2011). The HLUP Toolkit is one way that healthcare clinicians and organizations can begin to address the issue of limited HL in their practice and ensure that patient quality and safety goals are being met (Brega et al., 2015a).

The Program of All-Inclusive Care for the Elderly (PACE)

The Program of All-Inclusive Care for the Elderly (PACE), is a nationally-recognized, community-based, long-term care model in the U.S., and is funded by Medicare and Medicaid (Mui, 2001; The Official U.S. Government Site for Medicare, n.d.). The PACE Model of Care was created in 1973 in San Francisco, to help the Asian-American community care for its elders in their own homes; as placing them in a nursing home was not a culturally appropriate option (National PACE Association [NPA], 2017). In order to meet the needs of the community, the founders created an innovative way to offer various services including comprehensive medical care, physical and occupational therapy, nutrition services, transportation, respite care, and socialization through home care and adult day care settings (NPA, 2017). Since its beginnings, PACE has grown from a small initiative that provided long-term care to immigrants, to a best-
PACE programs meet the unique needs of each individual by coordinating and providing all preventative, primary, acute, and long-term care services, to ensure that their participants are able to continue to live in the community (NPA, 2017). To qualify for PACE, a person must be 55 years or older, live in a PACE service area, and be certified by the state to need nursing home-level care (NPA, 2017). There are four components of the PACE model that enable it to respond to the unique needs of everyone enrolled in the program; these include: interdisciplinary teams, capitated payment arrangements, PACE centers, and transportation (NPA, 2017). The interdisciplinary teams at PACE include: physicians, nurse practitioners, nurses, social workers, van drivers, aids, and others (NPA, 2017). These team members are all employed by PACE and meet regularly to discuss any issues that need to be resolved with participants to ensure that their needs are being met (NPA, 2017).

Funding for PACE comes as a monthly, capitated payment, or lump sum, from Medicare combined with Medicaid or a participant’s private insurance and is used to pay for the comprehensive services that PACE provides (NPA, 2017). This funding allows PACE to provide preventive, primary, acute, and long-term care services that are tailored to the specific needs of each individual, rather than being concerned with the traditional fee-for-service from Medicare and Medicaid (NPA, 2017). The program is designed to provide comprehensive care, meet the specific needs of participants, and ensure close monitoring of participants, to help prevent costly acute hospital admissions and avoid nursing home placement; as much as possible (NPA, 2017).
Another part of the program is the PACE center. The PACE center is a central facility located in the participant’s community, where they come to receive various types of care and socialization. The average participant will visit the PACE center about three days a week (NPA, 2017). At the center participants have access to an on-site physician and nurse practitioner, physical and occupational therapy facilities, and can participate in social and recreational activities (NPA, 2017). This regular contact with healthcare clinicians allows any subtle changes in participants’ health to be quickly noticed and addressed appropriately (NPA, 2017).

Transportation is another critical aspect of the PACE model and is financially covered for PACE participants (NPA, 2017). PACE participants are provided transportation to and from the day center and to other specialist appointments they may have (NPA, 2017). The PACE van drivers are also trained to pick up on any cues that could suggest a change in the participants health and are able to notify the participant’s healthcare providers of any concerns (NPA, 2017). The transportation system helps to facilitate participants living as independently as possible, while still having access to the care and services they need (NPA, 2017). Participants in PACE programs have increased health, quality of life, lower mortality rates, increased ability to choose how to spend their time, and increased confidence in managing life’s problems (NPA, 2017). While the PACE program has had great success and provides excellent care to its participants, HL is an issue that is not specifically addressed in its present model of care.

**Challenges and Opportunities**

In the past decade HL has become a major focus of research. This presented a challenge for the scholarly project as the literature related to HL is voluminous and overwhelming. A basic search of the term “health literacy” in the EBSCO databases resulted in over 30 thousand articles. This amount of literature can be overwhelming to healthcare clinicians and may make
them less likely to listen to information regarding HL. The volume of the literature has also created skepticism among the healthcare community as much of the research has had limitations and discrepancies (Poureslami et al., 2017; Woody, 2016).

The complexity of HL also makes it a challenging issue to address. As previously mentioned, there are multiple definitions of HL and a lack of standardization in measurement tools for HL (Poureslami et al., 2017; Sorensen et al., 2012). There are also no specific guidelines to help providers address HL in the context of chronic disease or in the elderly population (Poureslami et al., 2017; Woody, 2016). This has led to uncertainty among healthcare clinicians about the best way to approach and address this issue; especially in the elderly population.

Another challenge in addressing the issue of HL is that many healthcare clinicians are unaware of the impact low HL has on patients and have not received training related to HL (Coleman, 2011; Mitchell et al., 2012; Sand-Jecklin et al., 2010). Research also suggests that healthcare clinicians often overestimate the HL levels of their patients, leading to misunderstanding and miscommunication among patients (Coleman, 2011; Dickens et al., 2013; Hersh et al., 2015; Sorensen et al., 2012; Welch et al., 2011). Limitations in the research include that much of the research has focused on individuals, with little attention being given to providers and systems (Poureslami et al., 2017). There is also a lack of measurement tools that evaluate HL among providers and systems (Poureslami et al., 2017).

Challenges in working with healthcare clinicians at PACE include care provision of PACE participants with age-related communication barriers such as presbyopia, presbycusis, and memory loss (Mullen, 2013). These age-related barriers put PACE participants at increased risk for having low HL and negative health outcomes due to low HL. Healthcare clinicians may
focus on these other communication barriers and overlook the issue of limited HL in this elderly population. This could lead to poor communication and misunderstanding of information by participants.

An opportunity presented by this scholarly project was enabling research to be incorporated into practice by healthcare clinicians in the PACE environment. In contrast to a Doctor of Philosophy (PhD) in nursing, the Doctor of Nursing Practice (DNP) places an emphasis on practice rather than research (Chism, 2013). The role of the DNP is to implement research into practice, to ensure that healthcare clinicians are providing expert clinical practice (Chism, 2013). Research demonstrates that healthcare clinicians are unaware of the challenges of limited HL and do not utilize strategies and interventions in their practice (Coleman, 2011; Dickens et al., 2013; Hersh et al., 2015; Sorensen et al., 2012; Welch et al., 2011). The scholarly project aimed to align with the needs and goals of the PACE organization to positively impact current and future healthcare, by increasing clinicians’ awareness of the challenges of limited HL and provide them with strategies and interventions that they can utilize (Moran, Burson, & Conrad, 2014).

The scholarly project also presented an opportunity to continue to build on and improve the quality of care provided by the healthcare clinicians in the PACE environment. Low HL presents a significant barrier to quality care and leads to many negative health outcomes for patients. The present model of care at PACE does not include a HL component. Addressing this issue by raising clinicians’ awareness of the challenges of limited HL and providing them with proven strategies and interventions that they can utilize, should enable clinicians to improve their communication with participants. Improved communication between PACE participants and their healthcare clinicians should prevent misunderstanding by participants and enable them to
have improved health outcomes, including increased medication adherence, improved management of chronic disease, increased ability to care for themselves, and increased quality of life.

**Implications for Practice**

Health literacy plays a crucial role in successful, patient-centered, quality care. Individuals with low HL have difficulty reading, understanding, and applying health information, which presents a significant barrier to their ability to care for themselves and prevent disease (Hersh et al., 2015). Limited HL is common, affecting over 80 million adults in the U.S. (Heinrich, 2012; Hersh et al., 2015). Low HL has been associated with many negative health outcomes including increased hospitalizations and use of emergency care, decreased ability to take medications appropriately, decreased ability to interpret medication labels and health messages correctly, lack of understanding of chronic diseases, poor self-care skills, and increased mortality (Berkman et al., 2011; Lee et al., 2015; Sorensen et al., 2012; Weiss, 2007). Older adults are also at risk for having low HL levels, which can negatively impact their knowledge and comprehension of information, decision making ability, self-management skills, and adherence to medication and plans of care (Poureslami et al., 2017).

Adequate HL is critical to successful management and prevention of chronic disease (Poureslami et al., 2017). Chronic disease is the leading cause of global mortality worldwide, and presents complex, long-term challenges for patients, providers, and the healthcare system today (Poureslami et al., 2017). Self-care is a vital component of chronic disease and has been related to positive health outcomes and decreased hospitalizations (Poureslami et al., 2017). Patients’ ability to appropriately care for themselves is inhibited when they are unable to understand their diagnosis or treatment (Poureslami et al., 2017). Healthcare providers play a
crucial role in health communication with patients (Poureslami et al., 2017). Evidence suggests a lack of awareness and training among healthcare clinicians related to limited HL (Coleman, 2011; Mitchell et al., 2012; Sand-Jecklin, et al., 2010). There is pressing need to raise the awareness of the challenges of limited HL among healthcare clinicians. Little research has focused on limited HL related to healthcare clinicians, healthcare systems, and certain at-risk groups such as the elderly (Poureslami et al., 2017). This gives great credence for the further study and exploration of HL among healthcare clinicians in the PACE environment.

**Problem Statement**

There is decreased awareness among healthcare clinicians regarding the challenges facing patients with low HL, and there is poor utilization of appropriate strategies and interventions to ensure understanding when working with low HL patients. Health literacy is noted as a social determinant of health that many patients face; however, healthcare providers are often unaware of the HL level of their patients and the impact it has on patients’ health (Coleman, 2011; Dickens et al., 2013; Hersh et al., 2015; Sorensen et al., 2012; Welch et al., 2011). Many healthcare clinicians do not utilize recommended HL strategies and interventions when communicating with their patients, resulting in poor communication and misunderstanding of medical information (Coleman, 2011; Dickens et al., 2013; Hersh et al., 2015; Sorensen et al., 2012; Welch et al., 2011). This issue must be addressed by healthcare clinicians, as low HL has significant negative ramifications for patients, families, healthcare systems, and communities at large.

**Purpose of the Project**

The purpose of this evidence-based practice, scholarly project, was to raise the awareness of the challenges of limited HL among healthcare clinicians caring for PACE participants and to
provide them with strategies and interventions that they can utilize in their practice. This should improve communication between healthcare clinicians and PACE participants and increase the quality of care provided.

**Significance of the Project**

Health literacy presents a significant challenge to quality healthcare provision today and demands the attention of healthcare clinicians and organizations. Clear communication between clinicians and patients is vital to ensure understanding of information by patients (USHHS, 2010). The following statements were used to support the project:

1. There is limited awareness among healthcare clinicians about the challenges that individuals with low HL face.
2. Communication is a vital component of patient-centered care, self-management, and chronic disease, and is directly linked to HL.
3. The elderly population is at an increased risk for having low HL and has poorer health outcomes due to low HL.
4. Despite the call to action to increase awareness of HL from various governing bodies and organizations, action among healthcare clinicians has been limited.
5. There is poor utilization of recommended strategies and interventions for low HL among healthcare clinicians.

**Clinical Question**

The project addressed the following clinical question: For healthcare clinicians working within the PACE setting, does an educational intervention regarding HL, specifically the effects of limited HL and proven strategies and interventions for healthcare clinicians, impact their HL awareness and existing practice?
Population

The target population for this project were practicing healthcare clinicians (Medical Doctors, Nurse Practitioners, License Practical Nurses, Registered Nurses, Registered Dietitians, Pharmacists, Physical Therapists, Occupational Therapists, Certified Occupational Therapy Assistants, Physical Therapy Assistants, and Master’s Prepared Social Workers) within a PACE program in a community-based hospital system.

Intervention

The intervention was an online educational activity which included a PowerPoint presentation and continuing education opportunity for PACE healthcare clinicians to raise their awareness of HL issues and provide them with recommended HL strategies and interventions to improve their care delivery.

Comparison

The HL awareness of PACE healthcare clinicians was compared via a pre- and post-test, and a post-survey was used to evaluate their usage of HL strategies and interventions one month after the intervention.

Outcomes

The desired outcomes for the project were: (1) to increase healthcare clinicians’ awareness of the challenges of limited HL among PACE participants; (2) to provide healthcare clinicians with recommended HL strategies and interventions that they can utilize in practice; and (3) to evaluate healthcare clinicians’ utilization of the recommended strategies and interventions, one month after the intervention.
SECTION TWO: LITERATURE REVIEW AND SYNTHESIS

Supporting the Iowa Model of Evidence Based Practice in preparation and examining the
need for this project, the project leader conducted a comprehensive review of the literature. Two
search strategies were used to identity articles; a computer assisted search and an analysis of
reference lists.

Search Strategy

A computer assisted search of the databases and an analysis of reference lists were used
to complete the literature review for this project. Databases that were searched included all
EBSCOhost databases, CINAHL, MEDLINE, PubMed, ProQuest, The National Guideline
Clearing House, and Google Scholar. The key words and phrases searched included health
literacy, education and health literacy, health literacy awareness, healthcare providers
knowledge of health literacy, health literacy and self-care, health literacy and chronic disease,
health literacy and clinician awareness, health literacy and educating providers, health literacy
and educating clinicians, health literacy and universal precautions, health literacy and the
PACE model, health literacy and a program of all-inclusive care for the elderly, educating
clinicians about health literacy, and health literacy guidelines.

The project leader narrowed the literature by using the following inclusion criteria: the
availability of articles in full text, articles written in the English language, and articles written in
the last 10 years. Noting that HL research is voluminous, as research has been on going over the
last 50 years, the reviewer felt it necessary to include articles published in the last 10 years and
one pertinent article that dated back more than 10 years. Although outside the proposed date
range, that particular article offered substantial support for the topic of interest. The 27 studies
fell into the following date range categories: one study in 2005, three between 2007 and 2010, 14 between 2011 and 2013, and nine between 2014 and 2016.

The search of the various key words yielded a total of 187 articles. These were narrowed down by evaluating the title and abstract for relevance to the project and yielded 67 articles. The literature was further narrowed by population, intervention, outcomes, and study design, yielding 27 articles, which were included in the literature review. The types of designs included: 3 guidelines, 1 systematic review of randomized controlled trials, 3 randomized controlled trials, 5 quasi-experimental studies, 5 correlational studies, 4 systematic reviews of descriptive studies, 3 descriptive studies, 2 qualitative studies, and 1 expert opinion. Six supplemental articles were also included in the review.

**Selection Criteria**

**Population.** The primary population for this project were healthcare clinicians. Articles that included Medical Doctors (MD’s), Nurse Practitioners (NP’s), License Practical Nurses (LPN’s), Registered Nurses (RN’s), Registered Dietitians (RD’s), Pharmacists, Physical Therapists (PT’s), Occupational Therapists (OT’s), Certified Occupational Therapy Assistants (COTA’s), Physical Therapy Assistants (PTA’s), and Master’s Prepared Social Workers (MSW’s), were included in the review. Articles specific to PACE healthcare clinicians were also included, however, there was no limitation on the type of healthcare setting; all types were included. The secondary population for this project included older adults and those with chronic diseases.

**Intervention.** The intervention of focus was educational interventions for healthcare clinicians. The project aimed to implement an educational intervention to raise clinicians’ awareness of the issues of limited HL and strategies and interventions. Articles with information
regarding educational interventions as well as recommended strategies for healthcare clinicians were included in the search.

**Outcomes.** The desired outcomes for the project included: increased awareness of the challenges of limited HL among healthcare clinicians, increased awareness among healthcare clinicians of the strategies and interventions they can use for clients with limited HL, and the ability of healthcare clinicians to utilize the recommended strategies and interventions. Articles related to each of these outcomes were included in the review.

**Study design.** Articles were not limited based on study design; all types of study designs were included in the review.

**Quality of Research**

The research was reviewed by a single reviewer and appraised for its quality using the Nursing Melnyk Level of Evidence (LOE) Pyramid (University of Michigan Library, 2017). This LOE scale was created for nursing research and incorporates a variety of research designs including descriptive and qualitative studies, making it suitable for this project (Thompson, 2017). The Nursing Melnyk Pyramid rates articles from Level I though VII (highest to lowest LOE), see Appendix B for an example of the Pyramid. The articles were appraised and leveled resulting in: 4 level I’s, 3 level II’s, 5 level III’s, 5 level IV’s, 4 level V’s, 5 level VI’s, and 1 level VII; see article matrix in Appendix A for the appraisal of each article. The quality of data sources also involved considering the methodological rigor of the study, the limitations of the study, and the value of information provided by the study. Articles related to guidelines for HL were included, and supplemental evidence supporting HL were also reviewed and included.
Literature Categories

The literature review included 27 research articles and 6 supplemental articles. The articles were broken into the following categories: guidelines and standards, research, and supplemental evidence.

