Nursing Students at the HeLM: A Study of the Effect of a Health Literacy Module (HeLM) on the Health Literacy Knowledge, Skills and Attitudes of Pre-Licensure Baccalaureate Nursing Students

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HEALTH LITERACY

NURSING STUDENTS AT THE HELM:
A STUDY OF THE EFFECT OF A HEALTH LITERACY MODULE (HELM) ON THE
HEALTH LITERACY KNOWLEDGE, SKILLS AND ATTITUDES OF PRE-LICENSEURE
BACCALAUREATE NURSING STUDENTS

By

JOY G. BORRERO

A dissertation submitted to the Graduate faculty in Nursing in partial fulfillment of the requirements for the Degree of Doctor of Philosophy, The City University of New York 2018
Approval Page

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Joy G. Borrero

This manuscript has been read and accepted for the Graduate Faculty in Nursing in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

Nursing Students at the HeLM: A Study of the Effect of a Health Literacy Module (HeLM) on the Health Literacy Knowledge, Skills and Attitudes of Pre-Licensure Baccalaureate Nursing Students

by

Joy G. Borrero

Advisor: Dr. Catherine Alicia Georges

Background: Effective communication is a foundation of high-quality, patient-centered health care. Understanding health literacy is an essential attribute that health care professionals need to possess in order to promote effective partnerships with patients and their significant others. Nurses, especially, need to be involved in addressing the epidemic problem of low health literacy in the United States because they are responsible for the majority of patient, caregiver and community health education and communication. Nurses play a key role in providing health care information to individuals, families and groups in a variety of settings and therefore should be educated about the essentials of health literacy, its prevalence in society and its relationship to health outcomes. There are currently no standards for including health literacy training in the undergraduate nursing curriculum. Few studies have been conducted to assess nursing students’ knowledge, practice and attitudes or perceptions of health literacy which are also components of the Quality Safe Education for Nurses (QSEN) initiative (QSEN, 2014).

Purpose: The purpose of this study was to evaluate the effectiveness of the Borrero Health Literacy Module (HeLM) on health literacy knowledge, skills and attitudes of pre-licensure baccalaureate nursing students using a pretest and posttest.
Method: Pre-licensure baccalaureate nursing students (n=180) were invited to participate in this quasi-experimental study, which consisted of a 2 hour classroom session. Students completed the health literacy questionnaire: The Health Literacy Knowledge and Experience Survey (HL-KES) as both a pretest and a post test. The classroom session included the components of the HeLM which was designed by the researcher and validated by two experts in the field of higher education and health literacy. The results of the HL-KES were statistically evaluated to assess for any changes in health literacy knowledge, skills and attitudes.

Findings: The results of the HL-KES pretest and post-test analyses showed statistical significant differences in the average literacy score change of +4.97, the 5-unit difference is statistically significant (p<.001) at the .1 level of significance. The questions of the HL-KES were grouped according to five content areas, and the statistical analysis of the pre-test and post-test scores resulted in statistically significant differences in each content area. Bivariate linear regressions were also done on each of the other study variables, and variable-specific t-tests were generated. Statistical analysis supports that the Borrero HeLM made a statistically significant difference in the health literacy knowledge, skills and awareness of nursing students who participated in this study.

Keywords: health literacy, nursing curriculum, health literacy education, patient teaching
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“At the end of the day people won’t remember what you said or did, they will remember how you made them feel.” Maya Angelou
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Chapter 1

Introduction

Low health literacy has a significant impact on patient outcomes. “Low health literacy is recognized as a serious public health problem due to its widespread prevalence and significant impact on patient outcomes” (Universal Precautions for Health Communications, n.d.). The Institute of Medicine’s (IOM) report, “Health Literacy: A Prescription to End Confusion,” brought further attention to this problem with its focus on the quality of health systems and the way in which health information is given to patients (Institute of Medicine, 2004). The importance of patient education has been recognized as a mandate by accrediting organizations like the Joint Commission and the state boards of nursing. In addition, health literacy is included in Healthy People 2020 that has been drafted by the US Department of Health and Human Services (Healthy People, 2020). One of the goals for Healthy People 2020 is “to use health communication strategies and health information technology (IT) to improve population health outcomes and health care quality, and to achieve health equity.” Effective communication is a foundation of high-quality, patient-centered health care. Health literacy is an important part of this goal because it is an essential attribute required to comprehend basic health information. Better understanding of health information will promote effective partnerships between patients and their health care providers (HCPs) (Healthy People 2020).

