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Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: an Online Education Program for Nurse Practitioners

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ADDRESSING HEALTH LITERACY NEEDS OF THE OLDER ADULT
FOCUSED ON IMPROVING MEDICATION ADHERENCE:
AN ONLINE EDUCATION PROGRAM FOR
NURSE PRACTITIONERS

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ABSTRACT

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As healthcare providers, nurse practitioners are tasked with assuring patients have a clear understanding of their medical health, know how to navigate the healthcare system, and recognize the need to develop self-care skills. Several populations are known to be at risk for the effects of inadequate health literacy; however, the older adult population is at greater risk because of increased burdens related to negative effects of aging on cognitive skills and increased prevalence of chronic disease requiring complex medication regimens. Inadequate health literacy has been linked to increased risk of hospitalizations, emergency room visits, adverse drug reactions and interaction, and increased morbidity and mortality in the older adult population. With over half of older adults identified as having inadequate health literacy, the risk in the older adult population needs to be more adequately addressed. Current health literacy recommendations include the use of universal precautions when assessing for every individual's understanding of current treatments; however, evidence showed that healthcare providers might not have adequate health literacy education to know how to implement health literacy-sensitive interventions.

The older adult population has unique needs regarding health literacy that require adaptations to health literacy-sensitive interventions to best meet this population's needs.

To address this gap, the goal of this scholarly project was to develop an educational

program, which four nurse practitioners completed, that focused on evidence-based,

tangible health literacy-sensitive interventions that would best address the unique needs

of the older adult population, specifically addressing medication adherence. The program

was developed using the evidence-based *Agency of Healthcare Research and Quality*

Universal Precautions Health Literacy Toolkit (2015) to deliver core health literacy

education, helping to identify and address the needs of the older adult population.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The World Health Organization (cited in Nutbeam, 1998) defined health literacy as "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health" (p. 357). Early conceptions of health literacy were tied to an individual's ability to read, write, and understand numeracy. While health literacy is closely related to literacy, the two terms are not necessarily interchangeable (U.S. Department of Health and Human Services [HHS], 2010). Health literacy is even more complex and requires a person have more than basic literacy and numeracy skills; it also requires a person to have an understanding of their "body, healthy behaviors, and the workings of the health system" (HHS, 2010, p. 5).

Additionally, an early conception of health literacy included the belief the educational grade level completed by the individual was equivalent to their health literacy skills; however, "approximately 45 percent of high school graduates have limited health literacy" (HHS, 2010, p. 5). As healthcare providers, it is easy to assume an individual's health literacy is higher if it is based solely on a patient's completed grade level. Many other confounding variables that influence health literacy require consideration. Language, culture, age, socioeconomic status, previous experiences, cognitive abilities, and a person's mental health can all affect an individual's health literacy level (HHS, 2010). These confounding variables make addressing health literacy needs complex and

require the use of multidisciplinary strategies from not only healthcare professionals but also the media, policymakers, and educators. However, as healthcare providers, there are always opportunities for making significant impacts on patients' lives and helping them make informed healthcare decisions.

It is important that healthcare providers/nurse practitioners provide individualized and centered care for each patient. Creating a relationship of trust allows for individuals to share their true needs regarding their health care and not be concerned about judgments. Additionally, providers should use evidence-based health literacy interventions to meet patients where they are and feel empowered to develop and increase their health literacy skills. In the *National Action Plan to Improve Health Literacy* (HHS, 2010), two primary visions regarding health literacy were simple:

1. Everyone has the right to health information that helps them make informed decisions

2. Health services are delivered in ways that are understandable and beneficial to health, longevity, and quality of life. (p. 16)

When developing the action plan, HHS (2010) identified several populations who are vulnerable to having inadequate health literacy: non-White race or ethnic groups, recent refugees and immigrants, individuals with less than a high school degree or general equivalency diploma, those at or below the poverty level, non-native English-speakers, and older adults. The older adult population is one of the fastest growing populations within the United States (National Council on Aging [NCOA], 2018). While inadequate health literacy can affect individuals of all age groups, Cutilli, Simko, Colbert, and Bennett (2018) reported 59% of older adults had inadequate health literacy. Older

adults also have a high prevalence of chronic disease (Centers for Disease Control and Prevention [CDC], 2018b). The percentage of older adults on polypharmacy regimens (five or more medications) increased from 12.9% in 1988 to 39% in 2010 (Charlesworth, Smit, Lee, Alramadhan, & Odden, 2015). With the effects of aging including cognitive decline, increases in visual and hearing deficits (Speros, 2009), and the increased prevalence of chronic disease requiring daily self-care management (Bazargan et al., 2017; Soones et al., 2016), older adults with inadequate health literacy are at a greater risk for poor health outcomes (Cutilli et al., 2018). Their unique health literacy needs are crucial for healthcare providers to understand and address to help mitigate preventable adverse outcomes.

Background and Significance

Health Literacy Levels

The National Assessment of Adult Literacy (NAAL; cited in Kutner, Greenberg, Jin, & Paulsen, 2006) was the first study to investigate the issues of health literacy through assessment of more than 19,000 adults categorized as 16 years of age and older in the United States. Health literacy was categorized into four main groups: proficient, intermediate, basic, and below basic. Categories were determined through an assessment of an individual's skills regarding prose literacy, document literacy, and quantitative literacy. According to Kutner et al. (2006), those three different types of literacy were as follows:

- Prose literacy assesses the individual's ability to search, comprehend, and use information from organized sentences or paragraphs such as stories or brochures

- Document literacy assesses the individual's ability to search, comprehend, and use information from noncontinuous text such as forms or nutritional labels

- Quantitative literacy assesses the individual's ability to use numbers within the text to compute daily tasks such as checkbook balancing or calculating a medication dose from over the counter medication listing.

National Assessment of Adult Literacy's
Health Literacy Definitions

Proficient. Individuals achieving a proficient health literacy level are able to read, understand, and problem-solve using lengthy prose texts, complex documents, and can find more abstract quantitative information across documents.

Intermediate. Individuals achieving an intermediate level can read, understand, and problem-solve using less lengthy prose texts.

Basic. Individuals achieving a basic level can read, understand, and locate information from short, simple documents. They are able to make easy inferences and simple arithmetic calculations including add, subtract, multiply, and divide.

Below basic. Individuals achieving a basic level might be nonliterate in English and have very basic skills to identify short prose text and simple documents. They can follow basic instructions and can do basic mathematics calculations such as addition or subtraction; however, the information would need to be more concrete with limited need to make inferences.

National Assessment of Adult Literacy
Report Findings

The NAAL (Kutner et al., 2006) report found the majority (53%) of adult participants fell into the intermediate level of health literacy while only 12% were found to have the highest level of health literacy--proficient. According to Kutner et al. (2006), 22% of participants were found to have basic health literacy with 12% of participants having below basic health literacy.

The NAAL (Kutner et al., 2006) revealed several more vulnerable populations having inadequate health literacy: adult individuals living at or below the poverty level, any race or ethnicity other than non-Hispanic White, less than high school education, non-English speakers, refugees or immigrants to the United States, and older adults. Significantly, in this study, older adults had lower health literacy scores when compared to younger age groups. The average score for older adults was just 214, which placed them into the basic health literacy category; a lower percentage of participants ages 65 and older (38%) met the intermediate level of health literacy compared to younger adult age (53-58%) groups (Kutner et al., 2006). Twenty-nine percent of older adults fell into the below basic health literacy category, another 30% met the basic level, while only 3% met the proficient level of health literacy (Kutner et al., 2006).

Older Adults

Currently, there are an estimated 49 million older adults within the United States with a projected 98 million by the year 2060 (NCOA, 2018). In just over 10 years, all individuals of the baby boomer generation will be 65 years or older. According to the HHS (2010), older adults are at greater risk of having lower health literacy levels. In 2003, the National Assessment of Adult Literacy (NAAL; cited in Kutner et al., 2006)

provided the first assessment of health literacy, finding 59% of older adults had inadequate health literacy skills. Based on current older adult population estimates and applying the findings of the NAAL, nearly 28 million older adults are likely to have inadequate health literacy with an anticipated increase to just over 57 million older adults who will be at risk for inadequate health literacy by the year 2060. Inadequate health literacy in older adults has been linked to an increased incidence of preventable hospitalizations, emergency room use, and decreased use of preventative healthcare such as immunizations, screenings, and lifestyle management (Baker et al., 2007; Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; MacLeod et al., 2017; Sudore et al., 2006b; Tschaftary, Hess, Hiltner, & Oertelt-Prigione, 2018). Older adults with inadequate health literacy have also been found to have a higher incidence of poorer overall health status and higher mortality rates (Baker et al., 2007; Sudore et al., 2006b). Sudore et al. (2006a) suggested health literacy "may be an independent risk factor for health disparities in older people" (p. 770).

Older Adult Health Trends

Characteristically, older adults in the United States are living longer but are also increasingly tasked with managing chronic diseases. On average, an adult at 65 years of age is expected to live 19.4 additional years (CDC, 2017b). While there have been improvements in the prevention of disabilities, older adults are more likely to be affected by chronic disease than other populations. According to the CDC (2018b), the prevalence of having multiple chronic diseases in those over the age of 65 years within the United States is three in four older adults. The NCOA (2018) reported 80% of older adults have at least one chronic illness and approximately 70% of Medicare beneficiaries

have two or more chronic illnesses. The most common chronic diseases affecting the

older adult population include diabetes, cancer, heart disease, hypertension, stroke,

chronic obstructive pulmonary disease, and arthritis (Federal Interagency Forum on

Aging-Related Statistics, 2016).

Chronic Disease Burden in
Older Adults

Diabetes. The CDC (2017a) reported approximately 12 million older adults had

diabetes in 2015, which accounted for 25.2 % of the older adult population. Another 23.1

million (48.3%) older adults had a diagnosis of prediabetes in 2015 (CDC, 2017a).

Twenty-three percent of older adults, ages of 65-74, and 29.2% of older adults, 75 years

of age or older, had some form of cancer diagnosis compared to just 9.9% of adults

between the age of 45-64 years and 2% of adults between the ages of 18-44 (Blackwell &

Villarroel, 2018). According to the CDC (2015b), the term *heart disease* encompasses a

broad range of disease processes including coronary artery disease, acute coronary

syndrome, angina, congestive heart failure, arrhythmias, atherosclerosis, congenital heart

defects, rheumatic heart disease, aortic aneurysm, and peripheral artery disease.

Although there has been a slight decrease in the percentage of older adults with heart

disease, 28.9% of older adults had a heart disease diagnosis in 2015-2016 compared to

31.8% in 1997-1998 (National Center for Health Statistics, 2018). Consequentially, heart

disease followed by cancer were the top two leading causes of death in the older adult

population in 2016 (National Center for Health Statistics, 2018). Hypertension is the

most commonly seen chronic disease in older adults; approximately 70% of older adults

had a hypertension diagnosis in 2014 (Ritchey et al., 2016). Of the older adults with

hypertension, Ritchey et al. (2016) reported, "Only about half of whom have their blood

pressure controlled (i.e., <140/90 mmHg)" (p. 967). According to the Federal

Interagency Forum on Aging-Related Statistics (2016), between 2013-2014,

approximately 8% of older adults reported a history of stroke, chronic bronchitis or

emphysema affected 8.1 % of older adults, and 49% of older adults reported being

affected by arthritis.

**Inadequate Health Literacy's Effect
on Chronic Disease**

Sudore et al. (2006a) found older adult patients with inadequate literacy levels

were also more likely to have chronic diseases including hypertension, diabetes, obesity,

and depression. Individuals with inadequate health literacy have been found to have less

knowledge about their chronic illnesses (Al Sayah, Majumdar, Williams, Robertson, &

Johnson, 2013; Gazmararian, Williams, Peel, & Baker, 2003; MacLeod et al., 2017;

Peterson et al., 2011; Sudore et al., 2006a; Williams, Baker, Parker, & Nurss, 1998).

When individuals have inadequate health literacy, they are more likely to struggle with

making decisions about their healthcare needs and have worse disease self-management

(MacLeod et al., 2017; Sudore et al., 2006a). Individuals with inadequate health literacy

are also more likely to have chronic diseases that are uncontrolled (Gazmararian et al.,

2003). Chronic disease management can be complicated, requiring frequent monitoring

by primary care and specialty care providers, complex medication regimens, and, most

importantly, day-to-day self-care management.

Accessing health care. With the increase in the older adult population, so will

the need for older adult patients to access health care. In 2015, the National Ambulatory

Medical Care Survey (cited in Rui & Okeyode, 2015) found 45.3% of office visits by

older adults were for a chronic problem while preventative care only accounted for 14.2%

of office visits. Another 24.2% of office visits were for a new problem and 7% of office visits were for a flare-up of a chronic problem (Rui & Okeyode, 2015).

Inadequate health literacy often leads to delayed access to health care. According to Levy and Janke (2016), older adults with inadequate health literacy were most concerned with their inability to afford health care they needed. While individuals with inadequate health literacy were less likely to report they were too busy to go to a provider appointment compared to those with adequate health literacy, they struggled in other ways (Levy & Janke, 2016). More commonly, transportation issues, difficulty finding a provider, fear of what would be told to them, and long waits once arriving at the office were some self-reported barriers to accessing health care (Levy & Janke, 2016).

Medication adherence. An additional concern for the older adult population has been medication adherence for chronic disease management. While medication non-adherence is considered multifactorial, the component of health literacy is one that can be mitigated. In a study assessing the effect of health literacy on medication adherence, Parekh, Ali, Davies, and Rajkumar (2018) found inadequate health literacy accounted for a 26% increased risk in mortality when assessing for a participant's ability to read medication instructions compared to those with adequate health literacy. Commonly, older adult patients need management for multiple chronic diseases, resulting in polypharmacy regimens (Charlesworth et al., 2015). Older adults are taking more medications now compared to 20 years ago. Charlesworth et al. (2015) reported the median number of medications older adults are taking has doubled from two to four between 1988 and 2010. The percentage of older adults who are on polypharmacy regimens tripled from 12.6% to 39.0% between 1988 and 2010, respectively

(Charlesworth et al., 2015). As older adults age, the percentage of patients with polypharmacy has increased even more. In a study by Bazargan et al. (2017), the researchers found older adult African American participants took an average of 5.7 medications, supporting Charlesworth et al.'s (2015) findings.

Older adults are at greater risk for adverse outcomes of medication non-adherence compared to younger populations. According to Mayo-Gamble and Mouton (2018), "Medication non-adherence accounts for 26% of hospital admissions, almost 25% of nursing home admissions, and 20% of preventable drug events in community settings" (p. 1125). Additionally, Mayo-Gamble and Mouton shared that the older adult population is at greater risk for more serious consequences of medication non-adherence compared to younger populations. On average, "only 50% to 60% of patients take their prescribed medications correctly, while those with limited health literacy are more likely to get confused about their medication regimen" (Mayo-Gamble & Mouton, 2018, p. 1124). Bazargan et al. (2017) and Soones et al. (2016) discussed the more complex a medication regimen was, the greater the risk for non-adherence and associated hospitalizations.

Considering Older Adults with
Inadequate Health Literacy

While it is likely the majority of health literacy-sensitive interventions within the Agency of Healthcare Research and Quality (AHRQ; Brega et al., 2015) *Health Literacy Universal Precautions Toolkit* could be successfully applied in the older adult population, research suggested providers need to focus on tailoring the interventions to the older adult population (Brooks, Ballinger, Nutbeam, & Adams, 2017; Kripalani et al., 2006; Lê, Terry, & Woodroffe, 2013; MacLeod et al., 2017; Ruppar, Conn, & Russell, 2008;

Wali, Hudani, Wali, Mercer, & Grindrod, 2016; Wannasirikul, Termsirikulchai, Sujirarat, Benjakul, & Tanasurgarn, 2016).

A study by Brooks et al. (2017) found older adults with inadequate health literacy desired to build relationships with their provider and felt they could trust them. Brooks et al. discussed how the concept of relationship building had not necessarily been discussed previously in the literature and appeared to be an important component when addressing health literacy needs. Additionally, Brooks et al.'s study found older adults preferred face-to-face interactions when obtaining health information. Understanding the older adult population is an important consideration when providing education in a progressively moving electronic age. A study by Wortz et al. (2012) also found 62% of older adult participants with chronic obstructive pulmonary disease desired to have improved communication with their providers and to learn ways in which they could improve their self-care management. Wortz et al.'s (2012) study found older adult patients were confused and frustrated with their lack of disease understanding.

Older adults with inadequate health literacy are at greater risk of having adverse outcomes, particularly when it relates to medication adherence self-care practices (Federman et al., 2013; Jones, Treiber, & Jones, 2014; Mayo-Gamble & Mouton, 2018; Parekh et al., 2018; Soones et al., 2016). As healthcare providers, there is a potential of making incorrect assumptions regarding a patient's compliance with prescribed treatments if his/her health literacy skills are not considered. Healthcare providers' incorrect assumptions regarding a patient's understanding, motivations, and, ultimately, his/her health literacy abilities could contribute to an adverse outcome including medication errors, increased hospitalizations, emergency room visits, morbidity, and

mortality. Additionally, for older adults, contributing factors of cognitive impairments, visual or hearing impairments, and previous paternalistic healthcare provider experiences might exacerbate their health literacy struggles.

Aging has been associated with a decline in health literacy (Baker, Gazmararian, Sudano, & Patterson, 2000; Chesser, Woods, Smothers, & Rogers, 2016; Speros, 2009; Wolf, Feinglass, Thompson, & Baker, 2010). Both cognitive and physical changes result in an older adult's changes in health literacy. Sometimes, patients require additional support from caregivers such as family, friends, or hired support (Speros, 2009). However, Speros (2009) discussed how implementing caregiver support was when older adults were not able to perform self-care activities, which could also increase the risk for a further decline in their ability to manage their own healthcare needs if there was no focus on helping them return to self-care management. Cognitive decline has been strongly associated with lower health literacy levels (Federman, Sano, Wolf, Siu, & Halm, 2009). Older adults with inadequate health literacy are at three to five times at greater risk for impaired memory and verbal fluency compared to those with adequate health literacy levels (Federman et al., 2009). Improving health literacy might help older adults better compensate for their decline in cognitive functioning. Physical deficits, such as visual and hearing losses, could also play a role in the ability of older adults to adequately gain, understand, and use health information (Speros, 2009). Older adults might try to compensate by lip reading, turning their head in an effort to hear, or pretending they understand what is being said during a patient-provider interaction. These physical barriers can often be frustrating to the older adult and require recognition by practitioners to tailor education needs to address these barriers.

The Federal Interagency Forum on Aging-Related Statistics (2016) reported a steady increase in the older adult population regarding those who were high school graduates. Overall, between the years of 1965 and 2015, the percentage of older adults who were high school graduates rose from 24% to 84%, respectively. Despite these increases, it was still necessary to be cautious when considering the use of translated school level completion into health literacy level. Within the older adult population, the non-Hispanic White (89%) population had the highest percentage of high school graduates compared to Black (75%), Asian (74%), or Hispanic (54%) populations.

Older adults in the United States have seen a steady decline in the rates of those living below the poverty line. In 2014, 10% of the population was living below the poverty line compared to 29% in 1966 (Federal Interagency Forum on Aging-Related Statistics, 2016). However, racial and sex disparities were also present within the older adult population when assessing poverty. Of those within the older adult population, non-Hispanic White men (5%) were the least likely to live in poverty while Hispanic (20%) and Black women (21%) were the most likely to live in poverty in 2014 (see Figure 1).

25

20

15

10

5

0

Non-Hispanic White   Black   Asian   Hispanic

5   10   17   21   13   16   16   20

■ Non-Hispanic White Men
■ Non-Hispanic White Women
■ Black Men
■ Black Women
■ Asian Men
■ Asian Women
■ Hispanic Men
■ Hispanic Women
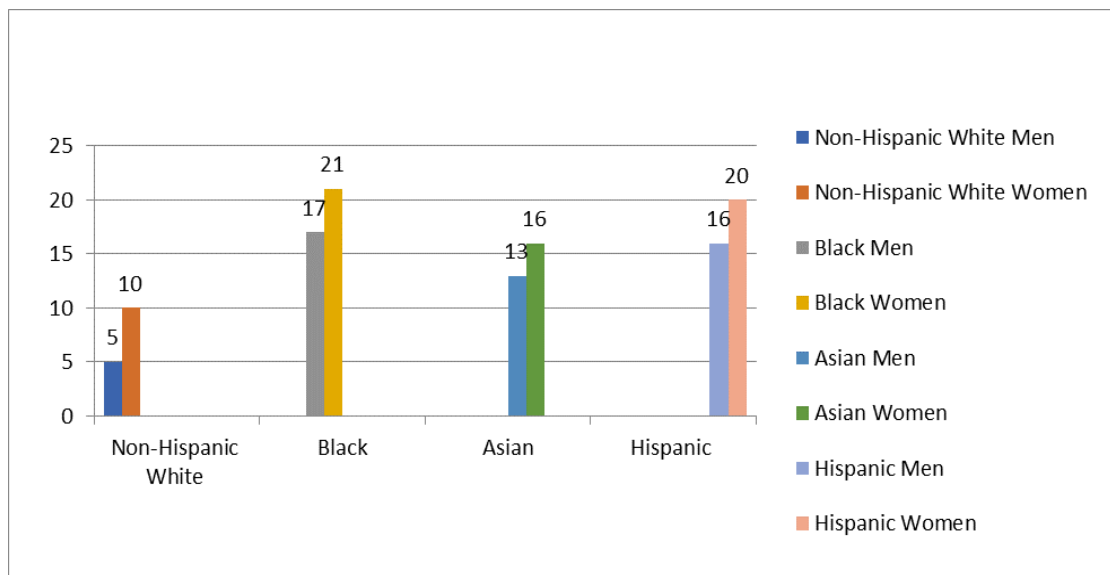
Figure 1. Older adults' poverty level based on race and sex (Data adapted from the Federal Interagency Forum on Aging-Related Statistics, 2016).

Financial Burden of Inadequate Health Literacy

According to Vernon, Trujillo, Rosenbaum, and DeBuono (2007), the burden associated with limited health literacy has been estimated to range between $106 billion and $238 billion annually in the United States. In 2009, Eichler, Wieser, and Brugger published a systematic review assessing the cost of limited health literacy. Within the systematic review, Eichler et al. found between 3 and 5% of total health care costs could be attributed to limited health literacy. In 2017, Hudson, Rikard, Staiculescu, and Edison published a commissioned report called *Improving Health and the Bottom Line: The Case for Health Literacy.* Within the report, Hudson et al. estimated $3.5 trillion would be spent on health care based on the CDC's 2016-2025 national health expenditure projections. Hudson et al. then applied a previous projection model by Eichler et al. (2009) of health literacy costs to project a potential cost savings of $105 to $175 billion per year if health literacy needs were more adequately addressed.

A recent retrospective study by Haun et al. (2015) reviewed the utilization of health care and costs within the Veterans Health Administration. In their study, Haun et al. found of the 92,749 veterans, those with inadequate to marginal health literacy were estimated to spend $143 million more over three years than veterans with adequate health literacy. The percentage of veterans who fell into the marginal or inadequate health literacy categories was only 17%. The authors suggested using interventions designed to meet the needs of those veterans with inadequate to marginal health literacy could result in a cost savings of approximately 8% of the total three-year cost.

Mitchell, Sadikova, Jack, and Paasche-Orlow (2012) found patients with inadequate health literacy were more likely to be readmitted to emergency rooms or hospitals within 30 days than those with adequate health literacy levels: "1.71 times more likely to be readmitted to the emergency department ($p < .05$) and 1.67 (95% CI [0.98, 2.83], $p < .06$, times more likely to be readmitted into the hospital within 30 days of index admission" (p. 334). Mitchell et al. found an individual's health literacy was an independent predictor of hospital utilization in patients readmitted within 30 days of discharge. These findings contributed to the need for adequately addressing health literacy needs and ensuring outpatient follow-up especially in those with inadequate health literacy.

Financial Burden of Medication Non-Adherence

Bazargan et al. (2017) reported medication non-adherence likely costs over $170 billion annually in the United States. Costs were largely associated with increased morbidity and mortality and healthcare costs (Bazargan et al., 2017; Lemstra, Nwankwo, Bird, & Moraros, 2018). Lemstra et al. (2018) reported even higher estimates of $270

billion for nonadherence of chronic disease medication regimens. According to Mayo-Gamble and Mouton (2018), approximately 26% of hospital admissions and almost 25% of nursing home admissions were a result of medication non-adherence in older adults. Berkman et al. (2011) reported patients with inadequate health literacy were found to have a poorer ability to take medications appropriately. Berkman et al. (2011) discussed how one study found patients with inadequate health literacy and coronary heart disease were "less likely to identify all of their medications" (p. 99).

Healthcare Provider Health Literacy Practices

Like other healthcare providers, nurse practitioners need to be able to understand and use a variety of health literacy tools to best address each patient's health literacy needs. While there has been a call to action through the publishing of the *National Action Plan to Improve Health Literacy* (HHS, 2010), nurse practitioners' education institutions might not have added health literacy education into the curriculum as yet. However, practicing nurse practitioners are also likely to be lacking adequate education regarding health literacy and evidence-based interventions that should be implemented for those with low health literacy. Focusing on helping nurse practitioners increase their health literacy knowledge and implement health literacy-sensitive interventions have implications for improving health outcomes including reducing the use of hospital and emergency room services, reducing medication-related adverse outcomes, and improving overall health in older adults (Cho, Lee, Arozullah, & Crittenden, 2008).

Liang and Brach (2017) analyzed health literacy practices in the United States through use of the AHRQ's (2017) *Medical Expenditure Panel Survey--Household Component*. The study found while there have been significant increases in the

recommended universal precautions between 2011 and 2014, only 29% of patient

respondents reported having their provider using the teach-back method during their visit

and 70% of respondents reported their providers gave them easy to understand

instructions. Only 17% of respondents reported being offered help with filling out forms.

Encouraging data were reported by Liang and Brach (2017) study, indicating

respondents who were 75 years of age or older were 45.6% more likely to be offered

assistance with filling out forms compared to participants between the ages of 25 and 44

years ($p < .001$). Additionally, universal precaution interventions might be reaching

some portions of vulnerable populations needing them. However, if the

recommendations are for all patients to receive universal precautions, there is still a long

way to go. Recommendations by Liang and Brach included the suggestion that providers

make greater efforts to reach those with poor physical or mental health until universal

precautions can be fully implemented into the healthcare arena. Additionally, Liang and

Brach recommended increasing a provider's health literacy skills and having healthcare

organizations integrate health literacy practices into everyday practice.

Similar survey data to the AHRQ's (2017) *Medical Expenditure Panel Survey--*

Household Components were the Consumer Assessment of Health Care Providers and

Systems (CAHPS®; Clancy, Branch, & Abrams, 2012). The CAHPS collects data from

consumers of health care to assess how each provider, clinic, and organization were

doing related to the patient experience (Clancy et al., 2012). Specific questions related to

health literacy made it possible for healthcare providers to know if their interventions

provided health literacy-sensitive interventions. Components assessing health literacy

included questions regarding provider-patient communications, provider explanations of

health items in ways patients could understand, medication instructions in ways patients could understand, and whether patients were offered help with filling out forms. Having the CAHPS in place within clinics increased the need for practitioners to have increased skills in addressing health literacy needs of their patients. A study by MacLeod et al. (2017) assessed older adult patient responses through the CAHPS regarding their satisfaction with their healthcare providers. MacLeod et al. found older adult patients who had inadequate health literacy were generally sicker and less satisfied with their health care including clinic, providers, specialists, and general healthcare experiences. The authors suggested that because of these patient responses, it was likely clinics should be providing more interventions to address the needs of patients with inadequate health literacy.

In a study by Schillinger et al. (2003), physician-patient interactions were assessed for the frequency providers assessed for diabetic patients' comprehension. Through direct observation of physician-patient interactions, researchers also assessed for the number of new concepts discussed during the interaction. A total of 74 physician-patient interactions were recorded and coded for common themes. The average age for participants was 64 years and the median Short Test of Functional Health Literacy in Adults (S-TOFHLA; Baker, Williams, Parker, Gazmararian, & Nurss, 1999) score was 12 or a fourth to sixth-grade reading level (Schillinger et al., 2003). Physicians introduced a total of 124 new concepts. In 61 of the visits, physicians conveyed a mean of two new concepts; more than half (56%) were related to medication management changes including starting, stopping, or changing administration instructions (Schillinger et al., 2003). It was found physicians only assessed for patient comprehension in 12

(20%) of the 61 visits that included new concepts. Of the 124 new concepts introduced

by physicians, only 15 (12%) concepts were assessed for patient comprehension

(Schillinger et al., 2003).

Additionally, when patients were asked to recall what the physician had

explained, 47% of the time patients responded incorrectly (Schillinger et al., 2003).

These findings reinforced the importance of assessing patient comprehension through the

teach-back method. However, one of the concerns expressed in another study (Soones et

al., 2016) was the amount of time that comprehension assessments might cause the visit

to increase; it was found not to be significantly different compared to one that did not

include an assessment of comprehension (20.3 vs 22.1 minutes; $p = .50$) in the Schillinger

et al. (2003) study.

One additional measure Schillinger et al. (2003) assessed was whether physician-

patient interactions were associated with improved glycemic control through assessing

the hemoglobin A_{1c} (HBA_{1c}) by comparing those patients whose comprehension was

assessed to those who did not have an assessment. Schillinger et al. found an

improvement in glycemic control in those with inadequate health literacy levels who

received an assessment of comprehension. However, limitations of this study included a

small sample size, consideration for other confounding variables could have contributed

to the glycemic control variations, and timing of when the HBA_{1c} was measured. An

important component of diabetes management includes assessing patient comprehension

of the plan. However, Schillinger et al.'s study showed the majority of physician-patient

interactions did not include an assessment of comprehension. It is important to note this

study was completed before the NAAL (2018) assessment that highlighted concerns

about inadequate health literacy, although the American Medical Association (cited in

Baker et al., 1996) was already starting to try to address health literacy needs.

Health Literacy Education in
Providers' Education
Programs

While there was minimal research about nurse practitioner health literacy

education, Coleman, Nguyen, Garvin, Sou, and Carney (2016) found of physician

residency programs surveyed, only 42% of respondent residency directors or residency

program coordinators reported having formal health literacy training as a requirement of

their programs. A total of 138 of 444 possible respondents completed the questionnaires.

The greatest barrier in those reporting not having a health literacy component as part of

their program was not having a "faculty authority on health literacy" (Coleman et al.,

2016, p. 53).

A study by Cafiero (2013) provided additional insight regarding baseline health

literacy knowledge of practicing nurse practitioners, their experiences with health

literacy, and intentions to implement health literacy-sensitive interventions. Cafiero's

study sample included nurse practitioners who were attending the American Academy of

Nurse Practitioners national conference and reported working in a primary care clinic

setting. Using the theoretical framework of the theory of planned behavior, Cafiero

developed an intention assessment tool called the Health Literacy Strategies Behavioral

Intention in an attempt to better understand nurse practitioners' intentions to implement

health literacy-related interventions.

Regarding health literacy knowledge of nurse practitioners, the findings of

Cafiero's (2013) study showed participants did have basic knowledge about health

literacy and were able to identify vulnerable populations. However, Cafiero noted participants were not able to identify older adults as having a higher prevalence of inadequate health literacy. Participants also recognized health literacy screening would be beneficial for patient teaching but more than half of the participants were not able to answer questions about specific screening tools included in the questionnaire. However, Cafiero noted the participant's recognition of inadequate health literacy might be more important than screening. Participants were also aware of recommended guidelines for simplified written materials but unaware of tools like the Fry method to check the level of written materials. There was also a gap in knowledge regarding ways to actively engage adult learners and ways to address different learning styles. Participants performed well on questions regarding strategies like teach-back.

A portion of participants' health literacy experience was evaluated using a previously validated survey called the Health Literacy Knowledge and Experience Survey, Part 2 (Cafiero, 2013); it focused on the nurse practitioner's educational experiences within his/her nurse practitioner program. Cafiero (2013) found nearly half of participants reported their program did not or only sometimes emphasized health literacy. However, at the time of Cafiero's data collection in 2011, *The National Action Plan to Improve Health Literacy* (HHS, 2010) in which the recommendations for educational institutions to incorporate health literacy education into their programs had only been published for one year. Nurse practitioner educational institutions might not have yet implemented the action plan recommendations into their curriculum.

Cafiero's (2013) study found that despite recommendations for the use of multiple forms of educational materials, participants reported most commonly using written

materials and a focus on cultural appropriateness. However, more than one-third of participants reported never or only sometimes checking the readability of the written materials (Cafiero, 2013). Based on the findings of the Cafiero study, nurse practitioners might benefit from additional education and support regarding alternative modes of education materials.

Finally, Cafiero (2013) found participants' intention to start using health literacy-sensitive screenings and interventions was high within the sample group. However, there were some concerns regarding the effects of external factors such as organizational policies and restrictions on time (Cafiero, 2013). Cafiero's recommendations included improving nurse practitioner's knowledge regarding health literacy concepts and strategies and allowing nurse practitioners the opportunity to complete competencies regarding best practices for providing patient education such as learning about alternative educational media formats. Lastly, nurse practitioners need to feel supported within their clinical practices to make positive changes that would improve care to those with inadequate health literacy.

When Cafiero (2013) completed her review of the literature, only four previous studies were found by the researcher, all of which were conducted before publishing of the *National Action Plan to Improve Health Literacy* by HHS in 2010. The majority of the studies found providers were not knowledgeable about the effects or prevalence of inadequate health literacy. Schlichting et al. (2007) reported healthcare providers, who included nurse practitioners, were aware of the prevalence of inadequate health literacy in populations for whom they provided care. A resounding 78% of the providers felt they

would benefit from training specific to health literacy-sensitive interventions. Support

for evidence-based communication strategies was echoed by Brooks et al. (2017).

Additional support for this project was found when considering the patient was

ultimately at greatest risk for the effects of inadequate health literacy. One of the key

themes seen in clinical practice regarding patients with inadequate health literacy was

confusion. Patients reported being given conflicting information from multiple providers.

While patients with adequate health literacy might be able to infer what they should do

with the conflicting information, those with inadequate health literacy might become

concerned and develop a mistrust of the healthcare system, especially if a bad outcome

occurred because of the confusion.

Health Literacy Screening

While health literacy screening is frequently used in research studies to assess

health literacy specific interventions or understand the effects of health literacy on

outcome measures, not enough evidence supports the implementation of health literacy

screening in the clinical setting. Recommendations have been made for health literacy

screening to identify those who would benefit from additional health literacy

interventions, e.g., care coordination and referrals to community-based support (Kale et

al., 2015; MacLeod et al., 2017; Woods & Chesser, 2017); however, health literacy

screenings have not been validated in the older population (Chesser et al., 2016). One

tool was recently pilot tested in a small sample ($n = 64$) of older adults using a Single

Item Screener (SIS; Bishop et al., 2016) question that asked individuals about their

confidence filling out forms and compared it to the validated S-TOFHLA. The SIS found

fewer participants (64.1%) had adequate health literacy compared to the S-TOFHLA

(93.8%), suggesting the SIS would overestimate the number of patients with inadequate health literacy 30% of the time (Woods & Chesser, 2017). At this point, the SIS would need additional testing to allow for validation of results in a larger sample size (Woods & Chesser, 2017).

However, Paasche-Orlow and Wolf (2008) explored the potential risks and benefits of literacy screening and found the potential for stigmatizing those individuals with inadequate health literacy might cause more harm than good. Cornett (2009) approached health literacy screening as a way to individualize patient education and utilize different materials such as videos, audio, demonstrations, or other visual materials. However, Cornett also discussed the shared concerns discussed by Paasche-Orlow and Wolf and how the provider's goal of screening for health literacy might result in a patient feeling shame.

Health Literacy Screening Tools

As of February 2019, 139 health literacy screening tools have been developed and are housed in a data repository called the Health Literacy Tool Shed (National Institutes of Health [NIH], 2019). The data repository allowed for researchers and providers to access validated health literacy screening tools that might be most appropriate within their study or clinic population.

While screening might not currently be recommended in clinical practice, an overview of the most common validated health literacy screening tools used in research included the Test of Functional Health Literacy in Adults (TOFHLA; Parker, Baker, Williams, & Nurss, 1995), the Rapid Evaluation of Adult Literacy in Medicine (REALM; Davis et al., 1991), the Newest Vital Sign (NVS; Weiss et al., 2005), and the Wide Range

Achievement Test-Revised (WRAT-R; cited in Chesser et al., 2016). Many of the health

literacy screening tools have been modified for research samples or shortened to reduce

the time of administration. However, original screening tools such as the TOFHLA can

be time-consuming, making them difficult to implement into clinical practices.

Additionally, each screening tool assesses variations of health literacy that also result in

variations in how health literacy levels are reported. The most commonly reported levels

of health literacy are adequate and inadequate or adequate, marginal, and inadequate.

Health Literacy Toolkits

Health literacy toolkits and action plans addressing different components of health

literacy have been developed by the AHRQ (2018) and Centers for Medicare and

Medicaid Services (CMS; 2010). Additionally, some states within the United States have

also developed health literacy toolkits that frequently link to different health literacy

programs including the AHRQ and CMS toolkits. The toolkits provide reference

guidelines to help organizations implement health literacy-sensitive interventions into

their clinical practices based on identified needs. Some toolkits are targeted toward

healthcare provider education and others are targeted toward individual patients and

communities. Additionally, in response to the call to action by the HHS (2010),

individual states have also focused on creating health literacy toolkits that support various

initiatives within the state.

Agency for Healthcare Research and
Quality Health Literacy Universal
Precautions Toolkit

DeWalt et al. (2011) published the first version of the *AHRQ Health Literacy*

Universal Precautions Toolkit to provide evidence-based guidance and tools to help

healthcare organizations make changes which better address individual health literacy needs. The second version of the *AHRQ Health Literacy Universal Precautions Toolkit* was updated by Brega et al. in 2015 to provide additional resources regarding referrals, survey templates, and ways in which primary care clinics could use the toolkit to meet specific organizational quality standards such as patient-center medical home certification. The toolkit provides a robust set of recommendations to address four domains needed in clinical practice: components of both written and spoken communication, self-management and individual empowerment, and supportive systems.

The AHRQ (2018) believes addressing health literacy should be applied as a universal precaution, i.e., much like the use of gloves, gowns, eye protection are considered universal precautions to protect against unknown pathogens. In 2004, the Institutes of Medicine (IOM) published *Health Literacy: A Prescription to End Confusion* that discussed the prominent role health literacy had in healthcare management. The AHRQ recognized that in order to improve health literacy, organizations and practitioners needed to change the way they communicated with all patients. Through the development of the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015), organizations could apply evidence-based health literacy tools into their practice, which could improve care for all patients, especially those with inadequate health literacy.

The AHRQ (2018) has developed 21 tools, all of which are included in the toolkit. Intended to be implemented into a primary care clinic, three tools can help an organization assemble a team that will focus on implementing tool components they identify as being needed in their clinic setting.

Seven tools focus on ways in which providers and office staff can improve spoken and written communications with individuals who are at risk of having low health literacy (AHRQ, 2018). Tools specific to improving spoken communications include interventions about clear communications, use of the teach-back method, patient follow-up, improvements in telephone access, brown bag medication reviews, addressing of language barriers, and consideration of cultural customs and beliefs (AHRQ, 2018). Interventions focused on written communications include helping organizations learn how to assess written material for health literacy levels and ways in which to best select patient education materials appropriate for different levels of health literacy (AHRQ, 2018).

Four tools focus on helping patients develop self-care management skills and also help empower them to ask questions of their practitioners (AHRQ, 2018). Patients need to feel comfortable and build a trusting relationship with their providers and clinic staff. The AHRQ (2018) toolkit emphasizes the importance of creating a shame-free environment that fosters asking questions. Another valuable component addressed in this section of tools is obtaining patient feedback on how easily the obtained information is to understand or concerns they have. Since the goal of this program is to improve communication and help patients to better care for themselves, it is an important component for organizations to understand. Additional tools are focused on shared-decision making through the development of action plans and reminder forms for health improvement, medication management, or disease management.

Lastly, there are tools focused on supporting individuals to increase their health literacy skills and helping connect them to both community and medical resources they

might need. One of the new tools in the second edition focuses on improving the referral

process to assist patients in easily navigating the healthcare system. Additionally, there

are components within the referral tool that discuss considerations of the most

appropriate referrals for patients based on the timeliness of referral appointments,

language barriers, and communication from specialist providers.