Guidelines and standards. In general, the review of the literature noted a lack of professional guidelines for healthcare clinicians related to HL. In searching the National Guideline Clearinghouse, one guideline was found to promote client-centered learning and recommended that healthcare clinicians promote HL by creating a safe, shame-free environment, utilizing universal precautions for HL, and using plain language, pictures, and illustrations (Registered Nurses’ Association of Ontario [RNAO], 2012). Two other guidelines recommended that healthcare clinicians utilize various strategies and interventions to promote HL in their clinical practice including: utilizing universal precautions with all patients, avoiding medical jargon, breaking down information or instructions into small concrete steps, limiting the focus of a visit to three key points or tasks, assessing for comprehension using the teach-back method, and making the environment patient-friendly (Hersh et al., 2015; Weiss, 2007).

Recommendations for printed information included: creating and using patient-friendly written materials; ensuring that information is written at or below a fifth-to-sixth-grade reading level; utilizing visual aids, graphs, or pictures to enhance understanding; and presenting numerical information in a concrete way (Hersh et al., 2015; Weiss, 2007). Recommendations also included providing all patients with easy-to-understand information and ensuring information is delivered in a format that is clear and uses plain language (Weiss, 2007).

The CDC (2016) provides information related to guidelines, laws, and standards for HL and plain language. The Federal Plain Language Guidelines are geared towards ensuring that
the federal government provides clear communication to its citizens (CDC, 2016). Laws noted by the CDC (2016) include the *Plain Writing Act of 2010* which requires that federal agencies train staff to use plain language when they communicate with the public. To promote personal, family, and community health standards the Joint Committee on National Health Education Standards created expectations for what individuals should know and be able to do by grades two, five, eight, and 12 (CDC, 2016). The Department of Health and Human Services has also created the *National Culturally and Linguistically Appropriate Services (CLAS)* standards to help organizations address the cultural and language differences between information providers and those receiving information, to ensure effective communication (CDC, 2016). This information provides guiding documents for HL; however, there are no specific guidelines for healthcare clinicians.

Health literacy must be addressed by healthcare clinicians as it is a vital component of clear communication and quality care (Hersh et al, 2015; Weiss, 2007). Weiss (2007) explains that HL is a greater predictor of an individual’s health, more than age, income, employment status, level of education, or race. Limited HL is also noted as common, impacting over 80 million adults in the U.S. (Hersh et al., 2015; Weiss, 2007). Recommended strategies and interventions are noted for healthcare clinicians to promote HL; however, clinicians often overlook HL in routine patient care (Hersh et al., 2015; RNAO, 2012; Weiss, 2007). Due to the lack of guidelines for healthcare clinicians, many clinicians are unaware of and do not utilize the recommended strategies and interventions to promote HL in practice (Hersh et al., 2015). This gave great credence for this scholarly project, to raise clinicians’ awareness about limited HL, and promote utilization of recommended strategies and interventions in care provision.
Research. The project leader noted several themes in the research including: the impact of limited HL on health outcomes, chronic disease, and the elderly; the decreased awareness among healthcare clinicians of the impact of limited HL; the lack of HL training for healthcare clinicians; and the need to implement strategies and interventions to promote HL in practice.

Impact of limited health literacy. The impact of limited HL on health outcomes, chronic disease, and the elderly was emphasized in 16 of the articles (Aboumatar et al., 2013; Berkman et al., 2011; Cormier & Kotrlik, 2009; Dennis et al., 2012; Dickens et al., 2013; Heinrich, 2012; Lee et al., 2015; Mitchell et al., 2012; Mullen, 2013; Sand-Jecklin et al., 2010; Seligman et al., 2005; Sequeira et al., 2013; Smith et al., 2015; Sorensen et al., 2012; Welch et al., 2011; Yin et al., 2015).

Health outcomes. Seven articles suggested a correlation between limited HL and many negative health outcomes for patients (Berkman et al., 2011; Dickens et al., 2013; Heinrich, 2012; Lee et al., 2015; Mitchell et al., 2012; Sorensen et al., 2012; Welch et al., 2011). Low HL significantly impacts patients’ quality of life and has been associated with a lack of understanding of disease and lack of self-care skills (Heinrich, 2012; Lee et al., 2015; Sorensen et al., 2012). Limited HL also impacts patients’ quality of care and is associated with increased hospitalizations and use of emergency care, decreased access to healthcare, lower use of mammography, lower receipt of influenza vaccines, and decreased ability to interpret labels and health messages (Berkman et al., 2011; Mitchell et al., 2012; Welch et al., 2011). Patients with limited HL are also noted to have a shorter life expectancy and are at increased risk for being readmitted to the hospital within 30 days of discharge (Dickens et al., 2013; Mitchell et al., 2012). Mitchell et al. (2012) notes that low HL is a significant, independent, and modifiable risk factor for 30-day hospital readmissions after discharge. A decreased ability to take medications
appropriately has also been correlated with low HL (Berkman et al., 2011; Lee et al., 2015; Sorensen et al., 2012). Positively impacting HL presents an opportunity for healthcare clinicians to impact and improve patient outcomes, increase the quality of care they provide, and improve patients’ quality of life.

*Chronic disease.* Seven articles note the vital role that HL plays in chronic disease management (Aboumatar et al., 2013; Berkman et al., 2011; Dennis et al., 2012; Heinrich, 2012; Lee et al., 2015; Seligman et al., 2005; Sequeira et al., 2013). Low HL is considered a barrier for individuals with chronic conditions as they have a decreased understanding of their health and poorer self-care skills (Berkman et al., 2011; Dennis et al., 2012; Heinrich, 2012; Lee et al., 2015; Sorensen et al., 2012). Individuals with poor HL also have decreased knowledge of how to manage and prevent chronic disease (Seligman et al., 2005). Lee et al. (2015) found that HL was the strongest predictor of medication adherence in Korean older adults with chronic diseases. Limited HL is also associated with poor control of chronic conditions such as high blood pressure (Aboumatar et al., 2013). Clear communication between healthcare clinicians and patients is vital to promote patient understanding and knowledge of their chronic diseases and to ensure effective self-management skills (Seligman et al., 2005).

*The elderly.* Seven articles addressed HL and older adults and/or the elderly (Berkman et al., 2011; Cormier & Kotrlik, 2009; Lee et al., 2015; Mullen, 2013; Sand-Jecklin et al., 2010; Sequeira et al., 2013; Smith et al., 2015). Low HL is more prevalent in the elderly population and is related to poorer overall health and increased mortality rates (Berkman et al., 2011; Smith et al., 2015). Research notes that older adults with low HL skills experience difficulties with activities of daily living, increased limitations in physical activity, are more likely to experience faster physical decline overtime, have decreased medication adherence, and are at increased risk
of experiencing a more rapid decline in executive function scores (Lee et al., 2015; Sequeira et al., 2013; Smith et al., 2015). Older adults also have less confidence in filling out forms and often need assistance when reading hospital materials (Sand-Jecklin et al., 2010). In a study by Cormier and Kotrlik (2009), healthcare clinicians were not able to identify older adults as being high-risk for having low HL. This is concerning as low HL negatively impacts the health outcomes of older adults and their ability to manage their chronic diseases (Lee et al., 2015). Healthcare clinicians must pay attention to the HL skills of the elderly/older adults to promote quality care and improve health outcomes (Cormier & Kotrlik, 2009; Lee et al., 2015; Mullen, 2013; Smith et al., 2015). There is pressing need to raise healthcare clinicians’ awareness of the impact of low HL in this at-risk population (Cormier & Kotrlik, 2009; Lee et al., 2015; Mullen, 2013; Smith et al., 2015).

**Decreased awareness.** The review noted a lack of research focused on healthcare clinicians’ knowledge or awareness of HL (Lambert et al., 2014). Seventeen articles suggested that healthcare clinicians have a limited understanding of HL and the consequences of low HL for patients (Berkman et al., 2011; Coleman, 2011; Cormier & Kotrlik, 2009; Dennis et al., 2012; DeWalt et al., 2011; Dickens et al., 2013; Drake, 2015; Heinrich, 2012; Hersh et al., 2015; Koster et al., 2016; Lambert et al., 2014; Mackert et al., 2011; Mullen, 2013; Seligman et al., 2005; Smith et al., 2015; Welch et al., 2011; Yin et al., 2015). Research suggests that clinicians find it hard to identify patients with low HL and are unaware of the signs and symptoms of low HL (Brega et al., 2015b; Coleman, 2011; Cormier & Kotrlik, 2009; DeWalt et al., 2011; Seligman et al., 2005). Healthcare clinicians often overestimate the HL level of their patients, leading to poor understanding and miscommunication by patients (Dickens et al., 2013; Hersh et al., 2015). Further research notes that clinicians do not utilize systematic ways of identifying
patients with low HL and instead rely on their intuition or patient characteristics to identify these patients (Koster et al., 2016). There is a pressing need to raise awareness of limited HL among healthcare clinicians, as HL is vital to quality care, safety, self-management, education, and effective communication (Dennis et al., 2012; Drake, 2015; Heinrich, 2012; Lambert et al., 2014; Welch et al., 2011; Yin et al., 2015).

**Training.** Ten articles emphasized the need for education and/or training for healthcare clinicians related to HL (Coleman, 2011; Cormier & Kotrlik, 2009; Dennis et al., 2012; Dickens et al., 2013; Drake, 2015; Lambert et al., 2014; Mackert et al., 2011; Pagels et al., 2015; Seligman et al., 2005; Welch et al., 2011). Many clinicians did not receive information about HL during their educational training and lack the knowledge and experience to address limited HL in their practice (Coleman, 2011; Cormier & Kotrlik, 2009; Drake, 2015; Sand-Jecklin et al., 2010). Research suggests that healthcare clinicians may not recognize their own limitations about HL knowledge, making them less likely to seek training or information on their own (Mackert et al., 2011). The need for training in HL is not limited only to providers but is recommended for all healthcare clinicians who impact patient care (Dennis et al., 2012; Dickens et al., 2013; Koster et al., 2016; Mackert et al., 2011).

Further research is needed to recommend a specific curriculum, strategy, technique, or tool; however, Lambert et al., (2014) recommend that training should include basic information about HL, a universal precautions approach, and strategies to increase HL in patients (Coleman, 2011; Mullen, 2013; Seligman et al., 2005). Recommendations also include ensuring information about HL is incorporated into healthcare education curriculum, providing HL training throughout the clinician’s professional career, and for organizations to provide continuing education opportunities for clinicians to enable them to address limited HL in their
practice (Coleman, 2011; Cormier & Kotrlik, 2009; Drake, 2015; Mackert et al., 2011; Sand-Jecklin et al., 2010; Seligman et al., 2005). Widespread adoption of HL training programs and/or educational interventions is essential to improving delivery of healthcare to low HL patients, as the lack of knowledge and awareness among healthcare clinicians inhibits patients’ understanding and ability to manage their health (Dennis et al., 2012; Lambert et al., 2014; Mackert et al., 2011; Pagels et al., 2015).

**Strategies and interventions.** Fourteen articles emphasized the need for healthcare clinicians to implement strategies, interventions, and/or universal precautions in practice to promote HL (Brega et al., 2015b; Coleman, 2011; Dennis et al., 2012; DeWalt et al., 2011; Heinrich, 2012; Hersh et al., 2015; Lambert et al., 2014; Mitchell et al., 2012; Pagels et al., 2015; Sand-Jecklin et al., 2010; Smith et al., 2015; Weiss, 2007; Welch et al., 2011; Yin et al., 2015). Interventions addressing HL are vital to promote lifestyle changes in patients, ensure good communication, promote shared decision making, and reduce consequences related to low HL (Dennis et al., 2012; Mackert et al., 2011; Pagels et al., 2015). Multiple articles also note that limited HL is common and further emphasize the need for healthcare clinicians to use a ‘universal precautions’ approach by utilizing strategies and interventions with every patient regardless of their HL level (Brega et al., 2015b; Coleman, 2011; DeWalt et al., 2011; Heinrich, 2012; Hersh et al., 2015; Koster et al., 2016; Lambert et al., 2014; Weiss, 2007; Yin et al., 2015). Types of recommended strategies and interventions include: utilizing teach back, limiting medical jargon, ensuring educational materials are written at or below the fifth or sixth grade reading level, using visual aids and pictures, limiting the focus of a visit to three key points or tasks, assessing for comprehension, and obtaining patient feedback (Brega et al., 2015b; Hersh et al., 2015; Koster et al., 2016; Lambert et al., 2014; Mullen, 2013).
Welch et al. (2011) note that there is widespread underutilization of strategies and interventions to improve patient communication among healthcare clinicians. Barriers that prevent the utilization of strategies and interventions to promote HL in practice include: lack of knowledge and training, time restraints, and lack of support for professional development and funding for health education (Dennis et al., 2012; Koster et al., 2016; Lambert et al., 2014; Pagels et al., 2015). Five articles recommended utilizing the Health Literacy Universal Precautions Toolkit, developed by the AHRQ, to help healthcare clinicians and healthcare organizations overcome HL barriers and improve communication with all patients (Brega et al., 2015b; DeWalt et al., 2011; Dickens et al., 2013; Hersh et al., 2015; Mitchell et al., 2012). DeWalt et al. (2011) recommends implementing one or two tools from the Toolkit at a time to ensure lasting change in practice. Research also suggests that educational interventions increase healthcare clinicians’ knowledge and awareness of HL, increase their utilization of strategies and interventions to promote HL in practice, and are associated with improved patient outcomes (Pagels et al., 2015; Sand-Jecklin et al., 2010; Seligman et al., 2005; Yin et al., 2015). Health literacy impacts virtually every aspect of healthcare delivery. It is imperative that everyone who provides written or oral communication to patients, their families, and communities have basic competency in HL principles (Coleman, 2011).

**Supplemental evidence.** Six articles were included as supplemental evidence and present strong support for increasing healthcare clinicians’ awareness of the impact of limited HL, for healthcare clinicians to utilize HL strategies and interventions in practice, and for HL training and continuing education to be provided for healthcare clinicians (AHRQ, 2010; CDC, 2016; IOM, 2004; JC, 2007; Poureslami et al., 2017; USHHS, 2010). Limited HL is a common and costly issue facing the U.S. healthcare system, with estimates of $106 to $236 billion dollars
being spent annually due to poor HL in addition to the costs of chronic illness, disability, lost wages, and poorer quality of life (CDC, 2016; USHHS, 2010). Nearly half of all Americans have limited HL and struggle to understand the health information they are given leading to poorer health outcomes including: difficulty reading and understanding instructions on prescriptions, increased disease prevalence and severity, poor utilization of screening and preventative services, increased hospitalization rates, and increased morbidity and mortality (AHRQ, 2010; CDC, 2016; IOM, 2004; JC, 2007).

Healthcare clinicians are responsible for ensuring that clear communication occurs to maintain safe and quality care (AHRQ, 2010; CDC, 2016; JC, 2007; USHHS, 2010). However, there is decreased awareness of limited HL among healthcare clinicians and poor utilization of recommended strategies and interventions in practice (JC, 2007; Poureslami et al., 2017). Health literacy training and continuing education programs must be incorporated by healthcare organizations to enable healthcare clinicians to utilize recommended strategies and interventions in practice (AHRQ, 2010; IOM, 2004; JC, 2007; Poureslami et al., 2017; USHHS, 2010). Improving HL presents the greatest opportunity for reducing health disparities by empowering individuals to manage their health and is critical to achieving the Healthy People 2020 goals (CDC, 2016; USHHS, 2010).

**Strength and Generalizability of Evidence**

The literature related to HL is voluminous, with over 30 thousand articles being identified in the initial search of the term “health literacy.” This presented a significant challenge for the reviewer. The review identified a lack of literature specifically addressing healthcare clinicians’ awareness of HL. A lack of clinical guidelines and standards for clinicians related to HL, and a lack of randomized controlled trials, systematic reviews, and meta-analyses was also noted.
Overall, the strength of evidence was low to moderate. About 25 percent of the literature was level one or two on the Nursing Melnyk LOE Pyramid, leaving around 75 percent of the literature as level three through seven. The strength of evidence did support the need to increase awareness of the challenges of limited HL and recommended strategies and interventions among healthcare clinicians, to support effective communication and quality care.

The vast amount of information that lacked specifics related to healthcare clinicians’ awareness of limited HL and their utilization of strategies and interventions threatened the generalizability of the evidence. There were also noted limitations in the studies including low sample sizes, no control groups, voluntary participation, and limited reliability and validity of measurement tools. The review highlighted the complexity of HL and the vital role that healthcare clinicians play in impacting this issue. The wealth of information about HL speaks to the need for further consideration of HL. The supplemental evidence also supported the need to raise awareness among healthcare clinicians of the challenges of limited HL and promote training and continuing education among healthcare clinicians related to HL strategies and interventions, highlighting the need for this scholarly project.