What is health literacy? “Health literacy has been defined as the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan, 2000, p.210). Health literacy issues often lead to disparities in health care and an increase in health care expenses in the
United States (Glassman, 2008). The National Assessment of Adult Literacy 2003 (Kutner, Greenberg, Jin, & Paulsen, 2006) reported that about 77 million Americans, one-third of the population have low health literacy and 90% of the population “do not have the skills necessary to understand information and services and use them to make appropriate health decisions” (Institute of Medicine, 2009, p.14). In other words, 14% of adults have below basic health literacy and an additional 22% who have only basic health literacy.

According to Baur (2010), nurses need to be involved in addressing the low health literacy problem because “they are responsible for the majority of patient, caregiver and community health education and communication” (Baur, 2010, p.63). Nurses play a key role in providing health care information to individuals, families and groups in a variety of settings and therefore should be educated about the essentials of health literacy, its prevalence in society and its relationship to health outcomes. Mancuso (2009) compiled an integrative review of the literature of how routinely health literacy screening is being done in the clinical setting and found that there were no studies about how nurses assess health literacy in the clinical setting. The lack of research in health literacy assessment among health professionals across disciplines may be the result of a gap in effective teaching of health literacy concepts in professional education programs (Sheriden, et al, 2011, Torres & Nichols, 2014). Therefore, all nursing students and practicing nurses must be aware of the magnitude of the health literacy problem, how to assess health literacy in the persons they are caring for, and possess the skills to provide effective patient education.

Nurses are expected to teach patients, but where do they learn the skills to provide effective teaching to their patients? There are numerous health literacy assessment and education tools available from government resources such as the Agency for Healthcare Research and Quality
(AHRQ) and the Centers for Disease Control (CDC). The review of the literature in Chapter 2 will address the gap that exists in health literacy education and training of nurses and other healthcare providers.

The Joint Commission (2007) has identified provider communication as essential to improving patient health literacy and that the patient has a fundamental right and need to receive information in a way that they can understand. Health care providers, especially nurses, must be cognizant of the need to assess and address the issue of low health literacy which can negatively affect patient care and patient outcomes (Baur, 2010). Nurses can do this by communicating clearly and by giving understandable health information to diverse populations.

Health literacy is critical to effectively navigate one’s personal health care decisions within the health care system. Health literacy represents such essential skills as the ability to understand instructions on prescription drug bottles, appointment slips, medical education brochures, doctor’s directions, consent forms, and the capability to negotiate complex health care systems (Institute of Medicine, 2004). Health literacy is more than basic reading ability, given that it requires multiple complex skills, including: listening, analytical thinking, and decision-making skills, all which apply to health care (Glassman, 2012). Patients with below basic health literacy are at a disadvantage since they are unable to comprehend prescription medication labels or written health care instructions related to diet, medications and disease knowledge.

Individuals with low health literacy are at greater risk for hospitalizations, are more likely to report poorer health in general, and are more likely to have misinterpretations of their treatments (Pawlak, 2005). For example, Kalichman et al. (1999) measured self-reported adherence in 184 patients, and they reported that lower literacy was associated with greater odds of poor adherence defined as recall of missing any dose during the previous 48 hours after
adjustments for race, income, social support, and education. Also, low health literacy may contribute to increased medication errors and increased healthcare costs (Partnership for Clear Health Communication, 2008). For example, Persell, Osborn, Richard, Skripkauskas & Wolf (2007), found that limited health literacy was associated with a greater number of unreconciled or unreported medications by patients in an ambulatory care setting. Of the 119 participants in the study, 37 (31%) had inadequate health literacy and were less able to name any of their antihypertensive medications listed in their medical records compared to those with adequate health literacy.