Centers for Medicare and Medicaid
Services Toolkit for Making
Written Materials Clear
and Effective

The CMS (2010) developed a health literacy toolkit focused on improving written

materials to have clear and concise content to address the needs of individuals with

inadequate health literacy. The *Toolkit for Making Written Materials Clear and Effective*

contains 11 parts to help writers of health information provide clear information to CMS

audiences (CMS, 2010). Organizations who care for Medicare and Medicaid populations

are not required by CMS to use this tool; however, most organizations use commercially

produced patient education. This toolkit contains a section focused on addressing the

needs of older adults and discusses cognitive and visual changes of aging that can affect

their comprehension of written communications (CMS, 2010).

Problem Statement

Addressing the needs of the older adult with inadequate health literacy continues

to be a growing concern. Older adults are living longer, have a significant burden of

chronic disease, and are starting to have polypharmacy regimens to address their chronic

diseases. The National Assessment of Adult Literacy (Kutner et al., 2006) found 59% of

the older adult population had inadequate health literacy. The burdens of inadequate

health literacy on older adults' health are well documented. Inadequate health literacy in

older adults has been linked to an increased incidence of preventable hospitalizations, emergency room use, and decreased use of preventative healthcare such as immunizations, screenings, and lifestyle management (Baker et al., 2007; Berkman et al., 2011; MacLeod et al., 2017; Sudore et al., 2006b; Tschaftary et al., 2018). It has been estimated that health literacy costs between $105 billion and $238 billion annually in the United States (Hudson et al., 2017; Vernon et al., 2007).

Despite recommendations for healthcare providers to adopt health literacy universal precautions (HHS, 2010), Liang and Brach (2017) reported just under 30% of patients were being asked to complete the teach-back method to providers while only 17% of patients were being asked if they needed help filling out forms. Observational studies assessing clinical use of teach-back revealed providers checked for comprehension in only 12% of visits containing new concepts (Schillinger et al., 2003). Healthcare practitioners were unaware of their patients' health literacy levels or about evidence-based practices and skills to address health literacy needs (Coleman, 2011; McCleary-Jones, 2016; Rajah, Hassali, Jou, & Murugiah, 2018). Coleman (2011) discussed while there has been an increase in health literacy curriculum in healthcare professional education, a lag exists regarding health literacy curriculum seen in nursing literature. Experienced nurse practitioners and nurses might not have been exposed to health literacy curriculum when they were obtaining their nursing education as the concept of addressing health literacy is relatively new in professional healthcare education (Coleman, 2011). Like other healthcare providers, nurse practitioners need to be better equipped to address the health literacy needs of all patients. However, it is even more crucial for the older adult population. Providing practicing nurse practitioners with

additional health literacy training is crucial to begin addressing the health literacy needs of the older adult population and help mitigate the risk of adverse outcomes associated with inadequate health literacy.

Purpose of the Project

The purpose of this DNP scholarly project was to provide an educational offering to nurse practitioners that increased their health literacy knowledge base and taught them simple, efficient, and meaningful interventions could be applied when caring for older adults with inadequate health literacy. Through the use of the AHRQ (2018) health literacy toolkit, the program could aid nurse practitioners in identifying and mitigating risks in the older adult population, especially when related to an individual's ability to manage his/her medications. While several vulnerable populations have been identified at risk for adverse outcomes related to inadequate health literacy, the older adult population is one with significant growth over the next four decades with 59% of older adults having inadequate health literacy (Cutilli et al., 2018). When compared to younger adult populations, older adults use their interactions with healthcare providers as their main source of obtaining health information (Cutilli et al., 2018). However, older adults with inadequate health literacy might not seek out health information, requiring health care providers to use initiation strategies with this population. With increases in risks for chronic disease and more complex management, older adults are at higher risk for adverse outcomes related to inadequate health literacy.

Gray, Turner, and Bentley (2010) summarized the need for this project best by saying:

Nurse practitioners must continually be creative in determining ways to assist patients in understanding their health problems and managing their complex treatment regimens. Awareness of the populations served and the barriers to treatment inherent in low health literacy are the first steps in meeting the challenge of medication non-adherence. (p. 24)

While many health literacy-sensitive interventions might appropriate for all patients, the focus of this project was for those interventions showing evidence to potentially improve outcomes of the older adult patients with inadequate health literacy.

Project objectives included

1. Assessing nurse practitioners' perceived knowledge regarding health literacy

2. Increasing nurse practitioners' awareness of signs of potential inadequate health literacy

3. Providing nurse practitioners with tangible health literacy-sensitive intervention skills and strategies for the older adult patient to potentially improve medication adherence

4. Assessing individual practitioner intention to implement and actual implementation of health literacy-sensitive intervention skills and strategies in their practices

5. Assessing for perceived facilitators and barriers to implementation of health literacy-sensitive interventions in clinical practice.

Population, Intervention, Comparison,
Outcome, and Time Statement

One population, intervention, comparison, outcome, and time (PICOT) question

guided this Doctor of Nursing Practice (DNP) scholarly project.

Q1   In nurse practitioners who provide care for the older adult population, will
an online education program about health literacy increase their
knowledge and intention to implement health-literacy sensitive
interventions into their practice when interacting with older adults?

Definitions

Health Literacy

The definition used for this scholarly paper was from the World Health

Organization (cited in Nutbeam, 1998). The World Health Organization's definition of

health literacy was "the cognitive and social skills which determine the motivation and

ability of individuals to gain access to, understand, and use information in ways which

promote and maintain good health" (Nutbeam, 1998, p. 357). In 2008, Nutbeam

published an article discussing the evolving conceptualization of health literacy. Two

different approaches to defining health literacy were discussed: the first as a risk factor

and the second as an asset. When approaching health literacy as a risk factor, the focus is

more about mitigating the risks associated with inadequate levels of health literacy.

However, approaching health literacy as an asset suggests health literacy is something

that can be built upon and supported in a way that allows the individual to become

empowered in his/her healthcare journey. Nutbeam (2008) discussed how health

education and communication become integral to an individual developing competencies

regarding his/her self-care and the way in which he/she interacts with healthcare systems.

The World Health Organization's definition adopted an asset approach. The goal of this

DNP scholarly project was to approach health literacy as an asset approach that fosters building up an individual's health literacy including interventions focused on clear oral and written communication, assessing for comprehension, and providing additional clarity. Additionally, patients need to be empowered to feel comfortable to ask questions when they do not understand or desire to learn more about their health and feel they can make informed decisions.

Health Literacy Universal
Precautions

According to the AHRQ (2018), health literacy universal precautions are defined as "steps that practices take when they assume that all patients may have difficulty comprehending health information and accessing health services" (para. 2). Health literacy universal precautions include avoiding the use of medical jargon and clearly communicating, assessing for comprehension, encouraging patient questions, and empowering patients to increase their health literacy. Organizations should be working toward helping individuals to more easily access and navigate the health care system (AHRQ, 2018). Additionally, increasing an individual's health literacy skills should be a focus of healthcare providers to improve a patient's ability to provide self-care and promote health.

Medication Adherence

According to Neiman et al. (2017), "Medication adherence is a complex behavior influenced by factors along the continuum of care, relating to the patient, providers, and health systems" (p. 1248). Many patient-related factors can be classified as intentional and unintentional including forgetfulness, health literacy skill level, cognitive abilities, financial decisions, beliefs and attitudes (Neiman et al., 2017). Nonadherence behaviors

signifying concern include missed dosages, not refilling prescription, taking more or less than prescribed, not taking according to instructions, stopping medication for period of time, or self-stopping medications before therapy has been completed (Bazargan et al., 2017; Mayo-Gamble & Mouton, 2018; Wannasirikul et al., 2016; Weiss et al., 2016). Providers also play a contributing role in medication adherence based on provider-patient communication, prescribing regimens, and coordination of care between multiple providers (Neiman et al., 2017). Finally, health systems contribute to medication adherence by controlling access to providers, insurance, prescription drug coverage plans, prescription labeling, and equitable medication education for all patients (Neiman et al., 2017).

Older Adult

In Chesser et al.'s (2016) systematic review, they used the definition of 65 years of age and older to define the term "older adult." While in the United States, persons reaching the age 65 signifies eligibility for receiving Medicare benefits, other U.S. governmental acts provide for the definition of the older adult to include those who are 60 years of age and older. The Older Adults Act of 1965 was reauthorized in 2016 by U.S. President Obama. using 60 years and older as the definition of older individual when discussing access to services and distribution of funding to individual states. Organizations such as the NCOA (2018) and the Area Agency on Aging (2017) have also used the definition of 60 years and older when categorizing older adults. While there are variations in defining older adult, the definition of 60 years and older was employed when reviewing the literature to allow for greater inclusion.

Teach-Back Method

The teach-back method is a way for healthcare providers to assess whether the health information/education provided to patients is at a level they can comprehend. Teach-back allows for providers to find gaps in understanding and information that needs to be further clarified, potentially through a different approach (Brega et al., 2015). Using the teach-back method could help mitigate risks associated with a misunderstanding about medication regimens, follow-up plans, or testing to be completed. According to the AHRQ (Brega et al., 2015), "40-80% of the medical information that patients are told during office visits is forgotten immediately, and nearly half of the information retained is incorrect" (p. 18).

CHAPTER II

LITERATURE REVIEW

Health Literacy

To fully understand health literacy, it is important to understand how various skills and tasks are incorporated into what makes up health literacy. In their systematic review exploring the definition of health literacy, Sorensen et al. (2012) found 17 different definitions; however, all definitions provided common components encompassing skills that makeup health literacy: literacy, numeracy, and cognitive skills.

Literacy

Literacy was defined by the HHS (2010) as "a set of reading, writing, basic math, speech, and comprehension skills" (p. 5). All of these literacy skills are considered to be important to participate in our society. However, the HHS recognized that while literacy is a component of health literacy, the concept of literacy did not necessarily translate into a comparable health literacy level. Sorensen et al. (2012) also discussed the need for separating the concepts of literacy from health literacy as the concept of literacy has many meanings depending on the context in which is used. Sorensen et al. shared four different understandings of literacy:

1. Literacy as an autonomous set of skills

2. Literacy as applied, practiced, and situated

3. Literacy as a learning process

4. Literacy as text (p. 1).

Literacy has also been characteristically translated into the grade level the individual has completed but this does not always reflect the level of literacy the individual can effectively comprehend. When practitioners make assumptions regarding an individual's comprehension based on highest school grade level completed, there is a risk it could result in detrimental outcomes for the individual for whom they are providing care.

The issue with low literacy became apparent when the 1993 National Adult Literacy Survey conducted by (Parker et al. (1995) revealed 22% of Americans, approximately 40-44 million individuals, fell into the lowest skill level of literacy. It was believed key functional skills that individuals need to participate in their health management included the ability to read, write, and understand numeracy. Having those basic functional skills allowed individuals to understand their disease process, ask appropriate questions regarding their care, and to develop problem-solving skills. In 1995, Parker et al. developed a screening tool to assess the functional abilities--the TOFHLA. The TOFHLA is just one type of screening tool developed and validated over the years.

Numeracy

Numeracy has been defined by Rothman et al. (2006) as "the ability to use and understand numbers in daily life" (p. 391). Just like literacy, Nelson, Reyna, Fagerlin, Lipkus, and Peters (2008) cautioned against assuming a higher educational level meant the individual had a higher numeracy skill level. Numeracy also plays an important role in an individual's ability to comprehend health literacy-related information including medication prescribing instructions, medication tables, health risk listed in percentages or

ratios, as well as provider appointment times and phone numbers. It can be difficult for

individuals to understand percentages as related to the percentage of risk of adverse

effects when being prescribed a new medication regimen. Understanding the percentage

of risk is an important concept for patients to understand to be able to make informed

decisions about their healthcare.

Numeracy skills are increasingly important for an individual's understanding of

medication self-management. Individuals need to be able to read prescription bottles,

remove the correct amount of medications, and determine the frequency of dosing.

Additionally, patients must also determine timing of the dosing based on how the

medication has been prescribed. Numeracy skills are especially important for those

individuals with chronic disease such as diabetes. A study by Shiyanbola, Unni, Huang,

and Lanier (2017) discussed how numeracy skills are important in addressing diabetes

self-management and medication adherence. Patients need to be able to read numbers on

a blood glucometer, infer what those numbers mean, and based on the level determine

what amount of insulin they need if they are on an insulin regimen. They must also

calculate the number of carbohydrates they are consuming per meal or snack and again

determine the number of units they will need if using sliding scale insulin. A diabetic

management regimen can be quite complex for a patient with adequate health literacy but

might be nearly impossible for a patient with inadequate health literacy without adequate

support and interventions. According to Shiyanbola et al. (2017), when assessing the

relationship of health literacy and adherence, numeracy was found to moderate illness

perceptions ($\beta= .149$, $p = .038$) while there was no direct relationship between health

literacy and adherence. Health literacy also had a significant moderating effect between adherence and concern beliefs (β = -0.156, p = .014; Shiyanbola et al., 2017).

Another chronic disease requiring a higher level of numeracy skills is asthma. Apter et al. (2006) investigated participants' use of numeracy skills as it related to asthma management. Management components patients with asthma need to address include medication management, peak flow meter readings and inference of results, and percentage of risk associated with asthma medications (Apter et al., 2006). Patients with inadequate numeracy skills might struggle to understand when peak flow meter readings require additional interventions. When Apter et al. assessed participants' ability to answer percentage questions, 25% answered the simplest questions incorrectly; however, when asked a complicated percentage question, 70% of participants answered incorrectly. Apter et al. discussed how the use of percentages is important in correctly addressing peak flow meter readings. However, while numeracy has been considered a component of health literacy, more research is still necessary to fully understand the relationship between inadequate numeracy skills and health outcomes (Berkman et al., 2011).

Cognitive Skills

According to the CDC (2018a), "Cognition is a combination of mental processes that includes the ability to learn new things, intuition, judgment, language, and remembering" (para. 4). Cognitive skills encompass important components of health literacy including an individual's ability to comprehend, problem-solve, compare and contrast, interpret, adapt, and synthesize data (Speros, 2009). Individuals with a higher level of cognitive skills are better able to understand medical terms, can make decisions regarding health information they are presented, and determine variable dosing of

complex medication regimens. A decline in cognitive function could result in impairment of an individual's ability to complete health literacy-related tasks.

Cognitive decline is especially prevalent in the older adult population, resulting in decreases in health literacy (Serper et al., 2014; Soones et al., 2016; Speros, 2009). According to Federman et al. (2009), mild cognitive impairment affects between 2% and 8% of community-dwelling older adults, which might be difficult to detect because of the subtleness of the impairment. Impairment of memory and verbal fluency are strongly associated with inadequate health literacy (Federman et al., 2009).

Serper et al.'s (2014) cohort study assessed associations among health literacy, cognitive abilities, and functional health status in older adults. A total of 832 participants with an overall participation rate of 51% were included in the study where two structured interviews were completed (Serper et al., 2014). Researchers used the TOFHLA (Parker et al., 1995), REALM (Davis et al., 1991), and NVS (Weiss et al., 2005) to assess health literacy levels and cognitive abilities were assessed using a range test assessing processing speed, working memory, inductive reasoning, long-term memory, prospective memory, and verbal ability (Serper et al., 2014). Functional abilities were also assessed using the assessment tool SF-36 (Ware, Kosinski, & Keller, 1994), while depression and anxiety in participants were measured using the Patient-Reported Outcomes Measurement Information Services (PROMIS; Cella et al., 2007).

In comparing the three health literacy screening tool results, Serper et al. (2014) found the TOFHLA (Parker et al., 1995) resulted in 16.8% marginal health literacy and 12.5% inadequate health literacy while the REALM (Davis et al., 1991) screening found 15.4% marginal health literacy and 8.9 % inadequate health literacy. The NVS (Weiss et

al., 2005) revealed a higher percentage of participants with marginal (22.9%) health literacy and inadequate (28.9%) health literacy. Correlation scoring among the three screening tools was as follows: .76 (TOFHLA-REALM), .63 (TOFHLA-NVS), and .47 (NVS-REALM; all $p < .001$) and all health literacy measures were strongly correlated with all cognitive abilities (Serper et al., 2014). "Cognitive fluid abilities, an individual's ability to reason and process, were more strongly correlated with the TOFHLA and NVS than with the REALM (.76 and .73 vs .57, respectively" (Serper et al., 2014, p. 1255). Crystallized cognitive abilities associated with reading comprehension and vocabulary were found to have similar correlations among the three screening tools (TOFHLA: .77, REALM: .74, and NVS: .71; Serper et al., 2014). One of the key findings Serper et al. reported from their study was it was necessary to not just focus on providing individuals with plain language information but to consider how we could lessen their cognitive load. Serper et al. encouraged the use of written instructions with explicit instructions to reduce a patient's need to make inferences would also benefit those with cognitive deficits. Additionally, practitioners should consider simplification of medication regimens when possible, e.g., changing to extended release or a combination of medications (Serper et al., 2014).

Older Adults and Inadequate Health Literacy

**Health Literacy Interventions in the
Older Adult Population**

The *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) contains 18 intervention tools specific to addressing health literacy needs. Tools are grouped based on intervention focus including improving spoken communication, improving written communication, and improving self-management and empowerment.

Communicate clearly. According to the IOM (2001) report, *Crossing the Quality Chasm: A Health System for the 21ˢᵗ Century*, "effective methods of communication, both among caregivers and between caregivers and patients, are critical to providing high-quality care" (p. 10). Clear communication was supported by the AHRQ (2018) as a component of its health literacy universal precautions toolkit and the CDC's (2015a) publication, *Everyday Words for Public Health Communication,* a document to help organizations create plain language writing in public health materials. A large consensus of the literature supported clear communication in provider-patient interactions as an intervention that addressed the needs of older adults (Bazargan et al., 2017; Brooks et al., 2017; Federman et al., 2009; Kripalani et al., 2010; Speros, 2009).

Kripalani et al. (2010) investigated patients' reports of interactions with their providers in a hospital setting. Eight domains related to clear communication were evaluated including general clarity, responsiveness to patient concerns, explanation of patient problems, explanation of processes of care, explanation of self-care after discharge, empowerment, decision making, and considerations of patients' desire and ability to comply with recommendations. A total of 84 participants completed both in-hospital and telephone interviews--46% were 55 years or older, 44% had inadequate health literacy, and 50% had cognitive impairments. Health literacy was evaluated by the REALM tool (Davis et al., 1991) and cognitive assessment was completed through the Mini-Mental Screening Exam (Folstein, Robins, & Helzer, 1983). A 5-point Likert-type scale survey was used to assess all eight domains and found scoring was within the favorable half of the Likert scale for most domains. In the survey, a higher Likert scale score for the domain of general clarity was considered a more positive response while in

all other domains, a lower score reflected a more positive response (Kripalani et al.,
2010). In the overall participant sample, the highest scoring domains relating to
communication were "*responsiveness to patient concerns* (mean = 1.68), *explanations of
condition and prognosis* (mean= 1.75), and *empowerment* (mean = 1.68)" (Kripalani et
al., 2010, p. 272). The worst performing domain was related to consideration of patients'
desire and ability to comply with recommendation*s* with an *M* = 3.15 (Kripalani et al.,
2010). However, when assessing the differences between those with inadequate health
literacy compared to those with marginal and adequate health literacy, patients with
inadequate health literacy reported significantly worse ratings regarding "*general clarity*
(*M* = 3.36 vs. 3.89 for patients with marginal or adequate health literacy, *p* = .02),
responsiveness to patient concerns (*M*= 1.86 vs 1.53, *p* = .03), and *explanations of
processes of care* (*M* = 2.22 vs. 1.84, *p* = .04)" (Kripalani et al., 2010, p. 272).

Speros (2009) discussed the importance of providing older adults with clear
communication; however, practitioners must consider cognitive, physical, and
psychological changes when delivering communication to an older adult population.
Speros discussed the importance of allowing extra time for processing when teaching
older adults. Communication should avoid vagueness by requiring the individual to use
inference. Instead, directions should be provided that include "time, order, duration, and
frequency" (Speros, 2009, p. 2). Additionally, Speros recommended that practitioners
avoid negative messages that could create confusion for the older adult, e.g., "Do not take
this pill with food" (p. 2).

Physical challenges could also inhibit clear communications in an older adult
including hearing and visual deficits. Visual changes from aging often require older

adults to use corrective lenses; however, if they do not bring them to office visits, written materials or visual displays might not be helpful in arriving at a clear message. According to Walling and Dickson (2012), hearing deficits affect one-third of adults between 61 and 70 years with more than 80% of those older than 85 years. Speros (2009) reminded female practitioners to consciously focus on lowering their voice secondary to the older adult's loss of ability to hear high pitched tones. Use of audio and video media might be of benefit in cases of visual or hearing deficits as an alternative teaching modality.

In a qualitative study by Brooks et al. (2017), nine participants were interviewed, finding two themes participants reported had the greatest impact on their healthcare experience. The first was building a trusting, shame-free environment (discussed earlier) and tailoring communication to individual needs. Older adult participants found it was important to have communication that was patient-centered and reported preferences to learning styles--some desired experiential, observational, vicarious, and reflective learning (Brooks et al., 2017). Additionally, having a trusting relationship influenced older adults' "readiness to accept and implement the healthcare messages" (Brooks et al., 2017, p. 2432). Brooks et al. recommended that future research develop a brief tool to ask older adults about their communication and learning preferences: "Health literacy, with a particular focus on tailoring interactions and building trusting relationships and trust, should be integrated into mandatory clinical training programmes and the curricula of all healthcare providers' degree" (p. 2433).

In a cross-sectional cohort study, Federman et al. (2009) assessed the relationship among health literacy, memory, and verbal fluency in 414 older adult patients; 44.7% of

respondents were 75 years and older and 37.6% were men. The S-TOFHLA (Baker et al., 1999) was administered to participants to assess health literacy and the Mini-Mental Screening Exam (Folstein et al., 1983) assessed cognitive ability. A total of 107 participants (25.8%) could not complete the S-TOFHLA within the allotted time (Federman et al., 2009). A total of 24.3% had inadequate health literacy, 9.2% had marginal health literacy, and 66.5% had adequate health literacy. When comparing health literacy levels based on race and ethnicity, 38.6% of Black participants and 53.5% of Latinos had inadequate health literacy compared to 3.9% of White participants (Federman et al., 2009). Findings from the Federman et al. study showed clearly communicating to older adults required more than vocabulary simplification; communication must provide ways in which memory and verbal fluency were considered. Federman et al. recommended that practitioners use strategies that aided in compensating for limited cognitive skills including "using familiar language, testing for comprehension, contextualizing behaviors, and adequately following up with patients to reinforce learning" (p. 1479).

Teach-back. The teach-back method was highly recommended as a universal precaution technique that should be used with each interaction with patients to assess for comprehension of prescribed treatments. Individuals with inadequate health literacy are at greater risk of having limited knowledge and comprehension (Berkman et al., 2011). Schillinger et al. (2003) echoed Berkman et al.'s (2011) concerns, adding inadequate health literacy could limit an individual's ability to compensate for lapses in provider-patient communications.

In a dissertation study by Price (2014), the use of teach-back was applied to discharge teaching from the hospital setting. The goal was to assess the implementation of a patient-centered care model that included the method of teach-back and its effect on patient's understanding of how to manage his/her care--a reported item on the Hospital Consumer Assessment of Health Care Providers and Systems (CMS, 2019) survey. In addressing teach-back, Price also discussed the importance of considering a patient's health literacy level to help aid in adjusting teaching and teach-back to meet the needs of the individual. Nurses throughout a rural hospital setting were encouraged to receive mentoring regarding the teach-back method and the patient-centered program was adopted throughout the hospital. Based on the Hospital Consumer Assessment of Health Care Providers and Systems survey item assessing a patient's self-reported understanding of managing his/her care, an 18% increase (goal was 10%) was seen after implementation; however, the increase was not found to be statistically significant (Price, 2014). While the author struggled with implementation barriers, there was noted improvement; additional improvement might have been realized in a longitudinal study.

In a systematic review by Dinh, Bonner, Clark, Ramsbotham, and Hines (2016), the teach-back method was assessed for effectiveness in adherence and self-management of chronic diseases. The authors reviewed 12 articles meeting inclusion that included randomized and non-randomized control trials, cohort studies, before-after studies, and case-control studies (Dinh et al., 2016). In four studies, teach-back was found to improve an individual's knowledge of chronic disease. Dinh et al. discussed how studies reviewed showed the teach-back method resulted in positive improvements on various outcomes including medication adherence, self-efficacy, hospital readmissions, quality of

life, and self-care; however, not all had statistically significant findings. Dinh et al. also

discussed how findings of the systemic review provided evidence for the support of the

implementation of the teach-back method when providing patient education to those with

chronic disease; especially those at greater risk for adverse outcomes including

inadequate health literacy, cognitive impairment, and older adults.

      Follow-up. The *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et

al., 2015) discussed how the use of follow-up could be a powerful tool in assessing for

misunderstandings and answering questions for individuals. Use of interprofessional

teams could be employed to address follow-up needs of patients. MacLeod et al. (2017)

suggested including the use of care coordinators to more closely address patient concerns

following provider appointments, especially in patients who had greater comorbidities

and inadequate health literacy. MacLeod et al. discussed how those with low health

literacy and considered to be in the "sicker" category had higher use of hospitalizations

and emergency room visits. They were also less likely to obtain preventative care. Use

of care coordination could help alleviate preventable hospitalizations and emergency

room visits.

      Speros (2009) also recommended follow-up phone calls using the teach-back

method especially in patients who had recently received a new diagnosis to assess for

comprehension of new knowledge. Speros used the example of diabetes management by

assessing older adults' comprehension and application of monitoring their blood glucose

levels or assessing for side effects of new antihypertensive medications. Speros

discussed the importance of using open-ended questions that required a more detailed

response to assess for comprehension.

Medication education. When providing medication education to older adults,

several studies found important components for nurse practitioners to consider when

caring for older adults with inadequate health literacy and focus on improving medication

adherence. In a longitudinal study, Federman et al. (2013) found older adults with

asthma frequently had misconceptions about their disease. A total of 420 participants

from hospital and community practices in New York, New York, and Chicago, Illinois

were assessed for health literacy level using the S-TOFHLA (Baker et al., 1999).

Participants beliefs about their disease and medications were assessed through use of the

Beliefs about Medications Questionnaire (Horne, Weinman, & Hankins, 1999) and the

Common Sense Model of Self-Regulation (Levanthal, Phillips, & Burns, 2016).

Federman et al. found 36% of participants had inadequate health literacy and "were older

($p = .003$); they were also more likely to be non-white, of low income ($p < .0001$), less

educated ($p < .0001$), and have a prior history of intubation ($p = .001$)" (p. 4). Regarding

asthma health beliefs compared to individuals with adequate health literacy, those

participants with inadequate health literacy were more likely to believe no symptoms

meant they did not have asthma (*OR* 1.94, 95% CI [1.35, 2.79], $p = .003$); however, this

finding was not significant once adjustments were made for age, sex, race/ethnicity, and

asthma history (*OR* 1.27, 95% CI [0.83, 1.95], $p = .28$). Additionally, those with

inadequate health literacy had more than twice the odds regarding the health belief they

would not always have asthma (*OR* 2.59, 95% CI [1.29, 3.89], $p < .0001$) or the belief

doctors could cure their asthma (*OR* 3.51, 95% CI [2.22, 5.58], $p < .0001$; Federman et

al., 2013). When participants' beliefs about their need for asthma medications were

measured, Federman et al. found those with inadequate health literacy had a statistically

significant association even after adjustment for participants' medication necessity beliefs (β = -1.36, p = .01). Participants' medication concern beliefs only had borderline significance after adjustment (β = .92, p = .05).

Inadequate health literacy was associated with asthma-related beliefs, which predicted poor asthma medication adherence (Federman et al., 2013). Those participants with inadequate health literacy were more likely to believe asthma was not a chronic disease and could be cured by providers. Additionally, while those with inadequate health literacy were more likely to believe their asthma medications were necessary, they also had concerns about them. When further investigating participants' concerns about their asthma medications, the greatest concerns were related to side effects and addiction risk (Federman et al., 2013). Another important finding was related to race/ethnicity differences where Hispanic and Black participants were twice as likely as White participants to believe if they had no symptoms of asthma, they did not have asthma (Federman et al., 2013). These findings were similar in other older adult population studies; however, Federman et al. (2013) suggested a need for a focus on asthma education for older adults, especially in Hispanic and Black populations. Asthma education needs to address health literacy needs in addition to disease and medication beliefs.

In another study, a pre- and post-discussion group across three U.S. cities—Chicago, Miami, and Denver for a total of 46 older adult participants—was asked to provide insight on features in mobile applications that would be helpful for medication management (Russell et al., 2018). To be included in the study, participants needed to be at least 55-years-old, own and use a smartphone, be an English-speaker, and be

responsible for administering either to themselves or someone else at least five daily medications. Health literacy was measured using the REALM (Davis et al., 1991) screening tool--only 11% of participants had marginal health literacy and 89% had adequate health literacy. A total of 61% of participants were White and 30% were male with a mean age of 65 years ($SD = 9$; Russell et al., 2018). Study participants averaged 3.3 ($SD = 2.5$) chronic diseases with an average of seven medications ($SD = 3$) daily. While 85% of participants reported using mobile apps daily, only 7% had ever used one to manage their medications (Russell et al., 2018).

Some of the most common medication management challenges reported by participants included unclear dosing regimens where participants discussed taking all medications at the same time but they were unsure of when they were really supposed to be taken (Russell et al., 2018). Participants reported needing to complete manual checks (pill counting) of medication secondary to forgetting if a dose had already been taken. Managing missed dosages or potential adverse interactions unknown to the participant was another concern. Participants also reported confusion when pills came from different manufacturers and the color or shape changed. Finally, participants reported out of sequence medication refills were another one of their challenges (Russell et al., 2018).

Russell et al. (2018) found older adult participants were interested in using an application to help them manage their medication regimens. Key features preferred by participants included medication education with drug interaction warnings of the medications they were currently taking and also basic information about the medications. In addition, participants felt a comprehensive medication list was valuable for their medication management as well as reminders to take medications, reminders to refill, and

links to additional information about their medications. Russell et al. discussed the struggles older adults had with forgetfulness and cognitive changes related to aging; a well-designed mobile app could be provided for the older adult population to lessen the cognitive load. However, one component Russell et al. discussed when mobile apps were developed was they were not frequently tested by the older adult population regarding ease of use. Recommendations by Russell et al. included further research regarding the assessment of mobile apps on older adult medication adherence rates. Additionally, this study did not include any older adult participants with inadequate health literacy and would require additional research to assess if the same concerns are seen in the subgroup.

  Summary. Like other populations with inadequate health literacy, older adults value and need clearly delivered communications. However, older adults also need communications from practitioners who consider the impact of cognitive, physical and psychological changes occurring with the aging process (Federman et al., 2009; Speros, 2009). Older adults should be given time for processing of information and encouraged to ask questions they might have or clarify instructions they did not understand. Additionally, recognizing the impact visual and hearing deficits could have on an older adult who also has inadequate health literacy requires practitioners to consider an additional modification to provide clear communications including audio recorded instructions, adjusting the lighting in the room, reducing background noises, and fully facing the patient when interacting with him/her (Speros, 2009).

  Older adults desire patient-centered communications that consider their type of learning style (Brooks et al., 2017). Providing communications that are put into a patient-centered context might help older adults retain information better (Speros, 2009).

Developing a trusting and shame-free environment was also found to be an important

component that promotes clear communications for older adults. Evidence showed

establishing a trusting, shame-free patient-provider relationship resulted in an increase in

an older adult's willingness to adhere to prescribed treatment plans and feel empowered

to ask questions (Brooks et al., 2017; Dinh et al., 2016).

Consistent use of the teach-back method provides both providers and patients the

opportunity to further clarify communications to ensure patients are successful in self-

care management tasks. The teach-back method is especially important in the older adult

population secondary to their increased risk of having limited knowledge and

comprehension (Berkman et al., 2011). Individuals with inadequate health literacy are

less likely to ask questions when they do not understand secondary to feelings of shame

and anxiety; however, cognitive changes also inhibit an older adult's ability to process

oral communications, which can lead to incorrect comprehension (Speros, 2009). The

teach-back method allows for this recognition and can prompt practitioners to provide

alternative methods of patient education such as simple written instructions or an audio-

recorded message for the older adult to review at home.

When addressing medication education, older adults need to have clear

communications that avoid their need for the use of inference and lessen the cognitive

load to determine dosage instructions and avoid negative messages regarding medication

administration (Speros, 2009). It is also important to address underlying medication and

disease concerns in an older adult population with inadequate health literacy. Older

adults with inadequate health literacy might have developed misconceptions about their

medications or disease, which has been shown to have an effect on their medication

adherence (Federman et al., 2013). Employing follow-up practices of care coordination

is also recommended in older adults identified with having inadequate health literacy and

comorbidities (MacLeod et al., 2017).

Medication Adherence and Health
Literacy Interventions

Evidence was mixed regarding the relationship between medication adherence

behaviors and health literacy. Several studies demonstrated a relationship between

medication adherence and health literacy (Bazargan et al., 2017; Kripalani et al., 2006;

Mayo-Gamble & Mouton, 2018). Mayo-Gamble and Mouton (2018) studied the day-to-

day aspects of medication adherence and the effect health literacy levels had on those

components. Using the validated REALM (Davis et al., 1991) screening tool, the

researchers found older adults with inadequate health literacy were more likely to forget

to take their medication or took less of their medication than prescribed. Kripalani et al.

(2006) found the medication management capacity of patients was significantly

associated with literacy ($p < .001$). Kripalani et al. found patients with inadequate health

literacy "had 10 to 18 times the odds of being unable to identify all of their medications,

compared with those with adequate literacy skills" (p. 852). In their systematic review,

Zhang, Terry, and McHorney (2014) found those individuals with higher health literacy

were more likely to have better medication adherence.

Other studies found mixed results regarding the relationship between health

literacy and medication adherence (Shiyanbola et al., 2017; Zhang et al., 2014).

Shiyanbola et al. (2017) studied medication adherence as it related to health literacy and a

participant's health and illness beliefs when managing diabetes mellitus type II.

Shiyanbola et al. used several screening tools including the Medication Adherence Scale

(Morisky, Green, & Levine, 1986), the NVS (Weiss et al., 2005) health literacy screening tool, the Brief-Illness Perceptions Questionnaire (B-IPQ; Broadbent, Petrie, Main, & Weinman, 2006), the Self-Efficacy for Appropriate Medication Use Scale (Risser, Jacobson, & Kripalani, 2007), and the Beliefs in Medicines Questionnaire (BMQ; Horne et al., 1999). While findings of the Shiyanbola el al. study were inconclusive regarding the direct relationship between health literacy and medication adherence, the study suggested basic health literacy needs should be addressed for those with inadequate health literacy *before* addressing individual needs regarding medication adherence. Some very thought-provoking results were found within this study when considering the impact health literacy plays on medication adherence. Shiyanbola et al. found health literacy had a significant moderator effect on medication adherence when addressing *concern beliefs* and *illness perceptions*. Concern beliefs focused on whether individuals had concerns about the medications they were taking including component examples of side effects, adverse reactions, and disruptions the medications caused in their life. Illness perceptions stemmed from the self-regulatory model that focused on five domains including individual beliefs or understanding of disease symptoms, disease progression, the cause of his/her disease, effects of his/her disease, and whether his/her disease was controlled by medications (Shiyanbola et al., 2017). Individuals with moderate and low health literacy were more likely to have decreased medication adherence when there was a threatening illness perception. Participants who had a threatening illness perception scored high on the B-IPQ (Broadbent et al., 2006), which corresponded with an individual's locus of control regarding his/her disease and its management. While individuals with adequate health literacy had similar effects of medication non-

adherence, they were not as profoundly affected by a threatening illness perception and were more likely to continue their medication regimen. Shiyanbola et al. suggested adequate health literacy might have a protective effect on medication adherence because patients were able to apply their health literacy-related skills as a coping mechanism even when there was a threatening illness perception.

However, when evaluating health literacy's effect on concern beliefs and medication adherence, there was an opposite effect on those individuals with adequate and moderate health literacy compared to illness perception findings (Shiyanbola et al., 2017). Those with adequate and moderate health literacy were significantly more likely to have non-adherence because of concerns about their medication regimen. However, in individuals with low health literacy, even when they had a higher score regarding concern beliefs, it did not result in a significant difference in medication adherence. Shiyanbola et al. (2017) suggested because of their low health literacy, they might not be able to "have the capacity to understand and use health information to recognize the concerns about their medicines" (p. 5). Shiyanbola et al.'s findings might be clinically significant when addressing the needs of diabetic patients. It is important to recognize that while there might be similar trends of medication non-adherence, individuals with low health literacy might have different health literacy needs than those with adequate or moderate health literacy. Practitioners trying to address concern beliefs of those with inadequate health literacy might be missing the underlying basic low health literacy skills that need to be addressed first. Shiyanbola et al. recommended the use of the NVS (Weiss et al., 2005) health literacy screening tool as a part of the intake process to provide a preliminary understanding of a patient's health literacy level.

Kale et al. (2015) previously conducted a study similar to Shiyanbola et al.'s (2017) study. Kale et al.'s goal was to investigate the associations between health literacy and medication beliefs in a patient diagnosed with chronic obstructive pulmonary disease. Kale et al. found significant, well supported associations within the literature regarding vulnerable populations including racial minority groups, a lower income, and lower education. They also found patients who were not married had a significantly higher rate of inadequate health literacy, which was not necessarily presented in other studies. Kale et al. also used the B-IPQ (Broadbent et al., 2006) and BMQ (Horne et al., 1999) medication screening questionnaires but used the S-TOFHLA (Baker et al., 1999) health literacy screening tool compared to the NVS (Weiss et al., 2005) used by Shiyanbola et al.'s study. Both the Kale et al. and Shiyanbola et al. studies found older adult participants had similar illness perceptions and concern beliefs. Recommendations for providers included adding illness perceptions in discussions with patients with inadequate health literacy to better address their health literacy needs. Additionally, Kale et al. recommended the use of an integrated approach that utilized care coordination and care coaching to better address individual needs.

In a systematic review by Zhang et al. (2014), the authors discussed conflicting results found regarding the relationship between health literacy and medication adherence. Differences in study designs and analysis methods might have been the reason for this. However, after completing meta-analyses, Zhang et al. discussed how while many confounding variables might have affected medication adherence, health literacy might have a mediator effect on the components of a patient's medication beliefs and health knowledge. Similar findings were reported in the Shiyanbola et al. (2017)

study. However, better medication adherence was seen in those with higher levels of health literacy (Zhang et al., 2014).

Lyles, Culver, Ivester, and Potter (2013) also investigated the relationships of health literacy and medication adherence when an individual was prescribed five or more medications, which is considered polypharmacy. Their study did not find a relationship between health literacy and medication adherence or health literacy and polypharmacy. However, unlike Shiyanbola et al. (2017), they did not evaluate self-reported medication adherence; rather, they investigated several refills and what the patient had regarding a medication possession ratio (MPR). While the study used the REALM-Revised (Davis et al., 1993) to assess for health literacy, perhaps detection of relationships regarding health literacy and medication adherence needs to be evaluated by more than the MPR.

In Wali et al.'s (2016) systematic review of 47 intervention studies on ways to improve medication information in inadequate health literacy populations, six types of interventions were identified through the review: written information, visual information, verbal information, label/medication bottle, reminder systems, and educational programs and services. A total of 37 studies assessed knowledge, of which 27 were statistically significant, and 26 assessed for adherence, of which 19 were statistically significant. Written information was the most commonly used intervention to improve knowledge and adherence. Pharmacies are legally required to provide written information and could have been the reason written information was the most commonly seen intervention. Participants of studies preferred interventions that included "additional aids to enforce written information, personalized information, ease of navigation and accessibility" (Wali et al., 2016, p. 857). In meeting barriers to medication adherence, the most effective

interventions were tailored interventions focused on limiting stigma and creating a

shame-free environment. Wali et al. also recommended implementing simple education

tools such as podcasts, illustrations, and videos.

Health Literacy Screening Recommendations

The majority of the studies reviewed employed validated tools to assess health

literacy. Most commonly used tools were the TOFHLA (Parker et al., 1995), the S-

TOFHLA (Baker et al., 1999), or the REALM (Davis et al., 1991). Other less frequently

used but also validated screening tools included the Brief Health Literacy Screening

(Chew, Bradley, & Boyko, 2004)) instrument, the NVS (Weiss et al., 2005), the Single

Item Literacy Screener (Morris, MacLean, Chew, & Littenberg, 2006), SIS (Bishop et al.,

2016) and the Peabody Individual Achievement Test (Dunn & Markwardt, 1970). The

screening tools used most commonly for screening included the S-TOFHLA, REALM,

NVS, the Single Item Literacy Screener, and the Brief Health Literacy Screening

instrument. Some variation was seen in the Wannasirikul et al. (2016) study where

researchers used a variation of Nutbeam's (2008) concepts of health literacy that included

an unvalidated assessment of participants' functional, interactive, and critical health

literacy skills. Wannasirikul et al. also assessed participants' cognition, which was found

to have a mediating effect on participants' health literacy. Soones et al.'s (2016) study

also showed an association between health literacy and cognition ($\beta = -0.767$; $p < .001$)

but it did not find a mediating effect of cognition on health literacy in older adults with a

diagnosis of moderate to severe asthma.