**Conceptual Framework**

The Iowa Model of Evidence-Based Practice (EBP) was used as the conceptual framework for this scholarly project. A conceptual framework demonstrates how the various aspects of the project are connected (Moran et al., 2014). This framework is a necessary part of the DNP scholarly project, as it meets the DNP Essential I: Scientific Underpinnings for Practice (Moran et al., 2014). The Iowa Model of EBP is well known and has been widely used in the U.S. and around the world as a framework to guide the evidence-based practice process (Iowa Model Collaborative [IMC], 2017). The project leader obtained permission from the University
of Iowa to utilize the model for this scholarly project, to help translate the research into practice; see Appendix G (Hall & Roussel, 2014). The steps in the Iowa Model of EBP include:

identifying triggers for the project; stating the question or purpose; identifying if the topic is a priority; forming a team; assembling and synthesizing the evidence; assessing if the evidence is sufficient; designing and piloting the practice change; assessing the change to see if it is appropriate for adoption in practice; integrating and sustaining the practice change; and disseminating the results (IMC, 2017).

Triggering issues for a project can be clinical or patient identified issues; organizational, state, or national initiative issues; data or new evidence; accrediting agency requirements or regulations; and-or philosophy of care issues (IMC, 2017). These triggers cause the nurse to question current practice and evaluate the literature to see if there is evidence to support change (Hall & Roussel, 2014). There were several triggers that prompted this project including: the acknowledgement that HL is a significant problem facing the nation today; the call to action by governing bodies and organizations; research demonstrating a lack of clinician awareness of the challenges of limited HL; research demonstrating that the elderly and those with chronic diseases are at increased risk for negative outcomes related to low HL; the absence of a HL component in the present PACE model of care; recommendations to utilize strategies and interventions with every patient; and research suggesting that clinicians are not utilizing recommended strategies and interventions to promote HL in practice.

The purpose of this scholarly project was to raise the awareness of the challenges of limited HL among healthcare clinicians caring for PACE participants and to provide them with strategies and interventions that they can utilize in their care provision. The clinical question for this project asked if an educational intervention about HL and its proven strategies and
interventions would increase healthcare clinicians’ awareness of limited HL and enable them to integrate these strategies and interventions into their existing practice. The IOM, JC, and World Health Organization (WHO) all agree that HL is a critical quality and safety issue, emphasizing HL as a topic of priority for healthcare clinicians and organizations (Yin et al., 2015).

Following the Iowa Model of EPB, after identifying a trigger, a team consisting of the project leader, project Chair, and the Director of Clinical Operations at PACE was formed (IMC, 2017). Next, the project leader conducted a review of the literature, which demonstrated a scientifically sound base for making practice decisions related to the issue of limited HL and supported the need for the project (Hall & Roussel, 2014; IMC, 2017). The team worked together to design and implement the evidence-based practice project and ensured its success among the healthcare clinicians at PACE (IMC, 2017). The project was presented to the Medical Director, Director of Clinical Operations, and Quality Manager of PACE and written approval was obtained from the Medical Director of PACE; see Appendix F. Next, the project was defended to and approved by the project Chair. Approval was also given by the Institutional Review Board (IRB) at the designated university and the community-based hospital system that owns PACE; see Appendix C and Appendix D

After obtaining the appropriate approvals, the project was implemented by the project leader in accordance with the Iowa Model of EBP. Implementation of the project consisted of a pre-test, HL educational intervention, post-test, and a post-survey one month after the HL educational intervention. In keeping with the Iowa Model of EBP, the results were evaluated by a measurement consultant and the project leader, to assess whether the change was appropriate for adoption into practice (IMC, 2017). The intended practice change is for PACE to incorporate the HL educational intervention as part of their annual mandatory continuing education
requirements for healthcare clinicians (IMC, 2017). The outcomes and recommendations of the project will be presented to the leadership of PACE with a discussion of how integrate and sustain the practice change (IMC, 2017). Finally, dissemination of the project will include submission of the project to the Digital Commons at the designated university, face to face presentations at each of the PACE centers, a poster presentation at an annual research symposium, and publication in a healthcare journal (IMC, 2017).

SECTION THREE: METHODOLOGY

The scholarly project was an evidence-based practice project that utilized a quasi-experimental approach to collect and analyze data. The Iowa Model of EBP was used as a framework for the project. The project sought to implement a HL educational intervention within the PACE care environment. Success was measured using a pre-test, post-test, and post-survey to showcase the increased awareness of HL and usage of HL strategies and interventions by healthcare clinicians with PACE participants.

Variables

The independent variable was a HL educational intervention for healthcare clinicians at PACE. The dependent variables included: healthcare clinicians’ awareness of limited HL, their awareness of recommended strategies and interventions, and their ability to utilize these strategies and interventions one month after the intervention.

Design

The project was a quasi-experimental study involving a pre-test, post-test, and post-survey. This type of design allows for the examination of the relationships between the variables (Mateo & Foreman, 2014). For this project, the relationship between the independent and dependent variables was examined to determine the effectiveness of the HL educational
intervention among the PACE clinicians. A pre-test examined clinicians’ awareness of limited HL and the recommended strategies and interventions prior to the HL educational intervention. A post-test was used after the HL educational intervention to note a change in the clinicians’ awareness. A post-survey was used one month after the HL educational intervention to note the clinicians’ use of recommended strategies and interventions with PACE participants.

**Measurable Outcomes**

The measurable outcomes for this project included:

1. After a HL clinician educational intervention, clinicians will demonstrate improved awareness of the importance of limited HL.
2. After a HL clinician educational intervention, clinicians will demonstrate improved awareness of recommended strategies and interventions to improve patient HL.
3. After a HL clinician educational intervention, clinicians will demonstrate utilization of strategies and interventions to improve patient HL.

The first two outcomes were assessed before and after the clinicians completed the HL educational intervention via a pre- and post-test. These tests assessed participants’ awareness of HL and recommended strategies and interventions to improve HL; see Appendix K and Appendix L (Brega et al., 2015a). A post-survey was used one month after the HL educational intervention to measure the third outcome: the utilization of recommended strategies and interventions to improve HL by healthcare clinicians. The post-survey also assessed additional qualitative feedback from clinicians to see if they found the HL educational intervention helpful and if they noticed any changes in the outcomes for PACE participants; see Appendix M.
Setting

The setting for this project was three PACE centers located in Central Virginia. Each of these centers are owned and operated by a community-based hospital system, and provide care delivery that spans three cities, 15 counties, 87 zip codes, and covers over 50 square miles (Centra Health, n.d.). Each of the centers provide care to adults who are 55 years of age and older and who meet the requirements for needing nursing home level of care (n.d.; NPA, 2017). Many of the PACE participants have chronic diseases such as diabetes mellitus types one and two, congestive heart failure, chronic kidney disease, and hypertension.

The mission of PACE is to provide compassionate, quality care and services to older adults with chronic needs to increase their quality of life (n.d.). PACE strives to meet this mission by helping participants live in their homes and communities as long as they are medically and socially safe (n.d.). Limited HL negatively impacts individual’s ability to understand, process, and obtain health information which places them at a significant disadvantage, as they have a decreased ability to appropriately care for themselves and prevent disease (Hersh et al., 2015). The elderly and those with chronic diseases are also at increased risk for having limited HL, making this an important issue for PACE healthcare clinicians to be able to address in their practice (Berkman et al., 2011; Poureslami et al., 2017; USHHS, n.d.).

The scholarly project aligned with the mission and strategic plan of PACE, as it aimed to raise clinicians’ awareness of the challenges faced by PACE participants with limited HL. Rudd and Anderson (2006) note that clinicians and organizations with increased awareness and sensitivity to HL can help enhance patients’ learning, improve their safety, and increase their compliance with medications and plans of care. The project also aimed to equip healthcare clinicians with proven strategies and interventions that could be utilized in their care delivery.
This supported healthcare clinicians in their interactions with PACE participants, which should lead to improved communication and health outcomes. The project leader worked with the Director of Clinical Operations, who ensured the successful implementation of the scholarly project at each of the PACE centers.

**Sample**

The sample for the project was taken from practicing healthcare clinicians at each of the three PACE centers. This was a convenience sample, as only those healthcare clinicians who volunteered to participate in the project were included (Mateo & Foreman, 2014). Inclusion criteria for the sample were practicing healthcare clinicians who provided education to PACE participants as part of their job and those who participated in the pre-test, HL educational intervention, and post-test. Exclusion criteria included healthcare clinicians who did not primarily provide education to PACE participants and those who did not complete the pre-test, HL educational intervention, and post-test.

**Subjects**

A total of 46 subjects were invited to participate in the project and included: 3 Medical Doctors (MD’s), 3 Nurse Practitioners (NP’s), 15 Registered Nurses (RN’s), 4 Licensed Practical Nurses (LPN’s), 2 Registered Dieticians (RD’s), 2 Pharmacists, 3 Physical Therapists (PT’s), 2 Occupational Therapists (OT’s), 2 Certified Occupational Therapy Assistants (COTA’s), 3 Physical Therapy Assistants (PTA’s), and 7 Master’s Prepared Social Workers (MSW’s).

**Ethical Considerations**

To ensure that ethical considerations were incorporated and human subjects protected, the project leader and the project Chair completed the Collaborative Institutional Training Initiative (CITI); see Appendix E. The proposal for the project was also presented to the Medical Director
and Director of Clinical Operations at PACE, and a letter of support to conduct the study was
given by the Medical Director; see Appendix F. The scholarly project was successfully defended
to the project’s Chair and approval was given from the IRB at the designated university and the
IRB at the community-based hospital system that owns and operates the PACE centers; see
Appendix C and Appendix D.

Informed Consent

Upon IRB approval from the university and community-based hospital system, the
project leader sent a recruitment email to the prospective participants. The email included a brief
description of the project’s purpose and provided an invitation to participate in the project. A
consent form was included as the first page of the pre-test and participants typed their name and
the date at the end of that page, to indicate their consent to participate in the project; see
Appendix J. Participants were unable to complete the rest of the pre-test if they did not type
their name and the date on the consent page of the pre-test. The participating healthcare
clinicians were guaranteed confidentiality and assured that completing the tests and survey had
no influence on their job or employment status.

Protection of Human Subjects

The scholarly project involved minimal risk to participants, as it provided a HL
educational intervention for healthcare clinicians. The clinician’s rights were protected by
ensuring that they were given clear information about the project and provided informed consent
before participating in the project (Mateo & Foreman, 2014). A recruitment email was sent by
the project leader to each of the prospective participants. The email included a brief description
of the project’s purpose and provided an invitation to participate in the project. The pre-test,
post-test, and a post-survey were created via Survey Monkey and links for each of the tests and
survey were emailed to the prospective participants. Each prospective participant was randomly assigned a unique number, which they entered in each of the tests and survey. This number was used to track the differences from each test and survey for each participant. A master list containing the name, job title, and randomly assigned unique number for each prospective participant was created in a password-protected Excel spreadsheet. Basic demographic information including job title, years of practice, and gender were asked on each of the tests and surveys.

Results of the tests and surveys were collected by the project leader via Survey Monkey and remained confidential to protect against the invasion of privacy of the clinicians and ensured that no breaches in confidentiality occurred. The results were collected and entered into a password-protected Excel spreadsheet and saved on a password-protected computer, only accessible by the project leader. The results were kept on a separate password-protected Excel spreadsheet from the master list. The data will be maintained for a period of three years after completion of the project, only the project leader will have access to the data, and no copies will be made. After three years, the information will be deleted from the computer using commercial software to permanently delete data. No identifying information was/will be included in any presentation or publication of the project.

**Instruments/Tools**

The instrument that was used to assess healthcare clinicians’ awareness of limited HL and awareness of recommended strategies and interventions to improve HL, was the Health Literacy Brief Assessment Quiz. This instrument was developed by the AHRQ and is included in the Health Literacy Universal Precautions Toolkit, Second Edition (HLUP Toolkit) (Brega et al., 2015a). The instrument is part of Tool three: Raising Awareness in the HLUP Toolkit and is
designed to assess individuals’ knowledge and understanding of HL (Brega et al., 2015a). The instrument consists of nine multiple choice and/or true/false questions, and one short answer question (Brega et al., 2015a). These questions address basic information about HL and recommended practices for healthcare clinicians and ask what strategies healthcare clinicians can utilize to improve HL (Brega et al., 2015a). The instrument is not specifically noted to assess “awareness” of HL; however, it is recommended by the HLUP Toolkit to help raise awareness of HL among healthcare clinicians and does assess clinicians’ knowledge and understanding of HL. This is an understood limitation of the instrument. For this project healthcare clinicians’ knowledge and understanding of HL were considered their awareness of HL.

The HLUP Toolkit is validated by the AHRQ and recommended for use as evidence-based guidance to support addressing the issue of HL in primary care practices (DeWalt et al., 2011; Brega et al., 2015a). The reliability of the HLUP Toolkit is not known; however, it is noted as a way to improve healthcare for individuals with limited HL, increase awareness of HL among healthcare clinicians, and is recommended by multiple authors and organizations including the CDC (2016), AHRQ (2017), American Academy of Family Physicians (2017), and the University of North Carolina at Chapel Hill (2014) (Brega et al., 2015a; DeWalt et al., 2011; Dickens et al., 2013; Hersh et al., 2015; Mitchell et al., 2012). This is another understood limitation of this instrument.

The HLUP Toolkit is noted as public domain and may be used and reprinted without permission; see Appendix H (Brega et al., 2015a, p. ii). The HLUP Toolkit suggests implementing the Health Literacy Brief Assessment Quiz before and after staff training to assess healthcare clinicians’ knowledge of HL (Brega et al., 2015a). Permission to add questions to the Health Literacy Brief Assessment Quiz is given; see Appendix I (Brega et al., 2015a, p. 14). The
Health Literacy Brief Assessment Quiz was used as the pre-and-post-test for the project and was emailed out via Survey Monkey to the prospective participants (Brega et al., 2015a). Questions related to basic demographic information including job title, years of practice, and gender were included on both tests; see Appendix K and Appendix L. The post-test also included a question asking the participants if they completed the educational intervention.

The post-survey was created by the project leader using Survey Monkey and was emailed to the participants one month after completion of the educational intervention. The post-survey evaluated clinicians’ utilization of recommended HL strategies and interventions in their practice, their thoughts on whether the educational intervention was helpful, and if they noticed any changes in participant outcomes; see Appendix M. Basic demographic information including job title, years of practice, and gender were also included on the post-survey. Validity and reliability of the post-survey was unknown, as it was created by the project leader. This is an understood limitation of this tool. The project Chair reviewed the post-survey to evaluate for ease of use and applicability to the subject matter.

**Intervention**

The intervention for this project involved the implementation of a HL educational intervention for healthcare clinicians at PACE. Evidence supports the use of clinician education to change knowledge, beliefs, and practice. Creation of the HL educational intervention was guided by the HLUP Toolkit and consisted of a PowerPoint presentation and an online learning module.

**PowerPoint Presentation**

The project leader created a PowerPoint presentation that was emailed to participants to review on their own. The presentation incorporated information from the above literature review
and Tools three, four, and five of the HLUP Toolkit. The PowerPoint presentation provided basic information about limited HL and the recommended strategies and interventions to promote HL. Tool three of the HLUP Toolkit focuses on raising awareness of HL among healthcare clinicians (Brega et al., 2015a). The PowerPoint *Health Literacy: Barriers and Strategies* is provided in Tool three and was used to provide basic information about HL and strategies and interventions that healthcare clinicians can utilize in practice. Tool four of the HLUP Toolkit focuses on clear communication and presents several strategies that clinicians can utilize to facilitate clear communication with their patients (Brega et al., 2015a). Tool five of the HLUP Toolkit discusses and explains how to use the teach-back method to ensure patient understanding (Brega et al., 2015a). The PowerPoint presentation took about fifteen minutes to review.

**Online Learning Module**

The continuing education module, *Health Literacy & Public Health: Strategies for Addressing Low Health Literacy*, created by the New York New Jersey Public Health Training Center (PHTC) (2017), was used to educate the healthcare clinicians about HL strategies and interventions that they could utilize to support PACE participants. This module is recommended in Tool three of the HLUP Toolkit to increase clinicians’ awareness about HL and recommended strategies and interventions to improve HL (Brega et al., 2015a). The module required the healthcare clinicians to create an account with the New York New Jersey Public Health Training Center, and one hour of continuing education was given upon completion of the module (PHTC, 2017). The learning module took about forty-five minutes to one-hour to complete.
Implementation

Implementation of the intervention consisted of two phases (see Figure 1). Phase one included: recruitment for the project; consent to participate and completion of the pre-test; completion of the HL educational intervention, including review of the PowerPoint presentation and the online learning module; and completion of the post-test. Phase two involved the completion of the post-survey.