Problem Statement

Currently, there are no standards for including health literacy education in the undergraduate nursing curriculum (ANCC, 2014). Few studies (Cormier & Kotrlik, 2009), Torres & Nichols, 2014, Hartman, 2014) have been conducted to assess nursing students’ knowledge, skills and attitudes or perceptions of health literacy, which are part of the patient-centered care component of the Quality Safe Education for Nurses (QSEN) initiative (Cronenwett, Sherwood, Barnsteiner, Disch, Johnson, & Mitchell, 2007). Patient teaching has been taught informally in undergraduate programs, but there is little information about the nursing student’s preparation and exposure to health literacy related to patient teaching. There is no substantive amount of literature describing the nurse’s knowledge, skills and attitude of health literacy. Speros (2009) reports that the majority of health literacy education literature is outside of nursing, including medicine and pharmacy education.

Because health literacy and the impact on patient outcomes is recently being addressed, most health care professionals already in practice have not had formal education in improving communication skills. A growing number of continuing medical education courses in health
literacy are available (Schlichting, Quinn, Heuer, Schaefer, Drum & Chin, 2007). No formal education or continuing education in health literacy is required for health care professionals. Macabasco-O’Connell and Fry-Bowers (2013) reported that 59% of nurses in their study had never had any formal education or continuing education in health literacy and that 20% had never heard about health literacy.

Our nation’s health care system is inherently complex. It includes clinical and public health services. Many Americans must be able to interpret and understand healthcare including health insurance, information for enrollment, benefits, and out-of-pocket costs. These aspects of healthcare are complicated and often unfamiliar for all, including those who are highly literate individuals. Persons with below basic literacy skills are at a disadvantage and are potentially more confused, have more misconceptions, and lack an understanding of their healthcare.

Recent shifts in the delivery of care including an emphasis on self-management, and complex financing and coverage requirements—have placed additional demands on patients to be informed and proactive about their health. When people don’t get the information or treatment that would allow them to manage illnesses or prevent disease, health care costs escalate. Given that prevention services through screening, monitoring, and educational initiatives have shown to reduce chronic illness and contain costs, it is an essential strategy for health care (Centers for Disease Control, 2003). Knowing that there exists a strong relationship between low health literacy and poor health outcomes, it is essential to develop interventions for both the patient to navigate his or her healthcare and for practicing nurses to be prepared to use various techniques to improve patient communication (Schwartzberg, Cowett, VanGeest & Wolf, 2007).

The quality of clinician–patient communication can affect health outcomes, including how well patients follow instructions from clinicians (Sudore, Landefeld, Perez-Stable, Bibbons-
Domingo, Williams, & Schillinger, 2009). But few health care professionals receive much formal training in communication, particularly in working with people with limited literacy. (Barrett, Dyer & Westpheling, 2008). In recent years, the National Board of Medical Examiners has added a one-day clinical skills exam for all medical students that include an assessment of communication and interpersonal skills. Currently, the clinical skills test does not address how limited health literacy affects interactions with patients.

Need for the Study

Professionals, especially nurses play a vital role in direct patient care and in promoting changes in the health care delivery system to improve health information, communication, informed decision making, and access to clinical and public health services. Therefore, health literacy research may be a major target area for nurses and nursing education as nurses are the primary communicators with patients of all ages, diverse cultural backgrounds, and in all health care settings, from primary, acute, chronic and hospice care (Baur, 2010). It is essential that all nurses be prepared to work with patients with a variety of literacy levels and to be able to deliver appropriate and understandable information to their patients. Nurses could then make a difference in patient outcomes by ensuring that their patients are health literate, and in so doing, patients will be better at self-management, including understanding medications and prescribed treatments. It is also a requirement of state and national accrediting agencies to include QSEN competencies in undergraduate nursing curricula, but to date, there is no standardization of how to do this.