With the development of *AHRQ Health Literacy Universal Precaution Toolkit*,

DeWalt et al. (2011) recommended providers assume all patients have inadequate health

literacy and provide everyone with health literacy-sensitive interventions rather than complete health literacy screening. Another way to approach the delivery of health literacy is through universal precautions from an asset view where everyone deserves healthcare information they can understand, which makes it crucial for healthcare providers to start with the health literacy basics and move forward together by assessing for comprehension along the way. Both positive and negative effects are related to using health literacy screening in the clinical setting.

Potential Negative Effects of
Clinical Screening

Several studies reported concerns about individuals who felt increased shame secondary to being screened, which might result in them avoiding health care (Easton, Entwistle, & Williams, 2013; Paasche-Orlow & Wolf, 2008). Additionally, Paasche-Orlow and Wolf (2008) discussed how "shame could further alienate patients who already face significant barrier accessing health care" (p. 101). In another study, the majority of patients acknowledged the importance of having their healthcare provider be aware of the health literacy needs; however, they still reported increased anxiety and stress regarding health literacy screening (Rajah et al., 2018). Other studies also revealed patients' reluctance to share their inability to read; some patients reported they had never told their families about their struggles (Baker et al., 1996; Easton et al., 2013). Baker et al. (1996) recommended rather than completing formal health literacy screening, a shame-free environment should be promoted by sensitively asking about the patient's problems with reading by prefacing with a question such as "A lot of our patients have trouble reading prescription bottles and other things like that. Is this a problem for you" (p. 333)?

Potential Support for Clinical
Screening

Mayo-Gamble and Mouton (2018) and Parekh et al. (2018) recommended a

patient's health literacy level be known to address the needs of the patient before

medication adherence. Rajah et al. (2018) discussed both sides of the argument regarding

screening stating, "It is equally critical to creating a positive attitude among patients

towards HL [health literacy] screening and strategies to promote HL [health literacy]

interventions" (p. 131). Healthcare providers reported interest in having more objective

health literacy screening tools available as health literacy is frequently overestimated by

healthcare providers (Rajah et al., 2018). Another concept regarding screening reported

by the Shiyanbola et al. (2017) study was variations in the needs of diabetic patients with

adequate, moderate, and inadequate health literacy and the unique needs for each level.

Patients with inadequate health literacy needed even more focus on assessment of basic

numeracy skills before addressing their needs regarding concerns related to their

medications; those with higher levels of health literacy had different medication

concerns. Kale et al. (2015) and MacLeod et al. (2017) suggested the use of a health

literacy screening tool in the clinical setting that allowed providers to identify those who

needed additional health literacy support such as care coordination and community

resource support.

Medication Adherence Screening

Medication adherence can be measured in various ways including assessing for

self-efficacy through the Self-Efficacy for Appropriate Medication Use Scale (Risser et

al., 2007), the Morisky Medication Adherence Scale (Morisky et al., 1986), the

Adherence to Refills and Medication Scale (Kripalani, Risser, Gatti, & Jacobson, 2009),

BMQ (Horne et al., 1999), MedTake test (Raehl, Bond, Woods, Patry, & Sleeper, 2012), Medication Regimen Complexity Index (George, Phun, Bailey, Kong, & Stewart, 2004), and the Medication Adherence Rating Scale (Thompson, Kulkarni, & Sergejew, 2000). Okumura et al.'s (2016) research article focused on the validation of medication adherence tools within the inadequate health literate population. Okumura et al. (2016) discussed how the Adherence to Refills and Medication Scale (average score 15.6$\pm$ 3.4) was originally tested and validated in the inadequate health literacy population and provided validation for the MedTake and BMQ with reported significant correlations ($r =$ .535, $p < .01$; $r = .38$, $p < .01$, respectively).

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**Provider-Patient Relationships and Inadequate
Health Literacy**

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Trusting, Shame-Free Relationship

While it is important that providers and patients have a trusting relationship regardless of health literacy level, several studies discussed this as a crucial intervention in identifying those at risk for adverse medication adherence issues. Soones et al. (2016) discussed how components of the provider-patient relationships can act as potential barriers to underuse of asthma controller medications secondary to a provider's perception of the increased time it might take to counsel patients. Time constraints were identified as a valid concern of providers; however, the time spent counseling the patient might help the provider discover patient misunderstandings and could prevent adverse medication adherence issues. Increasing the use of open-ended questions could help the provider develop a better understanding of a patient's medication beliefs and fears. By using health literacy-sensitive interventions to create a shame-free and trusting environment, the patient can more freely express his/her concerns.

Soones et al. (2016) discussed the need to address education and management needs of older adults from a much different approach. Older adults often struggle with additional co-morbidities that increase the complexity of medication regimens. Soones et al. echoed the recommendations of the Federman et al. (2013) study to use a collaborative approach when addressing the needs of older adults with asthma. Soones et al. discussed how the provider-patient relationship should be focused on individual needs of the patient and understanding the level of health literacy with which the patient currently presents. Educational components are important and should be presented in a health literacy-sensitive format; additional techniques proven to work in older adult populations should be considered. Additionally, Soones et al. provided support for recommended interventions encouraged by national organizations such as the AHRQ (2018) in the use of their health literacy toolkit. These interventions include the use of the teach-back method and using audio, pictures, and simple terms when describing medical treatment plans and disease processes.

The importance of building trust was also seen in the study by Brooks et al. (2017). Their phenomenological study assessed for older adults' experiences and views regarding provider-patient interactions. One of the subordinate themes found from the study was older adults valued having a trusting relationship where they were building effective communication with their provider. Older adult respondents talked about how once there was a trusting relationship, they were more willing to participate in the therapies prescribed or when they implemented the therapy and it was successful (Brooks et al., 2017). In developing the study, Brooks et al. were careful to use screening techniques that promoted a shame-free environment based on previous studies (Baker et

al., 1996; Easton et al., 2013) wherein patients felt comfortable asking questions when they did not understand.

Several studies brought forth the discussion of encouraging clinics and providers to create a shame-free environment (Baker et al., 1996; Brooks et al., 2017; Easton et al., 2013; Parikh, Parker, Nurss, Baker, & Williams, 1996; Rajah et al., 2018; Wali et al., 2016). Baker et al.'s (1996) qualitative study contained 49 participants and focused on assessing difficulties patients had with poor reading skills in provider-patient interactions. The researchers assessed for skills patients would employ to cope and found patient heavily relied on oral explanations, visual clues, and demonstrations (Baker et al., 1996). However, participants were unlikely to reveal they had difficulties with reading to their providers secondary to shame. Participants also reported they were less likely to ask questions when they did not understand as they felt intimidated when providers used vocabulary unfamiliar to them. Some of the most troubling findings for Baker et al. were when patients described medication errors they had experienced secondary to their limited reading abilities, taking medications more frequently, or picking up a medication intended for someone else.

Easton et al. (2013) also completed a qualitative study containing 29 participants that explored perspectives of individuals with low literacy. Participants reported many struggles such as trying to figure out when appointments were, what the medical-related terms meant, and following instructions or requests, which were all compounded by feelings of anxiety and stress (Easton et al., 2013). Easton et al. had findings similar to Baker et al. (1996)-- people with limited literacy abilities were reluctant to share those difficulties because of the social stigma associated with limited literacy. Participants did

not want to feel like they were being looked down upon or being judged. Participants

had difficulties with their provider-patient interactions and frequently limited their

conversations to avoid revealing they did not understand (Easton et al., 2013).

Additionally, some participants felt even when providers seemed to have an idea

they did not understand, providers did not make an effort to assess or improve their

understanding (Easton et al., 2013). Ways in which participants suggested improvements

could be made in health care were to avoid the assumption everyone can read, simplify

communications and written materials, and reinforce medication instructions. However,

the most important component within the health care system was they wanted to know

they could trust their providers if they disclosed their inability to read (Easton et al.,

2013).

Parikh et al. (1996) examined the relationship between shame and low functional

literacy. Of 202 predominately indigent African American patients, 42.6% had

inadequate or marginal functional health literacy. Parikh et al. reported 67.4% of patients

with inadequate health literacy reported having troubles reading and comprehending.

Parikh et al. also found similar findings when assessing whether those with inadequate

health literacy had disclosed to their family members their difficulties with reading--

67.2% had never told their spouses. More than half (53.4%) had never told their children

(Parikh et al., 1996). When assessing whether the participants felt shame regarding their

struggles with reading, almost 40% reported they did feel shame (Parikh et al., 1996).

The shame felt by these patients signified a significant problem that needs to be

addressed by all healthcare providers.

In a systematic review of quantitative and qualitative studies, Rajah et al. (2018) assessed perspectives of both healthcare providers and patients regarding health literacy. Two qualitative studies were found to have similar findings as Baker et al. (1996) and Easton et al. (2013). Rajah et al. reported two other studies found patients felt shame and embarrassment when revealing their inability to read to healthcare providers. One study indicated "almost half (47.8%) of the patient populations reading at or below third-grade level admitted feeling shame and embarrassment about their reading difficulties" (Rajah et al., 2018, p. 128). The second study reported "patients acknowledge the importance of healthcare providers being aware of their reading abilities and having their literacy documented in their medical record" (Rajah et al., 2018, p. 128); however, it created anxiety and stress for them.

The systematic review by Wali et al. (2016) from the field of pharmacy also focused on health literacy interventions and discussed the need for shame-free environments. The researchers assessed the literature for interventions targeted toward improving medication information for inadequate health literate populations. According to Wali et al., patients with inadequate health literacy reported being too ashamed to seek help from pharmacists. The researchers discussed the need for minimizing negative effects that inadequate health literacy could impose on medication adherence by creating a shame-free environment. Wali et al. suggested creating medication information that is equally accessible and tailored to an individual's health literacy needs was one way to address this disparity. Another way was to assume the patient had questions about his/her medications rather than depending on the patient to initiate a patient-provider relationship.

Federman et al. (2013) recommended building culturally-sensitive relationships when providing self-management counseling, especially in the case of Black and Hispanic populations. Bazargan et al. (2017) discussed the need to promote appropriate health literacy communications between providers that focused on enhancing health literacy and disease-related knowledge. Bazargan et al. also discussed the need for interprofessional collaboration, keeping a patient-centered approach. Wannasirikul et al. (2016) discussed cultural differences seen within the Thai population. While patients might have inadequate health literacy, Thai cultural and societal norms remain; doctors and healthcare professionals are treated with high respect (Wannasirikul et al., 2016). When considering provider-patient relationships, providers should be aware of cultural differences in Thai older adults (Wannasirikul et al., 2016). Thai patients obey the advice of healthcare providers and, at times, do it out of fear of repercussions of medication or treatment non-adherence. Additionally, patients within the Thai culture prefer medications over lifestyle changes or diet modifications (Wannasirikul et al., 2016).

Increase Patient Empowerment

Development of a provider-patient relationship was demonstrated in a study by Grice et al. (2014). Grice et al.'s (2014) study involved student pharmacists who were assigned randomly to older adult residents and focused on screening and self-management counseling through the use of health literacy-sensitive interventions including the Four Habits Model (Frankel & Stein, 1999), Ask Me 3™ (Institute for Healthcare Improvement, 2019a) and Universal Precautions (DeWalt et al., 2011). Using these interventions, the study showed older adult residents reported overall satisfaction with the program and showed increased health literacy or understanding of

health-related issues (Grice et al., 2014). Older adults in the study also had increased

confidence, felt empowered to advocate for themselves with their healthcare providers,

and had a greater commitment to medication adherence through the development of a

provider-patient relationship. However, another study by Koops van't Jagt, De Winter,

Reijneveld, Hoeks, and Jansen (2016) reported patients with inadequate health literacy

reported struggling with the Ask Me 3 and similar programs due to a lack of confidence

in asking questions of their providers. Participants also reported difficulty with

understanding some of the terms within the Ask Me 3 pamphlet, which increased their

hesitancy to use the format in the provider-patient interaction. Additionally, Koops van't

Jagt et al. found older adults did not feel comfortable with asserting themselves in a

provider-patient interaction, which was partially attributed to some participants'

hierarchical belief regarding providers they were brought up to value. The key might be

the development of a trusting relationship to create an empowering relationship for those

initially hesitant to ask questions.

Early Assessment and Counseling to
Improve Health Literacy and
Medication Self-Management

Early assessment of potential inadequate health literacy and medication adherence

issues is important to help identify and mitigate adverse medication outcomes. Although

no older adult, validated health literacy screening tool exists, Mayo-Gamble and Mouton

(2018) recommended future research that assesses the impact of providers completing

health literacy screening before providing education on prescribed medications.

Bazargan et al. (2017) recommended conducting comprehensive assessments of patient's

medications and regularly looking for any potential medication adherence issues.

Bazargan et al. also recommend focused education intended to increase health literacy regarding disease and both therapeutic and adverse medication effects. Soones et al. (2016) discussed specific topics regarding self-management considerations for the older adult asthma patient that could easily be generalizable to other chronic illnesses. Soones et al. indicated topics of self-management should be addressed with health literacy-sensitive language and techniques should be utilized that are more specific to geriatric populations. While it was likely outside of the scope of the Soones et al. study, the authors did not provide examples of these population-specific interventions. A pharmacist-based study conducted by Lam et al. (2017) encouraged the use of provider-patient relationships focused on providing self-care counseling including topics such as blood pressure target goals when dispensing antihypertensive medications, discussing medication refills, preventative measures to avoid unintentional medication non-adherence, and handling medication changes.

Health Literacy-Sensitive Interventions for Older Adults

Speros (2009) discussed the importance of considering the effects of aging when addressing health literacy needs of older adults. Both cognitive and physical changes can result in older adults struggling to make healthcare decision and managing their self-care needs. Key cognitive components to consider when addressing health literacy needs of the older adult include message processing, message management, and abstract comprehension. Additionally, the effects of cognitive decline and increased processing time can result in older adults feeling rushed in the clinical setting. Speros discussed how the feeling of being rushed could result in an older adult feeling increased anxiety,

frustration, and an unwillingness to return demonstrations of task-related skills. Older

adults need adequate time for processing new information.

Patient-centered education was discussed by several articles (Bazargan et al.,

2017; Brooks et al., 2017; Speros, 2009; Wolf et al., 2016). Tailoring education to the

older adult draws on a patient's previous experiences to help improve problem-solving

and can help to identify potential for preconceived beliefs about disease or medications to

be addressed more promptly. Addressing disease beliefs and medication concerns could

help prevent medication nonadherence in the older adult (Federman et al., 2013; Soones

et al., 2016; Speros, 2009).

Another important topic Speros (2009) discussed was the importance of age-

appropriate teaching in the older adult population. Some key points highlighted by

Speros included the following:

- Respect, accept, and support in a shame-free environment.

- Time of day matters, usually early morning.

- Content needs to be practical and relevant to the older adult.

- Clear communication is crucial; speak slowly, clearly, use simple language.

- Be consistent in word usage, do not use multiple terms for the same thing.

- Remember to be culturally and age sensitive; understand their values and
  beliefs.

- When providing written materials, make them patient-centered, reinforce
  major points with bullet points, choose a l4-16-point font.

- Consider written materials at risk of stereotyping older adults, drawing
  simple pictures may be enough.

- Encourage the individual to keep written information in a place commonly seen to reinforce topics.

- Avoid vague instructions. If they should avoid dairy products, explain and give written reminders about what foods contain dairy.

- Engage and encourage participating through demonstration of a new skill.

- Teach and repeat important points and use the teach-back method.

- Encourage older adults to invite a family member or trusted friend to teaching sessions to help reinforce key topic learning.

Variations Regarding Chronic Diseases

Providers should be approaching patients with inadequate health literacy based on the type of chronic disease such as diabetes and asthma (Apter et al., 2006; Shiyanbola et al., 2017). Both of these chronic diseases require higher use of numeracy skills as part of disease management. Older adult patients with inadequate health literacy might require different interventions than those with adequate or moderate health literacy by first addressing numeracy skills. Shiyanbola et al. (2017) discussed how numeracy skills are more highly used. Diabetes management requires an individual to understand blood glucose reading, process nutritional label contents, and adjust daily medication regimens such as sliding scale insulin dosages. Additionally, risks for visual impairments could be a result of disease progression and might also hinder an individual's ability to process and implement necessary changes.

**Evidence-Based Interventions for
Improving Medication
Adherence in the
Older Adult**

Brown bag reviews. Several studies investigated the benefit of medication

reviews to help assess potential risks to adverse medication reactions and interactions.

The brown bag review was included in the *AHRQ Health Literacy Universal Precautions*

Toolkit (Brega et al., 2015) as a way to address health literacy needs of patients regarding

medication self-care management. The goal of the review is to assess patients'

comprehension of the medications they are taking, how they should be taking them, and

why they are taking them. It is an opportunity to address any misunderstandings and to

address the potential for drug interactions primary care providers might not have been

aware of secondary to the patient seeing other providers for their medical care or over the

counter medications and supplements the patient might have added. Previous studies that

have implemented the use of a brown bag medication review found while it might be

initially time-consuming, there were statistically significant benefits regarding screening

improvements (Bazargan et al., 2017; Mabachi et al., 2016; O'Connell et al., 2015; Weiss

et al., 2016). Patients also found the brown bag review to be helpful (O'Connell et al.,

2015).

According to Weiss et al. (2016), the AHRQ supported a national demonstration

of health literacy toolkit use and implementation. Weiss et al. reviewed the

implementation process of tools intended to improve medication review within clinical

settings. A total of 12 primary care practices were selected to implement various tools;

two implemented the brown bag medication review tool over six months and tracked

their progress. Using the implementation guide, the two practices implemented all

recommendations of the brown bag medication review tool from the AHRQ's *Health Literacy Universal Precautions Toolkit* (Weiss et al., 2016). Patients were asked to bring all their medications to their visits so comprehensive reviews could be conducted. Pre- and post-intervention medication reviews were conducted by the clinics to assess for changes in the number of patients who brought their medications to office visits. Clinics collected additional data regarding the number of medications brought to visits, the number reviewed, any drug-related problems identified, and changes made to medication regimens during the reviews. Each of the two clinics took a different implementation approach regarding who completed the comprehensive review: in one clinic, the medications were reviewed by the nurses before the visit with the patient's provider; in the second clinic, the resident physician completed the review.

The findings of the study, self-reported by each clinic, revealed significant improvements across all measures except for the measure regarding the identification of drug-related problems (Weiss et al., 2016). However, while not statistically significant, the identification of drug-related problem increased from 17.8% before to 34.2% after implementation ($x^2 = 3.0$, $df = 1$, $p = .082$). Weiss et al. (2016) reported statistically significant findings regarding the number of patients pre- and post-intervention who brought their medications to their appointment--from 20% to 63.8%, a three-fold increase ($x^2 = 27.4$, $df = 2$, $p < .001$). The number of medications patients brought to their appointments increased from an average of one medication pre-intervention to an average number of 6.8 medications ($t = 7.28$, $df = 57.9$, $p = < .001$), which was a six-fold increase (Weiss et al., 2016). As a result of patients bringing in their medications for review, the number of medications reviewed went from an average of 3.3 pre-implementation to 6.1

post-intervention (t= 3.03, df = 75, $p < .003$). Patients also brought their non-prescription

medications and supplements, which increased from 9.1% to 19.5% of patients ($x^2 =$

15.8, df = 4, p = .003). Despite not showing statistical significance regarding drug-

related problems, Weiss et al. reported a statistical significance regarding medication

changes addressed because of detecting issues (17.8% vs. 41.5%, x^2= 5.8, df = 1; p =

.016).

Weiss et al. (2016) reported potential bias secondary to the data being self-

reported by the clinics; sample bias could have occurred in the selection of patients where

the brown bag review was completed. Additionally, the researchers recognized the

sample size was small and that could have limited generalizability for all clinics. Weiss

et al. discussed the use of the brown bag review as a low-cost intervention that could

improve medication adherence and detect risks for adverse outcomes.

Mabachi et al.'s (2016) study simultaneously assessed a quality improvement

implementation at the same organizations reported by the Weiss et al. (2016) study. The

components of the study specifically discussed concerns regarding the consumption of

time required to complete the brown bag medication review (Mabachi et al., 2016).

Although time consumption seemed to be the greatest challenge for the two original

clinics who implemented the tool, 8 of the 12 clinics also decided to implement portions

of the brown bag medication review tool (Mabachi et al., 2016).

In a study by O'Connell et al. (2015), older adult participants taking at least five

medications, considered polypharmacy, were recruited from six senior centers and three

senior high-rises to complete a brown bag review with a team of pharmacists or

pharmacy students. A total of 84 participants had their medications reviewed to address

any potential drug-related problems, education was provided, recommendations for improvements were made, and preventative health measures were encouraged. All of these components are important when enhancing an individual's health literacy level. Participants were asked to complete a survey regarding their satisfaction with the brown bag review; any drug-related problems were captured for further analysis. On average, participants within this study took 9.9 ± 4.4 prescription and nonprescription medications and reported 6.1 ± 3.1 chronic illnesses (O'Connell et al., 2015). A total of 71% of patients obtained their prescription medications from one source, which allowed for interaction checks with the patient's other medications. Another 25% of participants reported using two sources and 4% used more than two sources to obtain their prescription medications (O'Connell et al., 2015). Participants reported the primary reason they attended the brown bag review session was they desired to have more information about their medications, the side effects, and some had concerns about whether some of their medications were even necessary. Upon completion of the reviews, a total of 356 drug-related problems were identified in which participants had an average of 4.3 ± 2.8 drug-related problems identified; only four participants had zero problems identified (O'Connell et al., 2015). Five domains for drug-related problems were identified including treatment effectiveness (30%), adverse reactions (25%), treatment costs (15%), information (13%), and other (17%; O'Connell et al., 2015). The drug-related problems were also classified into the severity and value of the recommended improvement. According to O'Connell et al. 2% of drug-related problems were classified as severe, 53% were classified as significant, 42% were classified as minor, and 3% were classified as no errors identified. When classifying

recommendations for improvement, O'Connell et al. found 2% were considered to be extremely significant, <1% were very significant, 48% were significant, 49% were somewhat significant, and <1% were not significant.

The older adult participants' reported satisfaction was extremely high (O'Connell et al., 2015). The satisfaction survey found 94% of participants enjoyed the brown bag review, 95% reported it met their needs, and 97% felt they would attend again. A total of 63% of participants implemented the recommended interventions when the researchers completed a three-month follow-up interview with participants (O'Connell et al., 2015). The study provided strong support for implementation into the clinical setting. However, each clinic would need to identify how to accomplish the brown bag review best as O'Connell et al. (2015) reported spending approximately 45 minutes per consultation. However, primary care providers might be able to perform the brown bag quicker because they are likely already familiar with the patient.

Bazargan et al. (2017) used a brown bag review to investigate medication compliance in older adult African Americans. Of the 400 African American participants, the average number of chronic illness managed by each participant was five but ranged from 0 to 17 chronic illnesses. "Nineteen percent (76) of participants reported at least eight chronic conditions" (Bazargan et al., 2017, p. 5). On average, participants were taking 5.7 (range: 0-18; $SD = 3.02$) prescription medications, meeting criterion for polypharmacy. The researchers reported 28% of patients were obtaining their prescriptions from three or more providers, which only increased the risk for adverse drug interactions. Almost 65% of participants were unable to verbalize the use of at least one of their medications. Bazargan et al. found those "participants with a higher level of

knowledge about the therapeutic purpose of dosage regimen were almost seven times more likely to adhere to their medications" (p. 9). This evidence supported the importance of enhancing patients' health literacy skills and helping them learn more about their medications and reasons for taking them. One important component Bazargan et al. highlighted was the co-pay requirements effect on medication adherence. The authors further discussed financial barriers regarding the co-pay requirement often faced by older adult African Americans, which was well documented in the evidence. Some improvements have been seen in this population with the implementation of the Affordable Care Act and Medicare Part D.

Recommendations by Bazargan et al. (2017) to help mitigate medication-related issues were to start with a comprehensive review, such as the brown bag review, and encourage patients to bring all their medications with them. The goal was to learn about the patients and their self-care management regarding their medications and to identify potential adverse medication situations that could result in preventable hospitalizations and emergency room visits. Bazargan et al. stressed the importance of using a patient-centered approach with a focus on clear communication between provider and patient. The brown bag review also allowed providers an opportunity to review prescription instructions to assure they were understandable to the patient, potentially reducing complexity in the medication regimen.

Universal medication schedule. As a part of AHRQ's (2018) *Health Literacy Universal Precautions Toolkit*, the use of "explicit and standardized prescription medication instructions" (p. 27) was intended to increase the clarity of patient prescription instructions. In 2013, the National Council for Prescription Drug Programs

published recommendations for the adoption of a universal medication schedule (UMS) by all providers and pharmacies within the United States. The UMS is intended to improve prescription instructions for patients by encouraging providers and pharmacists to use standardized prescription labeling that is more clearly understood by patients using health literacy-sensitive concepts. Originally developed by a research team at Northwestern University, the UMS has been supported by both the IOM (2004) and the U.S. Pharmacopeia (2019) as prescribing best practice (National Council for Prescription Drug Programs, 2013). Prescribers are encouraged to be more specific about administration directions. For instance, a medication intended to be taken twice daily would be written as taking one pill in the morning and take one pill in the evening. Increasing the clarity of instructions is important for those individuals with low health literacy since they have a higher likelihood of having difficulties understanding medication administration labels (Berkman et al., 2011; Wolf et al., 2016).

Wolf et al.'s (2016) study tested the effectiveness of a patient-centered drug label using the best practices of the UMS discussed by the National Council for Prescription Drug Programs (2013). The study discussed how the UMS provides standard intervals that can be used by physicians and pharmacists to provide clear communication. Writing of medication administration timing would be addressed as morning, noon, evening, and bedtime (Wolf et al., 2016). Use of numerical characters rather than words and separating doses onto separate lines are each examples of the UMS format (Wolf et al., 2016). In a two-arm, multi-site, patient-randomized pragmatic trial, Wolf et al.'s study assessed 845 patients' medication adherence rates. The two arms included a control arm

where participants received standard medication labeling while the intervention arm received UMS-supported, patient-centered drug labeling.

Additionally, sub-groupings were assessed for the difference in Spanish- and English-speaking participants when translating UMS label instructions (Wolf et al., 2016). The findings were more significant in English-speaking participants compared to Spanish-speaking participants when assessing medication adherence. Wolf et al. (2016) discussed the need for further studies to investigate variations seen in Spanish-speaking populations.

The most positively impacted were patients with inadequate health literacy and those with polypharmacy challenges (Wolf et al., 2016). According to Wolf et al. (2016), patients with low health literacy were actual found to have rates of adherence "comparable to, if not higher than, those who had adequate literacy skills, were taking once-a-day regimens, or were contending with fewer medications in their regimens" (p. 1487). Wolf et al. found participants with lower health literacy skills in the intervention group saw significant benefit by two different measures--self-reported (*OR* 4.29, 95% CI [0.94, 19.49], *p* = .06) and objectively through pill count (*OR* 5.08, 95% CI [1.15, 22.37], *p* = .03)--compared to those with limited health literacy in the control group.

One of the limitations discussed by Wolf et al. (2016) was medications taken by participants were more commonly once-a-day dosing (74.7 %) and twice-a-day (24%). According to Wolf et al., only 1.2% of patients were on complex medication regimens, making it difficult for this study to assess the significance of patient-centered labels in those with complex regimens. However, California has already implemented the UMS

labeling changes, which may provide additional insight regarding medication adherence rates (Wolf et al., 2016).

Health Literacy Toolkits

One of the most robust of all toolkits is the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015). The toolkit is currently on the second edition with the first developed in 2010 by DeWalt et al. (2011) as a commissioned project for the University of North Carolina at Chapel Hill (2019). The 2015 edition provides additional resources for clinics regarding making the referral process easier for patients, updated resources to assess written materials, and ways in which using the toolkit could help organizations meet certification requirements for patient-centered medical homes (AHRQ, 2018). DeWalt et al. developed the toolkit with three major task objectives:

1. Developing individual tools (modules explaining how to use or implement a strategy to minimize the effects of low health literacy) using existing health literacy resources when possible,

2. Testing individual tools in practice and assembling them into a prototype toolkit, and

3. Testing implementation of the prototype toolkits in practice.

The health literacy universal precautions were developed and tested by six practices within the North Carolina Network Consortium. Further testing of the assembled prototype toolkit was completed by four of the original six practices plus an additional four practices (DeWalt et al., 2011). All practices varied in size, populations served, and staff composition to allow for feedback from various types of clinic settings.

In designing the toolkit items, DeWalt et al. (2011) searched for existing health literacy tools that provided generalized health literacy skills training. A total of 250 items were identified through their searches, which were reduced down to 22 prototype tools (DeWalt et al., 2011). The primary goal of each tool was to allow for clinical implementation.

The health literacy universal precautions were broken into four overarching categories: "improving spoken communications, improving written communications, improving self-management and empowerment, and improving supportive systems" (DeWalt et al., 2011, p. 4). Through the plan/do/study/act model (Institute for Healthcare Improvement, 2019b), six participating clinics were asked to complete the initial implementation of four tools on a small scale to allow for rapid evaluation and feedback (DeWalt et al., 2011). Tools were modified and the health literacy universal precautions prototype was then tested by eight practices over a four-month period. Participating clinics were asked to implement five toolkit items into their practice over an eight-week period, which was found to be difficult for some clinics secondary to lack of resources or time to implement all five tools (DeWalt et al., 2011).

DeWalt et al. (2011) reported the *AHRQ Health Literacy Universal Precautions Toolkit* was found to be a useful tool by clinics. Some clinics initially felt the health literacy universal precautions were going to be additional work but reported they just changed the way they provided care to those with inadequate health literacy. However, a significant time commitment was necessary for the implementation and there was a need for adequate on-going support to assure forward motion and continued tool implementation (DeWalt et al., 2011). One important finding by DeWalt et al. concerned

the implementation of tools after skimming the materials without full engagement and in-

depth learning to complete the step by step process explained in the health literacy

universal precautions. Participants did not fully understand the tool nor its full benefit.

DeWalt et al. discussed the *AHRQ Health Literacy Universal Precautions Toolkit* was

designed to be an immediate implementation type of toolkit but it could also be used "as

a change package for a collaborative improvement project or with practice coaching" (p.

8). The project educational course could empower nurse practitioners or other healthcare

providers advocate for their clinics and colleagues to implement additional tools from the

toolkit.

The American Academy of Family Physicians (2019) also endorsed the use of the

AHRQ Health Literacy Universal Precautions Toolkit (Brega et al., 2015) and provided a

link directly to the AHRQ website to download the toolkit.

University of North Carolina Health
Literacy Toolkits

The University of North Carolina (2019) provides links to the second edition of

the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) as well as

two additional toolkits modeled after the AHRQ toolkit. One toolkit was designed for

cardiology clinics and one was designed for rheumatology clinics. Both toolkits provide

the same components of the original toolkit with additional specialized documents

developed for specifically for cardiology and rheumatology clinics.

National Patient Safety Foundation
Health Literacy Toolkit

The National Patient Safety Foundation as part of the Institute for Healthcare

Improvement (2019a) developed the program called Ask Me 3 to help patients to be

active participants in their care by asking three questions when they are interacting with their provider. The three questions are related to what the main problem is, what they need to do, and understanding why it should be important for them to implement the recommended therapy (Institute for Healthcare Improvement, 2019a). This program is also included within the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) as a tool for empowering patients.

Always Use Teach-Back! Toolkit

The *Always Use Teach-back* (2019) toolkit is web-based learning intended for healthcare providers to learn about the teach-back method by completing an interactive module. Healthcare providers are provided education about teach-back through use of quizzes and video vignettes that show the teach-back method in practice (Always Use Teach-back!, 2019). The toolkit was developed through a grant supported by the Picker Institute, Des Moines University, and the Iowa Osteopathic Education and Research Program and is currently managed by the Institutes of Health. This toolkit was also included in the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015).

Summary

Based on the review of literature and the identified needs of the older adult patient with inadequate health literacy, the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) provided the most encompassing toolkit of evidence-based components, all of which could be adapted in the development of an educational program for nurse practitioners. Tools that best applied to the needs of the older adult population included clear communication; teach-back method; follow-up with patients; consider

culture, customs, and beliefs; conduct brown bag medication review; help patients to remember how and when to take their medications; and encourage questions.

Theoretical Frameworks

Two theoretical frameworks were applied to this project. The first was Orem's (1997) self-care deficit nursing theory, which acted as the underpinning in the development of program content. The second framework was the theory of planned behavior (Ajzen, 1991), which was used to assess participants' intentions to implement tools provided to them from this educational program.

Orem's Self-Care Deficit Nursing Theory

The central themes of health literacy focus on an individual's ability to address his/her healthcare needs. Orem's (1997) self-care deficit nursing theory provides important underpinnings necessary to help nurses and advanced practice nurses to best address an individual's health literacy needs. Based on the self-care deficit nursing theory, individuals with limited health literacy would be seen as having a self-care deficit or affecting the individual's ability to perform self-care actions. Orem's theory as applied as the theoretical framework for education development is comprised of three nursing theories: the theory of self-care, the theory of self-care deficit, and the theory of nursing system.

Theory of self-care. According to Hartweg (1991), Orem defined self-care as an action that must be learned and is considered to be a deliberate action. Orem (1991) further defined self-care to say it "stands in distinction from other types of regulation of human functioning" (p. 143) but helps the person to regulate his/her health and further his/her development throughout the lifecycle. Orem recognized individuals would

address situations based on their experiences and outside influences--it is a learned

action. Orem further stated, "All individuals have the potential ability and motivation

necessary to provide care for themselves and dependents. However, having the ability or

potential does not mean that all will seek knowledge or take action" (Hartweg, 1991, p.

12). The individual needs interventions that provide support and education to develop

self-care skills.

 Self-care agency. Orem (1991) defined self-care agency as an individual's ability

to perform self-care actions necessary to meet his/her needs. Agency helps the individual

perform deliberate actions. For an individual to have self-care agency, the individual

needs to be able to understand the skills necessary to achieve self-care requisites, develop

a plan to acquire those skills, assess for their impact, and make changes based on their

assessment (Orem, 1991). Many internal and external factors can affect the individual's

self-care agency including his/her cultural beliefs, experiences, and health state (Orem,

1991). Health literacy is one of those components that can also affect an individual's

self-care agency. Orem recognized nursing's role is to assess whether the individual's

self-care agency is adequate to meet self-care requisites. It is also important to consider

meeting the individual where they are and accepting what the individual can conceivably

do at that point in the relationship. If the older adult has cognitive deficits, a complex

medication regimen for diabetes management might not be within his/her self-care

agency. Interventions developed would need to take into account those limitations.

 Universal self-care requisites. Universal self-care requisites (USCR) are self-

care requisites necessary for all human beings to live. According to Orem (1991), eight

self-care requisites are common to all human beings:

1. Ensuring sufficient air intake

2. Ensuring sufficient water intake

3. Ensuring sufficient food intake

4. The capability to carry out tasks associated with the elimination of human waste

5. Maintaining a balance between rest and activity

6. Maintaining a balance between solitude and social interactions

7. Preventing hazards to human life, human functioning, and human well-being

8. Promoting human functioning and development within social groups in accord to human potential, their limitations, and human's desire to be normal. (p. 126)

Developmental self-care requisites. Orem (1991) described developmental self-care requisites (DSCR) as processes requiring the individual to develop new skills to address a situation that is affecting him/her. Two types of DSCRs were described by Orem. The first included requisites necessary for normal growth and development that supported the eight USCRs listed above and had a health promotion-driven focus. The second type was more specific to alterations that could adversely affect human development. Orem broke this second type into two subgroups: the first focused on prevention of the following deleterious effects and the second focused on mitigation of existent effects of the following conditions that might need further provisions of care:

- Educational deprivation

- Problems of social adaptation

- Failures of healthy individuation

- Loss of relatives, friends, associates

- Loss of possessions, loss of occupational security

- Abrupt change of residence to an unfamiliar environment

- Status-associated problems

- Poor health or disability

- Oppressive living conditions

- Terminal illness and impending death. (p. 131)

An example specific to the focus of this program included changes in cognitive development occurring with aging. Cognitive deficits could result in a deficit of the DSCR of education deprivation and require nursing provide interventions that could better support or decrease the cognitive load burden for the older adult (Orem, 1991). From the standpoint of providing health literacy education, this might mean chunking of small bits of information, speaking slowly, repetition of key topic items that allow for comprehension, and developing plans that support the cognitive abilities of the individual.

Health-deviation self-care requisites. Self-care requisites within the health-deviation self-care (HDSC) arena include those pathological changes that require the individual to make provisions to address them (Orem, 1991). These changes might occur abruptly, such as a myocardial infarct, or more subtly, such as hypertension. With regard to medication adherence, an HDSC might be affected by the way the individual views his/her health-deviation and how he/she chooses to address it. According to Soones et al. (2016), older adult individuals with asthma and low health literacy carried the disease-belief that when they did not have symptoms of asthma, they no longer had asthma--only

when there were symptoms. Having this type of disease-belief could lead to a deficit in

self-care secondary to misconceptions about their disease diagnosis and how they

approached self-care management. However, the component of providing medical

interventions also changed how the individual approached the HDSC requisites. An

individual with congestive heart failure might require frequent monitoring by specialists,

complex medication regimens, and daily monitoring by the individual for potential signs

and symptoms that could signal adverse disease changes. The demands on the individual

could be great and practitioners would need to be alert to potential self-care deficits the

individual might experience. All of these components could be affected by inadequate

health literacy.

Therapeutic self-care demand. Orem (1991) defined herapeutic self-care

demand (TSCD) as the "course of action" (p. 135) an individual must take to meet self-

care requisites. Nursing must understand both the TSCD being placed on the individual

and the factors to be managed to help devise a plan that could be successfully

implemented by the individual (Orem, 1991). Additionally, factors the individual might

exhibit that could affect how the TSCD is approached are called basic conditioning

factors (BCF). According to Orem (1991), these BCFs include

- the individual's age,

- gender,

- developmental state,

- health state,

- sociocultural orientation,

- health care system factors,

- family system factors,

- patterns of living including activities regularly engaged in,

- environmental factors, and

- resource availability and adequacy. (p. 136)

These BCFs must always be considered when prescribing or implementing self-care actions needed to meet the TSCD. Additionally, the individual must also recognize and feel they need help meeting his/her TSCDs. This recognition could be hindered or highlighted by the level of health literacy skills the individual possesses. Individuals with low health literacy might not be able to recognize the importance of a medication regimen if they do not believe their disease process requires it or the disease process is even present. As healthcare providers, it is necessary to understand an individual's perceptions of his/her current self-care needs before moving forward with a plan.

Theory of self-care deficit. This theory encompasses the components of the theory of self-care (Orem, 1991). Those individuals unable to perform self-care tasks, lack self-care agency, to meet therapeutic self-care demands would be considered to have a self-care deficit.

Orem (1991) linked the two theories of self-care and self-care deficits together into two sets of presuppositions. The first set discussed the need for the individual to have the ability to perform self-care measures, to have value in those self-care measures, and have completeness and quality based upon the culture within the individual's community or family; the act of engagement was based on the individual's limitations "in knowing what to do under existent conditions and circumstances or how to do it" (Orem, 1991, p. 71). The second set focused on the external forces of the society surrounding the

individual. The presuppositions of this set stated that when deficits are identified, society steps in to provide aid to the individual based on the nature of the need and reason for his/her dependency. When the individual is no longer able to live independently, the social group assists in providing those direct needs that can potentially be age-related (Orem, 1991). Direct services include social groups such as nursing and medical care.

When self-care deficits are present, a need for social dependency helps meet the agency required to address the deficit. As an example of how inadequate health literacy could affect a self-care deficit, consider an individual with inadequate health literacy and a new diagnosis of atrial fibrillation now requiring anticoagulation therapy. The individual struggles to even understand what atrial fibrillation is but must now understand how to take anticoagulating medications, his/her dietary restrictions, frequency of blood draws to assess anticoagulation regulation, changes based on results, and what needs to happen if adverse side effects occur. Additionally, the patient needs to have surgical procedures that require they have a bridging anticoagulation therapy, which requires even more from the individual regarding self-care agency to meet therapeutic self-care demands. If the individual does not understand or place value in self-care measures being asked of them because his/her limits are related to inadequate health literacy, there are greater risks for adverse outcomes for this patient.