Figure 1. Flow Chart Demonstrating the Phases of Project Implementation.

Phase one. The project leader created two emails and sent them to all prospective participants (see Figure 1). The first was a recruitment email which included a brief description of the project’s purpose and provided an invitation to participate in the project. The second email was an instruction email which guided participants through a four-step process:

1. Completion of the informed consent form and pre-test via Survey Monkey
2. Review of the HL PowerPoint presentation, created by the project leader
3. Completion of the linked continuing education module, *Health Literacy & Public Health: Strategies for Addressing Low Health Literacy*
4. Completion of the post-test via Survey Monkey
Clear instructions for completing each step were outlined in the second email. The participants were given two weeks to complete phase one of the project.

**Phase two.** One month after completion of phase one, project participants were sent a third email from the project leader. The email contained a link to complete the post-survey via Survey Monkey. Participants were given one week to complete the post-survey.

**Data Collection**

The Health Literacy Brief Assessment Quiz was the instrument used for the pre-and-post-test, as described in the Instrument/Tool section. The post-survey was the tool emailed to participants one month after the educational intervention, as discussed in the Instrument/Tool section. The intervention section describes how the instrument and tool were administered. Data from the pre-test, post-test, and post-survey were collected by the project leader via Survey Monkey.

Basic demographics were collected from the participants including their job title, years of experience, and gender. The differences in the pre-test, post-test, and post-survey for each healthcare clinician was tracked by the unique randomly assigned number that each participant entered in the pre-test, post-test, and post-survey. This number was included in the instruction email that participants received and allowed the project leader to suggest correlation of the HL educational intervention with clinician awareness and utilization of recommended strategies and interventions. The data was documented in password-protected Excel spreadsheets and analyzed using the Statistical Package for the Social Sciences (SPSS) software.

**Team Members**

The project team consisted of the project leader, project Chair, and practicum preceptor who is the Director of Clinical Operations for all the PACE centers. The project leader was
responsible for creating and emailing the pre-test, post-test, HL educational intervention, and post-survey to prospective participants and collecting all the data from participants. The project Chair provided guidance for the scholarly project. The practicum preceptor assisted the project leader in contacting each of the prospective participants, by providing email addresses, and sending out reminder emails to promote participation the project and ensured successful implementation of the scholarly project at each of the PACE centers. A measurement consultant was used to give input into the project design and assisted in evaluating the data in the final analysis. An editor was also utilized to support the publication of the final project for proofreading and formatting.

**Feasibility Analysis**

The following was considered to determine the feasibility of the scholarly project: personnel, resources and technology, and cost/benefit analysis.

**Personnel**

The project leader obtained approval and support for the scholarly project from the leaders of PACE. Discussion on the best way to ensure maximum involvement in the project by PACE healthcare clinicians led to the decision to create an email with steps for participants to follow. This approach enabled the participants to complete the project on their own time and was more feasible than trying to coordinate schedules for a lunch and learn/in person presentation. The personnel who played a role in conducting or participating in the scholarly project included:

- Project leader
- Project Chair
- Practicum preceptor
HEALTH LITERACY STRATEGIES AND INTERVENTIONS

- Editor
- Measurement consultant
- Healthcare clinicians at PACE

Resources and Technology

The resources and technology that were needed to complete the scholarly project included:

- Personal Computer
- Email Provider
- PowerPoint
- SPSS Software
- Excel
- Survey Monkey

Budget and Cost/Benefit Analysis

It is important to consider the cost of implementing a project into practice, to ensure that it is feasible and that the benefits outweigh the cost (Brownson, Colditz, & Proctor, 2012). The scholarly project was budget neutral, as all costs were covered by the project leader. The educational intervention was sent out and completed online and there was no cost for printing materials. The time to complete the educational intervention was estimated at under two hours. All time was taken away from personal work. No other expenses were expected or noted for this project. The potential benefits for implementing this project outweighed the cost, as increasing HL awareness among healthcare clinicians could lead to improved communication and outcomes for patients including decreased hospital readmissions, increased medication adherence,
decreased emergency room visits, and decreased morbidity and mortality (Hersh et al., 2015; Mitchell et al., 2012; Welch et al., 2011).

**Statistical Analysis and Evaluation**

Data collected from the pre-test, post-test, and post-survey were collected and analyzed using Excel and SPSS software. Descriptive statistics were run on the data to examine the statistical and clinical significance of the results. The pre-test and post-test were pre-coded by assigning simple numbers to each of the possible responses, allowing the data to be entered directly into SPSS. Paired t-tests were run on the data from the pre-test and post-test to examine the differences between the two tests and its significance. The qualitative information from the short answer question in the pre-and-post-test were examined to gain an understanding of the clinicians’ awareness of recommended strategies and interventions to promote HL in practice. The qualitative information in the post-survey was also examined to gain an understanding of the clinician’s opinion of the educational intervention, if they continued to utilize strategies and interventions in their practice, and if they noticed any changes in their patient outcomes.

**SECTION FOUR: RESULTS**

A total of 46 healthcare clinicians was invited to participate in the project. There were 23 healthcare clinicians who met the inclusion criteria by completing both the pre- and post-test; of those, 19 completed the post-survey. The results of the data analysis are discussed below, beginning with demographics, followed by missing data, assumptions, key findings, and a summary of findings related to each measurable outcome.

**Demographics**

**Sample size.** Pre- and post-test data was collected on 23 participants \( n = 23 \). Post-survey data was collected on 19 participants \( n = 19 \). Of the 23 healthcare clinicians who
completed the pre- and post-test, four individuals were lost to follow up and did not complete the post-survey. Due to the small sample size, the pre and post-test data for these individuals were still included in the data analysis.

**Gender.** All the participants were females.

**Type of healthcare clinician.** The types of healthcare clinicians that participated in the project included: 2 Nurse Practitioners (NPs), 8 Registered Nurses (RNs), 2 Licensed Practical Nurses (LPNs), 1 Physical Therapist (PT), 1 Physical Therapy Assistant (PTA), 1 Occupational Therapist (OT), 2 Pharmacists, 2 Dieticians, and 4 Master’s Prepared Social Workers (MSWs) (See Figure 2).

*Figure 2. Types of Healthcare Clinicians Who Participated in the Project.*

**Years of practice.** The years of practice for the participating healthcare clinicians ranged from one to 42 years, with an average number of 13.96 years of practice.
Missing Data

There were no missing data for the pre-test. For the post-test one participant did not answer question 11. As previously mentioned, four participants did not complete the post-survey. On the post-survey, one participant did not answer question two and one did not answer question three. There were no other missing data.

Assumptions

Two assumptions were made for the statistical analysis. The first was that participants completed the pre-test before they completed the educational intervention, which included the PowerPoint and online learning module. The second was that they did not discuss any of the pre-test, post-test, or post-survey questions with anyone when completing each test and survey.

Key Findings

The following were noted as key findings for the study. The Health Literacy Brief Assessment Quiz was used as the pre- and post-test, to evaluate the healthcare clinicians’ awareness of limited HL and recommended strategies and interventions to improve HL. The quiz consisted of nine multiple choice and/or true/false questions; however, question eight had several parts that were scored separately, resulting in 14 scored questions. Participants received a score out of 14 according to their number of correct answers. The final question of the pre- and post-test was a short answer question, which the project leader evaluated separately.

**Descriptive statistics.** Descriptive statistics for the pre-test showed a mean of 11.652, standard error of 0.205, and standard deviation of 0.982. The post-test descriptive statistics showed a mean of 12.522, standard error of 0.258, and standard deviation of 1.238.

**Paired t-test.** A paired-samples t-test was conducted to evaluate the pre- and post-intervention means of health literacy awareness, as measured by the Health Literacy Brief
Assessment Quiz. The results suggest that the mean before the intervention \((m = 11.652, sd = 0.982)\) is statistically different at alpha = 0.05, from the post-intervention mean \((m = 12.522, sd = 1.238)\) with the \(p\) value of 0.009 and \(t(22) = -2.865\) (See Tables 1, 2, and 3).

**Table 1**

*Paired Samples t-test*

<table>
<thead>
<tr>
<th>Total Correct</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>11.6522</td>
<td>23</td>
<td>0.98205</td>
<td>0.20477</td>
</tr>
<tr>
<td>Post-test</td>
<td>12.5217</td>
<td>23</td>
<td>1.23838</td>
<td>0.25822</td>
</tr>
</tbody>
</table>

**Table 2**

*Paired Samples Correlations*

<table>
<thead>
<tr>
<th>Total Correct and Post-test</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test and Post-test</td>
<td>23</td>
<td>0.156</td>
<td>0.477</td>
</tr>
</tbody>
</table>

**Confidence interval.** The 95% confidence interval indicates that plausible values of the mean differences of the pre- and post-intervention range from -1.499 to -0.240 (See Table 3). It is uncertain whether the population value for the mean difference of the pre- and post-intervention are contained between the upper and lower range of the confidence interval.

**Table 3**

*Paired Differences*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>(t)</th>
<th>(df)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test and Post-test</td>
<td>-0.86957</td>
<td>1.45553</td>
<td>0.30350</td>
<td>-1.49898 -2.4015 -2.865</td>
<td>22</td>
<td>0.009</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical significance.** To evaluate for clinical significance \(\eta^2\) was computed. The \(\eta^2\) was 0.272, which indicates that 27.2% of variance between the mean differences can be accounted for by the intervention. This suggests that the intervention had a relatively small impact on the mean differences between the time points. Furthermore, the absolute mean
difference of 0.869 suggests small differences on the current scale. As such, it is difficult to conclude definitively that the intervention is the direct cause for the mean differences.

**Short answer question.** The final question of the pre- and post-test was a short answer question, which the project leader evaluated to gain an understanding of the clinicians’ awareness of recommended strategies and interventions to promote HL in practice. A list of key strategies and interventions identified by the project leader are noted in Table 4.

**Table 4**

<table>
<thead>
<tr>
<th>Key Strategies and Interventions Noted by Healthcare Clinicians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Test</strong></td>
</tr>
<tr>
<td>Simple terms/language/words</td>
</tr>
<tr>
<td>Clear communication</td>
</tr>
<tr>
<td>Repeat information</td>
</tr>
<tr>
<td>Repeat back</td>
</tr>
<tr>
<td>Assess comprehension</td>
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</table>

**Post-survey.** Nineteen people completed the post-survey (*n* = 19). In response to the first question of the post-survey, 18 out of 19 clinicians said that they found the intervention helpful (See Figure 3). For question two, 14 out of 19 clinicians stated that they were utilizing HL strategies and interventions in practice (See Figure 3).
In response to question three, five out of 19 clinicians noted improvements in their practice after the intervention (See Figure 3). A list of the types of strategies and interventions that clinicians utilized in practice and the improvements that clinicians saw in practice can be found in Table 5.

Table 5

<table>
<thead>
<tr>
<th>Strategies and Interventions Used in Practice</th>
<th>Changes Seen in Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple words/plain language</td>
<td>Increased understanding of information</td>
</tr>
<tr>
<td>Avoiding medical jargon</td>
<td>Increased medication adherence</td>
</tr>
<tr>
<td>Concise information/Limit information</td>
<td>Improved mental health</td>
</tr>
<tr>
<td>Evaluating written material for readability</td>
<td></td>
</tr>
<tr>
<td>Teach back</td>
<td></td>
</tr>
<tr>
<td>Pictures</td>
<td></td>
</tr>
</tbody>
</table>

Summary of Findings

The measurable outcomes for this project were: (1) after a HL clinician educational intervention, clinicians will demonstrate improved awareness of the importance of limited HL;
(2) after a HL clinician educational intervention, clinicians will demonstrate improved awareness of recommended strategies and interventions to improve patient HL; (3) and after a HL clinician educational intervention, clinicians will demonstrate utilization of strategies and interventions to improve patient HL. Each outcome is discussed below.

**Outcome 1: Improved awareness of the importance of limited HL.** As demonstrated by the post-survey findings, most healthcare clinicians found the HL educational intervention to be useful. In support of these results, the mean differences demonstrated a higher mean at post-intervention ($m = 12.522$) compared to the pre-intervention ($m = 11.652$), with a mean difference of 0.869. Moreover, the $t$ test demonstrated statistical significance at alpha 0.05 with $p = 0.009$. This suggests increased awareness of the importance of limited HL among the healthcare clinicians. When examining for clinical significance the impact of the educational intervention on the mean differences of the pre- and post-test, was relatively small with $\eta^2 = 0.272$. However, given that this was a short-term intervention with many variables that could have impacted the results, 27.2% variance is a positive finding.

**Outcome 2: Improved awareness of recommended strategies and interventions.** The findings discussed above also suggest an increase in awareness of recommended strategies and interventions among healthcare clinicians; with a higher mean post-intervention, statistically significant $t$ test results, and most clinicians stating the intervention was helpful. An evaluation of the short answer question revealed that healthcare clinicians listed more key strategies and interventions in the post-test when compared to the pre-test (See Table 4). While the statistical analysis did not demonstrate clinical significance ($\eta^2 = 0.272$), when considering the many variables that could have impacted the intervention, the short-term nature of this project, and the positive responses of the healthcare clinicians, these results suggest that the HL educational
intervention positively impacted the healthcare clinicians’ awareness of recommended strategies and interventions.

**Outcome 3: Utilization of strategies and interventions.** The post-survey results suggest that over half of the healthcare clinicians, 14 out of 19, were utilizing HL strategies and interventions 30 days after the educational intervention (See Figure 3). It is notable that most of the healthcare clinicians found the intervention helpful; however, due to the small sample size, loss of four clinicians in follow up, and the fact that it was unknown whether the clinicians were utilizing HL strategies and interventions before the educational intervention; it is uncertain whether the educational intervention directly caused this utilization.

Five out of 19 healthcare clinicians noted seeing positive changes in PACE participant outcomes after utilizing HL strategies and interventions. These included an “increased interest in medication adherence,” increased “autonomy with accountability and follow through on medication regimen and record keeping,” and improved “mental health” and “understanding of information.” It is beyond the scope of this project to determine if the educational intervention directly caused these changes in outcomes.

**SECTION FIVE: DISCUSSION**

The purpose of this evidence-based practice project was to raise the awareness of the challenges of limited HL and the recommended strategies and interventions among healthcare clinicians in a PACE program. The clinical question for this project asked if an educational intervention about HL and its proven strategies and interventions would increase clinicians’ awareness of limited HL and enable them to integrate these strategies and interventions into their existing practice. The findings of this project indicate that the educational intervention was beneficial in increasing PACE healthcare clinicians’ awareness of the challenges of limited HL
and their awareness of recommended strategies and interventions to promote HL in practice. The findings also suggest that the educational intervention positively impacted the healthcare clinicians’ utilization of HL strategies and interventions 30 days after the intervention. Furthermore, several improvements in PACE participant outcomes were noted by the participating healthcare clinicians; however, this cannot be definitively accredited to the educational intervention.

This project adds to the evidence that educational interventions related to HL increase practicing healthcare clinicians’ awareness of limited HL, increase their awareness of recommended HL strategies and interventions, promote the utilization of these strategies and interventions in practice, and are associated with improved patient outcomes (Pagels et al., 2015; Sand-Jecklin et al., 2010; Seligman et al., 2005; Yin et al., 2015). Sand-Jecklin et al. (2010) found that a short HL educational intervention among nursing students positively impacted their knowledge of vital HL issues. Similarly, Yin et al. (2015) found that utilizing provider-centered HL educational interventions were associated with improved patient outcomes related to limited HL and recommend utilizing interdisciplinary and provider-centered training related to HL. In their study, Pagels et al. (2015) found that residents who participated in a HL training program demonstrated a significant increase in HL knowledge and confidence in caring for patients with limited HL. Another study by Seligman et al. (2005) found that physicians who received HL training were more likely to utilize recommended HL strategies and interventions in practice compared to those who did not receive the training.

Limitations

The project has noted limitations. The sample for this project was a small convenience sample taken from a specific population of healthcare clinicians in a PACE program. There were
also four healthcare clinicians who were lost in follow up and did not complete the post-survey. These factors limit the generalizability of the results.

The project also had a limited timeframe for implementation and evaluation, which could have impacted the results. Several healthcare clinicians noted that they were still working to implement the strategies and interventions that they had learned from the educational intervention and/or had not had time to implement these in practice at the time of the post-survey. Another noted limitation related to the timing of the project was that the PACE organization was audited by Centers for Medicaid and Medicare Services (CMS) during the second week of the project implementation. This CMS audit could have impacted the healthcare clinicians’ participation in the project and the loss of four clinicians in follow up.