Health literacy is related to many health indicators and outcomes. Since nurses play a direct role in patient communication, patient education and management of care, the study of nurses’ health literacy knowledge, skills and attitudes should be an important area of research.
Patient education is an integral part of the professional nurse’s role and has long been considered a key element in providing holistic and patient-centered care as the nurse interacts with patients, families and other healthcare professionals.

Professional and government organizations such as the American Nurses Association (ANA), the International Council of Nursing (ICN), The Joint Commission (TJC, 2005), the Institute of Medicine (IOM, 2004b), the United States Department of Health and Human Services, and Healthy People 2020, have provided recommendations for teaching patients. One of the objectives of Health People 2020 is to close the gap in health literacy by the development of appropriately written in plain language materials. Other sources of support for quality patient education are the American Hospital Association, which developed the Patient Bill of Rights in 1970 and the Pew Health Professions Commission which has published numerous recommendations for quality patient education (Bastable, 2008).

Low health literacy is considered a national health issue and is being addressed by organizations such as the Institute of Medicine, the Centers for Disease Control and the National Institutes of Health (NIH), which recognizes the need to apply research advances in such a way as to ensure improved health for all Americans. Recently the NIH issued a number of announcements supporting research on health literacy. The goal of NIH-funded research is to improve scientific understanding of the nature of health literacy and its relationship to healthy behaviors, illness prevention and treatment, chronic disease management, health disparities, and health outcomes, including mental and oral health (NIH, 2013).

The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has also mandated patient education standards and support for teaching nurses about health literacy.
(Torres & Nichols, 2914). Additionally, the implementation of the Affordable Care Act (ACA) and the accompanying changes will have an impact on health care navigation, as 30 million more Americans are now eligible for health care. Even though health literacy is not a major component of the ACA, those implementing the law should consider how to incorporate health literacy into strategies for enrolling beneficiaries and delivering care (Somers & Mahadevan, 2010).

Given the significance of low health literacy in the United States and the effect on patient outcomes, nurses play a crucial role in educating patients to assure that patients understand the health information given to them. This study intends to support the inclusion of health literacy education in all pre-licensure nursing programs.

**Purpose of the Study**

The purpose of this study is to assess the health literacy knowledge, skills and attitudes in pre-licensure baccalaureate nursing students using a pretest/post-test to measure the effectiveness of the Borrero Health Literacy Education Module (HeLM). The study of what nursing students know about health literacy and its connection to patient outcomes may guide future practicing nurses to using health literacy skills in every patient encounter.

**Theoretical Framework**

For this study, Knowles Adult Learning Theory (Knowles, 2015) will provide the necessary basis for reliable measurement and the development of interventions to improve health literacy. For this study, Knowles Adult Learning Theory will provide the theoretical framework to guide the art and science of adult learning. Knowles’ developed six assumptions of adult learners: the need to know, the learner’s self-concept, adult learner experience, readiness to learn, orientation to learning and motivation to learn. (Knowles, 2015). These assumptions and his four principles of andragogy (the art and science of adult learning) will be used to explain
how the Borrero Health Literacy Education Module (HeLM) can be effective in the pre-licensure nurse’s education. Also, Parnell’s Health Literacy Tapestry Model (HLT) will be used as a conceptual model that demonstrates how the individual’s (in this study, the pre-licensure nurse) health literacy skills impact the health care that they provide. The HLT uses a holistic nursing approach that weaves “threads” and “fibers” that impact on both the providers and the individuals receiving care. These threads and fibers include the knowledge, experience and skills of the providers and can be applied to enhance nursing knowledge, guide practice and raise awareness of the importance of proficient health literacy skills that can be used in every patient encounter.

**Research Questions**

1. What knowledge, skills and attitudes do pre-licensure baccalaureate nursing students have of health literacy?

4. What is the effect of a health literacy education module (HeLM) on the health literacy knowledge, skills and attitudes of pre-licensure baccalaureate nursing students?