Theory of nursing systems. Orem (1991) provided this central idea of the theory of nursing systems:

All systems of practical action that is nursing systems are formed by nurses through their deliberate exercise of specialized nursing capabilities (nursing agency) within the context of their interpersonal and contractual relationship with

persons with health-derived or health-associated deficits for production of continuing, effective, and complete care for themselves or their dependents for purposes of ensuring that therapeutic self-care demands are known and met and self-care agency is protected or its exercise or development regulated. (p. 72)

The theory of nursing systems encompasses components of both the theory of self-care and the theory of self-care deficit and examines the needs required to return the individual to a state where he/she can successfully provide self-care agency once again or make adaptations to meet the current state of the individual. Much of the role of the nurse practitioner in the outpatient clinical setting is related to addressing self-care needs in a supportive-educative role. When the individual requires additional support, nurse practitioners must seek out an additional nursing agency to address self-care demands in the form of hospitalization, long-term care, home health nursing, or family/friend support determined based on the needs.

Theory of Planned Behavior

The theory of planned behavior was first introduced as a way to explain human social behavior predictions (Ajzen, 1991). The concept of intention was the central focus for this project and how nurse practitioners who completed the program showed intention to implement health literacy-sensitive practices into their clinical practice. According to Fishbein and Ajzen (2010), understanding intention helps to predict the likelihood a person will perform a behavior. Fishbein and Ajzen agreed upon eight components in which one or more of the following needed to be present for an individual to perform a behavior:

1. The person has formed a strong positive intention (or made a commitment) to perform the behavior;

2. There are no environmental constraints that make it impossible for the behavior to occur;

3. The person has the skills necessary to perform the behavior;

4. The person believes the advantages (benefits, anticipated positive outcomes) of performing the behavior outweigh the disadvantages (costs, anticipated negative outcomes); in other words, the person has a positive attitude toward performing the behavior;

5. The person perceives more social (normative) pressure to perform the behavior than to not perform the behavior;

6. The person perceives that performance of the behavior is more consistent than inconsistent with his or her self-image or that its performance does not violate personal standards that activate negative self-sanctions;

7. The person's emotional reaction to performing the behavior is more positive than negative; and

8. The person perceives he or she has the capabilities to perform the behavior under a number of different circumstances; in other words, the person has perceived self-efficacy to execute the behavior in question (p. 19).

The aspect of intention to implement health literacy-sensitive interventions was assessed by Mackert, Ball, and Lopez (2011) and Coleman and Fromer (2015) through measurements of pre- and post-interventions of a participant's intentions. Cafiero (2013) conducted a study measuring the baseline state of health literacy knowledge and

experiences of nurse practitioners as well as their intention to implement health literacy-sensitive interventions. Cafiero developed an intention screening tool called the Health Literacy Strategies Behavioral Intention instrument using the theory of planned behavior as the underpinning for instrument development.

The theory of planned behavior has also been applied to assessing evidence-based practice implementation (Burgess, Chang, Nakamura, Izmirian, & Okamura, 2016) and changing physician behavior with implementation intentions (Saddawi-Konefka, Schumacher, Baker, Charnin, & Gollwitzer, 2016). In the study by Burgess et al. (2016), researchers explored the intentions of practitioners to use evidence-based practices when caring for youth with mental health needs. Common themes pulled out of interviews completed with participants included attitudes, subjective norms, and perceived behavioral control.

Attitudes toward evidence-based practices that showed participants understood positive treatment outcomes were often seen because there was evidence to support actions (Burgess et al., 2016). While evidence-based practices do not always work with every patient, they provide the groundwork to continue making progress. In cases where evidence-based practice employed scripts or worksheets, participants reported feeling restricted in their ability to adjust treatments based on patient needs; however, at the same time, they offered a starting point for those new to the concepts, the work had already been done, and it eliminated the need for guessing what else was needed in a situation (Burgess et al., 2016). Additionally, some participants discussed the epistemological approach of depending upon sources of knowledge such as intuition or scientific evidence to direct their application of certain treatment plans.

When addressing subjective norms with participants, they were asked about those who shaped their normative beliefs--whether individuals or groups (Burgess et al., 2016). Participants discussed the impact on their normative beliefs stemmed from opinions or expectations from employers, clients, other mental health professions, and non-clinical administrators. Normative beliefs were based on being driven by time-sensitive outcomes, patients wanting proven therapies, or even negative feelings about evidence-based practices by other mental health professionals (Burgess et al., 2016).

Perceived behavioral control was measured based on components the participants felt inhibited or facilitated their use of evidence-based practices. Participants identified advanced graduate education as both an inhibiting force and a facilitating force that was dependent on the focus of the education. If graduate schools embraced evidence-based practice, it was more likely to be embraced by participants. Continuing education was also an important facilitator of evidence-based practice, especially when it was brought into the clinic versus making participants attend off-site. Time and financial constraints were seen as inhibiting forces when trainings were off-site.

Additionally, time constraints were perceived as inhibiting forces secondary to the burdens of seeing patients and then trying to obtain training as well (Burgess et al., 2016). Participants also felt perceived support from the administration could both inhibit or facilitate their use of evidence-based practice. Support following training was one component participants felt was important to facilitate implementation of evidence-based practices. Administrators encouraging implementation and creating accountability were more likely to be seen as a facilitator for implementing evidence-based practice (Burgess et al., 2016).

In an article by Saddawi-Konefka et al. (2016), the authors discussed the use of a technique called implementation intention as a way to help learners in medical education move from intention to implementing a practice. Saddawi-Konefka et al. discussed how "knowledge and good intentions are, by themselves, insufficient to produce behavior change" (p. 1211). Achieving goals requires the individual to act and execute behaviors that would move them toward his/her goals (Saddawi-Konefka et al., 2016). An implementation intention is one way to address goal attainment; however, implementation intention requires a different mindset from the participant. Saddawi-Konefka et al. explained how implementation intentions involve the use of "if-then" plans to address the intended behaviors. For instance, in the case of implementing health literacy-sensitive interventions, the nurse practitioner could say, "If I am prescribing medications to a patient in the clinic, then I will use teach-back to assess their understanding about the medication." This simple act of using an "if-then" intention statement was seen in the literature as a highly effective way to increase goal attainment. Saddawi-Konefka et al. conducted a meta-analysis of nearly 100 studies where an implementation intention demonstrated a medium to large effect ($d = 0.65$).

In discussing the underlying psychological mechanisms, Saddawi-Konefka et al. (2016) discussed how the use of implementation intention aided in behavior changes to become an automated behavior that did not require a high cognitive load. Because the individual had already identified situations in which the behavior would be used, the individual was more likely to identify it when it arose in day-to-day interactions. However, important components to applying the implementation intentions were discussed by Saddawi-Konefka et al. that included "how challenging the goal is, features

of the if-then components selected, and features of the individual's overarching goals and motivations" (p. 1213). Applying intention implementations to goals requires a higher level of self-regulation with a thoughtful selection of if-then that could help trigger responses, which could move the individual closer to the goal compared to ambiguous if-then statements. However, if the individual's overarching goal did not align with the intention implementation goal, then it was likely the person would find internal conflict and be less successful in goal attainment.

The theory of planned behavior framework (Ajzen, 1991) was used in the assessment of intention of participants to implement health literacy-sensitive interventions with patients seen in their clinic setting. In the program development, Fishbein and Ajzen's (2010) eight components were considered to best address the learning objectives outlined in Chapter III.

Conclusion

Regarding clinical practice, it is unknown to what extent health literacy is currently being addressed by healthcare providers when focused on medication adherence in older adult populations. The literature resoundingly encouraged a strong provider-patient relationship focused on interventions that continually assessed for and provided individualized health literacy-sensitive education. The focus of nursing care has long been on providing patient-centered education and care. It is important to understand what advanced practice nursing providers know about health literacy regarding medication management. Additionally, it is also important to understand how nurse practitioners are currently addressing health literacy in the older adult population, more specifically when addressing medication adherence. By gaining an understanding of current clinical

practice trends, there is potential for the development of nurse practitioner-specific

continuing education and a nursing practitioner curriculum.

CHAPTER III

METHODOLOGY

Design

This project provided an online educational program wherein nurse practitioner participants learned about health literacy, the prevalence of inadequate health literacy, vulnerable populations, effects of inadequate health literacy on health outcomes, and evidence-based health literacy-sensitive interventions that could be implemented into their clinical practice. An additional component discussed the research regarding the older adult population and interventions considered beneficial to this population. The participants were invited to attend a web-based educational program that included videos, PowerPoint presentations, interactive modules, and handouts intended to be taken and used within their practice. It was anticipated participants would spend four hours to complete all modules within the program. Additionally, a resource section was included for participants who desired to learn more about health literacy after completing the modules.

The *AHRQ Universal Precautions Health Literacy Toolkit* (Brega et al., 2015) was used as the framework for the program intervention guide. The toolkit was originally intended to be used in primary care and could be modified based on each clinic's health literacy needs. While all tools with the AHRQ toolkit were appropriate to be used with all populations, this program focused on the tools likely to best address the older adult population's health literacy needs based on the evidence.

Participants' basic knowledge of health literacy, ways to identify patients at risk for inadequate health literacy, and use of health literacy-sensitive intervention skills/strategies were assessed before and after the educational intervention. As participants moved through the modules, six key learning objectives were addressed at the conclusion of the program. Participants would:

1. Report increased awareness regarding the prevalence of inadequate health literacy and identify vulnerable populations compared to their self-reported knowledge in the pre-intervention survey.

   - Evaluation is based on changes in participant's self-reported knowledge; survey items: #1-3 on the pre-intervention survey and #1-3 and 5 on the immediate post-intervention survey (see Appendix A).

2. Report an increase in individual's behaviors suggesting inadequate health literacy;

   - Evaluation is based on participant's self-reported behaviors; survey items: #5-6 on the pre-intervention survey, and #6-7 on the immediate post-intervention survey (see Appendix A).

3. Report an increased ability to identify the effect inadequate health literacy has on patient outcomes compared to the pre-intervention survey;

   - Evaluation is based on participant's self-reported behaviors; survey items: # 4 of the pre-intervention survey and #4 of the immediate post-intervention survey (see Appendix A).

4. Report an increased intention to use health literacy-sensitive intervention skills and strategies in clinical practice compared to self-reported pre-intervention use of health-literacy sensitive interventions.

- Evaluation is based on participant's self-reported behaviors and intention to implement behaviors; survey items #5-19 on the pre-interventions survey and #6-20 on the immediate post-intervention survey (see Appendix A).

5. Report an increased likelihood to implement health literacy-sensitive intervention skills/strategies specific to older adult populations addressing medication adherence compared to the pre-intervention survey.

- Evaluation is based on participant's self-reported behaviors and intention to implement behaviors; survey items # 20-23 on pre-intervention survey, and #21-24 on immediate post-implementation survey (see Appendix A).

6. Show increased application of health literacy-sensitive intervention skill/strategies two-weeks post-intervention compared to self-reported practices on pre-intervention survey and immediate post-intervention self-reported intention

- Evaluation is based on participant's self-reported application behaviors; survey items: # 5-23 on the pre-intervention survey and #1-19 on the two-week post-intervention survey (see Appendix A).

- Evaluation is based on participant's self-reported application behaviors compared to their reported intention to implement health literacy-

sensitive intervention skills and strategies; survey items: #6-24 on the immediate post-intervention survey and #1-19 on the two-week post-intervention survey (see Appendix A).

Setting

The setting for this health literacy-sensitive intervention program was a self-paced, online education platform completed within one month of starting.

Sample

The primary intended sample was practicing nurse practitioners currently subscribed to the Northern Colorado Nurse Practitioner Coalition. However additional recruitment methods were considered to meet target sample needs and are further discussed in the recruitment section. The targeted sample size was between 42 and 54 participants based on an effect size of 1.03 with a desired power of .95 (Plichta & Kelvin, 2013). The calculated effect size was based on Mackert et al.'s (2011) study results and Cohen's tables for determining sample size (Plichta & Kelvin, 2013).

Inclusion Criteria

Participants who were currently certified nurse practitioners and licensed to care for older adult populations (family nurse practitioners, adult-gerontology nurses practitioners, women's health nurse practitioners, certified nurse midwives, psychiatric mental health nurse practitioners, emergency nurse practitioner, acute care nurse practitioner) and currently working within the outpatient clinic or acute care settings that included the older adult populations as a part of the nurse practitioner's patient panel were approached for inclusion in the project.

Exclusion Criteria

Exclusion criteria included any nurse practitioner participant who was not certified or licensed to care for the older adult populations (neonatal nurse practitioners, pediatric nurse practitioners), not currently working in the outpatient or acute care settings, currently working in a clinic setting that did not see older adults, or was retired.

Recruitment

Following approval by the University of Northern Colorado's Institutional Review Board (IRB; see Appendix B), potential participants were recruited through an email sent to the Northern Colorado Nurse Practitioner Coalition email list (see Appendix C), advertisement on the Northern Colorado Nurse Practitioner Coalition website (see Appendix C), and through distribution of fliers by the project lead at the June 26, 2019 Northern Colorado Nurse Practitioner monthly meeting (see Appendix C). To assure adequate sample size, snowball recruitment was also used--participants were encouraged to share fliers, emails, and the link to enroll with nurse practitioners who would be interested in participating the program. A secondary recruitment reminder email sent out by the president of the Northern Colorado Nurse Practitioner Coalition was also considered to assure adequate sampling. A secondary recruitment consideration included the online community on the Doctors of Nursing Practice, Inc. website using a web-based advertisement. Approval was obtained from the Northern Colorado Nurse Practitioner Coalition president to recruit participants through these mechanisms (see Appendix D). Participants who decided to participate were directed to a participant recruitment and consent electronic sign-up form that contained the program description, consent information and asked the participate to provide an email address in order to provide

weekly email updates with associated survey links and health literacy information (see

Appendix E). Email addresses were kept confidential in a password protected file and

were not shared with other participants in the program. The project lead was the only one

with access to password protected information. Consent to participate was implied by the

participant's completion of the sign-up link and active participation in the surveys and

education program modules. Additionally, formal participation consent language will be

stated on the sign-up form (see Appendix E) and at the beginning of each survey with

participants addressing an acknowledgement statement of consent for use of survey data

collection (see Appendix E).

Project Mission, Vision, and Objectives

Mission

The mission of this DNP Scholarly project was to increase nurse practitioner's

health literacy knowledge, skills, and intention to implement health literacy-sensitive

strategies into their everyday professional practice, which are known have an impact on

improving health outcomes particularly in the vulnerable population of older adults.

Vision

Through the use of this program, nurse practitioners were able to implement

health literacy-sensitive interventions, understand interventions specific to older adults

and see a reduction in adverse medication outcomes, increased medication compliance,

and improved chronic disease self-management. Participants demonstrated increased

confidence to be able to adapt learned interventions for each individualized patient and

develop further working interventions that could be shared within the nurse practitioner

community to improve health outcomes.

Project Objectives

The primary objective of this project was to develop and implement an evidence-based, health literacy-sensitive educational program focused on increasing the nurse practitioner's awareness of health literacy trends, vulnerable population, and evidence-based interventions they could apply to their current professional practice when communicating with older adults with inadequate health literacy.

Project objectives included:

1. Assess nurse practitioner's perceived knowledge regarding health literacy

2. Increase nurse practitioners' awareness of signs of potential inadequate health literacy

3. Provide nurse practitioners with tangible health literacy-sensitive intervention skills and strategies for the older adult patient to potentially improve medication adherence

4. Assess for individual practitioner intention to implement and actual implementation of evidence-based, health literacy-sensitive intervention skills and strategies into practice

5. Assess participant's perceived facilitators and barriers to implementing health literacy-sensitive interventions into their clinical practice.

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Project Plan

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Using the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) implementation guide, toolkit recommendations were used to develop the learning modules in addressing health literacy in the nurse practitioner sample currently practicing in the primary care settings who participated in this program. Because the *AHRQ Health*

Literacy Universal Precautions Toolkit is an evidence-based guidance program, the program covered the recommendations covered in the health literacy universal precautions toolkit and implementation guide. Orem's (1991) self-care deficit nursing theory framework provided the underpinning of the program development and approach to health literacy interventions. The program combined some tools based on similar content areas. The *AHRQ Health Literacy Universal Precautions Toolkit* included health literacy-related facts that were sent in weekly update emails (see Appendix F) to participants with reminders to complete program modules and questionnaires.

The online program was housed on a secure webpage which requires login and password to access program materials. External links guided participants to the modules associated with the health literacy universal precautions tool including the "Always Use Teach-back!" website (with permission, see Appendix D) Weekly reminders including health literacy education facts were sent to participants over the course of the program's anticipated run time of four weeks period; it was estimated participants would take between 5 and 10 minutes per week to review those emails. There will be a total of four modules for participants completed four modules (see Appendix G).

Pre-Intervention Weeks

During the two weeks before the program started, participants meeting inclusion criteria were recruited and received a link to the project description and consent information. Participants had the ability to contact the student researcher through the contact information available on the recruitment forms and at the beginning of all surveys. The project lead sent an email that included two attached links. The first link was to the Qualtrics pre-intervention survey (see Appendix G) that assessed participants'

current health literacy knowledge, current health literacy practices/skills, previous health

literacy education experiences, and demographic information. The second link took them

to the designated website where all participants created a login and password to access

the modules. Use of a standard login allowed for program information to be accessed by

those with the provided login and password, which kept the content secure. When

completing all surveys, participants were asked to provide survey identification that

included the first three letters of their last name and the numerical format of their birth

month and day. Use of the survey identification allowed for monitoring of improvement

between pre- and post-intervention data points; all data collected remained confidential.

Intervention Weeks

At the designated start date of the invention, all participants were sent an email to

remind them the program was open for them to begin working through modules and

would be available for one month. Participants who had not completed the pre-

intervention questionnaire were encouraged to complete the pre-intervention

questionnaire and begin the modules. Each week a reminder email was sent to

participants to encourage completion within the designated timeframe and health literacy

facts. The project lead also provided her contact information for participants to contact

her with any questions, concerns, or needs during and after program completion. Upon

completion, participants were asked to complete a post-intervention questionnaire (see

Appendix A) assessing their learning of intervention-specific education, their opinions

regarding ease of use of interventions, barriers to implementation of interventions, and

their likelihood of utilizing health literacy-sensitive interventions with their older adult

patients.

Post-Intervention Weeks

Following the completion of the educational program, participants will be sent a third questionnaire two weeks following completion of the second post-intervention questionnaire (see Appendix A) to assess for the application into practices by the nurse practitioner participants based on previous learning. At the completion of the two-week post-intervention survey, participants will be directed to click on an external link to a raffle for a $50.00 Amazon electronic gift card as a token of appreciation for the time to participate in the program. Participants desiring to enter the raffle will be asked to provide only an email address and the $50.00 electronic gift card will be sent to the randomly selected winning participant's email address. No additional personal data will be collected, and email addresses will remain confidential.

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Instrumentation

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The Pre- and Post-Intervention on Knowledge, Skill, and Intended Behavior instrument (see Appendix H) was originally developed by Mackert et al. (2011; see Appendix D for permission to use) to assess a healthcare provider's percieved health literacy knowledge, actual practice behaviors, and implementation intention behaviors regarding health literacy-sensitive interventions skills and strategies. The instrument was broken into three sections of perceived knowledge, current use of strategies and skills in practice, and intended behaviors. The theory of planned behavior (Ajzen, 1991) was the basis for the decision to use the Mackert et al. instrument as one of the instruments whose focus was to measure intention of participants to implement knowledge learned into practice.

To evaluate implementation practices, Mackert et al.'s (2011) post-intervention survey was adapted by changing the survey item anchors to assess for participants' clinical implementation behaviors two weeks after completion of the program (see Appendix H). These survey results were compared to results of the same survey items in both the pre-intervention survey and the initial post-intervention survey.

The Mackert et al. (2011) survey items were also adapted to contain anchors to ask participants about their practice behaviors as they related to older adult populations when addressing medication adherence. These survey questions were added to all surveys to assess current, intended, and post-application behaviors of participants. Additional skills items specific to medication education were added to the older adult anchor section to gain insight to on current behaviors and post-intervention intention and application of health-literacy sensitive skills related to medication education and adherence (see Appendix G).

Finally, demographic data were collected to describe participants in this project. In previous studies (Coleman & Fromer, 2015; Mackert et al., 2011), demographic data collected included gender, age, healthcare provider type, and years of healthcare experience. Years of healthcare experience were replaced to assess for both nurse practitioner's years of experience and previous years of nursing experience. Based on Cafiero's (2013) study, this project also obtained nurse practitioner certification type, nurse practitioner degree type, and clinical setting type.

Pre- and Post-Intervention on Knowledge, Skill, and Intended Behavior Instrument

The Pre- and Post-Intervention on Knowledge, Skill, and Intended Behavior instrument (Mackert et al., 2011) has been used in two studies to date. The first was in a

multi-site, interprofessional sample of healthcare providers including physicians, nurse practitioners, nurses, social workers, office staff, administrators, and others (Mackert et al., 2011). The second study was a single-site, interprofessional sample of healthcare providers including physicians, nurses, medical assistants/certified nursing assistants, patient advocates, social workers and office staff (Coleman & Fromer, 2015).

In both studies (Coleman & Fromer, 2015; Mackert et al., 2011), all pre-survey anchored items were set up in a Likert-type scale format, ranging from 1 (*Strongly Disagree/Never*) to 7 (*Strongly Agree/Always*), to assess participants' percieved baseline health literacy knowledge, current practice behaviors used in interactions with patients who had inadequate health literacy, and current use of health literacy-sensitive skills (techniques). Four survey items were used to assess participants' perceived health literacy knowledge (items 1-4; see Appendix H) and three survey items assessed participants' perceived behaviors to deal with patients with inadequate health literacy including identifying patients with inadequate health literacy, assessing patient comprehension, and maintaining a culturally sensitive healthcare experience (items 5-7, see Appendix H; Mackert et al., 2011). The final six survey items (items 8-13; see Appendix H) assessed participants' current use of health literacy-sensitive skills (techniques) that focus on improve communication including: speaking slowly, using plain language, use of pictures or drawing, limiting information, using teach-back, and a shame-free environment (Coleman & Fromer, 2015; Mackert et al., 2011).

In the post-intervention survey, participants' health literacy knowledge was assessed for a second time using the same survey items and anchor format as the pre-survey. Anchored items that assessed for perceived abilities in the pre-intervention

survey were changed to using intention anchors where the Likert-type scale ranged from 1 (*Very Unlikely*) to 7 (*Very Likely*). Mackert et al. (2011) addressed the importance of assessing for intention; correlations between intention and future behavior were also supported by Cafiero's (2013) research and the theory of planned behavior (Fishbein & Ajzen, 2010).

Survey scoring. Pre-intervention survey items were scored individually using the values of 1 (*Strongly Disagree/Never*), 2 (*Disagree/Rarely*), 3 *(Somewhat Disagree/Occasionally)*, 4 (*Neither Agree or Disagree/Sometimes*), 5 (*Somewhat Agree/Frequently*), 6 (*Agree/Usually*), and 7 (*Strongly Agree/Every Time*). The mean score of each item was reported with a higher mean reflecting a more positive response and a lower mean reflecting a more negative response. The initial four survey items assessed participants' perceived knowledge regarding health literacy-related items; a higher mean response for each survey item reflected higher perceived knowledge about each of the health literacy related-topics (see Appendix H). The next three survey items assessed participants' baseline/current perceived ability to deal with patients with inadequate health literacy; a higher mean response for each survey item reflected a higher perceived ability to manage patients with inadequate health literacy including actively identifying patients with inadequate health literacy, monitoring for comprehension, and maintaining a culturally sensitive healthcare experience (see Appendix H).

The final six survey items assessed participants' current perceived use of health literacy-sensitive intervention skills (techniques) including speaking slowly; using plain, non-medical language; showing or drawing pictures; limiting amounts of information and repeating it; using teach-back or show-me techniques; and creating a shame-free

environment. A higher mean score for each item reflected greater use of the specific health literacy strategy (see Appendix H).

Initial post-intervention survey items were scored individually using the values of 1 (*Strongly Disagree/Very Unlikely*), 2 (*Disagree/Unlikely*), 3 *(Somewhat Disagree/Somewhat Unlikely*), 4 (*Neither Agree or Disagree/Neutral*), 5 (*Somewhat Agree/Somewhat Likely*), 6 (*Agree/Likely*), And 7 (*Strongly Agree/Very Likely*). The initial four survey items assessed participants' perceived post-intervention health literacy knowledge; a higher mean score reflected a higher level of perceived participant knowledge. The fifth survey item assessed participants' degree to which they thought they overestimated their pre-intervention health literacy knowledge; a higher mean score reflected participants' higher level of agreement regarding overestimation. The next three survey items assessed participants' intention of focusing more on strategies to address patients with inadequate health literacy (identifying, monitoring for comprehension, and maintaining a culturally sensitive healthcare experience). With these three survey items, a higher mean score reflected a higher intention to use health literacy-sensitive strategies. The final six survey items assessed participants' intention to focus on using the same health literacy-sensitive intervention skills assessed in the pre-intervention survey; a higher mean score reflected a higher intention to use health literacy-sensitive skills.

Statistical analyses. In the Mackert et al. (2011) and Coleman and Fromer (2015) studies, a paired samples *t*-test and Student's *t*-tests, respectively, were used to assess for mean changes in the group aggregated responses for each of the items measured during the pre- and post-intervention timeframes. Neither study completed

validation for internal reliability on the Pre- and Post-Intervention on Knowledge, Skill, and Intended Behavior instrument. Coleman and Fromer (2015) reported this was a potential limitation of their study and discussed variations that might have been seen in their results had they used the Cafiero's (2013) Health Literacy Strategies Behavior Intention survey.

Older Adult-Specific Survey Items

The same Mackert et al. (2011) survey items regarding health literacy-sensitive intervention skills (techniques) were adapted to focus on participants' behaviors regarding interactions addressing medication adherence in older adults who might have inadequate health literacy. The pre-intervention survey anchor contained the following language: "When prescribing medications to Older Adult Patients, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (Never) to 7 (Frequently)?" The post-intervention survey anchor contained the following language: "When prescribing medications to Older Adult Patients, on a scale of 1-7, indicate how likely you are to focus more on each task from 1(Very Unlikely) to 7 (Very Likely)." Four additional survey items regarding health literacy-sensitive intervention skills (techniques) related to medication adherence based on the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015) items were included in the education (see Appendix H). These skills included the brown bag medication review, patient-centered medication instructions, medication reminder forms, and medication forms.

Scoring of older adult survey items. Pre-intervention survey items were scored individually using the values of 1 (*Never*), 2 (*Rarely*), 3(*Occasionally*), 4 (*Sometimes*), 5 (*Frequently*), 6 (*Usually*), and 7 (*Every Time*). A higher mean score indicated

participants' higher frequency of use. In the post-intervention survey, items were scored individually using the values of 1(*Very Unlikely*), 2 (*Unlikely*), 3 (*Somewhat Unlikely*), 4 (*Neutral*), 5 (*Somewhat Likely*), 6 (*Likely*), and 7 (*Very Likely*). A higher mean score would indicate greater intention of implementing health literacy-sensitive intervention strategies or skills into practice.

Two-Week Post-Implementation Survey

To assess for implementation of health literacy-sensitive interventions into a nurse practitioner participant's practice, Mackert et al.'s (2011) survey anchor was adjusted to use the following language: "In the past two weeks, how frequently did you use each technique from 1 (never) to 7 (every time)?" Survey items specific to health literacy-sensitive intervention skills included speaking slowly; using plain, non-medical language; showing or drawing pictures; limiting the amount of information provided and repeating it; using teach-back or show-me techniques; and creating a shame-free environment (see Appendix H).

Survey items regarding older adults and the implementation of health literacy-sensitive interventions to promote medication adherence were also assessed in this post-implementation survey. The survey anchor included the following language: "When prescribing medications in Older Adult Patients in the past two weeks, how frequently did you use each technique from 1 (never) to 7 (always)?" Survey items listed above in this section again addressed the frequency of use in the older adult population and also contained medication adherence-specific, health literacy-sensitive interventions including the brown bag medication review, patient-centered medication instructions, medication reminder forms, and medication forms (see Appendix E).

Finally, an open comment text box was made available for participants to provide feedback about any parts of the program. Additionally, a survey question was included that asked participants to share perceived facilitators and barriers to implementing health literacy-sensitive interventions into their practice.

Survey scoring. Two-week post-intervention survey items were again scored individually using the scoring values of 1 (*Never*), 2 (*Rarely*), 3 (*Occasionally*), 4 (*Sometimes*), 5 (*Frequently*), 6 (*Usually*), and 7 (*Every Time*); a higher mean score suggested a higher level of implementation of individual health literacy-sensitive intervention skills in the post-implementation period.

Any feedback data provided by participants regarding implementation barriers and facilitators were evaluated and reported as themes.

<div align="center">

Analysis

</div>

The primary objectives of analysis for this project were to assess nurse practitioner participants' perceived knowledge about health literacy, health literacy skills, and perceived currently employed health literacy-interventions compared to intention to implement health literacy-sensitive interventions. By conducting pre- and post-intervention data collection, participants' knowledge was assessed for changes in understanding and changes in intention to implement health literacy-sensitive interventions.

Data Collection

Qualtrics (2019) survey software was used to collect all survey-related data. Participants were assigned a unique identification number that was used to complete three separate questionnaires electronically through the online Qualtrics survey platform. The

survey was designed by the project lead based on prior research and use of the Pre- and Post-Intervention on Knowledge, Skill, and Intended Behavior Instrument developed by Mackert et al. (2011). Before program implementation, the survey was reviewed by University of Northern Colorado nursing faculty to ensure content validity and usability.

All electronic survey data were kept in a password protected file and the project lead was the only holder of the password. Raffle entries were provided to participants in a separate electronic link from the post-intervention survey that was not associated with any survey-related data. All email addresses obtained from raffle entry were password protected and the project lead was the only holder of the password. Once the raffle was complete, the file was destroyed. All data collected in Qualtrics were aggregated on an Excel spreadsheet and data were transferred into the IBM SPSS 25 for data analysis.

Statistical Analysis

Descriptive statistics including means, frequencies, and percentages were used to describe the sample demographically with gender, age, ethnicity, race, nurse practitioner's years of experience, prior nursing experience, nurse practitioner certification type, nurse practitioner degree type, and practice setting type.

The intention was to complete analysis of the pre- and post-intervention survey data of perceived knowledge, skill use, and intention items using a paired t-test analysis to compare and assess for differences in the means for each of the pre- and post-intervention variables regarding participant's perceived knowledge, current use of health literacy strategies, intention for use of health literacy-sensitive strategies and skills, and implementation into practice in the post-intervention period. However, secondary to a small sample size, no inferential statistical analysis was completed for this project.

Two-week post-implementation survey data were compared against both pre- and immediate post-implementation survey data and assessed for changes in participants' responses for corresponding survey items. Non-parametric analysis was also considered for this data analysis component and was dependent on the data collected; however, secondary to a small sample size, inferential statistical analysis was not utilized for this project. Results of the survey findings were reported in the aggregate for each survey item.

Duration of Project

This project was completed over a nine-week timeframe from the start of recruitment to completion of final interviews. Analysis and interpretation took an additional two weeks with final submission of findings and defense to be completed by October 31, 2019.

The timeline for this project was as follows.

- May 3, 2019: Proposal completion and defense

- May 13, 2019: Submission to the University of Northern Colorado's IRB committee

- May 31, 2019: Completion of the web-based program

- June 21, 2019: IRB approval granted

- Starting June 26, 2019, through June 30, 2019: Participant recruitment, baseline questionnaires, and sign-up procedures

- June 29, 2019: Advertisements posted to Northern Colorado Nurse Practitioner Coalition website

- June 30, 2019: Start of intervention, kickoff email was sent to all participants

- July 7, 2019: Weekly email reminder for participants to complete the program

- July 14, 2019: Weekly email reminder for participants to complete the program

- July 16, 2019: Second advertisement posted on the Northern Colorado Nurse Practitioner Coalition website and emails to members

- July 21, 2019: Weekly email reminder for participants to complete the program; information regarding raffle entry and completion of the post-intervention questionnaire

- July 29, 2019: Completion of intervention

- July 29, 2019: Sent a reminder email to complete Post-Intervention Survey

- August 5, 2019: Sent follow-up reminder to complete post-intervention survey

- August 12, 2019: Sent two-week Post-Intervention Survey email

- August 26, 2019: Conducted Raffle for $50 Amazon gift card and notified winner to send the gift card

- July 29-August 26, 2019: Post-intervention questionnaires completion

- August 26-September 6, 2019: Data analysis and interpretation.

- August 16-September 9, 2019: Completion of final paper

- September 25, 2019: Defended DNP scholarly project

- October 31, 2019: File final DNP scholarly project document

Ethical Considerations

The overall objective of this program was to provide participants with evidence-based education using the *AHRQ Health Literacy Universal Precautions Toolkit* (Brega et al., 2015). The education provided was not considered to be controversial and the risks

to participants in receiving this education were expected to be minimal. This DNP scholarly project was submitted through the IRB at the University of Northern Colorado to evaluate any risk to human participants. Participants received a written explanation of the study, an implied consent, as well as an introductory email. Participants were assured their participation was voluntary and any survey questions might be left unanswered at will. A token of appreciation was made available to participants who completed the educational program and the pre- and two post-intervention surveys in the form of a raffle for an electronic $50 Amazon gift card. Participants were encouraged to ask questions of the project lead at any time; the project lead was available in person, by phone, or email. All data remained confidential and secure.

Summary

This program was designed to incorporate evidence-based practices regarding health literacy to help nurse practitioners best address the needs of older adults with inadequate health literacy. Health literacy guidelines recommended the use of universal precautions when addressing health literacy but evidence suggested practicing healthcare providers felt they needed more education regarding health literacy and the ways in which they should be addressing it (Cafiero, 2013; Coleman, 2011; Schlichting et al., 2007). Additionally, the evidence suggested healthcare provider education has been slow to adopt health literacy education into their curricula (Coleman et al., 2016).

It was hypothesized that participants who completed this program would (a) have increased knowledge regarding health literacy and the importance of using evidence-based health literacy interventions to improve health outcomes for all patients and (b) implement one or more health literacy intervention strategies into their clinical practice.

With the older adult population's rapid growth over the next several decades, older adults with inadequate health literacy will require increasing support from healthcare providers. regarding medication nonadherence. Using Orem's (1991) self-care deficit nursing theory, practitioners who are able to adopt health literacy universal precautions into their practices will feel and be better equipped to address older adults' health literacy needs.

CHAPTER IV

DATA ANALYSIS AND RESULTS

All survey data collected from the Qualtrics (2019) survey software were exported to an Excel (version 1902) spreadsheet for analysis. No inferential analysis was completed using IBM SPSS secondary to small sample size in the pre-intervention ($n =$ 4), immediate post-intervention ($n = 2$) and two-week post-intervention periods ($n = 2$). Changes in participant responses were reported and displayed to assess for changes in participants' self-reported health literacy knowledge, intentions to implement, and actual implementation of health literacy-sensitive interventions.

Participants were asked to complete the pre-intervention survey prior to beginning the online health literacy modules. At the completion of the final online module, participants were directed to complete the immediate post-intervention survey. While the program was intended to extend over a four-week period, beginning July 1, 2019 and ending July 29, 2019, participants were able to complete the program at their own pace, which resulted in variability in program initiation and completion and post-intervention survey completion. Regardless of the participant's program initiation or completion, all participants were sent the two-week post-intervention at the six-week point from the original program kick-off date, August 12, 2019. Data from four participants were included in the analysis of this DNP scholarly project. The paired *t* test was the anticipated statistical analysis for comparing the means for pre-, post-intervention, and

two-week post-intervention data; however, based on the limited participation. descriptive

data are presented.

Participants

After obtaining IRB approval, recruitment of participants was initially done

through the Northern Colorado Nurse Practitioner Coalition's June 26, 2019 monthly

meeting where the program was presented to attendees and flyers were distributed to

members. Using a snowball recruitment method, attendees were also encouraged to share

information of the program with other potentially qualified participants. Following the

meeting, the program was also published on the Northern Colorado Nurse Practitioner

Coalition webpage, which also resulted in email notifications to Coalition members.

Four participants were recruited from the initial recruitment. In an attempt to obtain

additional participants, the program lead requested the Coalition president to send out a

program recruitment reminder two weeks after the initial recruitment advertisement was

posted on the Coalition webpage. The advertisement was sent out again to Northern

Colorado Nurse Practitioner Coalition members via the webpage and email notification to

Coalition members. Two additional participants were recruited following the second

advertisement, which resulted in a total of six participants who ultimately completed the

electronic recruitment and consent form.

Additionally, secondary recruitment was attempted through an advertisement on

the Doctors of Nursing Practice Inc. website; however, no additional participants were

recruited through this method. Due to the minimal participant recruitment via the

original recruitment plan, an addendum was submitted to the University of Northern

Colorado IRB to include additional recruitment strategies that included advertisements

posted on two Facebook® Nurse Practitioner groups, The Nurse Practitioners, and The

Nurse Practitioner Newbies groups (see Appendix I). Advertisements were posted on

two separate occasions, one week apart, on both Facebook® group pages; however, this

additional recruitment attempt did not generate any additional participants. Had this

modification to the recruitment plan resulted in additional participants, an alternative

program time line was also accounted for within the IRB addendum submission (see

Appendix I).

Of the six participants who completed the consent to participate, two did not sign

onto the website and create a user name and password to allow for the access to program

content. All six participants received the weekly email reminders and health literacy tips

throughout the program. A total of four participants completed the pre-intervention

survey and created user names and passwords to access the program website. Of the four

participants who completed the pre-intervention survey, only two completed both the

immediate post-intervention survey and two-week post-intervention survey. Data from

the four participants are included in the pre-intervention survey results and data from the

two participants are included in the immediate post- and two-week post-intervention

survey results.

<div align="center">**Pre-Intervention Survey Results**</div>

Participant Demographics

Of the original four participants, all identified as female ($n = 4$). Half of the

participants fell into the 30- to 39-year-old category while the other half fell into the 50-

to 59-year-old category. Half of the participants reported having a Family Nurse

Practitioner certification type while the other two participants reported having other

certifications types including one Adult Nurse Practitioner and one Certified Nurse

Midwife certification. Regarding participants' years of experience as nurse practitioners,

half of the participants reported having five years or less, one participant reported having

6 to 10 years of experience, and one responded having 11-15 years of nurse practitioner

experience. When asked about years of nursing experience prior to obtaining their nurse

practitioner license, one participant reported having five years or less of nursing

experience, two reported having 6-10 years of nursing experience, and one reported

having 11-15 years of nursing experience. The settings in which participants currently

provided care varied for all participants—one reported providing care in a family practice

setting, one in an internal medicine setting, one in a women's health setting, and one in a

peri-operative medicine setting.

Health Literacy Education
Experience

When asked about past experiences with health literacy education, all four

participants reported never having completed any formal education or training regarding

health literacy. Additionally, all participants denied completing any previous continuing

education regarding health literacy.

Perceived Health Literacy
Knowledge

Participants were asked to rate their perceived health literacy knowledge prior to

beginning the online educational health literacy modules. Using a 7-point Likert-like

scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*, 75% of participants (*n* =

3) reported they somewhat agreed with the statement that they understood what it meant

for patients to have low health literacy and one participant reported she agreed with the

statement. Regarding participants' perceived knowledge of the prevalence of low health

literacy, responses were more diverse ranging from one participant responding with

Disagree, one participant responding with *Somewhat disagree*, one response of *Neither*

agree nor disagree, and one participant reporting she somewhat agreed. When asked

about their perceived knowledge about populations more likely to have inadequate health

literacy, participants' responses were again more diverse with 50% of participants ($n = 2$)

responded with a *Somewhat agree* response, one participant responded with S*omewhat*

disagree, and one participant responded with *Disagree*. Regarding participants'

understanding of health outcomes associated with low health literacy, 75% of participants

($n = 3$) reported they agreed somewhat with understanding health outcomes and one

participant reported she disagreed somewhat with having an understanding of health

outcomes. Results are displayed in Table 1.