Another limitation of this project is that healthcare clinicians were not evaluated whether they were utilizing HL strategies and interventions before the educational intervention. While the pre-test did ask the clinicians to list any strategies and interventions for HL, it did not specifically ask if they were using these strategies and interventions. This makes it difficult to definitively conclude that the educational intervention lead to an increase in utilization of HL strategies and interventions.

The project leader also assumed that the clinicians completed the pre-test before they completed the educational intervention and that they did not discuss any of the pre-test, post-test, or post-survey questions with anyone when completing these tests and surveys. The educational intervention was emailed to the participants and included links to the pre-test, PowerPoint presentation, and online learning module; making it possible for the clinicians to view the PowerPoint presentation and online learning module prior to completing the pre-test, which would have impacted their pre-test results.
There were also limitations of the pre-test, post-test, post-survey, and educational intervention. The Health Literacy Brief Assessment Quiz, which was used for the pre- and post-test, did not specifically assess awareness of HL but assessed knowledge and understanding of HL; for this project the clinicians’ knowledge and understanding of HL was considered their awareness of HL. The validity and reliability of the post-survey was unknown, as it was created by the project leader. Furthermore, the reliability of HLUP Toolkit, which was used to guide the HL educational intervention, was also unknown.

**Implications for Practice**

The findings from this project support the use of the HL educational intervention as a way to increase PACE healthcare clinicians’ awareness of the challenges of limited HL and their awareness of recommended strategies and interventions to promote HL in practice. The findings also suggest that utilizing the educational intervention could promote continued utilization of recommended HL strategies and interventions in practice among healthcare clinicians at PACE. Recommendations for practice include incorporation of the educational intervention as part of the mandatory continuing education requirements for healthcare clinicians at PACE.

Health literacy impacts nearly every aspect of healthcare delivery, making it imperative that everyone providing written or oral communication within the healthcare field has basic competency in HL principles (Coleman, 2011). Research suggests that healthcare clinicians are often unaware of the challenges that individuals with limited HL face and are unprepared to address this issue with their patients, as they have not received education or training related to HL (Berkman et al., 2011; Coleman, 2011; Dennis et al., 2012; DeWalt et al., 2011; Dickens et al., 2013; Heinrich, 2012; Hersh et al., 2015; Seligman et al., 2005; Smith et al., 2015; Welch et
The lack of professional guidelines related to HL also makes it difficult for healthcare clinicians to address this issue in practice (Coleman, 2011).

The issue of limited HL is not currently incorporated as part of the PACE model of care. This issue must be addressed by PACE organizations as the elderly/older adults and those with chronic diseases are at increased risk for having limited HL, resulting in poorer health outcomes and quality of life (AHRQ, 2010; Berkman et al., 2011; Poureslami et al., 2017; Seligman et al., 2005; Sequeira et al., 2013; Smith et al., 2015; USHHS, n.d.). As healthcare continues to become more complex, clear communication between healthcare clinicians and patients is vital to ensuring that patients can adopt recommended health behaviors, be empowered to care for their own health, and guarantee that they understand the health information they are given (USHHS, 2010). Health literacy must be made a top priority by healthcare clinicians and organizations, as it is vital to quality healthcare and patient outcomes (Coleman, 2011; Dennis et al., 2012; Dickens et al., 2013; Pagels et al., 2015; Seligman et al., 2005; Welch et al., 2011).

Incorporating the educational intervention as part of the continuing education requirements for healthcare clinicians at PACE is one way that the organization can begin to address this issue and continue to build on the quality care that they provide to PACE participants.

Another recommendation for practice is that healthcare clinicians and organizations utilize other tools in the HLUP Toolkit to help them overcome various HL barriers (Brega et al., 2015a; Mitchell et al., 2012). Health literacy is a complex, common, and challenging issue for healthcare clinicians to address. The HLUP Toolkit has 21 tools and over 30 resources which are intended to help healthcare clinicians and organizations address the issue of limited HL and ensure that they are meeting their patient quality and safety goals (Brega et al., 2015a). The educational intervention for this project was guided by Tools 3, 4, and 5 of the HLUP Toolkit.
The positive findings of this project demonstrate how the HLUP Toolkit can be utilized by healthcare clinicians and organizations to help them address issues related to HL in practice.

**Implications for Research**

Opportunities for further research include conducting this project among a larger group of healthcare clinicians and at other healthcare practices including but not limited to primary care practices, various hospital settings, and other specialty practices. Implementing this project among a larger audience of healthcare clinicians will allow for greater generalizability of the results and greater understanding of how the project impacts the clinicians’ HL awareness and utilization of recommended strategies and interventions in practice.

Further research should also be done to evaluate the continued utilization of recommended HL strategies and interventions among the participating PACE healthcare clinicians six months and one year after the educational intervention. Also, research should be conducted to evaluate for changes in outcomes among PACE participants related to the educational intervention and utilization of HL strategies and interventions, as this was beyond the scope of this project.

**Dissemination Plan**

Dissemination is pivotal to ensuring that evidence is translated into practice (Brownson et al., 2012). Project dissemination will be considered at local, state, and national conferences pending acceptance. Objectives related to the dissemination of the research include:

1) To expand the community awareness and understanding of the impact of limited HL

2) To provoke action by healthcare organizations to include education about HL as part of their new hire process and yearly mandatory education for healthcare clinicians
3) To promote the use of HL strategies and interventions by healthcare clinicians in their daily practice

The project leader will disseminate the results among the healthcare clinicians at each of the PACE centers through face to face presentations at each center’s monthly staff meeting. Dissemination among the community-based hospital system that operates PACE will be sought through the submission of an abstract for a poster-presentation at the hospital’s annual research symposium. The written manuscript will also be submitted to the designated university’s digital commons, which is directly linked to Google Scholar, allowing for dissemination on a global scale. Further dissemination will be considered by sharing the results with various literature repositories and journals as applicable.

**Conclusion**

Improving the issue of limited HL offers the greatest opportunity to reduce health disparities facing the U.S. today (Heinrich, 2012; USHHS, 2010). Occurring in the context of care delivery and significantly impacting the quality of care provided, HL is not simply a patient problem; it places a substantial burden on healthcare clinicians to ensure they are providing clear communication (CDC, 2016; JC, 2007; Poureslami et al., 2017; Welch et al., 2011). The elderly/older adults and those with chronic diseases are at increased risk for having low HL and experiencing poorer health outcomes and decreased quality of life due to limited HL skills (AHRQ, 2010; Berkman et al., 2011; Poureslami et al., 2017; Seligman et al., 2005; Sequeira et al., 2013; USHHS, n.d.). Healthcare clinicians and organizations must make HL a top priority to promote clear communication between healthcare clinicians and patients and to enable patients to take control of their own health (USHHS, 2010).
Due to a lack of training related to HL, healthcare clinicians are often unaware of and unprepared to address issues of limited HL in practice (Berkman et al., 2011; Coleman, 2011; Dennis et al., 2012; DeWalt et al., 2011; Dickens et al., 2013; Heinrich, 2012; Hersh et al., 2015; Seligman et al., 2005; Smith et al., 2015; Welch et al., 2011). Adopting HL education and training, such as the educational intervention from this project, is a way for healthcare organizations to increase awareness of the challenges of limited HL and promote the utilization of recommended strategies and interventions for HL among healthcare clinicians (Coleman, 2011; Dennis et al., 2012; Dickens et al., 2013; Pagels et al., 2015; Seligman et al., 2005; Welch et al., 2011). This could lead to many positive outcomes such as but not limited to increased medication adherence, better understanding of healthcare conditions, increased management of chronic diseases, and increased quality of life. Increasing clinician awareness related to the challenges of limited HL and equipping them with strategies they can utilize in practice is vital to providing safe, efficient, and quality care to patients and their families.
References


Dennis, S., Williams, A., Taggart, J., Newall, A., Denney-Wilson, E., Zwar, N. … Harris, M. F. (2012). Which providers can bridge the health literacy gap in lifestyle risk factor
modification education: A systematic review and narrative synthesis. BMC Family Practice, 13(44), 1-29.


**Appendix A**

**Literature Review Article Matrix**

<table>
<thead>
<tr>
<th>Article</th>
<th>Study Purpose</th>
<th>Sample</th>
<th>Methods</th>
<th>Study Results</th>
<th>Level of Evidence</th>
<th>Study Limitations</th>
<th>Use as evidence to support a change</th>
</tr>
</thead>
</table>
| Aboumat et al., 2013 | To understand how HL influences patient’s interest in participating in healthcare, medical visit communication, and patient reported visit outcomes. | Participants included 41 primary care physicians and 275 of their patients. | There were four intervention groups. Prior to the enrollment visit, physicians received a minimal intervention or communication skills training and patients received a minimal intervention or a pre-visit coaching session. The groups were | Patients with low HL versus those with adequate HL had poorer blood pressure control. Patients with lower HL were less likely to ask questions to their physicians. Overall, ratings of care didn’t differ based on HL, however, patients with | Level 2: Randomized Controlled Trial | The patients and physicians knew they were being audio taped, which could have influenced their behaviors. They may have failed to detect subtle differences in non-verbal behaviors due to audiotaping. The study was limited to patient-reported visit outcomes and did not assess the impact of literacy on clinical outcomes. There was a smaller number of low | • Patients with low and adequate HL were both interested in participating in medical decision making  
• Patients with low HL were less likely to experience PDM in their visits  
• Low HL patients in the intensive physician intervention groups asked fewer medical questions  
• Low HL patients may be less able to respond to physicians’ use of patient-centered communication approaches than |
| minimal patient/minimal physician; minimal patient/intensive physician; intensive patient/minimal physician; and intensive patient/intensive physician. The Rapid Estimate of Adult Literacy in Medicine was used to measure HL. Patient’s desire to be involved in decision making was evaluated, communication behaviors were evaluated, and patient ratings of lower HL in minimal physician intervention groups reported significantly lower PDM scores versus adequate HL patients. | literacy patients in each intervention. They used a 9th grade reading level cut off to define low versus adequate literacy. The REALM measure only assesses word recognition for HL. | A significantly lower percentage of low HL patients were able to achieve blood pressure control. adequate HL patients. |
**HEALTH LITERACY STRATEGIES AND INTERVENTIONS**

| **Berkman et al., 2011** | An update to the 2004 systematic review of healthcare service use and health outcomes related to HL. Also examined disparities in health outcomes and effective interventions in various sociodemographic groups. | Literature search of MEDLINE, CINAHL, Cochrane Library, PsycINFO, and the Educational Resources Information Center. Keywords: health literacy, numeracy, and literacy, and terms or phrases | They used standard Evidence-based Practice Center methods to review abstracts, full-text or articles, quality ratings, and strength of evidence. They used consensus to resolve disagreement s and | Americans with limited HL are at greater risk for poorer access to care and poorer health outcomes Lower HL was associated with increased hospitalization, greater emergency care use, lower use of mammography | Level 5: Literature review | The quality of the literature impacted the results. Small sample sizes impacted results. The use of HL tools focused mainly on reading ability. | - Low HL is associated with poorer health outcomes and poorer use of health care services - Low HL impacts health-related outcomes - Low HL impacts patient’s ability to take medication and interpret medication labels and health messages - Poor HL was related to poorer overall health and higher mortality rates in the elderly |
They evaluated if newer literature was available to answer their key questions. They excluded intervention studies that did no measure HL directly and updates the approach to evaluate individual study risk of bias and to grade strength of evidence.

| related to instruments known to measure HL and numeracy. They excluded editorials, letters to the editor, case reports, and non-English language studies. | hy, and lower receipt of influenza vaccine. Lower HL was associated with poorer outcomes including higher risk of mortality for seniors, poorer ability to demonstrate taking medications appropriately, poorer ability to interpret labels and health messages, and poorer overall health among seniors. | • Relationship between low numeracy and health outcomes is inconclusive |
There was insufficient evidence to evaluate the relationship between HL levels and costs.

HL could impact health disparities between blacks and whites.

To understand the strategies practices used in implementing Tool 11 and to assess whether use of the Tool resulted in higher quality patient materials

Quantitative and Qualitative methods were used. Over a 6-month time period, practices implemented several action steps in Tool 11. Interviews, site visits, and review of the practice’s providers cannot always tell which patients have low HL and have trouble understanding health information. Although most materials developed or revised

Level 3: Quasi-Experimental design. Involved Quantitative and Qualitative methods

Small sample size cannot generalize to all primary care practices. Short time-period to implement the tool. They focused on documents that would be most appropriate for standard assessment tools.

- The Health Literacy Universal Precautions Toolkit was developed to help healthcare clinicians improve communication and support patients of all HL levels.
- Recommends the use of universal precautions for HL
- The practices focused mainly on small documents
written materials were used. during the implementation period showed acceptable levels of readability, and comprehensive assessment of the quality did not show evidence of improvement in readability, understandability, or actionability. Most practices focused on documents that they had local control over. The short time frame could have impacted the

| Little guidance was given the practices in how to implement Tool 11. that they had the power to change. • Highlights the importance of engaging all developers and patient-focused documents, to improve the HL quality of these materials. • Affiliation with a health system was an important driver of decisions regarding which material to target for review and revision. • Practices must be able to commit to following recommended practices for producing comprehensible patient materials. • Practices must be able to commit resources to this effort over a long period of time. |
**HEALTH LITERACY STRATEGIES AND INTERVENTIONS**

<table>
<thead>
<tr>
<th>Coleman, 2011</th>
<th>Review of various ways to educate healthcare providers about HL. Highlights examples of</th>
<th>Literature was specific to teaching HL principles to</th>
<th>The medical, nursing, and allied health professions literature was reviewed related to teaching HL</th>
<th>Evidence suggests that health care professionals tend to lack adequate training in HL</th>
<th>Level 5: literature review.</th>
<th>There is inadequate data to recommend any given curriculum, teaching strategy, technique, or tool over another for</th>
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<td></td>
<td>project as they only had 6 months for implement the tool. For the majority of materials, readability scores met the Tool 11 recommendation that documents be written at or below the 6th grade level. Use of the tool did not produce higher quality materials.</td>
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<td></td>
<td>This study added to the refinement of Tool 11 in the second addition of the AHRQ’s HL toolkit.</td>
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</table>

- Supports addressing HL in continuing education venues, since most health professional are currently in practice.
- There is a need for increased and
<table>
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<tr>
<th>teaching techniques and tools for educating healthcare professionals about HL</th>
<th>healthcare personnel.</th>
<th>principles to health professionals</th>
<th>principles. Low HL is common and serious in the U.S healthcare. There is a need for increased and improved HL training for the healthcare workforce. The article reviews the literature on various principles for teaching HL to healthcare professional and presents several teaching options for educators.</th>
<th>teaching about health literacy.</th>
<th>improved HL training for the healthcare workforce.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Highlights a notable trend toward using multiple modalities to teach about HL.</td>
<td>• It notes that healthcare providers need to address low HL.</td>
<td>• HL should be taught to healthcare providers throughout their career.</td>
<td>• There is no one tool or strategy that is recommended over another.</td>
<td>• It highlights the need for further educational research to determine appropriate teaching strategies related to educating healthcare professionals about HL</td>
<td></td>
</tr>
<tr>
<td>Cormier &amp; Kotrlik, 2009</td>
<td>To assess the knowledge of HL and the experiences with HL of senior baccalaureate nursing students</td>
<td>361 senior baccalaureate nursing students at eight institutions in Louisiana</td>
<td>The students completed a researcher-developed survey, the Health Literacy Knowledge and Experience Survey, to assess their HL knowledge and experiences with HL.</td>
<td>The survey results suggested that participants had some HL knowledge but there were noticeable gaps. Participants were able to identify low socioeconomic groups at risk for low HL and were aware of the consequences of low HL. They could identify effective interventions that could be used to evaluate patient’s understanding.</td>
<td>Level 6: descriptive study</td>
</tr>
</tbody>
</table>
Gaps were noted in participants' ability to identify older adults as a high-risk group, screening for HL, and assessing guidelines for written healthcare information. Participants' experiences with conducting HL screenings and assessing reading level, illustrations, and cultural appropriateness of written materials.