**Research Hypothesis**

\[ H_0 \] Pre-licensure baccalaureate nursing students who have completed the health literacy education module (HeLM) will not have a statistically significant difference in health literacy knowledge, skills and attitudes.

**Definitions**

**Healthcare Information** – Information provided to an individual by a health care provider for health promotion, health prevention, and health maintenance (Osborne, 2013).
**Health Literacy** - “Degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan & Parker, 2000, p.210).

**Health Literacy Competence** - Professionals’ understanding of patients’ health literacy skills, and the identification and use of effective communication strategies (Bailey, McCormack, Rush & Paasche-Orlow, 2013).

**Health Communication** - The gold standard definition is that “health communication is a multifaceted and multidisciplinary approach to reach different audiences and share health related information with the goal of influencing, engaging and supporting individuals, communities, health professionals, special groups, policy-makers and the public to champion, introduce and adopt, or sustain a behavior, practice, or policy that will ultimately improve health outcomes” (Schiavo, 2013, p.5).

**Literacy** - “Using printed and written information to function in society, to achieve one’s goals, and to develop one’s knowledge and potential” (Kutner, Greenburg, Baer, 2006, p.2).

**Patient Education** is defined as the process by which health professionals give information to patients and their caregivers that will alter their health behaviors or improve their health. It is a primary responsibility of nurses. Important elements of patient education include preventive education, health promotion, disease specific education and responsibility. Basically, patients need to know when, how and why they need to obtain, process and understand pertinent health information and services to make appropriate health decisions (Bastable, Grambet, Jacobs, & Sopczyk, 2011, p.12).
Quality, Safe, Education for Nurses (QSEN) Competencies- Learning Domains:

**Cognitive Domain-Knowledge** includes basic facts about health literacy, consequences of low health literacy, health literacy screening, guidelines for written health materials, and evaluation of health literacy interventions. Overall knowledge of health literacy and health literacy strategies may be factors that could influence beliefs about health literacy (QSEN 2016).

**Skills Domain- Skills includes** health literacy strategies such as written, verbal or visual formats used with patients and their families. Skills would also include the inclusion of culturally and linguistically appropriate interventions (QSEN, 2016).

**Attitude Domain- Affective** includes attitude and awareness toward the effective behavior of using health literacy strategies. The terms attitude and awareness may be used interchangeably. Perception is a way of regarding, understanding, or interpreting something. The nurse’s attitude and awareness may have an effect on the value that is placed on health literacy competence in practice (QSEN, 2016).

**Pre-licensure baccalaureate nursing student:** a student enrolled in a pre-licensure baccalaureate nursing program in a school of nursing in the New York metropolitan area.

**Assumption**

1. Pre-licensure nursing students will benefit from a health literacy education program in health literacy.

**Limitations**

This study is limited to pre-licensure nursing students in a baccalaureate nursing program in the metropolitan New York area. The researcher has no control over the participants’ prior exposure or experience with health literacy education or knowledge. The researcher invited nursing students from all levels of clinical nursing courses.
This study was conducted using a quasi-experimental design. The use of a control group in the implementation of a student education intervention could strengthen the design.

**Chapter Summary**

Increasing nurses’ knowledge, skills and awareness of health literacy has the potential to affect patient understanding, self-care, and satisfaction and may be key to reducing health care disparities (Roter, 2011). Educators need to ensure that nurses, who are on the front lines of delivering this information and education, have proficient knowledge, skills and awareness to assess health literacy and to provide patient centered education interventions in order to provide optimum care. The need for effective patient communication and teaching skills for nursing students and future professional nurses has been identified as a priority in healthcare education by numerous professional and government institutions. Since health literacy has been identified as an indicator of health outcomes, it seems imperative that all healthcare providers have health literacy knowledge, skills and awareness.