Table 1

Pre-Intervention Health Literacy Knowledge Results

Item	Strongly Disagree N (%)	Disagree N (%)	Somewhat Disagree N (%)	Neither Agree nor Disagree N (%)	Somewhat Agree N (%)	Agree N (%)	Strongly Agree N (%)
I understand what it means for a patient to have low health literacy	0	0	0	0	3 (75)	1 (25)	0
I know the prevalence of low health literacy	0	1 (25)	1 (25)	1 (25)	1 (25)	0	0
I know the groups that are more likely to have low health literacy	0	1 (25)	1 (25)	0	2 (50)	0	0
I understand the health outcomes associated with low health literacy	0	0	1 (25)	0	3 (75)	0	0

Note. Anchor: Considering your current practice, on a scale of 1-7, please indicate your agreement with the following statements from 1 (*Strongly disagree*) to 7 (*Strongly agree*); $n = 4$.

Perceived Health Literacy Ability to
Deal with Patients with Low
Health Literacy

When addressing health literacy needs in the clinical setting, participants were asked about how they felt they dealt with patients with low health literacy. Participants were asked to rate their level of agreement with statements regarding their ability to identify patients with low health literacy, again using the Likert-like scale ranging from 1= *Strongly disagree* to 7 = *Strongly agree*. Two participants agreed somewhat that they were good at identifying patients with low health literacy, one participant reported she disagreed somewhat with the statement, and one participant reported she disagreed with the statement. Participants were also asked about how they felt regarding their ability to know whether their patients understood what they (providers) were telling them (patients). Seventy-five percent of participants ($n = 3$) reported they agreed somewhat with the statement and one participant reported she disagreed somewhat with the statement. In the final statement of the survey, participants were asked to address how they felt about their ability in maintaining a culturally sensitive healthcare experience to which all participants responded with more positive responses: 75% responded with a *Somewhat agree* ($n = 3$) and one participant responded with *Agree* ($n = 1$). Table 2 provides a display of participant responses regarding health literacy skills.

Table 2

Pre-Intervention Participants' Health Literacy Skills

Item	Strongly Disagree N (%)	Disagree N (%)	Somewhat Disagree N (%)	Neither Agree nor Disagree N (%)	Somewhat Agree N (%)	Agree N (%)	Strongly Agree N (%)
I do a good job identifying patients with low health literacy	0	1 (25)	1 (25)	0	2 (50)	0	0
I am good at knowing whether or not my patients understand what I tell them	0	0	1 (25)	0	3 (75)	0	0
I am good at maintaining a culturally sensitive healthcare experience	0	0	0	0	3 (75)	1 (25)	0

Note: Anchor: Considering your current practice, on a scale of 1-7, please indicate your agreement with the following statements from 1 *(Strongly disagree)* to 7 (*Strongly agree*); *n* = 4.

**Reported Use of Health Literacy-
Sensitive Interventions**

Participants were asked about their current overall practice and their use of six

health literacy-sensitive techniques that were focused on health literacy-sensitive

interventions: speaking slowly, using plain non-medical language, show or drawing

pictures, limiting the amounts of information and repeating it, using teach-back or show-

me techniques, and finally creating a shame-free environment. Again, using a Likert-like

scale, participants rated their use of these interventions ranging from 1 = *Never* to 7 =

Every time. Regarding the use of the health literacy technique of speaking slowly,

participant responses varied: *Occasionally* (*n* = 1), *Sometimes* (*n* = 1), and *Frequently* (*n*

= 2). Participant responses regarding the use of plain, non-medical language ranged from

a more neutral response of *Sometimes* (*n* = 1) to more positive responses of *Frequently* (*n*

= 2) and *Usually* (*n* = 1). Participants reported slight less use of the show or draw

pictures technique: 25% reported *Occasionally* (*n* = 1), 50% reported *Sometimes* (*n* = 2),

and 25% reported they *Frequently* (*n* = 1) used the technique. Fifty percent of

participants (*n* = 2) reported limiting the amount of information and repeating it

Frequently while the other 50% reported only *Sometimes* (*n* = 2). Regarding the use of

teach-back or show-me techniques, participants' responses varied: *Occasionally* (25%, *n*

= 1), *Sometimes* (50%, *n* = 2), and *Frequently* (25%, *n* = 1). The technique with the most

positive response regarded creating a shame-free environment. Responses to this last

survey item in this section were *Frequently* (50%, *n* = 2) and *Every time* (50%, *n* = 2).

Participants; results are displayed in Table 3.

Table 3

Pre-Intervention Health Literacy-Sensitive Intervention Use

Item	M	Never n (%)	Rarely n (%)	Occasionally n (%)	Sometimes n (%)	Frequently n (%)	Usually n (%)	Every Time n (%)
Speaking slowly	4.25	0	0	1 (25)	1 (25)	2 (50)	0	0
Using plain, non-medical language	5.00	0	0	0	1 (25)	2 (50)	1 (25)	0
Show or draw pictures	4.00	0	0	1 (25)	2 (50)	1 (25)	0	0
Limit the amount of information provided and repeat it	4.50	0	0	0	2 (50)	2 (50)	0	0
Use the teach-back or show-me technique	4.00	0	0	1 (25)	2 (50)	1 (25)	0	0
Create a shame-free environment	6.00	0	0	0	0	2 (50)	0	2 (50)

Note: Anchor: Considering your current practice, on a scale of 1-7 please indicate how frequently you use each technique from 1 (*Never*) to 7(*Every time*); *n* = 4.

Reported Use of Health Literacy-Sensitive Interventions with Older Adults

Participants were asked to consider their interactions with older adults regarding prescribing of medications and their use of health literacy-sensitive interventions, which included the same survey items in the previous section with the addition of health literacy-sensitive interventions specific to medication management: use of the brown-bag medication review, patient-centered medication instructions, medication reminder forms, and medication forms. Participant results are displayed in Table 4.

Table 4

Pre-Intervention Use of Health Literacy-Sensitive Interventions with Older Adults

Item	M	Never n (%)	Rarely n (%)	Occasionally n (%)	Sometimes n (%)	Frequently n (%)	Usually n (%)	Every time n (%)
Speaking slowly	5.00	0	0	1 (25)	0	1 (25)	2 (50)	0
Using plain, non-medical language	5.00	0	1 (25)	0	0	1 (25)	1 (25)	1 (25)
Show or draw pictures	3.50	0	1 (25)	1 (25)	1 (25)	1 (25)	0	0
Limit the amount of information provided and repeat it	4.75	0	0	1 (25)	1 (25)	0	2 (50)	0
Use the teach-back or show-me technique	4.25	0	1 (25)	0	1 (25)	1 (25)	1 (25)	0
Create a shame-free environment	6.00	0	0	0	1 (25)	0	1 (25)	2 (50)
Use of brown bag medication review	2.75	2 (50)	0	0	1 (25)	1 (25)	0	0
Patient-centered medication instructions	4.50	1 (25)	0	0	0	1 (25)	2 (50)	0
Medication reminder forms	3.75	1 (25)	0	0	1 (25)	2 (50)	0	0
Medication forms	3.75	1 (25)	0	0	1 (25)	2 (50)	0	0

Note. Anchor: When prescribing medications to Older Adult Patients, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (*Never*) to 7 (*Every time*); $n = 4$.

Immediate Post-Intervention Survey Results

Two participants who completed all modules were asked to complete the post-intervention survey to assess for changes in their knowledge of health literacy-related items previously evaluated in the pre-intervention survey. Additionally, participants' intentions to implement health literacy-related interventions were assessed in the immediate post-intervention survey. Participant health literacy knowledge results are listed in Table 5. Participants were asked an additional question regarding their perception of their original health literacy knowledge and whether they felt they had previously overestimated their health literacy knowledge in the pre-intervention survey to which one participant responded with an *Agree* response and one responded with *Strongly agree*, which suggested participants' reported knowledge was lower than originally reported in the pre-intervention survey. Participants reporting overestimation of their health literacy knowledge was also seen in other studies (Coleman & Fromer, 2015; Mackert et al., 2011).

Using a Likert-like scale ranging from 1 = *Very unlikely* to 7 = *Very likely,* participants were asked for their responses regarding their intention to focus on strategies for dealing with patients with low health literacy. These strategies included identifying patients with low health literacy, paying attention to whether or not patients understand what is being told to them, and maintaining a culturally sensitive healthcare experience. Participants' responses are displayed in Table 6.

Following the completion of the education modules, participants were also asked to rate their likelihood of focusing more on health literacy-sensitive techniques including speaking slowly; using plain, non-medical language; showing or drawing pictures;

limiting the amount of information provided and repeating it; using the teach-back or

show-me techniques; and creating a shame-free environment. Both participants

responded in the positive range using a Likert-like scale: 1 = *Very unlikely* to 7 = *Very*

likely (see Table 6).

Table 5

Immediate Post-Intervention Survey Results: Health Literacy Knowledge

Item	Strongly Disagree *N* (%)	Disagree *N* (%)	Somewhat Disagree *N* (%)	Neither Agree nor Disagree *N* (%)	Somewhat Agree *N* (%)	Agree *N* (%)	Strongly Agree *N* (%)
I understand what it means for a patient to have low health literacy	0	0	0	0	0	2 (100)	0
I know the prevalence of low health literacy	0	0	0	0	0	2 (100)	0
I know the groups that are more likely to have low health literacy	0	0	0	0	0	0	2 (100)
I understand the health outcomes associated with low health literacy	0	0	0	0	0	0	2 (100)
I originally overestimated my own knowledge of health literacy	0	0	0	0	0	1 (50)	1 (50)

Note. Anchor: Considering your current practice, on a scale of 1-7 please indicate your agreement with the following statements, (1= *Strongly disagree*, 7 = *Strongly agree*); *n* = 2.

Table 6

Immediate Post-Intervention Participants' Intention to Focus on Health Literacy Strategies and Techniques

Item	Very Unlikely N (%)	Unlikely N (%)	Somewhat Unlikely N (%)	Neutral N (%)	Somewhat Likely N (%)	Likely N (%)	Very Likely N (%)
Strategies							
Identifying patients with low health literacy	0	0	0	0	0	1 (50)	1 (50)
Paying attention to whether or not my patients understand what I tell them	0	0	0	0	0	1 (50)	1 (50)
Maintaining a culturally sensitive healthcare experience	0	0	0	0	0	1 (50)	1 (50)
Techniques							
Speaking slowly	0	0	0	0	0	1 (50)	1 (50)
Using plain, non-medical language	0	0	0	0	0	1 (50)	1 (50)
Show or draw pictures	0	0	0	0	0	1 (50)	1 (50)
Limit the amount of information provided and repeat it	0	0	0	0	0	1 (50)	1 (50)
Use the teach-back or show-me technique	0	0	0	0	0	1 (50)	1 (50)
Create a shame-free environment	0	0	0	0	0	1 (50)	1 (50)

Note. Strategies anchor: On a scale of 1-7 please indicate how likely you are to focus more on each strategy with the following statements from 1 (*Very unlikely*) to 7 (*Very likely)*; (*n* =2). Skills anchor: On a scale of 1-7 please indicate how likely you are to focus more on each technique with the following statements from 1 (*Very unlikely*) to 7 (*Very likely*); (*n* = 2).

The final survey items assessed in the immediate post-intervention survey

addressed health literacy-sensitive techniques participants were likely to use when

addressing health literacy needs in older adult populations. Participants were asked to

rate the likelihood of focusing on these techniques after completing the education

modules using a 7-point Likert-like scale ranging from 1 = *Very unlikely* to 7 = *Very*

likely. Health literacy-sensitive techniques covered included speaking slowly; using

plain, non-medical language; showing or drawing pictures; limiting the amount of

information provided and repeating it; using the teach-back or show-me techniques;

creating a shame-free environment; use of a brown bag medication review; patient-

centered medication instructions; medication reminder form; and medication forms.

Participant responses are displayed in Table 7.

Table 7

Immediate Post-Intervention Participant Intention to Use Health Literacy Techniques When Caring for Older Adult Patients

Item	Very Unlikely N (%)	Unlikely N (%)	Somewhat Unlikely N (%)	Neutral N (%)	Somewhat Likely N (%)	Likely N (%)	Very Likely N (%)
Speaking slowly	0	0	0	0	0	0	2 (100)
Using plain, non-medical language	0	0	0	0	0	0	2 (100)
Show or draw pictures	0	0	0	0	0	0	2 (100)
Limit the amount of information provided and repeat it	0	0	0	0	0	0	2 (100)
Use the teach-back or show-me technique	0	0	0	0	0	0	2 (100)
Create a shame-free environment	0	0	0	0	0	0	2 (100)
Use brown bag medication review	0	0	0	0	0	1 (50)	1 (50)
Patient-centered medication instructions	0	0	0	0	0	0	2 (100)
Medication reminder forms	0	0	0	0	0	0	2 (100)
Medication forms	0	0	0	0	0	0	2 (100)

Note. Anchor: When prescribing medications to older adult patients, on a scale of 1-7, indicate how likely you are to focus more on each task from 1 (*Very unlikely*) to 7 (*Very likely*); $n = 2$.

Changes in Perceived Health

Literacy Knowledge

To assess for participants' self-reported changes in health literacy knowledge, participants were asked to complete the same knowledge questions on both the pre-intervention survey and the immediate post-intervention survey. Overall responses of the two participants trended more positive for all survey items related to health literacy knowledge. Both participants moved from a *Somewhat agree* response to an *Agree* response regarding their understanding of what it meant for patients to have low health literacy (see Figure 2).
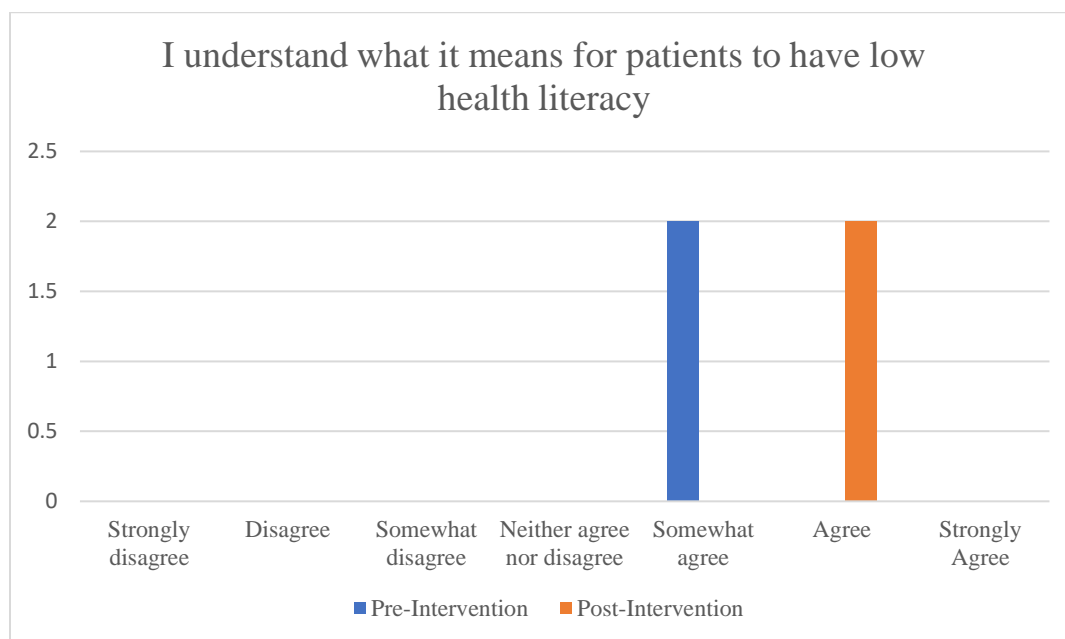
Figure 2. Comparison of pre- and immediate post-intervention knowledge data regarding statement, "I understand what it means for patients to have low health literacy"; (*n* = 2).

For the statement regarding their understanding of the prevalence of low health literacy, both participants moved to an *Agree* response on the immediate post-

intervention survey compared to their pre-intervention survey responses of *Disagree* and

Somewhat agree (see Figure 3).
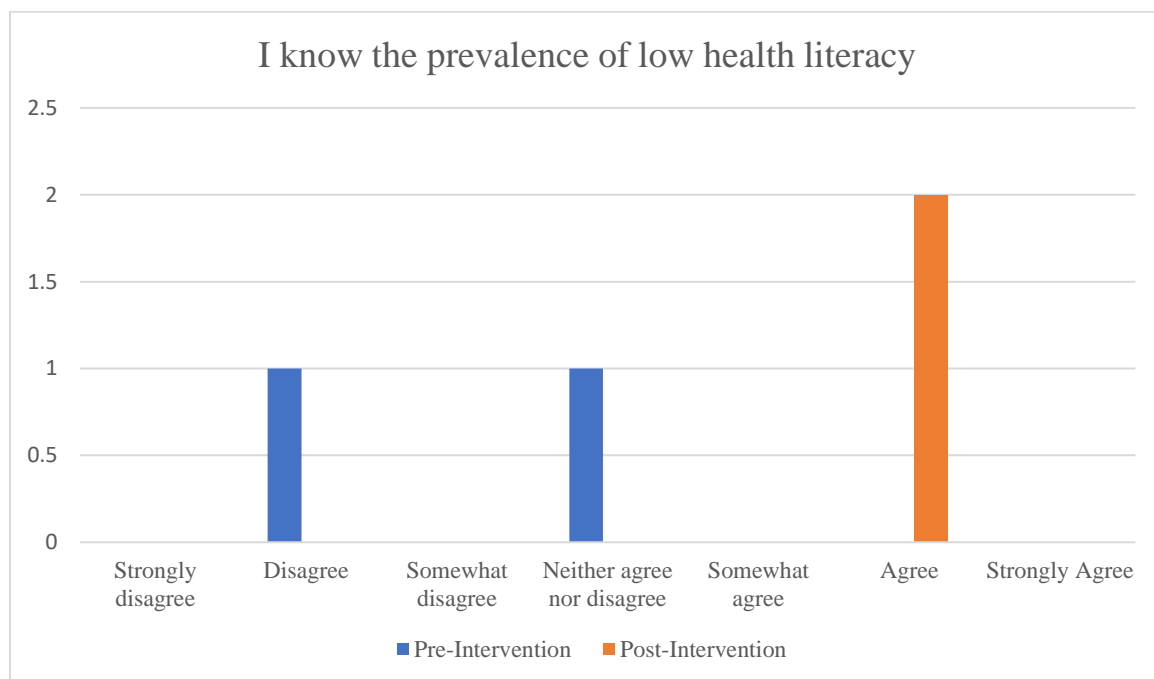
Figure 3. Comparison of pre- and immediate post-intervention knowledge data regarding statement, "I know the prevalence of low health literacy"; (n = 2).

When responding to the statement, "I know the groups that are more likely to

have low health literacy," both participants responded with a *Strongly agree* on the

immediate post-intervention survey compared to responses on the pre-intervention survey

that included both a *Disagree* response and a *Neither agree nor disagree* response (see

Figure 4).

I know the groups that are more likely to have low health literacy
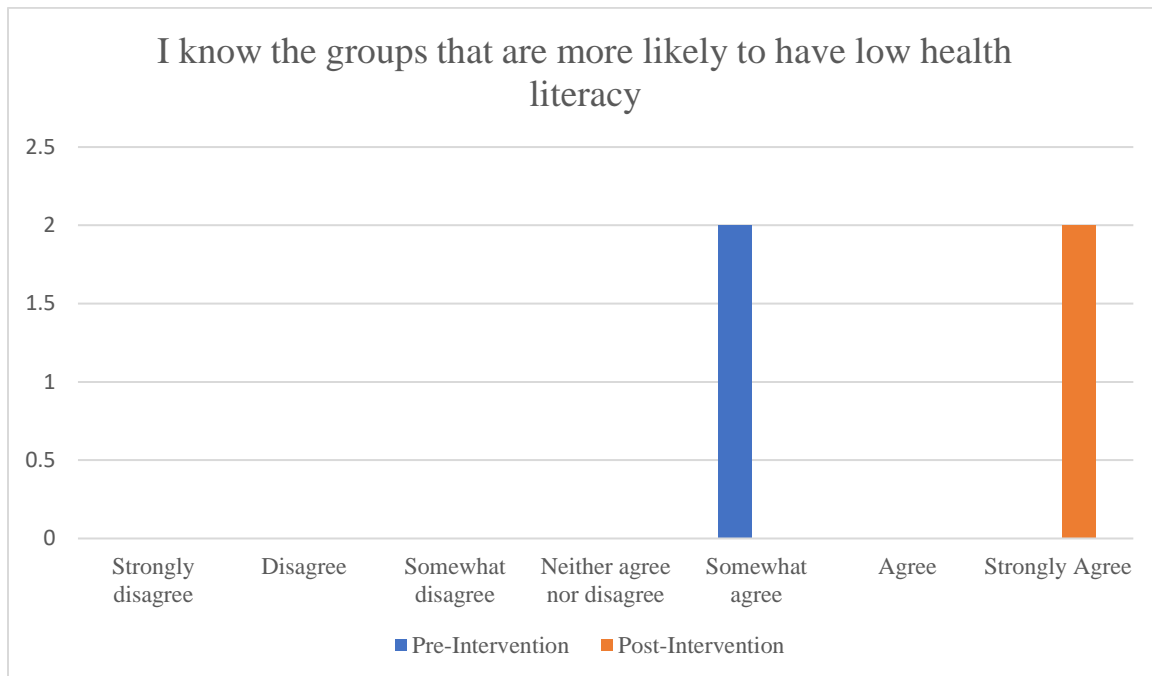
Figure 4. Comparison of pre- and immediate post-intervention knowledge data regarding statement, "I know the groups that are more likely to have low health literacy"; (n = 2).

The final knowledge question asked participants to rate their agreement with the statement, "I understand the health outcomes associated with low health literacy" (see Figure 5). Both participants had responded with a *Somewhat agree* response on the pre-intervention survey and both moved to the more positive response of *Strongly agree*.
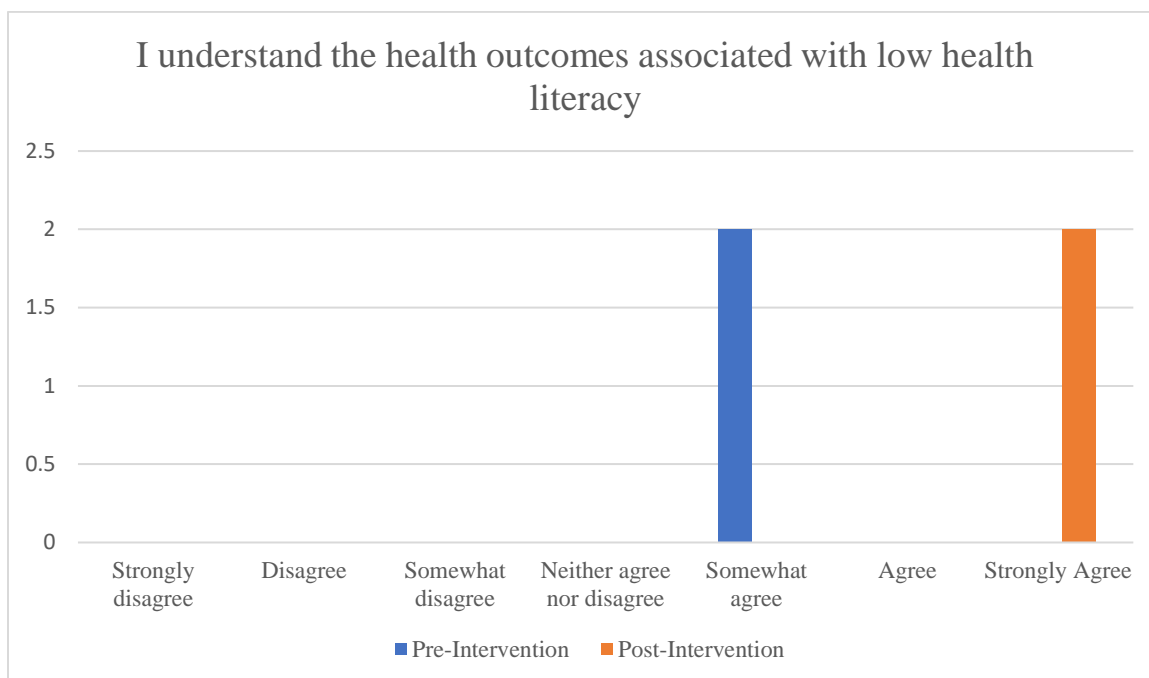
Figure 5. Comparison of pre- and immediate post-intervention knowledge data regarding statement, "I understand the health outcomes associated with low health literacy"; (*n* = 2).

Two-Week Post-Intervention Survey Data

All six participants were asked to complete a final survey sent to participants via an email at the start of the sixth week of the program. Participants were again asked to share health literacy-sensitive strategies and techniques they used in the two-week post-intervention period for all patients and then specifically for older adult patients for whom they were prescribing medications. Two participants completed the two-week post-intervention survey. These two participants completed all surveys, allowing for comparison of responses and changes in their practice across the pre-intervention, immediate post-intervention, and two-week post-intervention periods.

Participants' Self-Reported Use of
Health Literacy-Sensitive
Techniques

Participants were asked to rate their agreement with statements regarding their

current practice and use of health literacy-sensitive strategies including statements

focused on how well participants felt they were able to identify patients with low health

literacy and know whether their patients were understanding what was being told to them

while maintaining a culturally sensitive healthcare experience. Using a 7-point Likert-

like scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*, both participants

responded in the positive range with either a *Somewhat agree* or *Agree* response for all

three survey items (see Table 8).

Table 8

Two-Week Post-Intervention Survey Data Regarding Health Literacy-Sensitive Techniques

Item	Strongly Disagree N (%)	Disagree N (%)	Somewhat Disagree N (%)	Neither Agree nor Disagree N (%)	Somewhat Agree N (%)	Agree N (%)	Strongly Agree N (%)
I do a good job identifying patients with low health literacy	0	0	0	0	1 (50)	1 (50)	0
I am good at knowing whether or not my patients understand what I tell them	0	0	0	0	0	2 (100)	0
I am good at maintaining a culturally sensitive healthcare experience	0	0	0	0	1 (50)	1 (50)	0

Note. Anchor: Considering your current practice, please indicate your agreement with the statements on a scale of 1-7 from 1 (*Strongly disagree*) to 7 (*Strongly agree*); *n* = 2.

Changes in Participants' Self-Reported Use of Health Literacy-Sensitive Strategies

Changes in participants' self-reported use of health literacy-sensitive techniques in their practice were also assessed by comparing responses from their pre-intervention survey and two-week post-intervention survey responses. Overall, participant responses on the two-week post-intervention survey either stayed the same from their pre-

intervention responses or participants reported a more positive response for each of the

statements. The changes in responses are displayed in Figures 6-8.
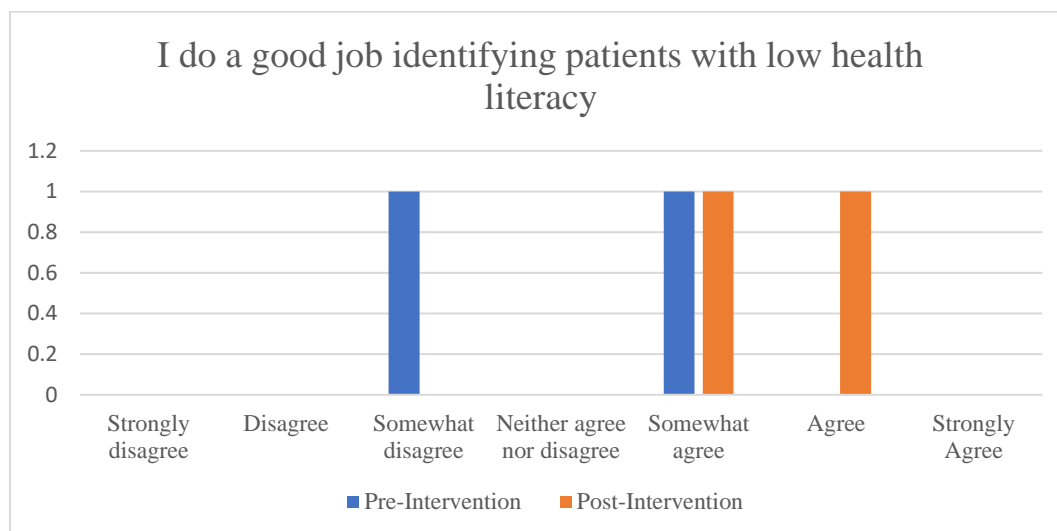
Figure 6. Comparison of participants' self-reported use of health literacy-sensitive techniques from pre-intervention and two-week post-intervention survey periods for statement, "I do a good job identifying patients with low health literacy"; *n* = 2.
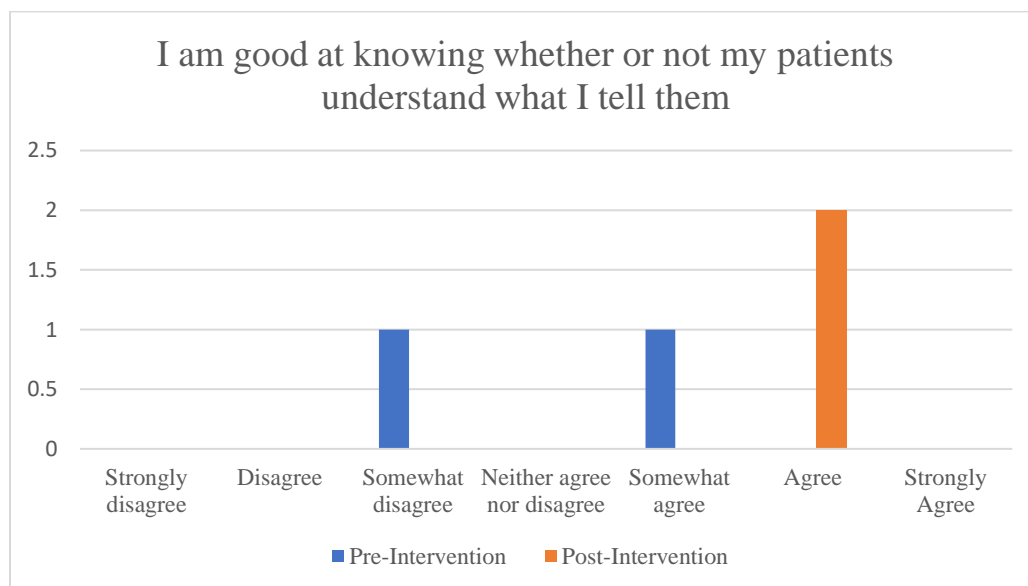
Figure 7. Comparison of participants' self-reported use of health literacy-sensitive techniques from pre-intervention and two-week post-intervention survey periods for statement, "I am good at knowing whether or not my patients understand what I tell them"; *n* = 2.
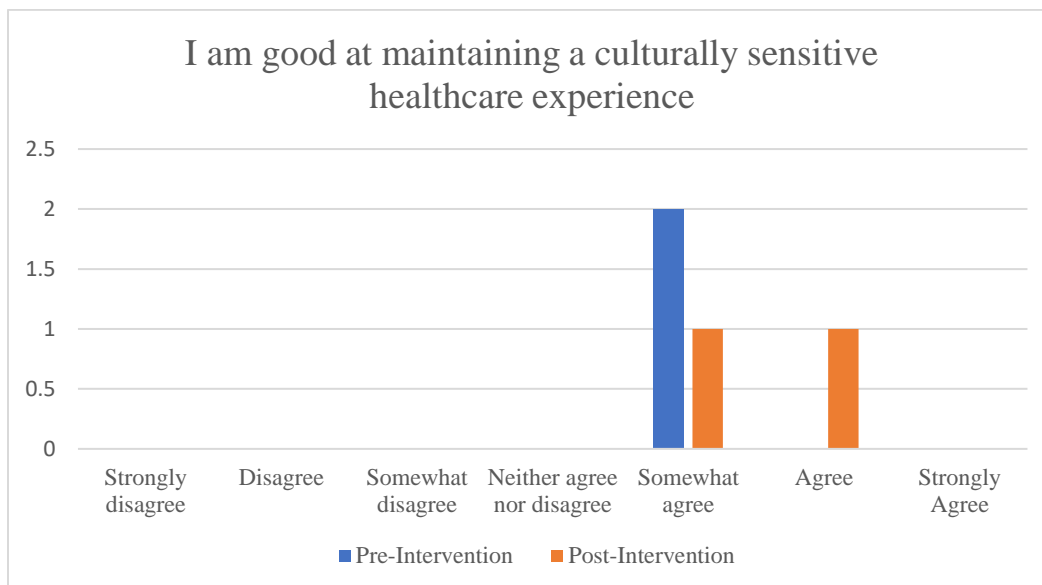
Figure 8. Comparison of participants' self-reported use of health literacy-sensitive techniques from pre-intervention and two-week post-intervention survey periods for statement, "I am good at maintaining a culturally sensitive healthcare experience"; *n* = 2.

**Participants' Self-Reported Use
of Health Literacy-Sensitive
Techniques**

Participants were again asked to rate their agreement with statements regarding their clinical practice use of health literacy-sensitive skills/techniques including speaking slowly; using plain, non-medical language; showing or drawing pictures; limiting the amount of information provided and repeating it; use of teach-back or show-me techniques; and creating shame-free environment. A 7-point Likert-like scale was used: 1 = *Never* to 7 = *Every time*. Participants were asked to rate their frequency of using these skills or techniques with all patients and then specifically with older adults when prescribing medications. Responses to survey items were characteristically more positive than pre-intervention responses (see Table 9).

Table 9

Two-Week Post-Intervention Survey Results: Skill Use in All Patients and Older Adult Patients

Item	Never n (%)	Rarely n (%)	Occasionally n (%)	Sometimes n (%)	Frequently n (%)	Usually n (%)	Every time n (%)
All Patients							
Speaking slowly	0	0	0	1 (50)	0	1 (50)	0
Using plain, non-medical language	0	0	0	0	1 (50)	1 (50)	0
Show or draw pictures	0	0	0	1 (50)	0	1 (50)	0
Limit the amount of information provided and repeat it	0	0	0	0	1 (50)	1 (50)	0
Use the teach-back or show-me technique	0	0	0	1 (50)	0	1 (50)	0
Create a shame-free environment	0	0	0	0	0	2 (100)	0
Older Adults							
Speaking slowly	0	0	0	0	0	1 (50)	1 (50)
Using plain, non-medical language	0	0	0	0	0	1 (50)	1 (50)
Show or draw pictures	0	0	0	1 (50)	0	1 (50)	0
Limit the amount of information provided and repeat it	0	0	0	0	0	2 (100)	0
Use the teach-back or show-me technique	0	0	0	1 (50)	0	0	1 (50)
Create a shame-free environment	0	0	0	0	0	1 (50)	1 (50)
Use brown bag medication review	0	0	0	1 (50)	0	1 (50)	0
Patient-centered medication instructions	0	0	0	0	0	2 (100)	0

Table 9 continued

Item	Never n (%)	Rarely n (%)	Occasionally n (%)	Sometimes n (%)	Frequently n (%)	Usually n (%)	Every time n (%)
Medication reminder forms	0	0	0	1 (50)	0	1 (50)	0
Medication forms	0	0	0	1 (50)	0	1 (50)	0

Note. All patients anchor: "Considering your current practice, on a scale of 1-7, please indicate how frequently you use each technique from 1 (*Never*) to 7 (*Every time*); Older adult patient anchor: "When prescribing medications to Older Adult Patients, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (*Never*) to 7 (*Every time*); *n* = 2.

Changes in Participants' Self-Reported Use of Health Literacy-Sensitive Skills: All Patients

To assess for changes in participants' use of health literacy-sensitive skills, pre-intervention survey responses were compared to the two-week post-intervention survey responses of the two participants who completed all surveys. Participant responses either stayed the same as their pre-intervention responses or moved to a more positive response. Regarding the frequency in which participants reported us the skill of speaking slowly, the participants reported *Frequently* and *Sometimes* in the pre-intervention survey, respectively; whereas one response increased to *Usually* and one response remained at *Sometimes* in the two-week post-intervention survey. The next statement asked participants to rate their frequency of using plain, non-medical language; participants reported *Sometimes* and *Frequently* responses in the pre-intervention survey; their responses increased to *Frequently* and *Usually*, respectively, in the two-week post-intervention survey. When assessing for changes in the use of the skill "show or draw pictures," participants reported *Sometimes* and *Frequently* using this skill, which remained the same in the two-week post-intervention survey regarding the *Sometimes* and

increased to *Usually*, respectively. In the pre-intervention survey, participants reported

limiting the amount of information provided and repeating it *Sometimes* and *Frequently*,

respectively; their responses increased to *Frequently* and *Usually*, respectively, in the

two-week post-intervention survey. In the pre-intervention survey, participants reported

using teach-back or show-me method *Occasionally* and *Frequently*; both responses

moved to a more positive response of *Sometimes* and *Usually*, respectively, in the two-

week post-intervention survey. For the final survey skill component, participants were

asked to rate how frequently they focused on providing a shame-free environment.

Although both participants reported *Frequently* using this health literacy skill in the pre-

intervention survey, their responses both increased to *Usually* in the two-week post-

intervention survey. Figures 9 and 10 provide visual representations of changes in

participant responses pre-intervention and two-week post-intervention.
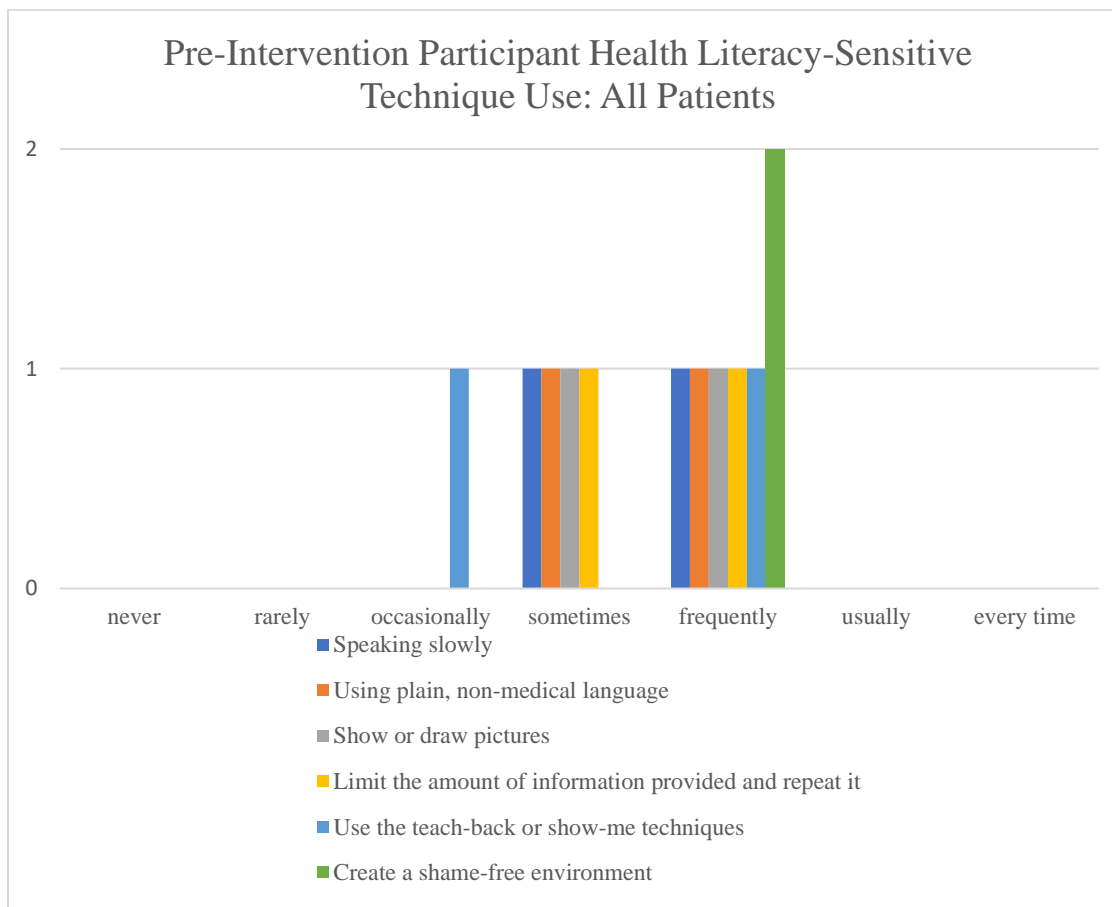
Figure 9. Pre-intervention participant self-reported use of health literacy-sensitive techniques with all patients; *n* = 2

Figure 10. Two-week post-intervention participant self-reported use of health literacy-sensitive techniques with all patients; *n* = 2.