- They also had limited experience in using technology when providing healthcare teaching to patients.
- It is important that nurse educators examine the nursing curricula to ensure that HL is addressed early in the curricula.
- HL content should be addressed early in the curricula.
- Patient education is a vital component of nursing care, and preparing nurses for a teaching role needs to be a priority for curriculum development.
- HL is a national health problem and needs to be addressed to ensure that nurses are able to provide safe, quality nursing care.
| Dennis et al., 2012 | To determine how effective primary healthcare providers are at impacting HL of patients to help them make lifestyle changes related to smoking, nutrition, alcohol, physical activity, and weight | Studies from January 1, 1985 through April 30, 2009 were examined. 52 papers were included in the review and they addressed the interventions that healthcare providers used to improve HL. | A search of Medline, Embase, Cochrane Library, CINAHL, Joanna Briggs Institute, Psychinfo, Web of Science, Scopus, APAIS, Australian Medical Index, Community of Science, and Google | Most of the studies noted an improvement in HL, especially when moderate to high intensity interventions were used. Non-medical healthcare providers were also able to positively impact HL, but this was confounded. | Level 1: Systematic review of randomized controlled trials | Most of the included papers had small numbers of providers in them. Most of the included papers were considered moderate quality, only 11 were high quality. There were a variety of interventions used in the papers. HL was not measured consistently in all studies. |

- Nurses need to be equipped with knowledge and experience to be able to address the needs of individuals with limited HL.

- Healthcare professional such as dieticians, educators, or physical therapists could effectively provide education and health coaching to patients.

- The context of the primary health care setting makes it difficult for providers to provide high intensity interventions to influence HL.

- Other healthcare professionals need to be utilized to...
| Impact HL and lifestyle risk factor modification | Scholar from January 1, 1985 to April 30, 2009. Hand searches of four key journals were also conducted | by the intensity of the intervention. Individuals with low HL and chronic diseases have a decreased ability to adequately self-manage their health. Individuals with high HL levels were associated with utilizing health promoting behaviors. Time constraints and support for professional development and funding for health | of the included studies | positively impact HL
- Healthcare providers need to be able to provide interventions to address HL to promote lifestyle changes in their patients
- Shared decision making, and good communication is important to improve HL, and promote trusting relationships
- Healthcare clinicians need to be educated about the impact of HL as it relates to self-management behaviors
- Many HL measurement tools may not be useful for general practice |
| DeWalt et al., 2011 | Discusses the development of the Health Literacy Universal Precautions (HLUP) Toolkit, that was commissioned by the AHRQ | Utilized participation by 6 practice-based research networks across the state of North Carolina | The tools were developed based on a literature search of existing materials, and 22 prototype tools were created. The tools were then tested by the 6 | It documents the development process of the Health Literacy Universal Precautions toolkit, and initial testing of individual tools. They found that practices | Level 3: Quasi-Experimental Design | The practices were motivated and interested in the topic of HL. The toolkit was not tested to see if improves healthcare quality measures or health outcomes. | • Practices will use tools that are concise, actionable, and not resource intensive. • Implementing practice changes takes time. • It may not be possible to implement all of the tools at one time. |
practices; each practice tested 4 tools over a 2-week period. The testing was on a very small scale and only involved 1 or 2 staff members. The Plan Do Study Act model guided the implementation. The practice staff then participated in debriefing, describing what they did and their thoughts on the tools. After this a Prototype toolkit was created and are not interested in tools that are lengthy or complex but prefer concise information that they can act on. They also found that it takes time to implement the various tools and implementing all of the tools in a short amount of time would not be feasible.

| • They recommended implementing 1 or 2 tools at a time. |
| • The toolkit can be used to help improve the primary care for patients with low HL. |
| • Research indicates that clinicians do not accurately identify people with low HL. |
| • Utilizing universal precautions if the best way to ensure that patients have the information they need to make health decisions. |
Dickens et al., 2013

Compared nurse’s estimate of their patient’s health literacy to the patient’s health literacy using the Newest Vital Sign (NVS) as the health literacy measurement. Also evaluated if there was a relation between the patient’s NVS score and results of tested among 8 practices over a 4-month time period, with debriefing afterwards.

Dickens et al., 2013

Used nurses and patients from two inpatient cardiac units. They were both men and women older than 18 years, had a cardiac-related diagnosis, and were able to read English.

A cross-sectional study was performed using a convenience sample of nurses and patients from two inpatient cardiac units. Patient demographic information was recorded from the medical record. Data about educational attainment was gathered through an educational attainment level as a

Nurses did not correctly identify patients with low health literacy, most overestimate the patient's health literacy. This leads to the patient not understanding the information that is being taught to them by the nurse.

Using educational attainment level as a

Level 6: Cross-sectional study.

Limitations: used a convenience sample, the patient and nurse sample came from two hospital units, it was a small sample, there was lack of diversity in race/ethnicity in the patient population, it did not control for the nurses' knowledge about HL or individual nurse characteristics. There is no established HL tool that

- Highlights the need of HL training for all healthcare professionals
- Recommends the Health Literacy Universal Precautions Toolkit as a resource
- It supports that awareness of a patient’s HL is integral to patient care, safety, education, and counseling.
- It notes that healthcare providers often overestimate their patient’s HL
- It notes that there is little evidence
| the Single Item Literacy Screener (SILS) of the patient’s self-reported education attainment | interview, patients completed the NVS and the SILS screening tools. The nurse was then asked to estimate the patient's health literacy level. | method to assess learning limitations may not be accurate. Suggests that training in HL is needed for inpatient nurses. Recommends HL training for all healthcare professionals who impact patient care experience. Recommends the Health Literacy Universal Precautions Toolkit as a resource | measures all elements of HL, so the three methods used did not measure the same constructs. | supporting health literacy screening. |
| Drake, 2015 | To examine if there is a relationship between Advanced Practice Registered Nurses (APRNs) practicing in primary care settings in Arizona and HL knowledge, experience, and education. | 63 APRNs who were working in the primary care setting in Arizona, completed the survey. | The Health Literacy Knowledge and Experience Survey was used to measure the HL knowledge and experiences of participants. A Likert-type response format was used to measure HL experiences. | Participants were able to identify that low HL skills are prevalent among all ethnic groups and were aware of the consequences associated with low HL. Gaps were noted in knowledge of basic facts about HL, HL screening, and guidelines for written healthcare information. HL experiences were found to be somewhat limited with | Level 4: correlational design, cohort study. | Information was self-reported. It used a non-probability, convenience sample. It had a small sample size, so generalizability is limited. The study used a specific survey, which limited the information that was gathered. Reliability of the survey was not tested; however, validity of the survey was established. | • Almost half of the participants indicated that they did not receive education about HL in nursing or nurse practitioner school.  
• 90 percent of the participants indicated that they do not receive continuing education about HL in their current practice setting.  
• Addressing HL is critical to improving the quality of healthcare.  
• The study highlights the need for leaders in nursing education programs to include information about HL in their curriculum.  
• Also supports the need for healthcare organizations to provide healthcare clinicians with |
regards to assessing the reading level of written health care materials, use of HL screening tools, and use of alternative teaching strategies.

The majority of the participants noted that they did not receive education about HL in their undergraduate or graduate programs. 90 percent of the participants noted that they do not receive continuing education related to HL and low HL.
### Heinrich, 2012

| Education about HL in their current places of work | HL was measured by the NVS. Study participants completed a demographic survey requesting information including: age, gender, level of education completed, and ethnicity/race. An interpreter obtained | Low HL was found in 65% of the study participants. Lower HL levels were seen in Spanish-speaking participants. No significant correlation was found between age and HL in this study. They recommend that HL be | Level 6: descriptive, cross-sectional design | No limitations were discussed. Small sample size. |

- Limited HL is so common that HL assessment needs to be considered in all clinical practice settings. However, assessment of HL does not need to be done on a regular basis.
- There is a positive correlation between education level and HL.
- HL has a major role in enhancing quality of life and promoting better health outcomes.

The sample consisted of 54 participants: 22% were Caucasian, 43% Black, and 35% Latino/Latina.
| **Hersh et al., 2015** | Provide an overview of the many issues of HL related to primary care practice | Clinical guidelines based on systematic reviews and meta-analyses, RCTs, and clinical trials and reviews | A PubMed search was completed using key terms health literacy, numeracy, interventions, and assessment. The search included meta-analyses, randomized controlled trials, clinical | Discusses the definition of HL and the many negative effects of low health literacy on patients. Discusses national data related to low HL. Findings: physicians often overlook HL | Level 1: clinical guideline | There were no specific date parameters | • Need to consider HL as the sixth vital sign • It notes that physicians often overlook HL in routine patient care, overestimate a patient’s HL, and incorrectly assume that health information and instructions are understood. • Explains that most patients do not identify their own deficiencies relating to HL. |
trials, and reviews. They limited the search to articles written in English. The Agency for Healthcare Research and Quality Evidence Reports, National Guideline Clearinghouse, Medline, and Google Scholar were also searched.

| In routine patient care; clinicians often overestimate patient's HL skills and assume that they understand the instructions they are given. Poor HL is related to poor health outcomes: higher mortality rates, worse overall health status, health disparities, increased costs, decreased cancer screening and |
|---|---|---|---|
| • It identifies recommendations for practice and identifies strategies for promoting HL in clinical practice: use of universal precautions with all patients, avoiding medical jargon, breaking down information or instructions into small concrete steps, limiting the focus of a visit to three key points or tasks, and assessing for comprehension. |
| • It has recommendations for printed information: should be written at or below a fifth- to sixth-grade reading levels; visual aids, graphs, or pictures can enhance patient understanding; present numerical |
| **Koster, et al., 2016** | To examine the ability of community pharmacy staff to identify patients with limited HL. To examine how they identify these patients, and evaluate the impact of intervention. | Staff at 27 community pharmacies were targeted. 74 pharmacy staff were interviewed including PharmDs, bachelor’s of pharmacy, and technicians. | Structured face-to-face interviews were conducted to examine pharmacy staff’s experiences. | The majoring of the staff (92%) stated that they were able to identify patients with limited HL. A lack of time and reimbursement were barriers. | Level 6: qualitative study | Different students with varying interview skills collected the data. Social desirability bias may have influenced the respondents and their daily practice. | • Most of the staff noted identifying patients with limited HL based on their intuition or patient characteristics. • There was no systematic identification of low HL patients. • A lack of time noted as a barrier to information in a concrete way. |
any interventions that they use to improve medication use. Perceived barriers to providing for low HL patients were also examined.

<table>
<thead>
<tr>
<th>Pharmacy and pharmacy technicians.</th>
<th>Pharmacy staff mainly focused on certain patient.</th>
<th>Limited HL patients may be different. They did not investigate the effect that the staff’s counseling had on patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested strategies to improve communication included: tailored education and information, intensive support or use of aids. A lack of systematically identifying patients with low HL could lead to patients being missed. Pharmacy staff mainly focused on certain patient.</td>
<td>Any limitations in counseling or tool use could lead to patients not receiving tailored care.</td>
<td>Providing tailored care to patients.</td>
</tr>
<tr>
<td>There is a need to increase awareness of HL among pharmacy professionals. There is a need to train pharmacy staff about using tools to identify patients with limited HL. Low HL is common. Focusing only on certain demographics or characteristics of patients to determine HL level is not accurate. The use of communication techniques such as teach back should be utilized to confirm understanding by patients. There is a lack of understanding of HL.</td>
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</table>
### Lambert et al., 2014

To explore the perceptions and understanding of health professionals about HL, perceived barriers that patients with low HL face, and their knowledge of strategies to increase HL in their daily practice.

| Four indigenous healthcare services were involved. 29 Health professionals including: nurses, doctors, service managers, community health workers, pharmacist, and | Interviews were conducted with the health professionals. The interviews were in-depth, semi-structured, and lasted between 40 and 60 minutes. A thematic analysis was completed and used to develop an | Most of the health professionals were not familiar with the term HL and thought it related to a patient’s skill at managing their health and navigating the healthcare system. The majority of health professionals did not | Level 6: Qualitative study | The health professionals were working with Indigenous people. It was a small sample size. | • Little research has focused on health professionals’ knowledge of HL or the barriers that patients face related to HL  
• Health professionals have a limited understanding of HL and the consequences of low HL for patients  
• Patient’s ability to improve understanding of their illness, and manage their health could be limited by the lack of |

| **Level 6: Qualitative study** | **The health professionals were working with Indigenous people. It was a small sample size.** | • Little research has focused on health professionals’ knowledge of HL or the barriers that patients face related to HL  
• Health professionals have a limited understanding of HL and the consequences of low HL for patients  
• Patient’s ability to improve understanding of their illness, and manage their health could be limited by the lack of |

| **Level 6: Qualitative study** | **The health professionals were working with Indigenous people. It was a small sample size.** | • Little research has focused on health professionals’ knowledge of HL or the barriers that patients face related to HL  
• Health professionals have a limited understanding of HL and the consequences of low HL for patients  
• Patient’s ability to improve understanding of their illness, and manage their health could be limited by the lack of |
<table>
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<tr>
<th>receptionists</th>
<th>intervention that was tested in phase two of the study</th>
<th>understand the role of the healthcare system and their role in impacting the HL level of patients. It is unclear what the best way to increase HL.</th>
<th>awareness of health professionals of limited HL</th>
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<tr>
<td></td>
<td>• Suggest using effective communication techniques to improve HL</td>
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<td>• Barriers in the healthcare system can prevent health professionals from addressing low HL in patients</td>
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<td></td>
<td>• Interventions need to focus on supporting health professionals, patients, and families in increasing HL</td>
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<td></td>
<td>• Health professional should be provided training related to HL</td>
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<tr>
<td></td>
<td>• Minimizing system barriers such as time restraints is important to improve HL</td>
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<tr>
<td><strong>Lee et al., 2015</strong></td>
<td>To examine the impact of HL on self-reported medication adherence in Korean older adults with chronic diseases</td>
<td>Participants were 65 years or older, taking at least one prescription medication for more than 6 months for a chronic disease, were able to read and write, and had no Data was collected with a questionnaire, by face-to-face interviews or by self-report. Participants provided sociodemographic information and health and medication</td>
<td>There was a significant relationship between medication adherence and perceived health status, use of a magnifying glass, and assistance with medication administration. There was</td>
</tr>
</tbody>
</table>
| History of drug abuse or addiction | Related information. They measured medication knowledge via a knowledge scale that assessed how well they know the names, purposes, recommended doses, frequencies, and side effects of their medications. HL was measured with the Short Test of Functional Health Literacy in Adults (STOFHLA). | A correlation between HL, medication knowledge, and medication adherence. HL was positively correlated with medication adherence and medication knowledge. Medication knowledge was not correlated with medication adherence. | Adults with chronic conditions is an important factor that impacts the health outcomes of patients.  
- Recommends that nurses pay particular attention to the HL skills of older adults with chronic disease.  
- Notes the need to raise the awareness of the impact of low HL among older adults and chronically ill patients.  
- Recommends educational programs for improving public awareness of HL. |
| Mackert et al., 2011 | To describe a training session designed to educate healthcare workers of all kinds about HL and provides an initial assessment of the training session | 166 participants, included social workers, nurses, nurse practitioners, health educators, office staff, administrators, and other. | Pre- and post-surveys were completed by 166 participants in training sessions designed to improve knowledge of health literacy and instruction in clear communication techniques. | The training course was intended to provide information that defined HL and explained its importance, discussed the role of HL in patient care, and provided participants with strategies for communicating more effectively with low HL patients. Results showed that participants improved from the pre-test to the post-test. Participants who initially overestimate | Level 3: controlled trial, quasi-experimental design | The post-test only assessed participant’s intentions to improve their behavior rather than actually assessing the behavior after the intervention. | • Participants initially overestimated their knowledge of HL • Healthcare workers may not recognize their own limitations about HL knowledge which may makes them unlikely to seek more information on their own • There is a need to improve initial training and continuing medical education regarding HL • There is a need to improve HL training for all kinds of healthcare workers • Widespread adoption of HL training programs would improve the delivery of healthcare to low HL patients • Patients receive health information |
d their own knowledge of health literacy, improved on outcome measures regarding perceived health literacy knowledge. Participants also indicated strong intentions to use clear communication techniques covered in the training, and a strong intention to focus on identifying low HL patients and pay attention to if the from a variety of healthcare professionals, not just physicians
- It is important that all healthcare workers are sensitive to the needs of those with low HL
- Education programs and healthcare organizations need to provide better training related to HL to improve clinician’s ability to provide care to low HL patients
- Recommendations to follow up on participants’ actual behavior to determine long-term efficacy of the training sessions
patients understand the information or not. It indicates that training can improve the perceived ability of healthcare workers of all kinds to understand HL and associated communication challenges.

Mitchell et al., 2012

Examined the relationship between HL and 30-day hospital re-admissions

Site was Boston Medical Center. The sample included 1,540 patients.

They measured HL using the Rapid Estimate of Adult Literacy in Medicine (REALM). The primary outcome was the rate of

Those with low HL were more likely to be: insured by Medicaid, be Black non-Hispanic; unemployed, disabled, or retired; low income; and

Level 4: Correlational Design, cohort study.