Health literacy and its impact on patient outcomes have been introduced. Chapter 2 will deliver a systematic review of the literature of the QSEN competencies and health literacy in nursing education.
Chapter 2

Review of the Literature

Introduction

This chapter begins with the current state of provider-patient communication and health care education. It continues with a review of the literature of the dependent variables of health literacy knowledge, skills and attitudes/awareness (KSAs) of health literacy of pre-licensure nursing students and continues with a review of the independent variables of health literacy and health literacy in nursing education. The chapter will conclude with a summary that supports health literacy education for nurses.

A literature search was conducted using EBSCO, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline, Science Direct, Wiley, SAGE Publishing, National Center for Biotechnology Information (NCBI) and Google Scholar. The selected databases included studies found in nursing journals, allied health journals and dissertations. The MeSH (Medical Subject Headings) terms and key words included: healthcare education, health literacy, health literacy in nursing education, nursing education, patient education, provider-patient communication and Quality Safe Education for Nurses (QSEN). Each of the selected studies addresses an aspect of health literacy in nursing education and was evaluated for relevancy and content, resulting in a compilation of pertinent publications.

Dependent Variables

QSEN Competences: Health Literacy Knowledge, Skills and Attitudes/Awareness

According to the Institute of Medicine (2003), nearly 90 million Americans have difficulty understanding and acting on health information. The findings of the 2003 National
Adult Literacy Survey (NALS) offers the most precise estimate of literacy in the United States to date. The survey revealed that 43% of adults in the United States have basic or below basic reading proficiency which affects the ability of many Americans to navigate the current health care system. Hence, the Institute of Medicine (2003) has called for the integration of new competencies into healthcare professionals’ education.

State boards of nursing and nursing professional organizations have included health literacy and patient teaching in their standards of practice (NCSBN.org, 2016; ANA, 2016). Current nursing education has embraced the QSEN initiative to meet the challenge of accomplishing the goals set forth by the IOM. Nurses will need to possess the required health literacy knowledge, skills and attitudes (KSAs) in order to improve the quality of healthcare information (Brown, Feller & Benedict, 2010). These three areas are to be developed in pre-licensure programs in each of the six QSEN competencies. These competencies are patient-centered care, teamwork and collaboration, evidence-based practice, patient safety, quality improvement and informatics (QSEN, 2013). The concept of health literacy is included in both the patient-centered care and teamwork and collaboration competencies.

Quality and safety are core values in health care and should be priorities in health education. Nurses represent the largest number of health care workers, and their drive to improve patient safety and quality of care has been supported by evidence (Sherwood & Zomorodi, 2014). Evidence shows that nurses are willing to apply the new competencies into practice, but often lack the skills to perform effective patient teaching and patient communication. Nurses who are clinically competent employ patient-centered best practices with a focus on quality and safety in the inter-professional healthcare environment. Bryer & Peterson-Grazioste, (2014) reported that a national study recommended that QSEN knowledge, skills and attitudes should be
introduced early in fundamental nursing courses and threaded throughout the nursing program. Mayer and Villaire (2011), Parnell (2016) would like to see nurses become more active in raising health literacy awareness by having policies to support a health literate organization, engaging in research to develop, implement and evaluate health literacy training programs and being actively involved in promoting best practices for effective patient communication.

Health literacy contributes to health status and outcomes, but research has not focused on developing the health literacy knowledge, skills and attitudes of health care providers (Ownby, Acevedo, Waldop-Valverde, Jacobs, Caballero, 2014; Richey, 2012; Jukkala, Deupree & Gordon, 2009). Health literacy assessment studies have been done with physicians, pharmacists, nurses, nurse practitioners, public health and nursing students. All support the need for health literacy education in the curriculum because all of these providers may need to provide health education to their patients and the literature shows that there is a gap in the health literacy knowledge, skills and attitudes in nursing medicine and other allied professions (Coleman, 2010; Coleman 2011; Schlichting, Quinn, Heuer, Schaefer, Drum & Chin, 2007; Roter, 2011.).