Changes in Participants' Self-Reported
Use of Health Literacy-Sensitive Skills:
Older Adult Focus

Generalized health literacy-sensitive interventions. While only two

participants completed all three surveys, there is a noticeable difference when comparing

participants' responses between pre-intervention survey data and the two-week post-

interventions survey data when addressing the older adult population. This section

focuses on participants' responses regarding their frequency of using health literacy-

sensitive skills when participants were prescribing medications to older adults in their

current practices using the Likert-like scale: 1 = *Never* to 7 = *Every time*. When

comparing participants' pre-interventions survey responses to their two-week post-

intervention surveys, there were noticeable shifts from mixed scale responses in the pre-

intervention survey to responses that reflected more positive responses in the two-week

post-intervention survey (see Figures 11 and 12).
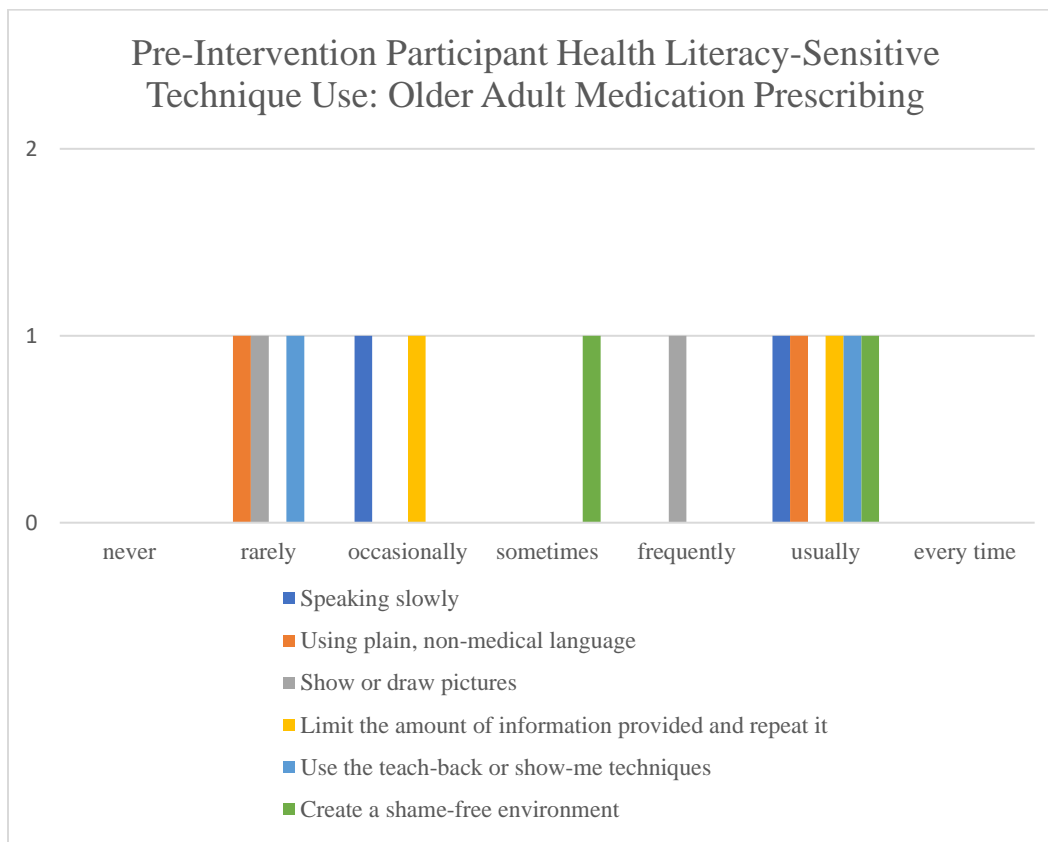
Figure 11. Pre-intervention participant self-reported use of health literacy-sensitive techniques with older adults when prescribing medications; *n* = 2.

Two-Week Post-Intervention Participant Health Literacy-Sensitive Technique Use: Older Adult Medication Prescribing

- Speaking slowly
- Using plain, non-medical language
- Show or draw pictures
- Limit the amount of information provided and repeat it
- Use the teach-back or show-me techniques
- Create a shame-free environment
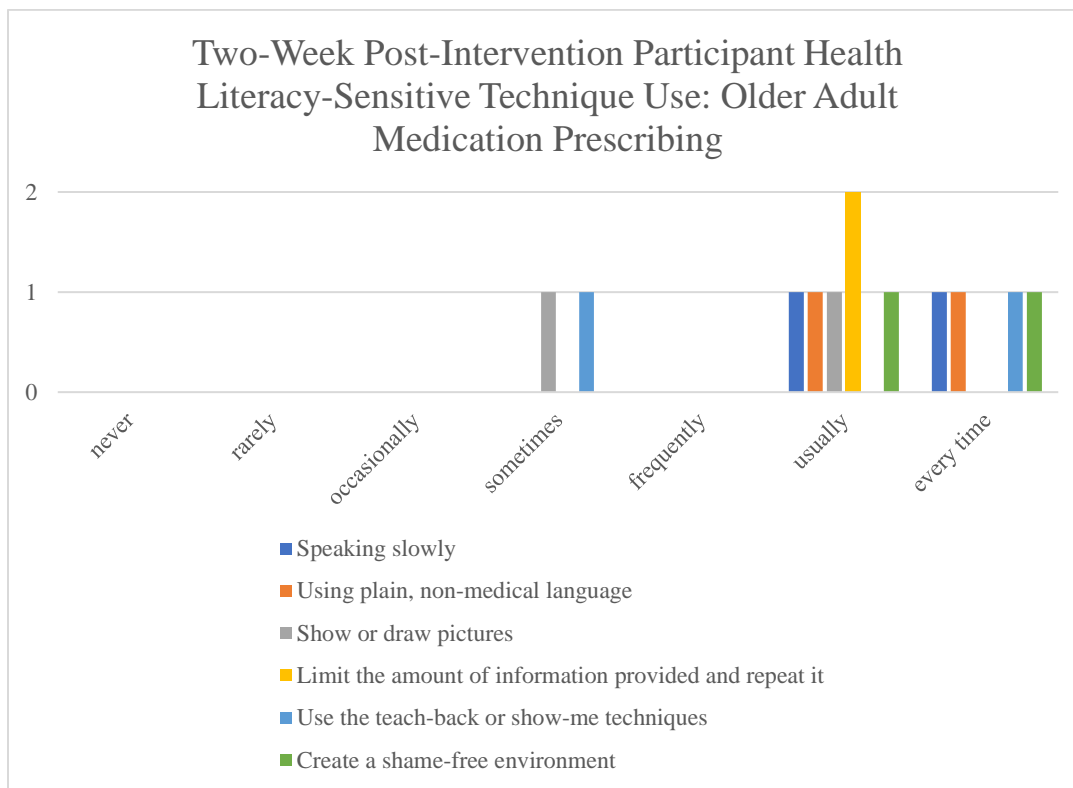
Figure 12. Two-week post-intervention participant self-reported use of health literacy-sensitive techniques with older adults when prescribing medications; *n* = 2.

Medication prescribing-specific health literacy interventions. Participants were also asked to provide self-reported frequency use of medication prescribing-specific health literacy interventions including use of the brown bag medication review, patient-centered medication instructions, medication reminder forms, and medication forms. Noticeable changes were found in participant responses from the pre-intervention period compared to the two-week post-intervention period. Both participant responses increased to a more positive response in the two-week post-intervention period. One participant's responses showed implementation of all health literacy-sensitive interventions in some capacity compared to never using the interventions in the pre-intervention survey response. The changes in responses can be seen in Figures 13 and 14.
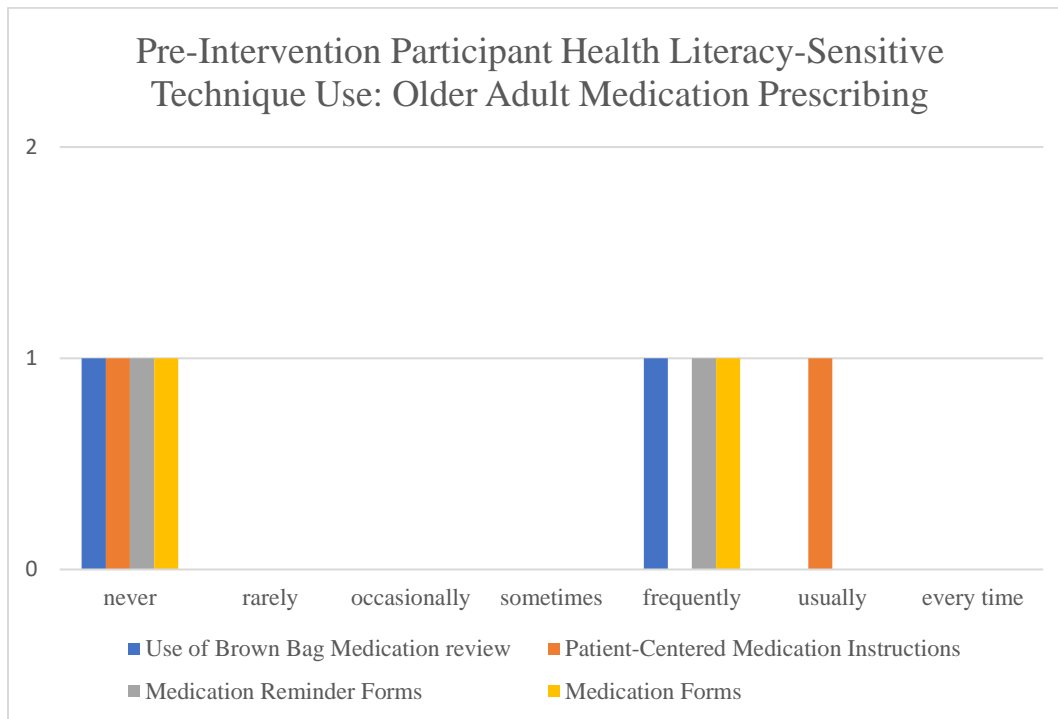
Figure 13. Pre-intervention participant self-reporting use of health literacy-sensitive techniques with older adults when prescribing medications; $n = 2$.
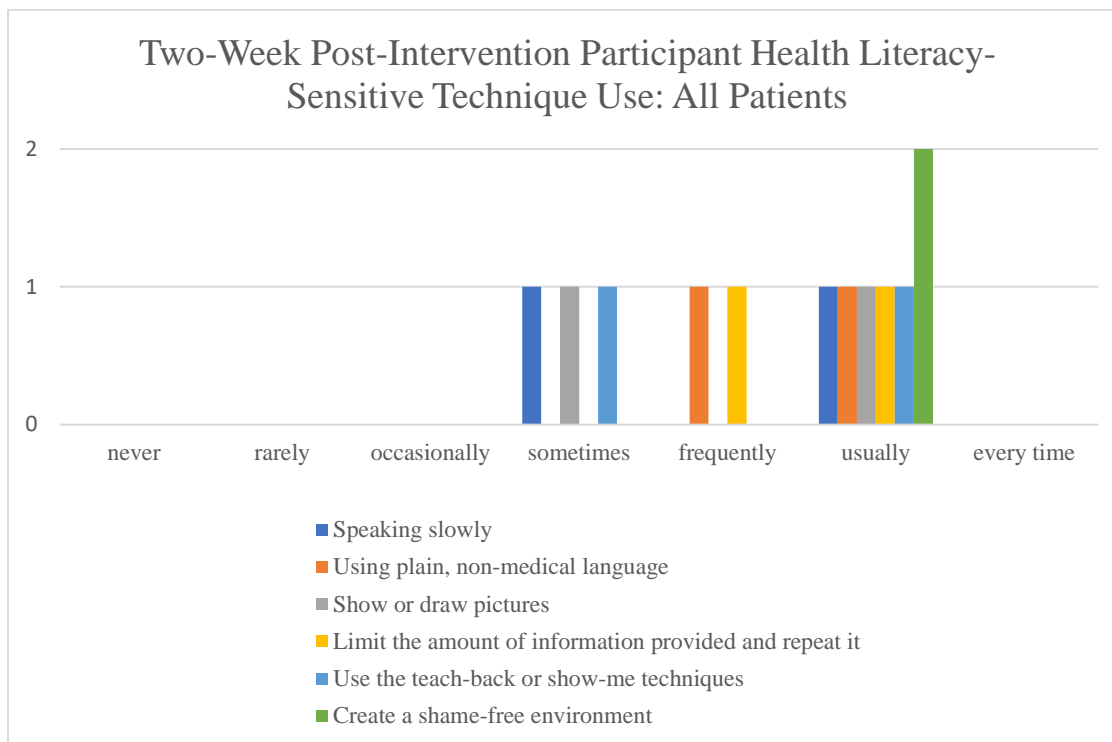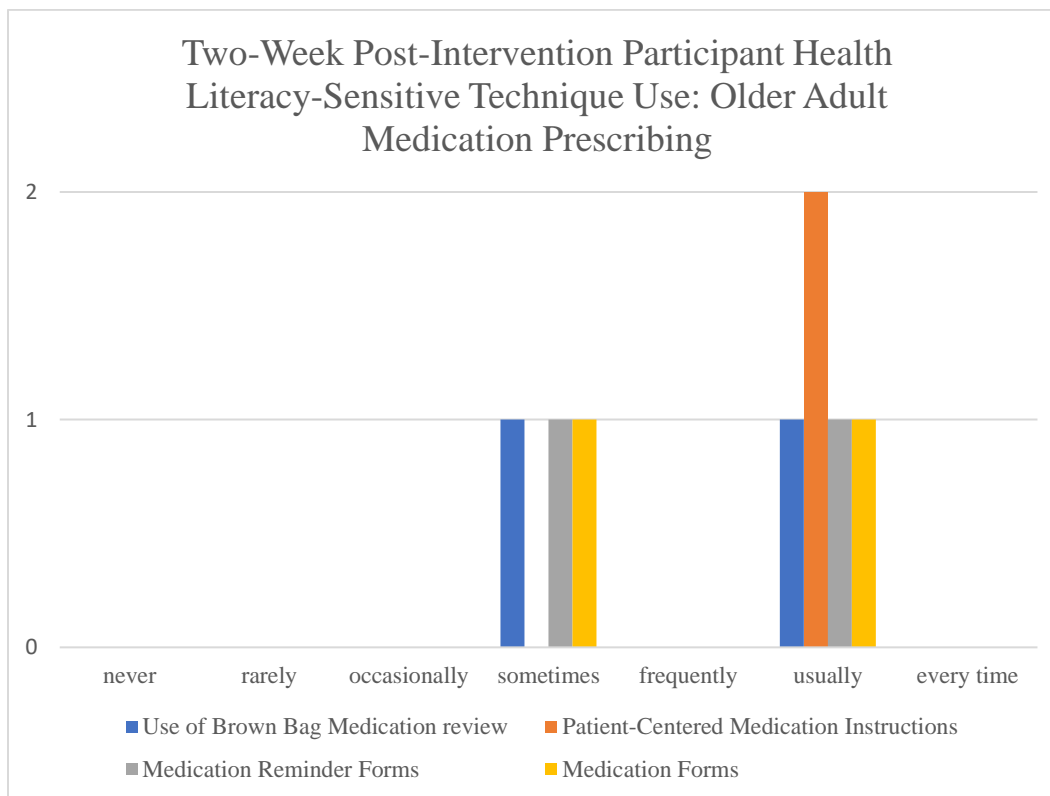
Figure 14. Two-week post-intervention participant self-reporting use of health literacy-sensitive techniques with older adults when prescribing medications; *n* = 2.

Two-Week Post-Intervention Qualitative Responses

Participants were asked to provide feedback regarding what they believed were facilitators and barriers in their current practice or clinic setting to implement health literacy-sensitive interventions. Participants reported facilitators as the willingness of providers to focus on improving care to those with inadequate health literacy in addition to have bilingual medical assistants to be able to better address language barriers. The barrier to implementation of health literacy-sensitive interventions reported by both participants was length of appointments. Participants were also asked to provide general feedback about the educational program to which overall ease of use and educational components were reported as being helpful.

CHAPTER V

DISCUSSION

Introduction

This DNP scholarly project was developed with the intention to create an evidence-based online education for nurse practitioners that focused on improving their health literacy knowledge, increasing their understanding of health literacy-sensitive interventions, and increasing their intentions; the most important component was actual implementation of these interventions. While health literacy interventions are intended to be used universally with all patients, this program provided additional focus on specific health literacy-sensitive interventions to aid in addressing the needs of older adults and medication adherence.

Program Successes

Secondary to a small sample size, inferential data analyses were not possible; however, findings of this program did show a positive impact on practitioners' reported health literacy-related knowledge, skills, intention to implement, and actual implementation of health literacy-sensitive interventions into their clinical practice. According to the immediate post-intervention survey, both participants reported strong intention to focus on using all health literacy-sensitive strategies and techniques. Their intention appeared to have translated into actual implementation behaviors in the two-week post-intervention period where participant responses were noticeably more positive

than their pre-intervention responses regarding their current use of health literacy-sensitive strategies and techniques in clinical practice.

Additionally, when compared to their pre-intervention survey responses, participants' two-week post-intervention responses reflected an increase in self-reported use of health literacy-sensitive interventions. The findings showed support for Fishbein and Ajzen's (2010) theory of planned behavior and adoption and health literacy education components previously studied by Mackert et al. (2011), Coleman and Fromer (2015), and Cafiero (2013).

Project Recruitment

Initial recruitment was primarily focused on using an in-person presentation at the Northern Colorado Nurse Practitioner Coalition meeting and advertisement on its webpage, which had the potential to reach over 1,500 practitioners. While advertisements were posted on the Coalition's webpage, only six participants completed the recruitment and consent form. Additional recruitment protocols also included advertisements on the Doctor of Nursing Practice incorporated website; however, this additional recruitment attempt did not generate any additional participants. When the original recruitment protocols appeared to be exhausted, an addendum to the IRB recruitment protocol was completed to include recruitment through Facebook® Nurse Practitioner groups, The Nurse Practitioners, and The Nurse Practitioner Newbies. Advertisements were posted twice one week apart; however, these recruitment attempts also did not generate additional participants (see Appendix I). It is unknown how many potential participants visited the recruitment page compared to those who completed with consent by entering their email address. This was a limitation as it did not provide any

information regarding the barriers to recruitment encountered in this project. Understanding the barriers to recruitment would be valuable for future implementations of this program.

The health literacy program was voluntary; likely the incentive for participation did not achieve a high enough value for the uptake of the program. When presenting the program to potential participants at the Northern Colorado Nurse Practitioner Coalition meeting, there were questions about the possibility of obtaining continuing education credits, which might have also increased participant recruitment for this voluntary program. In the study by Coleman and Fromer (2015), participation in the health literacy education program was considered to be mandatory for the participant's employment. In the Mackert et al. (2011) study, participants were recruited through a literacy group, which was instrumental in finding health literacy champions within clinics to which they were able to provide the training sessions (M. Mackert, personal communication, September 1, 2019).

The issue of time must also be considered regarding program recruitment. This DNP scholarly program was similar in length (an estimated four hours) to the Coleman and Fromer (2015) program, which was reported to be 3.5 hours. However, this DNP scholarly program was online while Coleman and Fromer's program was provided in-person and participants' time had been blocked out to participate in the program. While it was possible potential participants might have seen value in the program and the content presented, the time commitment by working nurse practitioners to complete the program might have been a deterrent to participation.

Diffusion of Innovation Theory and Recruitment

According to Rogers (2003), there are four main elements in the diffusion of innovation: "the innovation, communication channels, times, and the social system" (p. 10). Rogers further discussed how "the perceived newness of idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation" (p. 11). Participants in this DNP scholarly project who completed the pre-invention survey reported they had no previous formal education or continuing education regarding health literacy. By Rogers' definition, this program's content might be considered an innovation.

Adoption of innovative ideas varies by individual (Rogers, 2003). Furthermore, Rogers (2003) discussed the S-shaped adopter distribution that showed a slow rise in adoption of innovations at the beginning. However, over time, there was an acceleration of adoption until a point where half of the individuals within a specified group had accepted the change; then the adoption slowed again and began to taper off. While this DNP scholarly project provided evidence-based practice, adoption of this innovative program was reflective of the early points of the S-shaped adopter distribution.

Innovation

Rogers (2003) discussed the need for understanding the relative advantage, compatibility, complexity, trialability, and observability of the innovation. Relative advantage was defined by Rogers (2003) as the "degree to which an innovation is perceived as better than the idea it supersedes" (p. 15). However, this was based on the participant's perception, which required building of participant buy-in. While the topic of health literacy is not necessarily a new term, understanding how to address it with

health literacy-sensitive interventions has not been a mainstream medical/nursing education component. This innovative DNP scholarly project sought to develop a program focused on providing nurse practitioners with the knowledge about the topic of health literacy and interventions that could address the needs of the vulnerable older adult population. While the goal was to reach currently practicing nurse practitioners, this program might be better applied in the educational setting to begin to help reframe the nurse practitioner student's approaches to addressing patients in their practice settings.

Communication Channels

Communication channels used for diffusion of this DNP scholarly project included an in-person presentation to the members of the Northern Colorado Nurse Practitioner Coalition, encouraging word of mouth, and some mass media channels by placing advertisements on the Northern Colorado Nurse Practitioner Coalition website, the Doctorate of Nursing Practice Inc. website, and Facebook® Nurse Practitioner group pages.

When considering the uptake of innovations, Rogers (2003) discussed how typically diffusion of innovations was more dependent upon "a subjective evaluation of an innovation that is conveyed to them from the other individuals like themselves who have already adopted the innovation" (p. 18). By understanding this component of diffusion of innovation retrospectively, this program might have been more successful had the project lead introduced the program earlier than the week before implementation or developed a second-wave of implementation where previous participants became champions of the program and helped spread the word about the program.

Time

Rogers (2003) discussed how the aspect of time is often something that is ignored when considering the diffusion of innovation. Potential adopters of the innovation need time to be able to process and make decisions regarding their willingness to accept or reject the innovation. According to Rogers, potential adopters need to move through the innovation-decision process, which consists of five main steps: (a) knowledge, (b) persuasion, (c) decision, (d) implementation, and (e) confirmation.

Based on the discussion of time, this DNP project might have been more successful in the recruitment of participants had additional time been spent focusing on providing additional education/knowledge about the health literacy program before the implementation launch. The barrier to extending this timing was a short window between obtaining IRB approval and presentation at the June 26, 2019 Coalition meeting, which did not allow for earlier distribution through mass media communication channels. Delaying the implementation of the educational program was considered; however, the opportunity for later interpersonal communications would not have been possible based on time constraints of the program implementation plan.

However, adoption of this program would likely have continued to follow the diffusion of innovation S-curve where initial adoption tended to be slower. It was likely this program would have increased in adoption over time had there been additional focus on increasing communication channels and not being limited by the constraints of the IRB recruitment protocols.

Social Systems

The recruitment plan for this program focused on nurse practitioners primarily in the northern Colorado area by focusing on recruiting from the Northern Colorado Nurse Practitioner Coalition group, which has been supportive of innovative ideas and shown a willingness to consider adoption of practice changes. When considering the social system and innovation-decisions discussed by Rogers (2003), this DNP scholarly project fell into the optional innovation-decision category, which allows for each individual to decide on innovation adoption or rejection. This program might have been more successful had it been deployed in an established clinic with change agent champions ready to help to influence others to adopt or participate in the DNP scholarly project in a situation where there was more of a collective-innovation-decision. For a collective-innovation-decision to adopt or reject an innovation, the collective group would make a decision and once it was made the whole system would be required to adopt/reject the innovation. This was supported by Mackert et al. (2011) where the training sessions were completed within organizations that had change agents who already had forged relationships with potential adopters. In the Coleman and Fromer (2015) program, participants completed the program as part of their clinic's requirement to participate, which would be more characteristic of an authority innovation-decision described by Rogers where the decision to adopt or reject was made by a select few with authority to make the decision for the entire system.

Discussion of Program Findings

While the uptake of the program did not reach the targeted participation totals, there was evidence the program showed signs of meeting previously set out objectives.

This DNP scholarly project was a non-experimental study with the primary objective of developing and implementing an evidence-based health literacy-sensitive education program focused on increasing the nurse practitioner's awareness of health literacy-related topics and implementation of health literacy-sensitive interventions. The topics included health literacy trends, vulnerable populations, and evidence-based interventions nurse practitioners could apply to their clinical practice when communication with older adults who have inadequate health literacy.

Five objectives were developed to assess the success of this program:

1. Assess nurse practitioner's perceived knowledge regarding health literacy

2. Increase nurse practitioners' awareness of signs of potential inadequate health literacy

3. Provide nurse practitioners with tangible health literacy-sensitive intervention skills and strategies for the older adult patient to potentially improve medication adherence

4. Assess for individual practitioner intention to implement and actual implementation of evidence-based health literacy-sensitive intervention skills and strategies into practice

5. Assess participant's perceived facilitators and barriers to implementing health literacy-sensitive interventions into their clinical practice.

Outcomes of Objectives

Assessment of Participants' Perceived Knowledge

Before beginning the educational modules, all participants were asked to complete a pre-intervention survey where participants were asked to rate their health

literacy knowledge. Participants were asked again to rate their health literacy knowledge after program completion in the immediate post-intervention survey. Based on the two participants who completed both the pre-intervention and immediate post-intervention surveys, there was support that this DNP scholarly project could help improve nurse practitioners' health literacy knowledge.

Increasing Nurse Practitioner Awareness
of Inadequate Health Literacy

This DNP scholarly project design also focused on increasing nurse practitioner awareness of the effects inadequate health literacy could have on patient outcomes. Nurse practitioner participants were also educated on the prevalence of inadequate health literacy and populations vulnerable of having inadequate health literacy. Understanding the vulnerability of populations is particularly important since the older adult population is at a greater risk for adverse outcomes related to medication nonadherence (Mayo-Gamble & Mouton, 2018). Older adults need practitioners who recognize the signs of inadequate health literacy and understand that interventions could make a difference in whether a patient is adequately prepared to manage his/her day-to-day health care and medication management. Participants who completed pre- and post-intervention surveys demonstrated an increase in their self-reported understanding of signs of potential inadequate health literacy.

Provide Practitioners with Tangible
Health Literacy Interventions

Participants who completed this program were provided education on multiple health literacy interventions including the teach-back method, focusing on clear, concise non-medical language; use of pictures or drawings; and creating a shame-free

environment. Additionally, participants were provided with medication prescribing and management interventions that focused on assessing their patient's understanding of medication administration instructions. These interventions included the use of a brown bag medication review, patient-centered medication instructions, medication reminder forms, and simplified medication forms. Based on participants' pre-intervention and post-intervention survey responses, both participants reported an increased utilization of health literacy-sensitive strategies and techniques in the two-week post-intervention period.

Practitioners' Intentions and Actual Implementation of Health Literacy-Sensitive Interventions and Strategies

The assessment of participant intentions compared to actual implementation of health literacy-sensitive interventions was based on the theory of planned behaviors (Ajzen, 1991). Participants' immediate post-intervention survey responses regarding their intention to implement health literacy were compared to their reported implementation of health literacy interventions in the two-week post-intervention survey. While there might have been participant bias in the reporting of changes in self-reported behaviors, Fishbein and Ajzen (2010) discussed how the development of a strong positive intention provided a reliable prediction of the likelihood a person would perform the behavior. Findings from the survey results were mostly supportive of the Fishbein and Ajzen theory of planned behavior's eight components focused on the person forming a positive intention, development of necessary skills for behavior adoption, behavior adoption advantages outweighing disadvantages, having more positive emotional

reactions than negative to the behavior, and perceived self-efficacy to perform the behavior.

One of the eight components focused on environmental constraints to behavior adoption. Participants identified the environmental constraint of appointment time lengths as a barrier to their implementation of health literacy-sensitive interventions into clinical practice. A second component discussed by Fishbein and Ajzen (2010) that might also have been a barrier to a participant's behavior adoption was the component of feeling social pressure to adopt a behavior such as the use health literacy-sensitive interventions. Secondary to this being an online program, social pressures to perform behaviors in the clinical setting might not be as prominent as a program being implemented using a clinic-wide in-person education and adoption plan.

Practitioners' Perceived Facilitators
and Barrier to Implementing
Health Literacy-Sensitive
Strategies

Two facilitators of implementing health literacy-sensitive strategies were identified by participants. The first facilitator was the providers who desired to focus on improving the care they were providing to those with inadequate health literacy. Rogers (2003) discussed the importance of having individuals within the organization who could act as innovators or early adopters of innovation to help champion the change and increase adoption of the innovation. The participants who completed the program could act as change agents in helping other practitioners adopt the evidence-based practice changes, resulting in the integration of health literacy-sensitive interventions into their clinics.

The second facilitator identified by participants was having support staff such as medical assistants and nurses who were bilingual, which helped address the contributing effects of language barriers on a patient's health literacy abilities. A recent review by Yeheskel and Rawel (2019) explored the experience of patients with limited English proficiency and found one of the important themes in their review was about relationships with healthcare professionals. While some patients preferred to have healthcare providers who were also able to speak their native language, they also valued the ability to have high-quality conversations with their healthcare team (Yeheskel & Rawel, 2019). The use of limited English proficiency patient advocates was found to help reduce patients' concerns about their care and increased their trust in the medical treatment they were receiving (Yeheskel & Rawel, 2019). Having bilingual medical assistants and clinic nurses might help in providing this type of patient advocacy in the clinic setting when providers are not also bilingual.

The barrier identified by both participants was the valid concern of limited time of patient appointments that might not allow for the perceived time needed to implement health literacy-sensitive interventions. The concern of time constraints was also expressed in the literature (Saddawi-Konefka et al., 2016; Schillinger et al., 2003; Soones et al., 2016). While the health literacy-sensitive interventions are evidence-based, providers struggle in focusing on addressing all the patient's needs and also implementing new practices (Schillinger et al., 2003; Soones et al., 2016). Addressing the aspect of time to implement interventions would be an important component to consider in future research and program implementation plans. Studies have shown no

increased amount of time in completing health literacy-sensitive interventions such as use of the teach-back method (Schillinger et al., 2003).

Project Alignment to Enhances, Culmination, Partnership, Implements, and Evaluation

To demonstrate alignment of this scholarly project with the American Association of Colleges of Nursing's essentials of doctoral education, five criteria were used to evaluate the DNP scholarly project (Waldrop, Caruso, Fuchs, & Hypes, 2014). The five criteria are represented through the acronym EC as PIE (enhances, culmination, partnership, implements, and evaluation) and were used to discuss this project's alignment with the American Association of Colleges of Nursing's Doctor of Nursing Practice essentials. These five criteria also helped to assure DNP scholar programs developed are of high quality with robust and measurable outcomes (Waldrop et al., 2014).

The first criterion for evaluation focused on how the DNP project enhanced practice or health outcomes or could influence healthcare policies related to patient-centered care (Waldrop et al., 2014). This project focused on enhancing health and practice outcomes by focusing on improving nurse practitioner knowledge and implementation of evidence-based practices regarding health literacy. This DNP scholarly project supported initiatives of the *National Action Plan to Improve Health Literacy* established by the U.S. Department of Health and Human Services (2010) to focus on health literacy interventions focused on improving communications with patients, using interventions such as the teach-back method, and ensuring the interventions were patient-centered. Additionally, this program was developed using evidence-based practices complied by the AHRQ (2015), which has been a driving force

in addressing health literacy in the clinical setting. A focused effort of the program was on the older adult population and how practitioners could better address medication adherence in those with inadequate health literacy. By helping nurse practitioners better understand the importance of addressing health literacy needs of the older adult, they could better focus on mitigating the adverse implications inadequate health literacy has on patient outcomes and the negative financial impacts including preventable emergency room visits and hospitalizations and adverse medication outcomes.

This scholarly project provided expertise on the topic of health literacy and demonstrated "a culmination of practice inquiry" described by Waldrop et al. (2014, p. 302). The *culmination* of the knowledge gained throughout this doctoral program was applied to conduct reviews of the literature and to develop, implement, and evaluate this DNP scholarly project. While this project's online program focused on addressing nurse practitioner knowledge of health literacy and applied Orem's (1991) self-care deficit nursing theory, this program's content provided a pragmatic approach to addressing health literacy knowledge and understanding of health literacy-sensitive interventions. Despite the limited uptake of the online program, the health literacy interventions and strategies provided both pragmatic and practical approaches to better address the needs of patients with inadequate health literacy, which was considered to be an important component of the DNP final project requirements discussed by Waldrop et al. While implementation of health literacy-sensitive interventions requires practitioners to make changes in their approach when communicating with patients, practitioners who adopt the health literacy techniques and strategies consistently could likely see reproducible, improved patient outcomes as described by Waldrop et al. The development and ongoing

evaluation of this DNP scholarly project allowed for the project lead to more fully

understand the importance of using systematic approaches to create a program that met

robust criteria and she also produced valuable output data important to improving clinical

practice. This process also helped the project lead to better anticipate and understand

barriers to implementation. Program implementation requires careful monitoring and

modification when barriers are encountered. Additionally, while it was not always

possible for barriers to be overcome, this did not necessarily mean a program was

unsuccessful.

While this was an online education program, the DNP scholarly project required

forging *partnerships* with nurse practitioner professional organizations to generate

interest in the program and recruitment of nurse practitioner participants. Connections

were made with the Northern Colorado Nurse Practitioner Coalition and the Doctor of

Nursing Practice, Inc. Additionally, the development and planning of this program came

from suggestions of health literacy experts and organizations committed to improving

health literacy in our communities including the AHRQ (2015), the Always Use Teach-

back! Organization (2019), the University of North Carolina at Chapel Hill (2019), and

the American Medical Association (2019). The development of partnerships will

continue as discussions about health literacy education will be ongoing in all healthcare

fields.

This DNP scholarly project provided a practical avenue for translation of health

literacy evidence into an online education program. Through this program, nurse

practitioners could gain valuable knowledge about health literacy trends, vulnerable

populations within clinical practice at greatest risk for adverse outcomes, and ways in

which practitioners could *implement* health literacy-sensitive interventions into their everyday clinical practice and interactions with patients. Further translation of the evidence was completed by focusing on health literacy-sensitive interventions that might be most beneficial when addressing the needs of older adults when prescribing and addressing medication adherence. This robust online education program was developed and implemented using an evidence-based toolkit from the AHRQ (2015) with previous proven implementation into primary care clinical settings (Brega et al., 2015; DeWalt et al., 2011).

Although limited participants completed Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners, the online format of the program provided a springboard for additional implementation and outcome evaluations. The primary objectives of developing and implementing an online education program were met with positive findings suggestive of this program's continued success in improving nurse practitioners' health literacy knowledge and implementation of health literacy-sensitive interventions into everyday practice. Measures to *evaluate* practitioners' use of health literacy interventions are already in place within the primary care clinic setting. Clinics are often evaluated using CAHPS (Clancy et al., 2012) and the AHRQ's (2017) *Medical Expenditure Panel Survey—Household Component*, which allowed practitioners to evaluate their patient panel's feelings about their clinical interactions and better understand their patient's healthcare experiences.

Implications to Practice

Findings of this project provided preliminary support that this program could have a positive impact regarding increasing nurse practitioners' knowledge about health literacy-related topics including the prevalence of vulnerable populations and ways in which they could use interventions to improve the health of their populations by being more equipped to address a patient's health literacy needs. This was particularly evident in the nurse practitioner participants who reported a higher likelihood of using health literacy-sensitive interventions with all patients and focused medication adherence interventions with older adult patients *and* then also reported implementation of those health literacy-sensitive interventions in the two-week post-intervention period.

Findings of the online program demonstrated nurse practitioners were likely not receiving health literacy-specific education in their nurse practitioner programs and had not received training on how to recognize and address patients with inadequate health literacy. Many of the evidence-based interventions taught within this health literacy program were focused on adjusting communication with patients and additional tools that could be used to help patients better address their health needs on a daily basis regarding medication adherence. While these communication interventions should be used with all patients, it is even more crucial for practitioners to use these interventions with older adults who have the highest prevalence of inadequate health literacy.

Practitioners who participated in the online health literacy education program reported an increase in their knowledge related to the identification of those patients with inadequate health literacy, the prevalence of inadequate health literacy, groups who were more likely to have inadequate health literacy, and outcomes associated with inadequate

health literacy. While only two participants completed the entire program, findings of this project were in line with those in prior studies (Cafiero, 2013; Coleman & Fromer, 2015; Mackert et al., 2011).

While there is a clear need to continue to focus on increasing practicing nurse practitioners' health literacy knowledge; this online program and other online health literacy programs might be better implemented in nurse practitioner programs as a component of a nurse practitioner student's training. It will be increasingly important for nurse practitioner programs to incorporate addressing health literacy needs throughout their programs as the effects of inadequate health literacy will be encountered by nurse practitioners and other healthcare providers on a daily basis. Health literacy-sensitive interventions such as teach-back require the person to continually practice the skill, which might be better accomplished in an educational setting. Additionally, nurse practitioners who are able to identify patients with inadequate health literacy will be better prepared to develop patient-centered care for each patient and potentially mitigate the risks associated with inadequate health literacy including preventable hospitalizations, emergency room visits, worsening of disease processes, and mortality.

Limitations

The most significant limitation of this DNP scholarly project was the small sample size, resulting in the limitation of completing inferential analyses of data. While there were multiple recruitment attempts and a modification of the IRB recruitment protocols, there was limited program participation. It was recognized that the initial recruitment plan was too narrow and did not allow for recruitment by the project lead through professional networking outside of the Northern Colorado Nurse Practitioner

Coalition's June 26, 2019 meeting, which resulted in missed opportunities at professional conferences for nurse practitioners.

While the program was offered online, which allowed for participants to progress through the program at their own pace, an in-clinic educational program with a devoted time slot might have resulted in a higher number of participants who completed the program. Additionally, when considering the diffusion of innovation theory (Rogers, 2003) and the theory of planned behavior (Ajzen, 1991), a clinic-based health literacy education program might have fostered greater adoption secondary to increased motivating factors within the normative social behavior and use of champions to influence the diffusion of innovation.

Recommendations for Future Research

It would be beneficial to implement more extensive studies that have the ability to complete inferential statistical analysis regarding the use of online health literacy education programs and participants' intentions to implement health literacy-sensitive interventions while also comparing them to actual implementation practices. While this scholarly project appeared to show this online education program would likely be successful in increasing nurse practitioners' health literacy knowledge and the use of health literacy-sensitive strategies and techniques, additional studies would be necessary to confirm this hypothesis. Observational research components would have provided more real-time data regarding the actual use of health literacy-sensitive interventions by nurse practitioners in the clinical setting and potentially eliminate the component of potential participant bias when depending on participant's self-reported use of health literacy-sensitive intervention.

Additional research would be helpful to understand the level of adopting health literacy-sensitive interventions when comparing the use of online health literacy education programs to the use of clinic-based health literacy education programs. Previous health literacy education studies had not assessed for actual implementation practices of providers compared to their reported intention to implement practices (Coleman & Fromer, 2015; Mackert et al., 2011). By better understanding adoption behaviors when comparing these two education delivery options, additional educational programs could be implemented based on the level of actual behavior change.

Future research studies are also needed to assess whether an online health literacy program such as this DNP scholarly project would provide a greater likelihood of adopting the use of health literacy-sensitive interventions if it was deployed in nurse practitioner education programs. Previous studies by Mackert et al. (2011) and Coleman and Fromer (2015) incorporated the use of role-playing when focusing on health literacy intervention implementation. Since role-playing and simulations are already important components of nurse practitioner education programs, they could more easily allow for the incorporation of health literacy-related role playing into program curricula such as the teach-back method. Since interventions like the teach-back method require practice, it would be beneficial to know if nurse practitioner programs that incorporate health literacy education and role-playing would have an effect on patient outcomes related to inadequate health literacy.

Conclusion

This DNP scholarly project—Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for

Nurse Practitioners—provided a robust learning opportunity for nurse practitioners to gain valuable evidence-based health literacy knowledge and insight on how to better address the growing health literacy needs of patients. As our aging population continues to grow exponentially over the next several decades so will the need for healthcare providers to better adapt their care and communications with older adult patients to address their health literacy needs. While this program required a considerable time commitment on the part of nurse practitioner participants, findings of this project suggested this program would provide nurse practitioners with a greater understanding of how they could have an impact on health outcomes by adjusting the way they deliver healthcare messages and assess patient understanding. As patient's healthcare providers, we only see a snapshot of a patient's life during clinic appointments and patients are depending on us to provide them the guidance on how to best care for themselves in their day-to-day lives. While the time commitment to implement evidence-based health literacy-sensitive interventions will continue to be a valid concern for nurse practitioners, this time commitment might be a minimal inconvenience if it could prevent potentially detrimental, adverse outcomes related to inadequate health literacy.

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APPENDIX A

PRE- AND POST-INTERVENTION SURVEY BLOCKS

Pre-Intervention Survey Blocks

Participation Consent Block

This online education program is a DNP scholarly project. All data collected is confidential and does not contain any personal identifying features.