The data was taken from clinical trials implemented at a single safety net hospital and results may not be generalizable to other patient populations. Re-admissions were self-reported, but

• Low HL is a significant, independent, and modifiable risk factor for 30-day hospital re-admissions after discharge.
• Interventions to positively impact patient’s low HL should be utilized to
| **Mullen, 2013** | Discusses the impact of low HL and the interventions that can be used to minimize its effect on the elderly population | Focused on the elderly population | Presents a review of the literature related to HL and the elderly | Low HL is a problem for both healthcare providers and the individual patient. It is important for providers to understand the factors that are associated with low HL and learn | Level 5: Systematic review of descriptive and qualitative studies | Does not include inclusion or exclusion criteria for what literature was included | Clinicians need to be able to recognize signs or symptoms of low HL. Clinicians need to be able to utilize appropriate tools/strategies/interventions when communicating with patients. Advocates for the use of the teach back method. Written material should be written at
what interventions are effective. Clinicians should avoid using medical terms or jargon in their communication with patients.

It is important to consider age-related communication barriers such as presbyopia, presbycusis, and memory loss when caring for older adults.

<table>
<thead>
<tr>
<th>Pagels et al., 2015</th>
<th>To develop and evaluate a curriculum to train</th>
<th>Family Medicine residents in a county</th>
<th>The residents participated in a HL training</th>
<th>Overall, residents showed a significant</th>
<th>Level 3: Quasi-Experime</th>
<th>The study was conducted at one training site and</th>
</tr>
</thead>
</table>

- There is an urgent need to train healthcare professionals on
Family Medicine residents to effectively communicate with patients with limited HL.

supported indigent care clinic. Sample size 25.

program which included didactic lectures and an objective structured clinical examination (OSCE). Community promotoras acted as standardized patients and evaluated the residents’ ability to measure their patient’s HL, communicate effectively using the teach-back and Ask Me 3 methods, and appropriately use an interpreter. They used a

increase in HL knowledge, it was also noted that residents were more confident that they could recognize patients with low HL. They recommend that one-time training is not enough to address limited HL.

Healthcare providers need to be trained to improve communication barriers related to HL, and to reduce the

how to improve communication with low HL patients.

- Resident’s confidence in recognizing patients with low HL increased after the training.
- Their knowledge of HL increased, and they were able to utilize various strategies regarding HL.
- Tailored training is needed for specific populations, and it is recommended that it be early in medical school
| **RNAO, 2012** | **Guideline to provide evidence-based recommendations for registered nurses, registered practical nurses, and other healthcare providers to facilitate patient centered learning that enables them** | **A search of the literature related to facilitative client centered learning was conducted. Articles from 1999 to 2009 were included.** | **Hand-searches of the published literature including primary and secondary sources was done. Searched of the electronic databases including Medline, CINAHL, and PsycINFO. The articles were screened.** | **The guideline can be applied to any disease or condition that requires nursing care. Introduce the Listen, Establish, Adopt, Reinforce, Name, and Strengthen (LEARNS) model into nursing programs and continuing.** | **Level 1: Clinical guideline** | **Focuses on nursing, intendent for advance practice nurses, and nurses. The issue of HL was not included in the literature review. Focuses on facilitating client centered learning, not specifically HL.** | **- Create a safe, shame and blame free environment**  
- Use a universal precautions approach for HL to create a safe and shame free environment**  
- Assess the learning needs of patients**  
- Clinicians should tailor their approach and educational design by working with the client and inter-professional team**  
- Utilize more structured and**  
- Pre-test post-test, and post-didactic evaluation, an online follow-up survey, and score sheets to measure the results.**  
- Consequences of low HL.**
| **Health Literacy Strategies and Interventions** | **To care for their health** | **Based on inclusion and exclusion criteria and were critically appraised. 6 articles were included to create the guidelines.** | **Education courses.**  
Ensure that there are adequate resources to support and facilitate client centered learning.  
Encourage guideline uptake by clinicians by ensuring there is adequate planning, strategies, resources, organizational and administrative support. | **Intentional ways to facilitate client centered learning**  
- Use plain language, pictures, and illustrations to promote HL  
- Use several educational strategies to promote effective learning including: printed materials, telephone, audiotapes, video, and computer-based technology and multimedia presentations  
- Assess the client’s learning  
- Recommends the use of structured approaches and educational materials to promote HL | **Sand-Jecklin et al., 2010**  
To determine the impact of a HL education  
The sample was 112 students (101)  
A brief educational session was conducted  
There was a significant increase in student’s Level 3: Quasi-Experimental,  
It was a retrospective study, there was no control group  
- Even a short educational intervention can positively impact** |
session on student knowledge of HL concepts and ability to apply this knowledge in the clinical setting. It also identified the prevalence of limited HL among hospitalized patients and the behaviors that patient use to compensate for the poor understanding of health information.

females and 11 males, enrolled in a generic BSN program, they were all sophomore level nursing students.

with sophomore nursing students in a large Mid-Atlantic University. A pre-test was given to assess student’s knowledge before the content presentation. The education session consisted of 20 minutes of content. After the educational session, a post-test was conducted, and a retrospective data-analysis was completed on knowledge about HL and the need for nurses to assess the HL status of their patients.

Students were able to identify appropriate strategies to use with patients with low HL after the intervention. Older adults were significantly less confident in filling out forms and were more likely to report needing help to read.

Retrospective study. used. The patient population was a convenience sample

student’s knowledge of vital HL issues.

• All nurses and nursing students should be able to assess HL in patients and be able to intervene appropriately, to ensure understanding of health information.

• There is a need to include HL education in nursing undergraduate and graduate programs.
| Seligman et al., 2005 | To discern if notifying physicians of patient’s low HL will affect the behavior of the physician, satisfaction of the physician, or patient self-efficacy. | 63 primary care physicians in a public hospital and 182 diabetic patients with limited HL | All the patients were screened for limited HL. Physicians were randomized to be notified of their patients limited HL skills. After the patient visit, physicians reported the strategies they used, their satisfaction, and how effective their care was, and their thoughts. Physicians find it hard to identify patients with limited HL, which negatively impacts outcomes. Patients with low HL have decreased knowledge of how to manage and prevent chronic disease. Poor communication between physicians and patients could be related to. | Level 2: Randomized Controlled Trial | A single assessment of several outcomes was used which means that the reasons for the differences observed in physician behaviors between the intervention and control groups could not be determined. They could not determine whether intervention groups self-efficacy scores would have improved over a longer period of. | • Specific training and support needs to be provided to physicians to help them impact low HL.  
• Screening for HL without having training and support for physicians is unlikely to improve outcomes  
• Physicians are open to being notified of their patients HL levels  
• Patients supported the use of HL screening tools  
• Physicians did not feel prepared to discuss the results of the HL screening with patients. |
<table>
<thead>
<tr>
<th>Intervention physicians were more likely than control physicians to use recommended strategies for low HL. Intervention physicians were less satisfied with their visits. The post-visit self-efficacy scores were similar for the time. It could not be determined if the screening test impacted the self-efficacy scores of both groups. They relied on self-report by physicians about the strategies they used. The physicians were aware that they were enrolled in the study, which could have impacted their results/actions. Some patients did not want to participate would could indicate that overestimations of the acceptability of HL screening in patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further research needs to be done to find ways to help providers effectively engage low HL patients.</td>
</tr>
<tr>
<td><strong>Sequeira et al., 2013</strong></td>
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</table>

- Older adults with limited HL are at risk for more rapid decline in scores in executive function.
- Lower executive function is associated with worse chronic disease management, worse functional status and ability to perform daily activities, and a greater risk for falls.
| month evaluations. | daily, and participants in the intervention group were exposed to a computer-based conversational agent about walking. HL was measured using the Short Test of Functional HL in Adults. Executive function was measured at baseline and at 12 months with the Trail Making Test (TMT), Controlled Oral Word Association Test, and decline in performance on the TMT. The study demonstrated a relationship between limited HL in older adults and a more rapid decline in an executive function measure over only one year. | randomized controlled trial to promote walking, and physical activity could benefit cognition. |
| **Smith et al., 2015** | To determine if HL is a risk factor for decline in physical function among older adults | 529 community dwelling American Adults aged 55-74 years old | A longitudinal cohort of 529 community dwelling American Adults were recruited from an academic general internal medicine clinic and federally qualified health centers in 2008-2011. Multivariable analyses were conducted including HL, age, gender, alcohol consumption, smoking status, and exercise | Nearly half of the sample had either marginal or low HL. Average physical function was 83.2 of 100, and HL was associated with poorer baseline physical function. Participants with marginal and low HL were more likely to experience meaningful decline in physical function than the adequate HL group. | Level 4: Cross-sectional study, correlational design | This sample should be considered a healthier and less disadvantaged subsample of those that participated at baseline. Outcomes and exposure variables used in the study were self-reported | • Lower HL increases the risk of faster physical decline over time in older adults.  
• Strategies that reduce literacy disparities need to be designed and evaluated.  
• There is a need to promote healthy aging as a public health priority.  
• The prevalence of low HL is higher in older adults.  
• Clinicians treating older adults need to be aware that a large proportion of adults have limited levels of HL.  
• Level of education should not be used as a marker for HL.  
• Notes that increasing the awareness of the |
| **Sorense**n et al., 2012 | It defines HL and its conceptual dimensions. Captures the most comprehensive evidence-based dimensions of HL. | Identified literature with definitions and conceptual frameworks of HL. 17 keywords were combined with health literacy, health competence. | Systematic review in Medline, Pubmed and Web of Science was performed by two independent research teams in autumn 2009 and spring 2010 and the results compared and combined to obtain information. | Provides a comprehensive and working definition of HL. Notes that HL is a multidimensional concept and consists of different components. Most conceptual models not only consider the key components of HL, but also identify characteristics and mechanisms that influence HL. | Limitations were not noted by the authors. | • It provides a comprehensive definition of HL. • It provides information on the concepts of HL. • Provides an integrated conceptual model of HL. • Notes that enhancing HL is increasingly recognized as a public health goal and a determinant of health. |
regarding two research questions: (1) how is HL defined? And (2) how can HL be conceptualized?

Inclusion criteria: written in English; concerned with health literacy in a developed country; and offering relevant content with regard to the definition or conceptualization of HL, or a combination of these issues.

the individual and system-level factors that influence a person's level of HL, as well as the pathways that link HL to health outcomes.
| Weiss, 2007 | To enable physicians to “define the scope of the HL problem, recognize health system barriers faced by patients with low literacy, implement improved methods of verbal and written communication, and incorporate practical strategies to create a shame-free environment” | N/A | Discusses the National Assessment of Adult Literacy findings. Communication is essential for effective healthcare delivery. HL is a major predictor of a person’s health, more than age, income, employment status, level of education, or race. Patients often do not understand medical vocabulary and/or healthcare concepts. | Level 1: clinical guideline | None identified | • Provides good background information and statistics on HL • Discusses populations at risk for low HL • Discusses the outcomes of low HL • Patients often misinterpret or do not understand the medical information that they are given, leading to medication errors, missed appointments, and adverse medical outcomes. • Patients often do not understand medical vocabulary and/or healthcare concepts. • Level of education completed is not an accurate way to assess HL level |
Healthcare concepts.
Discusses signs and symptoms of low HL in patients, and ways to measure HL in patients.
Discusses strategies to improve patient’s HL. Discusses the importance of improving communication with patients and ways to do this.
Provides information on how to create “patient-friendly”
| Welch et al., 2011 | To explore the business and clinical cases for screening for HL using the NVS | The clinicians and patients of the Morehouse School of Medicine, Department of Family Medicine Comprehensive Health Care Clinic. The clinicians included 20 board-certified family physicians, one physician assistant, 2 clinical psychologists, a nutritionist, 7 nurses, | Data was taken from a larger clinical quality improvement initiative. HL screening and clinician training were undertaken. HL screening was implemented using the NVS, and all patients completed this tool as part of routine intake. Randomization of physicians was done among the intervention and control. | HL screening can be conducted with modest expenditures, requires only a small amount of time commitment from providers, and is low cost. The intervention did improve clinician’s awareness of the problem of HL. There is widespread underutilization of techniques to improve communication. | Level 4: correlational design, cohort study | The NVS is not validated for self-administration, but it was self-administered. While the intervention did improve clinician’s awareness of the problem of limited HL, the clinical application is somewhat problematic as there were delays and/or resistance by clinicians in implementing the recommended strategies to improve communication/patient understanding. Also, they only... |

- It highlights the negative impact of low HL on quality of health care.
- Discusses economic consequences of low HL and estimates the costs as ranging from $143 to $7797 per patient.
- Demonstrates the need to improve HL.
- Supports that clinicians are often unaware of the importance of limited HL, and often misjudge patient's HL abilities.
- Notes that there is wide-spread underutilization of techniques to improve communication.
and 15 family medicine resident physicians. The patient population was 5544.

Yin et al., 2015 | Discusses HL as an Educationally Sensitive Patient Outcome (ESPO). | N/A | Presents information to support HL as an ESPO. | HL informed strategies can be taught, and acquisition of skills can be measured. A range of teaching approaches have been used, including video tape review, small | Level 7: Expert Opinion | None noted. | • HL informed strategies can be taught, and achievement of skills can be measured.  
• Increasing providers knowledge about HL will positively impact patient outcomes.  
• Provides a conceptual model for HL and provides a framework to
group discussions, and standardized patients. Trainees and providers attending workshops on HL informed strategies report improved confidence in their abilities to assess and counsel patients. Provider participation in HL skill-building workshops improves provider skills and has a positive impact on patients, guide medical educators and research in designing and studying health professionals. education

- Over the past decade, HL has come to be considered a critical quality and safety issue by the Institute of Medicine, Joint Commission, and the World Health Organization.
- For patients to have improved outcomes, HL must be addressed as part of each clinical encounter
- A “universal precautions” approach to HL is recommended
- Provider-centered HL-informed interventions have
including greater patient confidence in medication management and ability to lose weight, increased preventative screening, and decreased healthcare utilization.

been associated with improved outcomes

- Inter-professional educational interventions improve patient outcomes
Appendix B

Melnyk Levels of Evidence Pyramid

Reference

Appendix C

IRB approval from the designated university.

INSTITUTIONAL REVIEW BOARD

January 12, 2018

Esther L. Carpenter

IRB Approval [redacted] An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting

Dear Esther L. Carpenter,

We are pleased to inform you that your study has been approved by the [redacted] IRB. This approval is extended to you for one year from the date provided above with your protocol number. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB, and we wish you well with your research project.

Sincerely,

[Redacted]
Appendix D

IRB approval from the community-based hospital that owns and operates PACE.

February 20, 2018

Esther L. Carpenter, BSN, RN

Dear Ms. Carpenter:

At the meeting of the Institutional Review Board on February 20, 2018 the research project and protocol CHIRB0402 An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting request for approval described in the approval application (Reference 1/28/18) was approved.

We do require annual renewal or closure of the research project. This expiration date is **February 20, 2019**. A renewal or closure application will be **due by February 05, 2019** to ensure this will be on the agenda for the **February 19, 2019** IRB meeting. If you complete the study prior to the expiration date, you are welcome to submit a closure application to the IRB at that time.

If you have any questions, please consult the **IRB Policy and Procedure Manual** or contact the IRB Secretary at **[contact information here]**.

Sincerely,

[Signature]
Appendix E

CITI Certificate

**COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)**

*NOTE: Scores on this Requirements Report reflect quiz completions at the time all requirements for the course were met. See list below for details. See separate Transcript Report for more recent quiz scores, including those on optional (supplemental) course elements.*

- **Name:**
- **Institution Affiliation:**
- **Institution Email:**
- **Institution Unit:**
- **Phone:**

- **Curriculum Group:** Human subject - Basic
- **Course Learner Group:** Nursing
- **Stage:** Stage 1 - Basic Course
- **Description:** This course is appropriate for students doing class projects that qualify as "No More Than Minimal Risk" human subjects research.

- **Record ID:**
- **Completion Date:**
- **Expiration Date:**
- **Minimum Passing:**
- **Reported Score:**

**REQUIRED AND ELECTIVE MODULES ONLY**

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<th>Requirement</th>
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<th>Score</th>
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<td>Students in Research (ID: 1321)</td>
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<td>10/10 (100%)</td>
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<tr>
<td>History and Ethical Principles - SBE (ID: 490)</td>
<td>06-Oct-2015</td>
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<tr>
<td>Defining Research with Human Subjects - SBE (ID: 491)</td>
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<tr>
<td>The Federal Regulations - SBE (ID: 502)</td>
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<td>Records-Based Research (ID: 5)</td>
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<td>Research Involving Children (ID: 9)</td>
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<td>5/5 (100%)</td>
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<td>Conflicts of Interest in Research Involving Human Subjects (ID: 488)</td>
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<tr>
<td>Liberty University (ID: 15111)</td>
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<td>4/5 (80%)</td>
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</table>

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid independent learner.