Coleman (2011) conducted a review of the literature and found there was little emphasis on communication skills and practices of healthcare personnel. His findings showed that there are significant gaps in knowledge, awareness and clinical recognition of low health literacy. Studies by Cormier & Kotrlik (2009); Jukkala, Deupree and Graham, (2009); Schwartzberg, Cowett, Van Geest & Wolf, (2007) and an earlier study by Bourhis, Roth & MacQueen (1989) found that healthcare providers do not possess the health literacy competencies to assess health literacy levels in order to communicate effectively with their patients. In fact, health professionals may be a part of the problem because of the lack of health literacy education in the
curricula. And since nurses play a major role during patient-provider interactions, they may be a critical link in ensuring that patient-provider communication is successful.

Nursing’s perception of health literacy continues to remain largely unexplored, yet, health promotion activities and patient education have always been independent and essential components of nursing care. There has been little health literacy research conducted with or by nursing professionals and with nursing students. Therefore, the nursing profession is not adequately mindful about the best practice for knowledge, skills and awareness of this concept. Nursing students’ KSAs of the impact of low health literacy on their patient population is essential to preparing competent and skillful practitioners before graduation and not afterward.

Cormier & Kotrlik (2009) and McCleary-Jones (2012) carried out studies to assess the knowledge and experiences of senior and beginning baccalaureate nursing students. McCleary-Jones (2012) evaluated nursing students’ knowledge about health literacy at the beginning of a baccalaureate nursing program. Almost half of the students rated themselves as being only somewhat familiar with the term health literacy. McCleary-Jones (2012) developed a simple 5-item multiple choice pre-test with questions to assess information on the students’ knowledge of health literacy. It asked for the definition of health literacy, potential outcomes for individuals with low health literacy, name a common tool to assess health literacy, patient behaviors associated with low health literacy and identify effective strategies to teach patients with low health literacy. After a 20-minute online health literacy presentation, the students completed the same questions in a post-test. The results showed a significant improvement from a pretest mean of 60.9 to a posttest mean 92.8. These results correlate with the findings of Sand-Jecklin, et al (2010) that support the need to include health literacy content in the nursing curriculum to prepare future nurses to provide quality patient centered education.
Cormier & Kotrlik (2009) discovered that nursing students had some proficiency in addressing and assessing health literacy in certain populations, but that they had limited experience in conducting health literacy screenings and assessing the appropriateness of written educational materials available for their patients. The authors surmised that the student enter into practice with some health literacy knowledge and experiences and that strategies must be developed for nursing students to gain health literacy competency. Cormier (2009) developed the Health Literacy Knowledge and Experience Survey (HL-KES) used with baccalaureate nursing students for her dissertation study, which is the instrument that was used in this study.

Nurse attitudes regarding health literacy have also not been thoroughly evaluated. Macabasco O’Connell and Fry-Bowers (2011) created the Nursing Professional Health Literacy Survey (NPHLS) to assess the knowledge of 76 registered nurses and advanced practice nurses regarding perceptions of health literacy in the clinical setting. Upon review of the results, 38% of participants were unsure if health literacy was included in their hospital’s protocols and less than 25% believed teaching materials for patients with limited health literacy were effective. Furthermore, over half of the participants reported never receiving formal health literacy education or training. Instead, 60% of respondents stated they often or always used their “gut feeling” to assess the patient’s health literacy. (Macabasco-O’Connell & Fry-Bowers, 2011, p.300).

Cafiero (2012) used the HL-KES to study nurse practitioners’ knowledge, experience and intention to use health literacy strategies in practice. Her findings also support the disparity in the education preparation of advanced practice nurses in health literacy principles. Cafiero found that 75% of participants reported “never” or only “sometimes” having health literacy emphasized in the curriculum. These findings also reflected the ones that Cormier discovered in that both
groups of participants did not understand the effect of health literacy on healthcare status, could not identify screening tools for low health literacy and could not evaluate education materials.