Contact Information:

Student Researcher: Angela Pickerel, BSN, RN, DNP-FNP-Candidate

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Research Advisor: Melissa Henry PhD, MS, RN

- E-mail: Melissa.Henry@unco.edu
- Phone: (970) 351-1735

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please verify below if you would like to participate in this research. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351- 1910.

Do you give consent for the use of your survey information for this scholarly project?

Yes

No

<u>Survey Identification</u>

Please enter the first 3 letters of *your* last name and the numerical two-digit month and two-digit day of *your* birth date (example: PIC0425)

_____

Demographic Section

<u>Age Range</u>

18-29

30-39

40-49

50-59

60-69

70-79

Do not wish to disclose

<u>Gender</u>

Male

Female

Other

Do not wish to disclose

<u>Nurse Practitioner Certification Type (check all that apply)</u>

Family Nurse Practitioner

Adult Gerontological Nurse Practitioner

Women's Health Nurse Practitioner

Psychiatric Mental Health Nurse Practitioner

Emergency Nurse Practitioner

Acute Care Adult Gerontological Nurse Practitioner

Duel Certifications _____

Do not wish to disclose

Nurse Practitioner Years of Experience

5 years or less

6-10 years

11-15 years

16-19 years

20 years or greater

Do not wish to disclose

Years of Nursing Experience Prior to Obtaining Nurse Practitioner License

5 years or less

6-10 years

11-15 years

16-19 years

20 years or more

Do not wish to disclose

Have you ever had formal training or education regarding health literacy?

Yes

No

Unknown

Do not wish to disclose

Have you ever completed continuing education regarding health literacy?

Yes

No

Unknown

Do not wish to disclose

What setting best describes the setting in which you currently provide care?

Family Practice

Internal Medicine

Women's Health

Psychiatric Mental Health

Acute Care Setting

Emergency Room

Urgent Care

Other (please specify)_____

Not currently in practice

Pre-Survey Items

Health Literacy Knowledge

Anchor: Considering your current practice, on a scale of 1-7 please indicate your agreement with the following statements

Likert Scale: values of 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree or disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree)

1. I understand what it means for patients to have low health literacy.
2. I know the prevalence of low health literacy
3. I know the groups that are more likely to have low health literacy
4. I understand the health outcomes associated with low health literacy

Reported Use of Health Literacy Strategies to Deal with Patients with Low Health Literacy

Anchor: Considering your current practice, on a scale of 1-7 please indicate your agreement with the following statements from 1 (strongly disagree) to 7(strongly agree)

Likert Scale: values of 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree or disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree)

5. I do a good job identifying patients with low health literacy
6. I am good at knowing whether or not my patients understand what I tell them.
7. I am good at maintaining a culturally sensitive healthcare experience

<u>**Reported Use of Health Literacy-Sensitive Intervention Skills(techniques)**</u>

Anchor: Considering your current practice, on a scale of 1-7 please indicate how frequently you use each technique from 1 (never) to 7(every time)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

8. Speaking slowly
9. Using plain, non-medical language
10. Show or draw pictures
11. Limit the amount of information provided and repeat it
12. Use the teach-back or show-me techniques
13. Create a shame-free environment

<u>**Older Adult Block**</u>

Anchor: When prescribing medications to <u>Older Adult Patients</u>, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (never) to 7 (every time)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

14. Speaking slowly
15. Using plain, non-medical language
16. Show or draw pictures
17. Limit the amount of information provided and repeat it
18. Use the teach-back or show-me techniques
19. Create a shame-free environment
20. Use Brown Bag Medication Review
21. Patient-Centered Medication Instructions
22. Medication reminder forms
23. Medication forms

Post-Intervention #1 Survey Blocks

Participation Consent Block

This online education program is a DNP scholarly project. All data collected is confidential and does not contain any personal identifying features.

Contact Information:

Student Researcher: Angela Pickerel, BSN, RN, DNP-FNP-Candidate

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Research Advisor: Melissa Henry PhD, MS, RN

- E-mail: Melissa.Henry@unco.edu
- Phone: (970) 351-1735

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please verify below if you would like to participate in this research. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351- 1910.

Do you give consent for the use of your survey information for this scholarly project?

Yes

No

Survey Identification

Please enter the first 3 letters of *your* last name and the numerical two-digit month and two-digit day of *your* birth date (example: PIC0425)

_____

<u>**Health Literacy Knowledge**</u>

Anchor: On a scale of 1-7 please indicate your agreement with the following statements from 1 (strongly disagree) to 7(strongly agree)

Likert Scale: values of 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree or disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree)

1. I understand what it means for patients to have low health literacy.
2. I know the prevalence of low health literacy
3. I know the groups that are more likely to have low health literacy
4. I understand the health outcomes associated with low health literacy
5. I originally overestimated my own knowledge of health literacy

<u>**Intentions for Use of Health Literacy Strategies to Deal with Patients with Low Health Literacy**</u>

Anchor: On a scale of 1-7 please indicate how likely you are to focus more on each strategy with the following statements from 1 (very unlikely) to 7 (very likely)

Likert scale: values of 1 (very unlikely), 2 (unlikely), 3 (somewhat unlikely), 4 (neutral), 5 (somewhat likely), 6 (likely), and 7 (very likely).

6. Identifying patients with low health literacy
7. Paying attention to whether or not my patients understand what I'm telling them
8. Maintaining a culturally sensitive healthcare experience

<u>**Intentions for Use of Health Literacy-Sensitive Intervention Skills (techniques)**</u>

Anchor: On a scale of 1-7 please indicate how likely you are to focus more on each technique with the following statements from 1 (very unlikely) to 7 (very likely)

Likert scale: values of 1 (very unlikely), 2 (unlikely), 3 (somewhat unlikely), 4 (neutral), 5 (somewhat likely), 6 (likely), and 7 (very likely).

9. Speaking slowly
10. Using plain, non-medical language
11. Show or draw pictures
12. Limit the amount of information provided and repeat it
13. Use of teach-back or show-me techniques
14. Create a shame-free environment

Older Adult Block

Anchor: When prescribing medications to <u>Older Adult Patients</u>, on a scale of 1-7, indicate how likely you are to focus more on each task from 1(very unlikely) to 7 (very likely)

Likert scale: values of 1 (very unlikely), 2 (unlikely), 3 (somewhat unlikely), 4 (neutral), 5 (somewhat likely), 6 (likely), and 7 (very likely).

15. Speaking slowly
16. Using plain, non-medical language
17. Show or draw pictures
18. Limit the amount of information provided and repeat it
19. Use of teach-back or show-me techniques
20. Create a shame-free environment
21. Use Brown Bag Medication Review
22. Patient-centered medication instructions
23. Medication reminder forms
24. Medication forms

Two-Week Post-Intervention Survey Blocks

Participation Consent Block

This online education program is a DNP scholarly project. All data collected is confidential and does not contain any personal identifying features.

Contact Information:

Student Researcher: Angela Pickerel, BSN, RN, DNP-FNP-Candidate

- Email: Pick8474@bears.unco.edu

Research Advisor: Melissa Henry PhD, MS, RN

- E-mail: Melissa.Henry@unco.edu
- Phone: (970) 351-1735

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please verify below if you would like to participate in this research. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351- 1910.

Do you give consent for the use of your survey information for this scholarly project?

Yes

No

<u>Survey Identification</u>

Please enter the first 3 letters of *your* last name and the numerical two-digit month and two-digit day of *your* birth date (example: PIC0425)

_____

<u>Reported Use of Health Literacy Strategies to Deal with Patients with Low Health Literacy</u>

Anchor: Considering your current practice, on a scale of 1-7 please indicate your agreement with the following statements from 1 (strongly disagree) to 7(strongly agree)

Likert Scale: values of 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree or disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree)

1. I do a good job identifying patients with low health literacy
2. I am good at knowing whether or not my patients understand what I tell them.
3. I am good at maintaining a culturally sensitive healthcare experience

<u>Reported Use of Health Literacy-Sensitive Intervention Skills(techniques)</u>

Anchor: Considering your current practice, on a scale of 1-7 please indicate how frequently you use each technique from 1 (never) to 7(always)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

4. Speaking slowly
5. Using plain, non-medical language
6. Show or draw pictures
7. Limit the amount of information provided and repeat it
8. Use the teach-back or show-me techniques
9. Create a shame-free environment

<u>Older Adult Block</u>

Anchor: When prescribing medications to <u>Older Adult Patients</u>, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (Never) to 7 (Frequently)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

10. Speaking slowly
11. Using plain, non-medical language
12. Show or draw pictures
13. Limit the amount of information provided and repeat it
14. Use the teach-back or show-me techniques
15. Create a shame-free environment
16. Use Brown Bag Medication Review
17. Patient-Centered Medication Instructions
18. Medication reminder forms
19. Medication forms

<u>Barriers and Facilitators Block (Free text fields)</u>
What do you perceive as being facilitators to the implementation of health literacy-sensitive interventions into your practice?

What do you perceive as barriers to the implementation of health literacy-sensitive interventions into your practice?

<u>Separate link to raffle entry page</u>

Upon completion of this survey, please click on the link below to be enter the raffle for a $50.00 Amazon gift card as a token of appreciation for completing this program and surveys. The raffle will be open at midnight on August 12, 2019 and run through August 25, 2019 to 11:59 pm. The drawing will occur on August 26, 2019 and the $50.00 Amazon gift card will be sent to the email address of the random raffle winner.

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

DATE: June 21, 2019

TO: Angela Pickerel, BSN, DNP-FNP-Candidate
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1440581-1] Addressing Health Literacy Needs of the Older Adult Focused
                               on Improving Medication Adherence: An Online Education Program for Nurse
                               Practitioners
SUBMISSION TYPE: New Project

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: June 21, 2019
EXPIRATION DATE: June 21, 2023

Thank you for your submission of New Project materials for this project. The University of Northern
Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB
regulations.

Angela,

*Thank you for such a well written and thorough IRB application! There were 2 minor changes that
needed to be made on your informed consent - adding the header and identifying that this is a research
project. I have made those changes for you rather than asking you to correct and resubmit, as I know you
are on a short deadline. I've highlighted my revisions and attached the revised informed consent along
with your approval letter. Please be sure to remove the highlight and use the attached consent with your
particpants.*

Thank you and best of luck with your project!

Nicole Morse, Research Compliance Manager

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu.
Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of
Northern Colorado (UNCO) IRB's records.

APPENDIX C

RECRUITMENT

DNP Candidate Seeking Nurse Practitioner Volunteers Who Provide Care to Older Adults for Research Project

We invite NCNPC members to participate in a research project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: Health Literacy Participation Form

Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners

- Do you worry about your patient's understanding of their new medications?

- Do you think that your patients have questions, but they are afraid to ask?

- Do you have patients that receive a new diagnosis or medication, but never ask a question?

- Do you know patients that have been hospitalized because they misunderstood their medications and had an adverse drug reaction?

An individual's health literacy level is an important consideration when providing patient education. Inadequate health literacy has been called a "silent epidemic" that requires a call to action for improving the way that health care providers address this important issue (Institutes of Medicine, 2004).

If you would like to have more information on participating in a Doctoral Scholarly project, where you will learn more about health literacy, its prevalence, evidence-based interventions that can be immediately implemented into your practice that can help improve medication adherence and health literacy, especially in the older adult population, please contact Angela Pickerel, project lead: Pick8474@bears.unco.edu

To sign-up for the Health Literacy-Sensitive Intervention Program

https://forms.gle/DHMZYeYX8yQKYGXQ8

OR

Use your QR Code Scanner app and scan the image below

Greetings,

My name is Angela Pickerel, and I am in my fourth year of the DNP program at the University of Northern Colorado in Greeley. As I wrap up my studies, I am recruiting participants for my DNP Scholarly project entitled, Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners. There is an abundance of evidence showing that health literacy is a crucial skill that patients need to be able to access, understand, and use health information to decide about their health and daily care actions. While several populations are more vulnerable to having lower levels of health literacy, the older adult population is at greater risk. With aging, we know that individuals are at increased risk for chronic disease, which requires increased monitoring, likely need for medication management, and potential for additional specialty care visits.

Additionally, cognitive decline, visual, and hearing changes can increase the older adult's risk of having adverse medication reactions. Cognitive impairments and health literacy have bidirectional associations to one another that require special attention by healthcare providers. There have been efforts to improve health literacy through simplifying patient education handouts and use of assessment methods like teach-back; however, providers may not know how to recognize those with health literacy needs or what interventions may be the most effective in the older adult population. If you currently are a nurse practitioner who provides care to older adults in your clinical practice, I would like invite you to volunteer for my project.

In this project, you will be invited to enroll in an online education program where you will learn more about health literacy, it's impacts, simple clinical screening, and evidence-based interventions that you can implement immediately into your practice when interacting with older adults. The education modules are self-paced to allow flexibility in your busy schedule and will likely take a total of 4 hours to complete. You will receive weekly reminder e-mails with additional health literacy tips. You will be asked to complete an online questionnaire before and two questionnaires immediately following completion of modules, and then two weeks post completion. The program will run from July 1st -July 31st, 2019.

Please click on this link to be directed to additional program information, consent, and sign-up form: Health Literacy-Sensitive Intervention Program.

If you would like more information, please contact me at:

- Email: Pick8474@bears.unco.edu

Thank you!

Angela Pickerel, BSN, RN, FNP-DNP-Candidate

Doctors of Nursing Practice, Inc Website Advertisement

**DNP Candidate Seeking Nurse Practitioner Volunteers Who
Provide Care to Older Adults for Research Project**

We invite Doctors of Nursing Practice, Inc. website members to participate in a research project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: Health Literacy Participation Form

APPENDIX D

PERMISSIONS

Permission for Recruitment through the

Northern Colorado Nurse Practitioner Coalition

Pickerel, Angela

Tue 4/2/2019 5:38 PM

- Laura Ornowski-Hildebrand <laurahildebrandnp@gmail.com>;
- Kathi Patterson <kathi.patterson1@gmail.com>

Hello Laura and Kathi,

That will be perfect. Have a great evening!

Warmest Regards,

Angie

From: Laura Ornowski-Hildebrand <laurahildebrandnp@gmail.com>
Sent: Tuesday, April 2, 2019 5:09 PM
To: Pickerel, Angela
Cc: Kathi Patterson
Subject: Re: University of Northern Colorado Doctoral Scholarly Project Recruitment Request

Sorry! You are correct, June is the 26th. I got my head stuck in April!

Best wishes,

Laura

On Tue, Apr 2, 2019 at 4:55 PM Pickerel, Angela <pick8474@bears.unco.edu> wrote:

Hello Laura and Kathi,

Thank you for the additional information. I just want to clarify about the date to come and present my project. I was hoping to do the June 26th meeting rather than later in July. Is that a possibility?

Thank you for your consideration and help,

Angie

From: Laura Ornowski-Hildebrand <laurahildebrandnp@gmail.com>
Sent: Tuesday, April 2, 2019 4:49 PM
To: Pickerel, Angela; Kathi Patterson
Subject: Re: University of Northern Colorado Doctoral Scholarly Project Recruitment Request

Hi Angie!

I am including Kathi Patterson, NCNPC's meeting coordinator. I don't think we need any formal documentation from the IRB, etc.   We can tentatively put you on the agenda for July, a few minutes during announcements. The date is Thursday the 25, not the 26th, just to clarify. You might want to bring some printed info on how to sign up...

Keep us posted if your timeframe changes.

Regards,

Laura

On Thu, Mar 28, 2019 at 2:09 PM Pickerel, Angela <pick8474@bears.unco.edu> wrote:

Hello Laura,

Thank you so much for your reply back. I would love to come and speak about the project. I hope to have a better idea of timeframes regarding the project within the next month. Based on the meeting dates, I think June 26th would likely be the best date for me to provide information to the group if that is okay.

Do you need anything from me regarding the IRB approval information or need me to complete any type of documentation? I am happy to complete anything you need; just let me know.

Warmest Regards,

Angie Pickerel, BSN, RN, DNP-FNP-Student

On Mar 28, 2019, at 1:48 PM, Laura Ornowski-Hildebrand <laurahildebrandnp@gmail.com> wrote:

Good afternoon Angela!

Sorry for the delay in my reply. Yes we would be happy to assist you with recruitment for your project. Once you have all your approvals, shoot me an email with details. Would you like to present at an upcoming meeting? Below are the tentative dates for the rest of 2019. We could give you 5 minutes during our announcements. I am copying our meeting coordinator, Kathi Patterson.

Kind regards,

Laura

| Thursday 11.21.19 |
| Wednesday 10.23.19 |
| Thursday 9.26.19 |
| Wednesday 8.28.19 |
| Thursday 7.25.18 |
| Wednesday 6.26.19 |

On Thu, Mar 21, 2019 at 5:53 PM Pickerel, Angela <pick8474@bears.unco.edu> wrote:

Dear Ms. Ornowski-Hildebrand,

My name is Angela Pickerel, and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently in the final year of my DNP-FNP program and actively working on completing my Doctoral Scholarly Project. My scholarly projectis focused on providing nurse practitioner's an online educational offering regarding health literacy, ways to identify those with it, and evidence-based, tangible health literacy-sensitive interventions that could be implemented into practice. This project will be submitted to the University of Northern Colorado Internal Review Board before it can be implemented. I am anticipating this step will be completed by mid-May 2019.

For my project, I am looking to recruit nurse practitioner participants to complete the health literacy education program and provide feedback regarding the program via pre- and post-intervention surveys. With the Northern Colorado Nurse Practitioner's Coalition Boards permission, I would like to ask Coalition members to consider participating in my project anticipated to be available mid-Summer 2019. If you permit me, I would like to send a recruitment email and place an advertisement on the Coalition website. Recruitment would not occur until the beginning of June 2019.
I would be happy to provide you with any additional information you would like to know about the program and I thank you for your consideration.
Please feel free to contact me via:

- Email: Pick8474@bears.unco.edu;
- Cell Phone:

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Permission for Recruitment through the

Doctors of Nursing Practice, Inc Website

Sent Jul 19

Hello, Angela. Please forgive my delay in responding. I'm honored that you connected and offer whatever services available to support your efforts.

We do not share our mailing list, but can indeed accept your post to the DNP online community in a blog. We will then share your blog link with the entire community and also insert it into OUTCOMES, the monthly electronic newsletter that goes out to about 11,000.

I cannot speak to the return on this investment, meaning I cannot predict how many will respond. As you know, not all DNP prepared nurses are nurse practitioners, but the majority in the DNP online community and those that attend the national DNP conferences are APRNs.

Please share your thoughts so that we can work together to support your success.

Best wishes to you,

David

From Angela Pickerel to David Campbell–O'...
Sent Jul 15

Dear Dr. Campbell–O'Dell,

My name is Angela Pickerel, and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently in the final year of my DNP–FNP program and actively working on completing my Doctoral Scholarly Project. My scholarly project is focused on providing nurse practitioner's an online educational offering regarding health literacy, ways to identify those with it, and evidence–based, tangible health literacy–sensitive interventions that could be implemented into practice. This project will be submitted to the University of Northern Colorado Internal Review Board before it can be implemented. I am anticipating this step will be completed by mid–May 2019.

For my project, I am looking to recruit nurse practitioner participants to complete the health literacy education program and provide feedback regarding the program via pre– and post–intervention surveys. With your permission, I would like to ask Doctors of Nursing Practice, Inc. members to consider participating in my project anticipated to be available mid–Summer 2019. If you permit me, I would like to send a recruitment email and place an advertisement on the Doctors of Nursing Practice, Inc. website. Recruitment would not occur until mid–June 2019.

I would be happy to provide you with any additional information you would like to know about the program and I thank you for your consideration.

Please feel free to contact me via:

- *Email: Pick8474@bears.unco.edu;*

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Agency for Healthcare Research and Quality Health

Literacy Universal Precautions Toolkit

RE: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project [revised]
Inbox

Lewin, David (AHRQ/OC) <u>via</u> bearsunco.onmicrosoft.com   2:05 PM (9 minutes ago)

to Angela, Randie, Cindy

Angela—

This revised email constitutes formal permission for you to use the materials in the *Health Literacy Universal Precautions Toolkit* (2nd ed.), created for and published by the Agency for Healthcare Research and Quality (AHRQ), in your Doctor of Nursing Practice program at the University of Northern Colorado. This includes permission for you to reproduce key slides from the PowerPoint® presentation "Health Literacy: Hidden Barriers and Practical Strategies" in your Capstone paper/thesis. Materials that are described in the Toolkit, but are housed on a Web site other than AHRQ's, may require permission from the source. If you subsequently decide to publish your findings in a professional journal or a book chapter, the publisher will need to obtain a separate reprint permission from AHRQ for the presentation slides.

The suggested reference citation for the presentation is:

> "Health Literacy: Hidden Barriers and Practical Strategies." *Health Literacy Universal Precautions Toolkit*, 2nd ed. [Tool #3: Raise Awareness]. Rockville, MD: Agency for Healthcare Research and Quality. February 2015. https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/tool3a/index.html

Once again, all the best in your project and DNP program.

Sincerely,

David I. Lewin, M.Phil.
Health Communications Specialist/Manager of Copyrights & Permissions
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane
Room # 07N58D / Mail Stop # 07N94A
Rockville, MD 20857 USA

225

Email: David.Lewin@ahrq.hhs.gov
Phone: +1 301-427-1895
Fax: +1 301-427-1783

Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Pickerel, Angela
Mon 4/29/2019 1:30 PM

- Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>

Hello Mr. Lewin,

I was wondering if you will have the time to complete the revised permission email today? Thank you in advance.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

On Apr 26, 2019, at 4:18 PM, Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov> wrote:

Yes, you have that permission. However, I'll send a revised permission email on Monday.

David I. Lewin, M.Phil.
Health Communications Specialist/Manager of Copyrights & Permissions
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane
Room # 07N58D / Mail Stop # 07N94A
Rockville, MD 20857 USA

Email: David.Lewin@ahrq.hhs.gov
Phone: +1 301-427-1895
Fax: +1 301-427-1783

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Friday, April 26, 2019 3:44 PM
To: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Subject: Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Hello Mr. Lewin,

Thank you for the written permission. Just to clarify can you also provide me the permission to use AHRQ Health Literacy Universal Precautions Toolkit and its contents? Just so that I have it for my doctoral committee and Institutional Review Board documentation.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

On Apr 26, 2019, at 1:33 PM, Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov> wrote:
Angela—

There is no problem with your using the PowerPoint® in your doctoral project, since that was created for the Agency for Healthcare Research and Quality (AHRQ) under a contract.

Therefore, this email constitutes formal permission for you to use the PowerPoint presentation "Health Literacy: Hidden Barriers and Practical Strategies" in your Doctor of Nursing Practice program at the University of Northern Colorado. This includes permission for you to reproduce key slides from the presentation in your Capstone paper/thesis. If you subsequently decide to publish your findings in a professional journal or a book chapter, the publisher will need to obtain a separate reprint permission from AHRQ.

The suggested reference citation for the presentation is:

> "Health Literacy: Hidden Barriers and Practical Strategies." *Health Literacy Universal Precautions Toolkit*, 2nd ed. [Tool #3: Raise Awareness]. Rockville, MD: Agency for Healthcare Research and Quality. February 2015. https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/tools/literacy-toolkit/tool3a/index.html

Once again, all the best in your project and DNP program.

Sincerely,

David I. Lewin, M.Phil.
Health Communications Specialist/Manager of Copyrights & Permissions
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane
Room # 07N58D / Mail Stop # 07N94A
Rockville, MD 20857 USA

Email: David.Lewin@ahrq.hhs.gov
Phone: +1 301-427-1895
Fax: +1 301-427-1783

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Wednesday, April 24, 2019 8:11 PM
To: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Subject: Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Hello Mr Lewin,

Thank you for the response back. I will look forward to your feedback. I also wanted to verify I will also be able to use the PowerPoint (Health Literacy: Barriers and Strategies) included in the toolkit or if I need to obtain permission from Dr. Davis?

Just so you have an idea of what I have already completed:

I have sent requests to the AMA Foundation, the American College of Physicians, and the University of North Carolina to use their videos in the program. I have received permission back from the University of North Carolina and from Dr. Abrams for the use of the Always Use Teach-back! interactive modules and the associated documents.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Sent: Wednesday, April 24, 2019 2:44 PM
To: Pickerel, Angela
Cc: Siegel, Randie A. (AHRQ/OC); Brach, Cindy (AHRQ/CDOM)
Subject: RE: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Hi Ms. Pickerel,

I'll get back to you tomorrow. I was out of the office yesterday and delayed today with some computer issues.

Regards,

David I. Lewin, M.Phil.
Health Communications Specialist/Manager of Copyrights & Permissions
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane
Room # 07N58D / Mail Stop # 07N94A
Rockville, MD 20857 USA

Email: David.Lewin@ahrq.hhs.gov
Phone: +1 301-427-1895
Fax: +1 301-427-1783

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Monday, April 22, 2019 9:08 PM
To: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Cc: Siegel, Randie A. (AHRQ/OC) <Randie.Siegel@ahrq.hhs.gov>; Brach, Cindy (AHRQ/CDOM) <Cindy.Brach@ahrq.hhs.gov>
Subject: Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Hello Mr. Lewin,

I was just checking to see if you have had a chance to look further at my permission requests and if there are further organizations that I would need to contact? Based on the information that you provided me last week, I was able to make contact with Dr. Abrams and have obtained permissions for the "Always Use Teach-back!".

Thank you for your assistance.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Sent: Monday, April 15, 2019 2:50 PM
To: Pickerel, Angela
Cc: Siegel, Randie A. (AHRQ/OC); Brach, Cindy (AHRQ/CDOM)
Subject: RE: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Dear Ms. Pickerel:

I've had a chance to glance over your request. Some of the items described and linked to in the HLUP Toolkit are not published by AHRQ, and need separate permissions. I immediately looked at your requests for "Tool 5. Use Teach-Back." While you are correct that you need permission regarding the "Always Use Teach-Back!" Web site, you do not have the right contact person. You need to contact Dr. Mary Ann Abrams, for use of the Web site and for "The Convictions and Confidence Scale." Dr. Abrams can be reached as follows:

<image001.jpg>

I will look over the other items and get back to you tomorrow.

Sincerely

David I. Lewin, M.Phil.
Health Communications Specialist/Manager of Copyrights & Permissions
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane
Room # 07N58D / Mail Stop # 07N94A
Rockville, MD 20857 USA

Email: David.Lewin@ahrq.hhs.gov
Phone: +1 301-427-1895
Fax: +1 301-427-1783

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Saturday, April 13, 2019 8:53 PM
To: Siegel, Randie A. (AHRQ/OC) <Randie.Siegel@ahrq.hhs.gov>
Cc: Lewin, David (AHRQ/OC) <David.Lewin@ahrq.hhs.gov>
Subject: Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Dear Mr. Lewin,

I was wondering if you have had a chance to review my permissions request document or if you have any questions that you would like further clarification on? Please feel free to contact me via email or my cell phone if that is easier for you. I am working against a deadline and hoping to have some firm plans to be able to provide to my doctoral committee. I look forward to your correspondence and thank you for your consideration.

email: Pick8474@bears.unco.edu

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Pickerel, Angela
Sent: Monday, April 8, 2019 3:04 PM
To: Siegel, Randie A. (AHRQ/OC)
Cc: Lewin, David (AHRQ/OC)
Subject: Re: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Dear Ms. Siegel and Mr. Lewin,

Thank you so much for your help in determining permissions. I have attached a document that outlines the toolkit sections and what I would like to incorporate into my program. I am essentially treating this project as a quality improvement to help get the education out about health literacy to nurse practitioner participants that would complete my doctoral project program.

I appreciate your consideration and look forward to discussing this further with you.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Student

On Apr 8, 2019, at 11:53 AM, Siegel, Randie A. (AHRQ/OC) <Randie.Siegel@ahrq.hhs.gov> wrote:
Dear Ms. Pickerel:

Thank you for your interest in AHRQ. I received your phone message and e-mail below. Mr. David Lewin on our Permissions Team will contact you regarding your request in the next 7-10 business days. Most of the items in the Health Literacy Toolkit are in the public domain. However, some items link out to other non-Governmental websites having copyrighted material. If you could respond to this e-mail and let Mr. Lewin know specifically what content you would like to use, that would be helpful.

Thank you,

Randie

Randie A. Siegel
Deputy Director
Office of Communications
Agency for Healthcare Research and Quality
5600 Fishers Lane, Room 07N31
Phone: 301-427-1852
Fax: 301-427-1873

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Wednesday, April 3, 2019 4:26 PM
To: Siegel, Randie A. (AHRQ/OC) <Randie.Siegel@ahrq.hhs.gov>
Subject: Permission to Use the AHRQ Health Literacy Universal Precaution Toolkit for Doctoral Project

Dear Ms. Siegel,

My name is Angela Pickerel and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently working on developing a project for my DNP scholarly work that I would like to use the AHRQ Toolkit to create a self-learning online module for nurse practitioners in the Northern Colorado region. I realize that the toolkit and implementation guide are within the public domain, but I would like to clarify that I can develop an online educational program using the toolkit content for practitioners currently practicing in primary care. This program will be secured by an encrypted login and participants are going to be assessed for pre- and post-learning assessments regarding knowledge, skills, and intention to implement. I would like to use the videos, PowerPoints and to develop a program that has a focus on the older adult population to help with medication adherence in this population.

I appreciate your consideration and look forward to your correspondence regarding this scholarly project. Please feel free to contact me with any questions that you may have.

Email: Pick8474@bears.unco.edu

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Health Literacy Universal Precautions Toolkit Items

Using the implementation guide, I would like to follow the toolkit recommendations in addressing health literacy in the nurse practitioner sample that currently practice in the primary care settings that will be participating in this program. Because this is an evidence-based guidance program, I would like to use it as close to recommendations that are located in the toolkit, but not for actual implementation into a clinic. This would include the suggested actions listed under each tool header. As well as using the facts to send in weekly updates to participants.

I will be acting as the team lead for this project. The goal of this project to provide education to nurse practitioners about health literacy and interventions that they can use in their everyday practice to improve health outcomes through improved health literacy. It will be a secured webpage that they will have to login to access the materials.

To provide general education about health literacy:

· Tool # 3 Raising Awareness

o Show the videos by the American College of Physician's Health Literacy Video (6 minutes)

o Show the Video: Health Literacy and Patient Safety: Help Patients Understand (23 minutes)

o Powerpoint: Health Literacy Barriers and Strategies will be a self-paced activity

o Will also be using the idea to have participants provide examples of health literacy

o Weekly reminders to participants

· Tool # 4 Communicating Clearly

o Brief Communication Assessment

o Provide the Communication Observation Assessment for participants to use in their practice if desired

o Key Communication Strategies: Will be discussed more in-depth

o Everyday Words for Public Health Communication

o Discuss the ways in which they can practice skills such as the explaining a blood test

· Tool # 5 Teach-back Method

o Always Use Teach-Back! Toolkit (I would like to direct participants to complete this interactive and have asked permission from Ms. Gail Nielsen based on contacts from the Institutes of Healthcare Improvement

o 5 Minute Teach-back Video only

o The Convictions and Confidence Scale

o Teach-Back Observation Tool

· Tool # 6 Follow Up with Patients

o This information will likely be adapted to a PowerPoint to address older adult needs

· Tool # 10 Consider Culture, Customs and Beliefs

o This information will also be adapted into a PowerPoint to address older adult needs

o I would like to link to the websites included EthnoMed, Culture Clues, and Culture, Language, and Health Literacy, but only in the resources section

· Tool # 8 Conducting Brown Bag Medicine Review

o The Medicine Review Form

o Content would be adapted into a PowerPoint

Tools to Improve Self-Management and Empowerment

· Tool # 14 Encouraging Questions

o Questions are the Answers Link to be included in resources

o Content would be adapted into a PowerPoint

· Tool# 15 Making Action Plans

o I would like to use the 6 minute video from the American College of Physicians Foundation (Do I need to get permission from them?)

o Simple Action Plan Form

o Link to Healthyfinders in the resources section

· Tool # 16 Help Patients To Remember How and When To Take Their Medicines

o My Medicine Form

o Medicine Reminder Form

o Content would also be adapted to a PowerPoint

Correspondence Regarding Always Use Teach-back! Toolkit

Re: Permission for Use of the Always Use Teach-Back Website Interactive Module for Doctoral Scholarly Project

Pickerel, Angela

Tue 4/23/2019 10:47 AM

- Abrams, Mary Ann <MaryAnn.Abrams@nationwidechildrens.org>

Dear Dr. Abrams,

Thank you for the permission for use of your program. I appreciate your feedback and intend to have participants complete the interactive module as you intend it to be completed.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Abrams, Mary Ann <MaryAnn.Abrams@nationwidechildrens.org>
Sent: Friday, April 19, 2019 6:46 AM
To: Pickerel, Angela
Subject: RE: Permission for Use of the Always Use Teach-Back Website Interactive Module for Doctoral Scholarly Project

Hello Ms. Pickerel. Thank you for your interest in the Always Use Teach-back! Toolkit.

We created the *Always Use Teach-back!* Toolkit to help individuals and organizations improve their use of teach-back. You are welcome to link to it and use it in your educational offerings. It is preferred that the interactive learning module content be used together (not just isolated video clips) since it is intended to be a package. The associated tools (pdfs and videos, specifically the Conviction and Confidence Scale) can be used as needed to supplement your training/project.

When using the Toolkit, please use this suggested citation: Abrams MA, Rita S, Kurtz-Rossi S, Nielsen G. Always Use Teach-back! Toolkit. 2012. www.teachbacktraining.org.

Thank you and best wishes with your work.

Mary Ann

Mary Ann Abrams, MD, MPH
GME Quality Improvement Medical Director
Ambulatory Pediatrics
614-722-4791

From: Pickerel, Angela <pick8474@bears.unco.edu>
Sent: Wednesday, April 17, 2019 12:32 PM
To: Abrams, Mary Ann <MaryAnn.Abrams@nationwidechildrens.org>
Cc: Pickerel, Angela <pick8474@bears.unco.edu>
Subject: Permission for Use of the Always Use Teach-Back Website Interactive Module for Doctoral Scholarly Project

[WARNING: External Email - Use Caution]

Dear Dr. Abrams,

My name is Angela Pickerel, and I am a nursing doctoral candidate at the University of Northern Colorado in Greeley, Colorado. I am currently working on my Doctoral Scholarly Project focusing on health literacy and providing nurse practitioners in the Northern Colorado region with an online educational program to help implement health

literacy-sensitive interventions when addressing the needs of older adults within their current practice.

I am planning to use AHRQ's Health Literacy Universal Precautions Toolkit to develop the program which links to the "Always Use Teach-back! Toolkit website. I believe that the "Always Use Teach-back! is well executed and a valuable tool that I would like to have participants complete the interactive modules as a part of their learning. The AHRQ's Health Literacy Universal Precautions toolkit as it has been designed using evidence-based methods which I believe is very important in developing a program. I believe that the "Always Use Teach-back!" is an important component which nurse practitioner participants would greatly benefit and more importantly their patients.

I appreciate your consideration regarding granting permission to use this program. The online program will be secured by login and password and the "Always Use Teach-back! Website link would be included in the module focused on the teach-back method.

Warmest Regards,

Angela Pickerel, RN, BSN, DNP-FNP-Student

Correspondence Regarding Pre and Post-Intervention Mackert Survey

Re: Permission of Use of 2011 Pre- and Post-Evaluation Tool Regarding Healthcare Worker's Knowledge and Intention

Pickerel, Angela

Wed 4/3/2019 9:04 AM

• Mike Mackert <mackert@utexas.edu>

Dear Dr. Mackert,

Thank you for such a quick response back. I have reviewed the survey forms and wanted to say how much I appreciate you sending them to me.   Have a wonderful day!

Warmest Regards,

Angela Pickerel

From: Mike Mackert <mackert@utexas.edu>
Sent: Wednesday, April 3, 2019 4:48 AM
To: Pickerel, Angela
Subject: Re: Permission of Use of 2011 Pre- and Post-Evaluation Tool Regarding Healthcare Worker's Knowledge and Intention

Of course, here are the survey forms we used. Sounds like you have a great project, good luck with it! Let me know if there's anything else I could do to help.

MICHAEL MACKERT, PHD
Provost's Teaching Fellow
Director, Center for Health Communication
Professor, Stan Richards School of Advertising & Public Relations
Professor, Department of Population Health
Moody College of Communication | Dell Medical School
The University of Texas at Austin
uthealthcomm.org | 512.471.8100 | @mackert
Author, Designing Effective Health Messages

On Tue, Apr 2, 2019 at 10:10 PM Pickerel, Angela <pick8474@bears.unco.edu> wrote:

Dear Dr. Mackert,

My name is Angela Pickerel, and I am a nursing doctoral candidate at the University of Northern Colorado in Greeley, Colorado. I am currently working on my Doctoral Scholarly Project focusing on health literacy and providing nurse practitioners with an online educational program to help implement health literacy-sensitive interventions when addressing the needs of older adults within their current practice.

I recently reviewed your team's published 2011 article in the Patient Education and Counseling Journal regarding your work to assess healthcare worker's knowledge and intention to improve health literacy through clear communications. I would like to obtain your permission to use your pre- and post-evaluation tool within my Doctoral Scholarly Project. It would be incorporated into my pre- and post-survey data collection to assess the knowledge and experience of the nurse practitioner's participating in my project. I have also reviewed previous work by Coleman and Fromer in 2015 using your assessment and feel that it would be beneficial for assessment of my sample population. Based on my anticipated sample population, I would also like to ask your permission to make small changes to wording that would be reflective of my process and participants. I would hope that my project will contribute to the body of knowledge regarding healthcare provider education focused on improving health literacy.

If you permit me, I would appreciate any additional documentation that you feel would be beneficial for me to review. I greatly appreciate your consideration and look forward to your correspondence.

Please feel free to contact me via:

- email: Pick8474@bears.unco.edu;

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Permission for Use of American Medical Association Health Literacy Video

Re: Permission for Use of the Health Literacy and Patient Safety: Help Patients Understand

Pickerel, Angela
Mon 4/29/2019 1:44 PM

● Emily Demko <Emily.Demko@ama-assn.org>

Hello Emily,

Thank you so much for the response back. I appreciate it.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Emily Demko <Emily.Demko@ama-assn.org>
Sent: Monday, April 29, 2019 11:20 AM
To: Pickerel, Angela
Subject: RE: Permission for Use of the Health Literacy and Patient Safety: Help Patients Understand

Hello Angela,

Thank you for reaching out regarding the use of our Health Literacy video. The AMA Foundation is happy to grant permission for educational use and health literacy promotion. When recognizing the material, we ask that you acknowledge copyright: 'Copyright 2007 American Medical Association Foundation and American Medical Association'.

Best,
Emily Demko

Emily Demko
Program Associate
Emily.Demko@ama-assn.org
Office: (312) 464-5019

The AMA Foundation brings together physicians and communities to improve our nation's health.

Support our shared mission: make a gift today.

From: Pickerel, Angela [mailto:pick8474@bears.unco.edu]
Sent: Friday, April 26, 2019 2:09 PM
To: Emily Demko <Emily.Demko@ama-assn.org>
Subject: Permission for Use of the Health Literacy and Patient Safety: Help Patients Understand

Hello Emily,

My name is Angela Pickerel and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently working on developing a project for my DNP scholarly work which includes the use of the Agency for Healthcare Research and Quality Toolkit to create a self-learning online module for nurse practitioners in the Northern Colorado region. A part of the AHRQ Toolkit includes the video titled "Health Literacy and Patient Safety: Help Patients Understand". I would like to ask for permission to include this video in the education program intended to help increase nurse practitioner's knowledge about health literacy. This program will be secured by an encrypted login and only participants will be able to access the program. There are no fees associated with the program.

I appreciate your consideration and look forward to your correspondence regarding this scholarly project. Please feel free to contact me with any questions that you may have.

Email: pick8474@bears.unco.edu

cell phone: (970) 301-0791

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Permission for Use of Teach-Back Video from

University of North Carolina Chapel Hill

Re: Comments/Suggestions to the Health Literacy Team

Pickerel, Angela
Wed 4/24/2019 3:02 PM

- Fratta, Megan <mfratta@email.unc.edu>

Hello Megan,

Yes, I was referring to the Teach-back video you linked to in your response. Thank you and I will credit NC Health Literacy.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

From: Fratta, Megan <mfratta@email.unc.edu>
Sent: Wednesday, April 24, 2019 2:22 PM
To: Pickerel, Angela
Cc: Ottosen, Terri
Subject: RE: Comments/Suggestions to the Health Literacy Team

Hi Angela,

Thank you for contacting NC health Literacy and for your interest in using materials from our website. The AHRQHealth Literacy Universal Precautions Toolkit is included on our website as a resource however we do not own any of the content. I wasn't able to find a link in the toolkit to the specific video you mentioned. Are you referring to the first video on this page? http://hsl.lib.unc.edu/health-literacy/videos-tutorials/ If so, you are welcome to use this video in your tutorial but please credit NC Health Literacy.