Verify at: [www.citiprogram.org/verify/7k395c9381-15e7-7a74-540e-ec6f15c95c1d-175e0974](http://www.citiprogram.org/verify/7k395c9381-15e7-7a74-540e-ec6f15c95c1d-175e0974)
COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI PROGRAM)

**NOTE:** Scores on this Transcript Report reflect the most current quiz completions, including quizzes on optional (supplemental) elements of the course. See list below for details. See Separate Requirements Report for the reported scores at the time all requirements for the course were met.

- **Name:**
- **Institution Affiliation:**
- **Institution Email:**
- **Institution Unit:**
- **Phone:**

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- **Course Learner Group:** Nursing
- **Stage:** Stage 1 - Basic Course
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- **Record ID:**
- **Report Date:**
- **Current Score:**

### REQUIRED, ELECTIVE, AND SUPPLEMENTAL MODULES

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</table>

For this Report to be valid, the learner identified above must have had a valid affiliation with the CITI Program subscribing institution identified above or have been a paid independent Learner.

Verify at: [www.citiprogram.org/verify/TX383c0381-16e7-4a74-3f0f-ec8f1f32e2-17e45974](http://www.citiprogram.org/verify/TX383c0381-16e7-4a74-3f0f-ec8f1f32e2-17e45974)
Appendix F

Letter of support from the Medical Director of PACE.

November 13, 2017

Attention: IRB

IRB Members:

Mrs. Esther Carpenter, BSN, RN, Liberty University Doctor of Nursing Practice Student has proposed to conduct her Doctor of Nursing Practice Scholarly Project: An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting.

PACE is committed to providing the most advanced, comprehensive care for our participants, facilitated by the pursuit of quality improvement. Mrs. Carpenter’s Doctor of Nursing Practice Scholarly Project aligns with our commitment that every participant receives the ultimate quality health care.

PACE is pleased to support Mrs. Carpenter’s Doctor of Nursing Practice Scholarly Project: An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting.

Please feel free to contact me if I can be of further assistance.

Respectfully,

Medical Director
Geriatric Services and Program for All-Inclusive Care of the Elderly (PACE)
Appendix G

Permission to use the Iowa Model of Evidence-Based Practice.

Permission to Use The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

You have permission, as requested today, to review and/or reproduce The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care. Click the link below to open.

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care

Copyright is retained by University of Iowa Hospitals and Clinics. Permission is not granted for placing on the internet.


In written material, please add the following statement:

Used/reprinted with permission from the University of Iowa Hospitals and Clinics, copyright 2015. For permission to use or reproduce, please contact the University of Iowa Hospitals and Clinics at 319-384-9060.

Please contact:
Appendix H

Permission to use and reproduce the Health Literacy Universal Precautions Toolkit

We acknowledge the following primary care practices and clinics for participating in testing of the second edition of the Toolkit:

Annville Family Medicine, Annville, Pennsylvania
Chula Vista Medical Plaza, Chula Vista, California
Complete Family Medicine, Kirksville, Missouri
Fairview Clinics – Lakeville, Lakeville, Minnesota
Family Medical Care Center, Granite Falls, North Carolina
Georgetown University-Providence Hospital Family Medicine Residency Program, Fort Lincoln
Family Medicine Center, Colmar Manor, Maryland
Legacy Medical Group – Emanuel, Internal Medicine, Portland, Oregon
Namaste Health Care, Ashland, Missouri
Omar Khan, MD & Javed Gilani, MD, Wilmington, Delaware
Providence Medical Center – South Lyon, South Lyon, Michigan
RST Medical Group Inc., Decatur, Georgia
Stony Brook Internal Medicine, Primary Care Center, East Setauket, New York

For convenience, we use the term “patient” throughout the toolkit, but recognize that health literacy improvement efforts often include caregivers, family members, and other consumers of health care.

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Suggested Citation
Appendix I

Permission to add items to the Health Literacy Brief Assessment Quiz

- Play a plain language game (use a plain language thesaurus as reference). Ask teams of staff members to come up with plain language names and descriptions for common medical terms.
- Have staff and clinicians role play good and bad health literacy practices. See Tool 4: Communicate Clearly for tips on communicating effectively.
- Use other tools in this Toolkit, like Tool 5: Use the Teach-Back Method and Tool 11: Assess, Select, and Create Easy-to-Understand Materials, to show how you can apply health literacy best practices.
- Consider using the Health Literacy Brief Assessment Quiz to gauge the knowledge of your staff. Ask staff to complete the quiz before and after your staff training. Feel free to add items that capture the key points you plan to cover.

Pursue continuing education credits in health literacy.

- Health Literacy and Public Health from the New York/New Jersey Public Health Training Center has 2 modules, each 1-2 hours long.
- Two health literacy Maintenance of Certificate (MOC) modules (the Part 2—Knowledge Self-Assessment and Part 4—Performance Improvement Modules) are available through the American Board of Pediatrics. MOC credit for other primary care physicians is expected to be available in 2015. If your organization issues continuing education credit and you would like to offer these modules, write to: HealthLiteracy@ahrq.hhs.gov.

Maintain health literacy awareness.

- Make sure to have a plan for revisiting the topic of health literacy periodically and training new staff. If you have fellows or residents, be sure to emphasize during their training that they’re learning communication skills that will be valuable regardless of their chosen specialty.
- Use existing opportunities (e.g., staff meetings, huddles, or “Lunch & Learns”) to provide training.
- Follow up your initial training with sessions covering key recommendations for improving communication provided in other tools (e.g., Tool 4: Communicate Clearly; Tool 5: Use the Teach-Back Method).
- Consider sending out “Health Literacy Weekly Reminders” to staff and clinicians with communication tips and plain language reminders to maintain interest in health literacy.
- Post Ask Me 3 posters in the practice to encourage patients and staff to ask questions (see Tool 14: Encourage Questions). Post the Key Communications Strategies (Tool 4: Communicate Clearly) posters in the practice to help staff remember the key tips for communicating effectively with patients.
- Provide Everyday Words for Public Health Communication to staff and clinicians to help them avoid medical jargon when talking to patients.
Appendix J

Informed consent for the evidence-based practice scholarly project.

CONSENT FORM

An Educational Intervention to Raise the Awareness of Limited Health Literacy and the Need to Utilize Recommended Strategies and Interventions Among Healthcare Clinicians in a Program of All-Inclusive Care for the Elderly Setting

Esther Carpenter
Doctor of Nursing Practice Program, School of Nursing

You are invited to take part in an evidence-based practice research project to increase your awareness of the challenges of limited health literacy and the recommended strategies and interventions that you can utilize when caring for PACE participants. You were selected as a possible participant because you provide education to PACE participants as part of your job. Please read this form carefully and ask any questions you may have before agreeing to participate in the project.

Esther Carpenter, a doctoral candidate in the Doctor of Nursing Practice Program in the School of Nursing at [redacted] is conducting this project.

What the Project is About: The purpose of this project is to raise awareness of the challenges of limited health literacy among healthcare clinicians caring for participants at PACE, and to provide them with strategies and interventions that they can utilize in their practice. The goal is to continue to build on the excellent care that is being provided to participants by improving communication between healthcare clinicians and PACE participants.

What You Will be Asked to Do: If you agree to be in this project, I would ask you to do the following things:

1. Complete a pre-test through Survey Monkey, which will ask you questions related to health literacy and recommended strategies and interventions. This is to see what you already know about health literacy and if you are using any strategies and interventions in your practice. This will take two to five minutes to complete. All responses will remain confidential.

2. You will be asked to review a PowerPoint presentation that will be linked to the email, with information about issues related to health literacy. This will take fifteen minutes to review.

3. You will be asked to complete an online continuing education module from the New York New Jersey Public Health Training Center about the strategies and interventions for health literacy that you can use in practice. This will require you to create a free account with the New York New Jersey Public Health Training Center. This will take forty-five minutes to one hour to complete, and you will receive one hour of continuing education credit for completing the module.

4. You will take a post-test through Survey Monkey, which will ask you questions related to health literacy and recommended strategies and interventions. This is to see what you learned about health literacy from the PowerPoint presentation and online educational module. This will take two to five minutes to complete. All responses will remain confidential.
5. One month after completing the post-test you will receive an email with a link to the post-survey via Survey Monkey. This will ask if you are using any health literacy strategies or interventions in your practice, your thoughts on the education you received, and if you have noticed any changes in outcomes for PACE participants. This will take two to five minutes to complete. All responses will remain confidential.

You will have two weeks to complete items 1 through 4, and one week to complete item 5.

Risks and Benefits: I do not anticipate any risks to you for participating in this project other than those encountered in everyday life.

The direct benefits that you should expect to receive from taking part in this project include improving your knowledge of health literacy and the challenges that individuals with low health literacy face, increased awareness and understanding of the recommended strategies and interventions that you can use in your practice, and the ability to utilize strategies and interventions in your practice. This will help to build on the excellent care that you already provide.

Possible benefits to PACE participants include improving communication for individuals with poor health literacy and increasing the quality of care they receive.

Compensation: You will not receive any financial compensation for being part of this project. You will receive one hour of continuing education when you complete the online learning module through the New York New Jersey Public Health Training Center.

Confidentiality: The records of this project will be kept private. In any sort of report that I might publish, I will not include any information that will make it possible to identify a project participant. Records will be stored securely on a password secured computer and password secured excel spreadsheets, and only the project leader will have access to the records. I may share the data that I collect from you for use in future research studies or with other researchers; if I share any of the data that I collect about you, I will remove any information that would identify you, if applicable, before I share the data.

Survey Monkey will be used to collect the information in the pre-test, post-test, and post-survey. Each participant will be randomly assigned a unique number which they will enter in each test and survey. Only the project leader will have access to the results. The data will be protected on secure systems and all data collected will be destroyed after 5 years as required by Federal law.

Voluntary Nature of the Project: Participation in this project is voluntary. Your decision whether to participate will not affect your current or future relations with [Redacted]. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

How to Withdraw from the Project: If you choose to withdraw from the project, please contact the project leader at the email address/phone number included in the next paragraph. Should you
choose to withdraw, data collected from you will be destroyed immediately and will not be included in the project.

Contacts and Questions: The project leader conducting this project is Esther Carpenter BSN, RN. You may ask any questions you have now. If you have questions later, you are encouraged to contact her at [contact information] or [contact information]. You may also contact the project leader’s faculty advisor at [contact information].

If you have any questions or concerns regarding this project and would like to talk to someone other than the project leader, you are encouraged to contact the Institutional Review Board, [contact information], or email at [contact information] or [contact information].

Statement of Consent: I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the project.

(NOTE: DO NOT AGREE TO PARTICIPATE UNLESS IRB APPROVAL INFORMATION WITH CURRENT DATES HAS BEEN ADDED TO THIS DOCUMENT.)

________________________________________  ______________________________________
Signature of Participant                          Date
Appendix K

Pre-Test

We would like to get a sense of the knowledge and understanding you have about health literacy. Please complete this brief quiz that assesses some key facts about health literacy.

1. Limited health literacy is associated with:
   A. Higher mortality rates
   B. Lower levels of health knowledge
   C. Greater use of inpatient and emergency department care
   D. Poor medicine adherence
   E. B and D
   F. All of the above

2. You can tell how health literate a person is by knowing what grade he or she completed.
   A. True
   B. False

3. Which of the following skills are considered to be components of health literacy?
   A. Ability to understand and use numbers
   B. Reading skills
   C. Speaking skills
   D. Ability to understand what is said
   E. Writing skills
   F. All of the above

4. Being anxious affects a person’s ability to absorb, recall, and use health information effectively.
   A. True
   B. False

5. What is the average reading level of U.S. adults?
   A. 4th-5th grade
   B. 6th-7th grade
   C. 8th-9th grade
   D. 10th-11th grade
   E. 12th grade

6. What is the grade level at which health-related information (like a diabetes brochure) is typically written?
   A. 4th-5th grade
   B. 6th-7th grade
   C. 8th-9th grade
   D. 10th grade or higher
   E. 11th grade or higher
   F. 12th grade or higher
   G. College level

7. What is the best reading level for written material used with patients?
   A. 3rd-4th grade
   B. 5th-6th grade
8. To use good health literacy practices, staff and clinicians should use which of the following words/phrases when talking to or writing instructions for a patient or family member?

Circle the word/phrase in either Option 1 or 2 in each row

<table>
<thead>
<tr>
<th>Option 1</th>
<th>OR</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Bad</td>
<td></td>
<td>b. Hypertension</td>
</tr>
<tr>
<td>d. You have the flu.</td>
<td></td>
<td>e. The cardiologist is Dr. Brown.</td>
</tr>
<tr>
<td>f. Your appointment is at 11:00 AM. Check in 20 minutes early.</td>
<td>OR</td>
<td>Your flu test was positive.</td>
</tr>
</tbody>
</table>

9. It is a good health literacy practice to assume that each patient you communicate with has limited health literacy.
   A. True
   B. False

10. What strategies could all of us adopt to minimize barriers and misunderstanding for patients?

11. The unique number that was provided to you in the instruction email: ______________

12. Your job title: ______________

13. How many years of experience you have: ______________

14. Your gender:
   C. Male
   D. Female
Appendix L

Post-Test

We would like to get a sense of the knowledge and understanding you have gained about health literacy from the educational intervention. Please complete this brief quiz.

1. I attest that I have completed the health literacy educational intervention including the PowerPoint presentation and the accompanying online learning module.
   A. Yes
   B. No

2. Limited health literacy is associated with:
   A. Higher mortality rates
   B. Lower levels of health knowledge
   C. Greater use of inpatient and emergency department care
   D. Poor medicine adherence
   E. B and D
   F. All of the above

3. You can tell how health literate a person is by knowing what grade he or she completed.
   A. True
   B. False

4. Which of the following skills are considered to be components of health literacy?
   A. Ability to understand and use numbers
   B. Reading skills
   C. Speaking skills
   D. Ability to understand what is said
   E. Writing skills
   F. All of the above

5. Being anxious affects a person’s ability to absorb, recall, and use health information effectively.
   A. True
   B. False

6. What is the average reading level of U.S. adults?
   A. 4th-5th grade
   B. 6th-7th grade
   C. 8th-9th grade
   D. 10th-11th grade
   E. 12th grade

7. What is the grade level at which health-related information (like a diabetes brochure) is typically written?
   A. 4th-5th grade
   B. 6th-7th grade
   C. 8th-9th grade
   D. 10th grade or higher
   E. 11th grade or higher
   F. 12th grade or higher
   G. College level
8. What is the best reading level for written material used with patients?
   A. 3rd-4th grade
   B. 5th-6th grade
   C. 7th-8th grade
   D. 9th-10th grade
   E. 11th-12th grade

9. To use good health literacy practices, staff and clinicians should use which of the following words/phrases when talking to or writing instructions for a patient or family member?

   Circle the word/phase in either Option 1 or 2 in each row

   **Option 1**                          **OR**                         **Option 2**
   a. Bad                               OR  Adverse
   b. Hypertension                      OR  High Blood Pressure
   c. Blood Glucose                     OR  Blood Sugar
   d. You have the flu.                 OR  Your flu test was positive.
   e. The cardiologist is Dr. Brown.    OR  The heart doctor is Dr. Brown.
   f. Your appointment is at 11:00 AM. Check in 20 minutes early.
      OR  Arrive at 10:40 AM to check in.

10. It is a good health literacy practice to assume that each patient you communicate with has limited health literacy.
    A. True
    B. False

11. What strategies could all of us adopt to minimize barriers and misunderstanding for patients?

12. The unique number that was provided to you in the instruction email: ______________

13. Your job title: ______________

14. How many years of practice you have: ______________

15. Your gender:
    A. Male
    B. Female
Appendix M

Post-Survey

1. Did you find the health literacy educational intervention helpful?
   A. Yes
   B. No

2. In the last month, have you utilized any of the health literacy strategies and interventions in your practice? List any used below.

3. In the last month, have you noticed any changes in the outcomes of PACE participants such as but not limited to increased medication/care plan adherence, improved self-care activities, and/or improved understanding of information?
   A. Yes
   B. No
   If yes, please list the changes you have seen:

4. The unique number that was provided to you in the instruction email: ______________

5. Your job title: _____________

6. How many years of practice you have: ______________

7. Your gender:
   A. Male
   B. Female