Best,
Megan

Megan Fratta, MLS
Community Outreach and Global Health Librarian
Health Sciences Library
University of North Carolina at Chapel Hill
mfratta@email.unc.edu | (919) 843-6235
https://orcid.org/0000-0002-0166-4197

From: HSL Development Group <hsl-developers@unc.edu>
Sent: Wednesday, April 24, 2019 3:17 PM
To: Ottosen, Terri <ottosen@email.unc.edu>; Fratta, Megan <mfratta@email.unc.edu>
Subject: Comments/Suggestions to the Health Literacy Team

Name	Angela Pickerel
Phone	
Email	pick8474@bears.unco.edu
Comments/Suggestions	My name is Angela Pickerel and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently working on developing a project for my DNP scholarly work which includes the use of the Agency for Healthcare Research and Quality Toolkit to create a self-learning online module for nurse practitioners in the Northern Colorado region. A part of the AHRQ Toolkit includes the video titled " Teach-back Method". I would like to ask for permission to include this video in the education program. This free program will be secured by an encrypted login and only participants will be able to access the program. I appreciate your consideration and look forward to your correspondence regarding this scholarly project. Please feel free to contact me with any questions that you may have. Email: pick8474@bears.unco.edu cell phone: (970) 301-0791 Warmest Regards, Angela Pickerel, BSN, RN, DNP-FNP-S

Permission for Use of the Health Literacy Video from the American College of Physicians

Hello,
I previously contacted you regarding my request for permission to use the video titled "Health Literacy" that is attached in this email as well. I received the follow-up email and I do not believe that any of the links would apply to my request. However, if there is a specific party that I should contact regarding this permission request, I would be happy to do so.
Warmest Regards,
Angela Pickerel, BSN, RN, DNP-FNP-S

My name is Angela Pickerel and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently working on developing a project for my DNP scholarly work which includes the use of the Agency for Healthcare Research and Quality Toolkit to create a self-learning online module for nurse practitioners in the Northern Colorado region. A part of the AHRQ Toolkit includes the video titled "Health Literacy" in which I have included the link below. I would like to ask for permission to include this video in the education program. This program will be secured by an encrypted login and only participants will be able to access the program.

I appreciate your consideration and look forward to your correspondence regarding this scholarly project. Please feel free to contact me with any questions that you may have.

Email: pick8474@bears.unco.edu
cell phone:

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

https://youtu.be/ImnlptxIMXs

Health Literacy

The American College of Physicians Foundation (ACP Foundation) has adopted the definition of health literacy developed for the National Library of Medicine a...
youtu.be

Re: Permission for Use of Health Literacy Video Published 4.8.2009 (Permission Requests)

P

Postmaster@acponline.org
 on behalf of
permissions <permissions@mail.acponline.org>
Wed 4/24/2019 12:55 PM

- Pickerel, Angela

Thank you for your interest in permissions from the American College of Physicians (ACP). Please note that our Permissions mailbox (permissions@acponline.org) now handles only requests that cannot be sought through the means below. We ask that you read this notice carefully and redirect your request as indicated for the quickest response to your request.

First, ACP does not charge for use of figures in a thesis or dissertation, and you can obtain the $0 dollar permission through the CCC and RightsLink.

Also, please note that the American College of Physicians does not allow article-level republication, except by the author in a thesis, dissertation, or collection dedicated to his or her educational work. If the article is freely available on annals.org, you may link to it without permission. For articles that are not freely available, you may purchase a link or electronic reprints with limited or unlimited views. If interested in purchasing electronic access to an article, please let us know through RightsLink or by emailing permissions@acponline.org.

I. Annals of Internal Medicine

Permissions can be requested directly from each individual journal article page on annals.org. Just click the "Get Permissions" link in the content toolbox, located in the horizontal bar across the top of the article title to go to RightsLink.

Permissions can also be obtained through the Copyright Clearance Center (CCC) website at https://nam03.safelinks.protection.outlook.com/?url=www.copyright.com&data=02%7C01%7Cpick8474%40bears.unco.edu%7C6da71b2bd37d45dee22308d6c8e671b2%7C48e07fd6ad72497fb298b5c57de6db2d%7C0%7C1%7C636917289413243812&sdata=H8PsAbDIeSUn%2FqoNt0zJ5fO9awoXx98lAJ%2BjO6DXeBo%3D&reserved=0.

For domestic reprint orders of 100 or more, please contact reprints@acponline.org. For international commercial reprints or international commercial republication rights, please contact Content Ed Net (https://nam03.safelinks.protection.outlook.com/?url=www.contentednet.com&data=02%7C01%7Cpick8474%40bears.unco.edu%7C6da71b2bd37d45dee22308d6c8e671b2%7C48e07fd6ad72497fb298b5c57de6db2d%7C0%7C1%7C636917289413253820&sdata=hRT4wy2Pg69KME7yqDa9kdVnNsj6sqe9SvpwiwZ08Us%3D&reserved=0).

II. ACP Internist, Hospitalist, and Effective Clinical Practice (Chronic Care Model)

Requests, including those for the Chronic Care Model, which was published in the journal, Effective Clinical Practice, can be handled through the Copyright Clearance Center (https://nam03.safelinks.protection.outlook.com/?url=www.copyright.com&data=02%7C01%7Cpick8474%40bears.unco.edu%7C6da71b2bd37d45dee22308d6c8e671b2%7C48e07fd6ad72497fb298b5c57de6db2d%7C0%7C1%7C636917289413253820&sdata=cm%2BHQcW0zF0GtPzMsvt80E%2FcQkdU3C%2B8kc1XP6SHTxw%3D&reserved=0).

The citation for the Chronic Care Model is Figure 1. "Chronic Disease Management: What Will It Take To Improve Care for Chronic Illness?" Effective Clinical Practice, August/September 1998. 1:2-4. https://nam03.safelinks.protection.outlook.com/?url=http%3A%2F%2Fecp.acponline.org%2Faugsep98%2Fcdmfg1.htm&data=02%7C01%7Cpick8474%40bears.unco.edu%7C6da71b2bd37d45dee22308d6c8e671b2%7C48e07fd6ad72497fb298b5c57de6db2d%7C0%7C1%7C636917289413253820&sdata=yDecbsiNas7LJJFl5LnsKe9jvRmOiQVZL1jDhzxdWH8%3D&reserved=0

Permission is not required to link to the figure at https://nam03.safelinks.protection.outlook.com/?url=http%3A%2F%2Fecp.acponline.org%2Faugsep98%2Fcdmfg1.htm&data=02%7C01%7Cpick8474%40bears.unco.edu%7C6da71b2bd37d45dee22308d6c8e671b2%7C48e07fd6ad72497fb298b5c57de6db2d%7C0%7C1%7C636917289413253820&sdata=yDecbsiNas7LJJFl5LnsKe9jvRmOiQVZL1jDhzxdWH8%3D&reserved=0

III. ACP Press Books, except MKSAP for Students and IM Essentials

Please email Chuck Graver at cgraver@acponline.org.

IV. MKSAP for Students and IM Essentials

Please contact Ted Warren at twarren@acponline.org.

V. MKSAP

Please contact Susan Galeone at sgaleone@acponline.org.

Thank You!

.

Permission for Use of Health Literacy Video Published 4.8.2009

This message was sent with High importance.
Pickerel, Angela
Wed 4/24/2019 12:54 PM

● permissions@acponline.org

My name is Angela Pickerel and I am a nursing doctoral candidate at the University of Northern Colorado. I am currently working on developing a project for my DNP scholarly work which includes the use of the Agency for Healthcare Research and Quality Toolkit to create a self-learning online module for nurse practitioners in the Northern Colorado region. A part of the AHRQ Toolkit includes the video titled "Health Literacy" in which I have included the link below. I would like to ask for permission to include this video in the education program. This program will be secured by an encrypted login and only participants will be able to access the program.
I appreciate your consideration and look forward to your correspondence regarding this scholarly project. Please feel free to contact me with any questions that you may have.

Email: pick8474@bears.unco.edu
cell phone:

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

https://youtu.be/ImnlptxIMXs

Health Literacy

The American College of Physicians Foundation (ACP Foundation) has adopted the definition of health literacy developed for the National Library of Medicine a...
youtu.be

APPENDIX E

PARTICIPANT RECRUITMENT EXPLANATION
AND CONSENT ELECTRONIC FORM

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title: Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners
Student Project Lead: Angela Pickerel, BSN, RN, DNP-S
Project Advisor: Melissa Henry PhD, MS, RN
You are invited to take part in an education research project which will evaluate a health literacy-sensitive educational program on nurse practitioners' knowledge, assessment, and likelihood to apply learned interventions when caring for older adult patients.

Project Description: During this project, you will learn about health literacy, simple clinical screening options, and interventions that can be immediately implemented into practice. You will be asked to enroll and complete a free online educational program. You will be asked to watch 5 Voice Over PowerPoint presentations created by the student project lead covering an overview of health literacy and it's impacts; a summary of the evidence supporting health literacy-sensitive interventions that have shown improvements in the older adult population; and resources and strategies for incorporating health literacy-sensitive interventions into your daily practice. Each presentation will be approximately 15 minutes in length. Additional activities, such as video presentations and interactive web-based modules will enhance learning and provide support for health literacy intervention implementation. You will be sent health literacy-related tips each week for the duration of the program via email.

Additionally, you will be asked to complete one online questionnaire prior to the start of the program that will assess your baseline health literacy knowledge, use of health literacy-sensitive intervention strategies and skills in current practice, and demographic questions. Immediately following program completion, you will be asked to complete a second online questionnaire. A third questionnaire will be sent two weeks following the completion of the program. The post-education questionnaires will assess your health literacy knowledge, intention and application to intervention practices, and knowledge attained regarding older adult populations. Each questionnaire will take approximately 10-15 minutes to complete.

The duration of program participation is anticipated to be approximately 4 weeks, however is dependent on how quickly you move through the modules. The weeks prior to the study will include enrollment set-up of a login and password. The two weeks following the program will be for follow-up data collection. Participants who complete the program and all 3 surveys will have the opportunity to enter a raffle for a $50.00 Amazon gift card which will be sent via the contact email address entered into a separate raffle electronic form.

Project Summary:
• 10-15 minutes to complete the pre-intervention questionnaire
• 45 minutes to complete Always Use Teach-back! interactive module
• 75 minutes to watch five 15-minute educational voice-over PowerPoint presentations created by the student researcher.
• 30 minutes to complete voice over PowerPoint presentation developed by Agency for Healthcare Research and Quality
• 5-10 minutes/week to read e-mail information
• 10 minutes to complete the post-intervention questionnaire
• 10 minutes to complete the secondary post-intervention questionnaire

Risks and Benefits of Participation: The risks inherent in this study are no greater than those normally encountered during regular online education participation including potential misunderstanding of educational offerings or misuse of educational topics if not completing program as intended, and risk for breach of information secondary to phishing scams or hacking of email and password. You are encouraged to use a different password from other internet passwords. You may benefit from the knowledge you will acquire during the program. Additionally, your participation in the study may benefit others through contributing to a better understanding of health literacy provider education. It is possible your patients will also benefit through your increased knowledge and skills. Upon completion of the project, you will have continued access to the online program including additional resources for your personal use.

Confidentiality Procedures: When signing up below for the online Health Literacy Program, you will be asked to share your email address, but your email will not be shared with other participants or linked to your survey responses in any way. Your entered email address will only be used to provide you with email information regarding the program. Once you begin the surveys, you will be asked to provide a unique survey identification which will not be linked to any personal information, including your email address. This unique identifier will allow for linkage of your survey responses. The project team will share no personal information about any participant, and you are free to share or withhold any information you choose. Collected data may be shared in aggregate at conferences or published without identifying information. No individual data will be used in any way.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Please enter your email address below as your signature and make a copy of this form for your reference. .For additional information regarding the program or questions, please contact Angela Pickerel:: E-mail: Pick8474@bears.unco.edu or Melissa Henry PhD, MS, RN
        E-mail: Melissa.Henry@unco.edu
        Phone: (970) 351-1735

Email address*

Valid email address

This form is collecting email addresses.

APPENDIX F

WEEKLY EMAIL REMINDERS TO PARTICIPANTS

Weekly Emails to Participants
Pre-Intervention Email

Welcome,

Thank you for your interest in the Addressing Health Literacy Needs of the Older Adult

Focused on Improving Medication Adherence: An Online Education Program for Nurse

Practitioners. Before beginning the modules, please complete the pre-intervention survey

by clicking here or clicking the survey link once you create an account.

Please click here to access the online program.

- You will need to create an account using your email address and a password. As
  with other websites, when developing your password, please chose a strong
  password which is not used for any other webpages or email passwords to protect
  your privacy.

- All program information is protected, and you will need to use your sign-in to
  access program contents. No data will be collected from your use of the online
  program.

- The program is designed to be self-paced, so you may work through the modules
  as quickly as you choose.

Please let me know if you have any questions or concerns. You can contact me, Angela

Pickerel, via email or cell phone.

- Email: Pick8474@bears.unco.edu

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-S

Week 1 Email

Hello!

Welcome to Week 1 of the Health Literacy-Sensitive Intervention Program. I hope by now you have been able to access the website and **complete the first survey**. Module 1 is focused on providing you with information about health literacy. There are two videos that will take approximately 30 minutes to complete, followed by three short PowerPoints discussing

- Clear Communication
- Orem's Self-Care Deficit Nursing Theory and Health Literacy
- Health Literacy Barriers and Strategies.

At the completion of this program there will be two surveys, one immediately upon completion of Module 4 and one that will be sent to you via email two weeks following completion of the program. Upon completion of both surveys, you will receive a link **to enter a raffle for a chance to win a $50.00 Amazon Gift card** as a token of appreciation for completing the program.

This program is a self-paced program and you may feel free to move through the modules as you are able. Please let me know if you have any questions or concerns. I would be happy to provide any assistance you may need. Feel free to contact me via email or cell phone.

Email: Pick8474@bears.unco.edu

Cell:

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 2 Email

Hello Again!

Welcome to Week 2 of the Health Literacy-Sensitive Intervention program. If you haven't already started Module 2, the focus of this module is learning about the Teach-Back method through the Always Use Teach-back! website. For this activity, you will follow the link in Module 2 and complete the "Interactive Learning Module". It will take approximately 45 minutes to complete the Teach-back module. After completing the module, there is a 15-minute PowerPoint discussing follow-up methods.

Health Literacy Fast Fact
"Studies have shown that 40-80% of the medical information patients are told during office visits is forgotten immediately, and nearly half of the information retained is incorrect". (AHRQ, 2018)

Please let me know if you have any questions or concerns. I appreciate your time in completing this program and look forward to hearing your feedback!

Email: Pick8474@bears.unco.edu

Cell:

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 3 Email

Hello Everyone!

Welcome to Week 3 of the Health Literacy-Sensitive Intervention Program. This week, Module 3 is focused on addressing the health literacy needs of the Older Adult regarding ways to help improve medication adherence. This week you will learn about the Brown Bag Medication Review, Medication List and Reminder forms, and ways in which you can adjust you prescribing of medications to increase clarity of medication label instructions for the older adult.

Did you know?

- **<u>59% of the older adult population</u>** have basic to below basic health literacy skills (Cutilli, Simko, Colbert, and Bennett, 2018).
- **3 out of 4** older adults have *more than one* chronic disease (CDC, 2018).
- Older adults are frequently taking a polypharmacy medication regimen, more than 5 medications to manage their chronic diseases.
- Number of older adults on a polypharmacy medication regimen tripled between 1988 & 2010 (Charlesworth et al., 2015)
  - **12.6% to 39.0%**
- Older adults are at greater risk for adverse drug outcomes compared to younger populations. Medication non-adherence in older adults accounts for:
  - 26% of hospital admissions
  - 25% of nursing home admissions
  - 20% of preventable drug events (Mayo-Gamble & Mouton, 2018)
- Inadequate health literacy accounts for a **<u>26% increased risk in mortality</u>** based on assessment of an older adult's ability to read their medication instructions compared to those with adequate health literacy (Parekh et al.,2018).

Please let me know if you have any questions or concerns. Feel free to contact me via email or cell phone.

Email: Pick8474@bears.unco.edu

Cell:

Best Wishes,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 4 Email

Greetings!

Welcome to the 4th week of the Health Literacy-Sensitive Intervention Program. In this final week, Module 4 will be focused on *Empowering Patients* with inadequate health literacy, focusing on encouraging patients to ask questions and to be actively engaged in their health care. Empowering patients requires an environment that feels safe for the individual to ask questions. Additionally, we will be talking about *Cultural Customs and Beliefs* as they relate to health literacy needs.

Once you have completed Module 4, please complete the post survey that will be found at the end of Module 4. Thank you for your time in completing this program. I hope that you have found it valuable to your practice and will implement these health literacy-sensitive interventions into your practice.

Please be watching your email for to complete **one last survey in the next two weeks**. There will also be a link for you to **enter the raffle for a $50.00 Amazon gift card** as a token of appreciation for completing this program and all 3 surveys.

As always, please let me know if you have any questions or concerns. Feel free to contact me via email or cell phone.

Email: Pick8474@bears.unco.edu

Cell: (970) 301-0791

Thank you!

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Tips

Here are some examples of how religion, culture, and ethnic customs can influence how your patients interact with you.

- **Health beliefs:** In some cultures, people believe that talking about a possible poor health outcome will cause that outcome to occur.

- **Health customs:** In some cultures, family members play a large role in health care decision making.

- **Ethnic customs:** Differing roles of women and men in society may determine who makes decisions about accepting and following through with medical treatments.

- **Religious beliefs:** Religious faith and spiritual beliefs may affect health care-seeking behavior and people's willingness to accept specific treatments or behavior changes.

- **Dietary customs:** Disease-related dietary advice will be difficult to follow if it does not conform to the foods or cooking methods used by the patient.

- **Interpersonal customs:** Eye contact or physical touch will be expected in some cultures and inappropriate or offensive in others. (AHRQ, 2018)

Week 5 Email

Greetings and Much Thanks!

I would like to thank you for your time and participation in the Health Literacy-Sensitive Intervention Program. If you have completed all 4 of the education modules, I would ask that you complete the follow-up survey. The link has been included **here** for your convenience and is expected to take less than 10 minutes to complete. Completion of the program and survey is completely voluntary.

You will receive an email with a link to one final survey in the following week which will also include a link to enter a raffle for a $50.00 Amazon gift card. I greatly appreciate your time and feedback. I look forward to your responses.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Email Week 6

Greetings!

I want to thank you again for your time and participation in this Health Literacy-Sensitive Intervention Program. I hope that you have found it to be beneficial and would appreciate your feedback regarding your current practice. Please the following link to complete the final survey and enter the Raffle for a chance to win a $50.00 Amazon gift card: **<u>Final Survey</u>**

The winner of the $50.00 Amazon gift card will be contacted via email on August 26, 2019.

Please let me know if you have any questions or comments.

Warmest Regards,

Angela Pickerel

APPENDIX G

PROGRAM MODULES

Health Literacy Intervention Program Outline

Module 1: Includes Tools 3 and 4 and Orem's Self-Care Deficit Nursing Theory

To provide general education about health literacy:

- Tool # 3 Raising Awareness

  - Show the Video: Health Literacy and Patient Safety: Help Patients Understand (23 minutes) (with permission, Appendix B)

  - PowerPoint: Health Literacy Barriers and Strategies will be a self-paced activity (35 minutes)

- Tool # 4 Communicating Clearly

  - Brief Communication Assessment

  - Provide the Communication Observation Assessment for participants to use in their practice if desired

  - Key Communication Strategies: Will be discussed more in-depth

  - Everyday Words for Public Health Communication

  - Discuss the ways in which they can practice skills such as the explaining a blood test

- Orem's Self-Care Deficit Nursing Theory

  - Theory of Self-Care

  - Theory of Self-Care Deficit

  - Theory of Nursing Systems

- Applying to inadequate health literacy

- Applying to medication adherence

- Applying to older adults

Module 2: Includes Tool 5 and 6

- Tool # 5 Teach-back Method

  - Always Use Teach-Back! Toolkit: Interactive Module (45 minutes)

  - The Convictions and Confidence Scale

  - Teach-Back Observation Tool

- Tool # 6 Follow Up with Patients

  - Deciding Reasons for Follow-up

  - Patient Participation in Recording Information

  - Clear Communication

  - Who should follow up

  - When to Follow-up Medication Adherence

  - Lab Follow-Up

Module 3: Medication Adherence Tools 8 and 16

- Tool # 8 Conducting Brown Bag Medicine Review

  - Overview of Brown Bag Medicine Review

- Implementing

- How to perform review

- Clarifying medication instructions

- The medicine review form

- Use of "Explicit and Standardized Prescription Medicine Instructions"

- Documentation of review

- Tool # 16 Help Patients to Remember How and When To Take Their Medicines

  - Overview of medication reminders for those with inadequate health literacy

  - My medicine forms

  - Medicine reminder form

  - Clear and concise instructions

  - Pill box use

  - Enlisting family

  - Adjust prescription refills

  - Documentation in EHR

  - Surveys to for patients

Module 4: Tools 14 and 10: PowerPoint adaptation and video

Tools to Improve Self-Management and Empowerment

- Tool # 14 Encouraging Questions

  - Creating an environment to ask questions

  - Questions are the Answers Link

  - Discussion of Programs

- Tool # 10 Consider Culture, Customs and Beliefs

  - Overview

  - Learning from patients

  - Learning from other sources

  - Additional links to the websites included EthnoMed, Culture Clues, and Culture, Language, and Health Literacy will be included in the resources section

APPENDIX H

**PRE- AND POST-INTERVENTION ON KNOWLEDGE,
SKILL, AND INTENDED BEHAVIOR INSTRUMENT**

Name:_____   Agency:_____

HEALTH LITERACY TRAINING PRE-SURVEY – HEALTHCARE PROVIDERS

Thank you for participating in this training, the purpose of which is to improve knowledge of health literacy and the role it plays in healthcare. Evaluation of the training program will help in tracking progress and help us continue to improve the training. No personally identifiable information will be retained in the analysis and reports of evaluations efforts.

Define health literacy in your own words:

_____

_____

_____

	Strongly Disagree					Strongly Agree	
I understand what it means for patients to have low health literacy.	1	2	3	4	5	6	7
I know the prevalence of low health literacy.	1	2	3	4	5	6	7
I know the groups that are more likely to be low health literate.	1	2	3	4	5	6	7
I understand the health outcomes associate with low health literacy.	1	2	3	4	5	6	7
	Strongly Disagree					Strongly Agree	
I do a good job identifying low health literate patients.	1	2	3	4	5	6	7
I am good at knowing whether or not my patients understand what I tell them.	1	2	3	4	5	6	7
I am good at maintaining a culturally sensitive healthcare experience.	1	2	3	4	5	6	7

On a scale of 1-7, indicate how frequently you use each technique from Never (1) to Frequently (7).

	Never					Frequently	
Speaking slowly	1	2	3	4	5	6	7
Using plain, non-medical language	1	2	3	4	5	6	7
Show or draw pictures	1	2	3	4	5	6	7
Limit the amount of information provided and repeat it	1	2	3	4	5	6	7
Use the teach-back or show-me techniques	1	2	3	4	5	6	7
Create a shame-free environment	1	2	3	4	5	6	7

Gender: □ Female   □ Male   Age: _____   Years Working in Medicine/Health: _____

Ethnicity: _____   Credentials/Degrees: _____

Role: □ Physician   □ Nurse Practitioner   □ Physician Assistant   □ Registered Nurse   □ Licensed Practical Nurse

□ Advanced Practice Nurse   □ Pharmacist   □ Administrator   □ Patient Reception/Office Assistant:

□ Patient Advocate/Promotora   □ Social Worker/Case Worker   □ Other: _____

Name: Agency:

HEALTH LITERACY TRAINING POST-SURVEY – HEALTHCARE PROVIDERS

Thank you for participating in this training, the purpose of which is to improve knowledge of health literacy and the role it plays in healthcare. Evaluation of the training program will help in tracking progress and help us continue to improve the training. No personally identifiable information will be retained in the analysis and reports of evaluations efforts.

Define health literacy in your own words:

_____

_____

_____

On a scale of 1-7, rank each statement from Strongly Disagree (1) to Strongly Agree (7).

	Strongly Disagree					Strongly Agree	
I understand what it means for patients to have low health literacy.	1	2	3	4	5	6	7
I know the prevalence of low health literacy.	1	2	3	4	5	6	7
I know the groups that are more likely to be low health literate.	1	2	3	4	5	6	7
I understand the health outcomes associate with low health literacy.	1	2	3	4	5	6	7
I originally overestimated my own knowledge of health literacy	1	2	3	4	5	6	7

On a scale of 1-7, indicate how likely you are to focus more on each task from Very Unlikely (1) to Very Likely (7).

	Very Unlikely					Very Likely	
Identifying low health literate patients.	1	2	3	4	5	6	7
Paying attention to whether or not my patients understand what I'm telling them.	1	2	3	4	5	6	7
Maintaining a culturally sensitive healthcare experience.	1	2	3	4	5	6	7
	Very Unlikely					Very Likely	
Speaking slowly	1	2	3	4	5	6	7
Using plain, non-medical language	1	2	3	4	5	6	7
Show or draw pictures	1	2	3	4	5	6	7
Limit the amount of information provided and repeat it	1	2	3	4	5	6	7
Use the teach-back or show-me techniques	1	2	3	4	5	6	7
Create a shame-free environment	1	2	3	4	5	6	7

Please give us any suggestions for ways to improve the training program:

_____

_____

APPENDIX I

**INSTITUTIONAL REVIEW BOARD ADDENDUM
APPROVAL LETTER AND
SUBMISSION CHANGES**

UNIVERSITY OF
NORTHERN COLORADO

Institutional Review Board

DATE: August 2, 2019

TO: Angela Pickerel, BSN, DNP-FNP-Candidate
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1440581-2] Addressing Health Literacy Needs of the Older Adult Focused
                         on Improving Medication Adherence: An Online Education Program for Nurse
                         Practitioners
SUBMISSION TYPE: Amendment/Modification

ACTION: MODIFICATIONS APPROVED/VERIFICATION OF EXEMPT STATUS
DECISION DATE: August 2, 2019
EXPIRATION DATE: June 21, 2023

Thank you for your submission of Amendment/Modification materials for this project. The University of
Northern Colorado (UNCO) IRB approves this project modification and verifies its continued status as
EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu.
Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of
Northern Colorado (UNCO) IRB's records.

Northern Colorado Nurse Practitioner Coalition Website Advertisement

DNP Candidate Seeking Nurse Practitioner Volunteers Who Provide Care to Older Adults for Scholarly Project

We invite NCNPC members to participate in a scholarly project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: Health Literacy Participation Form

Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners

- Do you worry about your patient's understanding of their new medications?

- Do you think that your patients have questions, but they are afraid to ask?

- Do you have patients that receive a new diagnosis or medication, but never ask a question?

- Do you know patients that have been hospitalized because they misunderstood their medications and had an adverse drug reaction?

An individual's health literacy level is an important consideration when providing patient education. Inadequate health literacy has been called a "silent epidemic" that requires a call to action for improving the way that health care providers address this important issue (Institutes of Medicine, 2004).

If you would like to have more information on participating in a Doctoral Scholarly project, where you will learn more about health literacy, its prevalence, evidence-based interventions that can be immediately implemented into your practice that can help improve medication adherence and health literacy, especially in the older adult population, please contact Angela Pickerel, project lead: Pick8474@bears.unco.edu

To sign-up for the Health Literacy-Sensitive Intervention Program
https://forms.gle/DHMZYeYX8yQKYGXQ8
OR
Use your QR Code Scanner app and scan the image below

Greetings,

My name is Angela Pickerel, and I am in my fourth year of the DNP program at the University of Northern Colorado in Greeley. As I wrap up my studies, I am recruiting participants for my DNP Scholarly project entitled, Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners. There is an abundance of evidence showing that health literacy is a crucial skill that patients need to be able to access, understand, and use health information to decide about their health and daily care actions. While several populations are more vulnerable to having lower levels of health literacy, the older adult population is at greater risk. With aging, we know that individuals are at increased risk for chronic disease, which requires increased monitoring, likely need for medication management, and potential for additional specialty care visits.

Additionally, cognitive decline, visual, and hearing changes can increase the older adult's risk of having adverse medication reactions. Cognitive impairments and health literacy have bidirectional associations to one another that require special attention by healthcare providers. There have been efforts to improve health literacy through simplifying patient education handouts and use of assessment methods like teach-back; however, providers may not know how to recognize those with health literacy needs or what interventions may be the most effective in the older adult population. If you currently are a nurse practitioner who provides care to older adults in your clinical practice, I would like invite you to volunteer for my project.

In this project, you will be invited to enroll in an online education program where you will learn more about health literacy, it's impacts, simple clinical screening, and evidence-based interventions that you can implement immediately into your practice when interacting with older adults. The education modules are self-paced to allow flexibility in your busy schedule and will likely take a total of 4 hours to complete. You will receive weekly reminder e-mails with additional health literacy tips. You will be asked to complete an online questionnaire before and two questionnaires immediately following completion of modules, and then two weeks post completion. Please click on this link to be directed to additional program information, consent, and sign-up form: Health Literacy-Sensitive Intervention Program.

If you would like more information, please contact me at:

- Email: Pick8474@bears.unco.edu

Thank you!

Angela Pickerel, BSN, RN, FNP-DNP-Candidate

Doctors of Nursing Practice, Inc Website Advertisement

DNP Candidate Seeking Nurse Practitioner Volunteers Who Provide Care to Older Adults for Scholarly Project

We invite Doctors of Nursing Practice, Inc. website members to participate in a scholarly project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: Health Literacy Participation Form

Recruitment Through Facebook Nurse Practitioner Pages Advertisements

DNP Candidate Seeking Nurse Practitioner Volunteers Who Provide Care to Older Adults for Scholarly Project

We invite The Nurse Practitioner Newbies Facebook Group members to participate in a scholarly project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: **Health Literacy Participation Form**

DNP Candidate Seeking Nurse Practitioner Volunteers Who Provide Care to Older Adults for Scholarly Project

We invite The Nurse Practitioner Facebook Group members to participate in a scholarly project regarding health literacy interventions in the older adult population. This project is being conducted by Angela Pickerel, a DNP candidate at the University of Northern Colorado, as a part of her doctoral scholarly project. If you decide to participate, you will be given access to an online education program, containing 4 modules regarding health literacy and health-literacy-sensitive interventions that can be applied to your clinical practice. There will a total of 3 pre- and post-intervention online surveys over the course of the program. At the completion of the program, eligible participants will be able to enter a raffle for a chance to win a $50.00 Amazon Gift Card.

To be eligible for this program, you must be a currently practicing nurse practitioner who cares for older adult populations in your clinical setting. If you would like to participate in this program, please click here for additional program information, consent, and sign-up for the study: **Health Literacy Participation Form**

Weekly Emails to Participants
Pre-Intervention Email

Welcome,

Thank you for your interest in the Addressing Health Literacy Needs of the Older Adult Focused on Improving Medication Adherence: An Online Education Program for Nurse Practitioners. Before beginning the modules, please complete the pre-intervention survey by clicking here or clicking the survey link once you create an account.

Please click here to access the online program.

- You will need to create an account using your email address and a password. As with other websites, when developing your password, please choose a strong password which is not used for any other webpages or email passwords to protect your privacy.
- All program information is protected, and you will need to use your sign-in to access program contents. No data will be collected from your use of the online program.
- The program is designed to be self-paced, so you may work through the modules as quickly as you choose.

Please let me know if you have any questions or concerns. You can contact me, Angela Pickerel, via email or cell phone.

- Email: Pick8474@bears.unco.edu

Warmest Regards,
Angela Pickerel, BSN, RN, DNP-FNP-S

Week 1 Email

Hello!

Welcome to Week 1 of the Health Literacy-Sensitive Intervention Program. I hope by now you have been able to access the website and **complete the first survey**. Module 1 is focused on providing you with information about health literacy. There are two videos that will take approximately 30 minutes to complete, followed by three short PowerPoints discussing

- Clear Communication
- Orem's Self-Care Deficit Nursing Theory and Health Literacy
- Health Literacy Barriers and Strategies.

At the completion of this program there will be two surveys, one immediately upon completion of Module 4 and one that will be sent to you via email two weeks following completion of the program. Upon completion of both surveys, you will receive a link **to enter a raffle for a chance to win a $50.00 Amazon Gift card** as a token of appreciation for completing the program.

This program is a self-paced program and you may feel free to move through the modules as you are able. Please let me know if you have any questions or concerns. I would be happy to provide any assistance you may need. Feel free to contact me via email or cell phone.

Email: Pick8474@bears.unco.edu

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 2 Email

Hello Again!

Welcome to Week 2 of the Health Literacy-Sensitive Intervention program. If you haven't already started Module 2, the focus of this module is learning about the Teach-Back method through the Always Use Teach-back! website. For this activity, you will follow the link in Module 2 and complete the "Interactive Learning Module". It will take approximately 45 minutes to complete the Teach-back module. After completing the module, there is a 15-minute PowerPoint discussing follow-up methods.

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Email: Pick8474@bears.unco.edu

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 3 Email

Hello Everyone!

Welcome to Week 3 of the Health Literacy-Sensitive Intervention Program. This week, Module 3 is focused on addressing the health literacy needs of the Older Adult regarding ways to help improve medication adherence. This week you will learn about the Brown Bag Medication Review, Medication List and Reminder forms, and ways in which you can adjust you prescribing of medications to increase clarity of medication label instructions for the older adult.

Did you know?

- **<u>59% of the older adult population</u>** have basic to below basic health literacy skills (Cutilli, Simko, Colbert, and Bennett, 2018).
- **3 out of 4** older adults have *more than one* chronic disease (CDC, 2018).
- Older adults are frequently taking a polypharmacy medication regimen, more than 5 medications to manage their chronic diseases.
- Number of older adults on a polypharmacy medication regimen tripled between 1988 & 2010 (Charlesworth et al., 2015)
    - ➢ **12.6% to 39.0%**
- Older adults are at greater risk for adverse drug outcomes compared to younger populations. Medication non-adherence in older adults accounts for:
    - ➢ 26% of hospital admissions
    - ➢ 25% of nursing home admissions
    - ➢ 20% of preventable drug events (Mayo-Gamble & Mouton, 2018)
- Inadequate health literacy accounts for a **<u>26% increased risk in mortality</u>** based on assessment of an older adult's ability to read their medication instructions compared to those with adequate health literacy (Parekh et al.,2018).

Please let me know if you have any questions or concerns. Feel free to contact me via email or cell phone.
Email: Pick8474@bears.unco.edu

Best Wishes,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Week 4 Email

Greetings!

Welcome to the 4th week of the Health Literacy-Sensitive Intervention Program. In this final week, Module 4 will be focused on *Empowering Patients* with inadequate health literacy, focusing on encouraging patients to ask questions and to be actively engaged in their health care. Empowering patients requires an environment that feels safe for the individual to ask questions. Additionally, we will be talking about *Cultural Customs and Beliefs* as they relate to health literacy needs.

Once you have completed Module 4, please complete the post survey that will be found at the end of Module 4. Thank you for your time in completing this program. I hope that you have found it valuable to your practice and will implement these health literacy-sensitive interventions into your practice.

Please be watching your email for to complete **one last survey in the next two weeks**. There will also be a link for you to **enter the raffle for a $50.00 Amazon gift card** as a token of appreciation for completing this program and all 3 surveys.

As always, please let me know if you have any questions or concerns. Feel free to contact me via email or cell phone.

Email: Pick8474@bears.unco.edu

Thank you!
Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Tips
Here are some examples of how religion, culture, and ethnic customs can influence how your patients interact with you.

- **Health beliefs:** In some cultures, people believe that talking about a possible poor health outcome will cause that outcome to occur.

- **Health customs:** In some cultures, family members play a large role in health care decision making.

- **Ethnic customs:** Differing roles of women and men in society may determine who makes decisions about accepting and following through with medical treatments.

- **Religious beliefs:** Religious faith and spiritual beliefs may affect health care-seeking behavior and people's willingness to accept specific treatments or behavior changes.

- **Dietary customs:** Disease-related dietary advice will be difficult to follow if it does not conform to the foods or cooking methods used by the patient.

- **Interpersonal customs:** Eye contact or physical touch will be expected in some cultures and inappropriate or offensive in others. (AHRQ, 2018)

Week 5 Email

Greetings and Much Thanks!

I would like to thank you for your time and participation in the Health Literacy-Sensitive Intervention Program. If you have completed all 4 of the education modules, I would ask that you complete the follow-up survey. The link has been included **here** for your convenience and is expected to take less than 10 minutes to complete. Completion of the program and survey is completely voluntary.

You will receive an email with a link to one final survey in the following week which will also include a link to enter a raffle for a $50.00 Amazon gift card. I greatly appreciate your time and feedback. I look forward to your responses.

Warmest Regards,

Angela Pickerel, BSN, RN, DNP-FNP-Candidate

Email Week 6

Greetings!

I want to thank you again for your time and participation in this Health Literacy-Sensitive Intervention Program. I hope that you have found it to be beneficial and would appreciate your feedback regarding your current practice. Please the following link to complete the final survey and enter the Raffle for a chance to win a $50.00 Amazon gift card: **<u>Final Survey</u>**

The winner of the $50.00 Amazon gift card will be contacted via email with the electronic gift card attached to the winning participant's email.

Please let me know if you have any questions or comments.

Warmest Regards,

Angela Pickerel

<center>**Two-Week Post-Intervention Survey Blocks**</center>

Participation Consent Block

This online education program is a DNP scholarly project. All data collected is confidential and does not contain any personal identifying features.

Contact Information:

Student Investigator: Angela Pickerel, BSN, RN, DNP-FNP-Candidate

- Email: Pick8474@bears.unco.edu

Research Advisor: Melissa Henry PhD, MS, RN

- E-mail: Melissa.Henry@unco.edu
- Phone: (970) 351-1735

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact the Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

Do you give consent for the use of your survey information for this scholarly project?

Yes

No

Survey Identification

Please enter the first 3 letters of *your* last name and the numerical two-digit month and two-digit day of *your* birth date (example: PIC0425)

_____

Reported Use of Health Literacy Strategies to Deal with Patients with Low Health Literacy

Anchor: Considering your current practice, on a scale of 1-7 please indicate your agreement with the following statements from 1 (strongly disagree) to 7(strongly agree)

Likert Scale: values of 1 (strongly disagree), 2 (disagree), 3 (somewhat disagree), 4 (neither agree or disagree), 5 (somewhat agree), 6 (agree), and 7 (strongly agree)

20. I do a good job identifying patients with low health literacy
21. I am good at knowing whether or not my patients understand what I tell them.
22. I am good at maintaining a culturally sensitive healthcare experience

Reported Use of Health Literacy-Sensitive Intervention Skills(techniques)

Anchor: Considering your current practice, on a scale of 1-7 please indicate how frequently you use each technique from 1 (Never) to 7(Every time)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

23. Speaking slowly
24. Using plain, non-medical language
25. Show or draw pictures
26. Limit the amount of information provided and repeat it
27. Use the teach-back or show-me techniques
28. Create a shame-free environment

Older Adult Block

Anchor: When prescribing medications to Older Adult Patients, on a scale of 1-7, indicate how frequently you currently use each technique from 1 (Never) to 7 (Every time)

Likert Scale: values of 1 (never), 2 (rarely), 3 (occasionally), 4 (sometimes), 5 (frequently), 6 (usually), and 7 (every time).

29. Speaking slowly
30. Using plain, non-medical language
31. Show or draw pictures
32. Limit the amount of information provided and repeat it
33. Use the teach-back or show-me techniques
34. Create a shame-free environment
35. Use Brown Bag Medication Review
36. Patient-Centered Medication Instructions
37. Medication reminder forms

38. Medication forms

Barriers and Facilitators Block (Free text fields)

What do you perceive as being facilitators to the implementation of health literacy-sensitive interventions into your practice?

What do you perceive as barriers to the implementation of health literacy-sensitive interventions into your practice?

Separate link to raffle entry page

Upon completion of this survey, please click on the link below to be enter the raffle for a $50.00 Amazon gift card as a token of appreciation for completing this program and surveys. The $50.00 Amazon gift card will be sent to the email address of the random raffle winner.

http://www.rafflecopter.com/rafl/display/855d29b21/?