Torres and Nichols (2014) concluded that health literacy is a major component of positive health outcomes in patients and that nurses pay a key role in patient education to patients with low health literacy levels, limited literacy and numeracy skills and cultural differences. Their study was to determine the current knowledge of health literacy for nursing students enrolled in an associate degree program, using the HL-KES as an assessment tool. Their findings demonstrated that the participants did have some knowledge about health literacy but there was a need to improve the knowledge about the basic concept of health literacy and to educate the nursing students about assessing a patient’s level of understanding and the tools available to do this.

Knight (2011) studied the knowledge and experiences of registered nurses and her findings were consistent with the above mentioned studies. It was noted that registered nurses have some health literacy knowledge, but they were not adequately prepared to provide effective health literacy screening and to develop patient education materials to the appropriate health levels of their patients. Although the participants in this study had at least three years of nursing experience, the criteria did not consider pre-licensure educational programs (associate or baccalaureate degree). Results revealed inconsistent health literacy knowledge and experience in all the participants. The majority (58%) of participants reported that health literacy was sometimes addressed in the nursing curriculum.

Health literacy knowledge and skills in the healthcare professions remain limited despite the initiatives from the IOM, Healthy People 2020, and the National Action Plan to Improve
Health Literacy (2010). Jakkula, Duepree & Graham (2009) also discovered that out of all of the groups of health care providers in their study, registered nurses had the least health literacy proficiency. This lack of awareness prevents nurses from communicating effectively with patients, using technical language at the level of their education, rather than at the patient’s level (Macabasco-O’Connell & Fry-Bowers, 2011). They described a study by Brown, et al (2004) that surveyed 36 allied health care providers and found that one third of respondents were unaware of the issues regarding health literacy, including the impact of inadequate health literacy on patient care, and also had no knowledge of health literacy resources.

Schillinger et al. (2003) found that clinicians and rarely assessed diabetic patients’ understanding of their treatment recall and their comprehension of new concepts. The authors called for greater attention to the patient-physician exchange during clinical encounters. Schwartzberg, et al. (2007) surveyed physicians, nurses and pharmacists and also found that the providers were using health literacy strategies but they were not routinely integrated into their clinical practice. Providers may also be aware of health literacy, but may not have the tools to work effectively with patients with low health literacy.

The above findings are also supported by a study done in New Zealand, Canada and Australia, which looked at the impact of literacy on the patient-health relationships and health professionals' understanding of health literacy. A qualitative study by Lambert, et al. (2014) evaluated doctors, nurses, a service manager and a receptionist on their understanding of health literacy, perceptions of barriers facing patients and strategies used to build patient health literacy. Interestingly, the themes that emerged was provider unfamiliarity with the term health literacy, and an alignment of health literacy as being patient issues such as inadequate reading, writing, and navigating. Therefore, this study also suggests that health professionals lack the knowledge
and awareness of health literacy and the consequences in patient outcomes (Lambert et al., 2014).

Zanchetta, et al. (2012) has reported on the QSEN attributes of knowledge, attitudes and health literacy behaviors of undergraduate nursing students in the clinical settings. The results of this qualitative study that included interviews and focus groups showed that the students’ competence in health literacy was hindered by the clinical settings being unsupportive of patient health education and insufficient theoretical preparation for effective patient education.

All of these studies (Cormier & Kotrlik (2009); Cafiero, 2012; Lambert, et al., (2014), Zanchetta, et al.,(2013) and Scott (2016) point to the need for all health professions educators to rethink how health literacy and if, health literacy is being taught in the curricula. In Zanchetta’s study (2013) students expressed concerns about a lack of support for patient education in the clinical environment as well as a lack of educational preparation for providing patient teaching, they recommended adding this topic to the nursing curriculum.

Studies by Dickens, Lambert, Cromwell and Piano (2013) and Schlichting et al. (2007) recognize that effective patient education and communication are integral to nursing and medicine. Dickens, et al. (2013) report that the skills to assess and address low health literacy are being taught, but not correctly and without long-term evaluation, which is resulting in an overestimation of patients’ health literacy that may affect teaching strategies, hospital readmission rates, and patient outcomes. Schlichting et al. (2007) studied provider perception of limited health literacy in community settings. Results show that 96% of the providers, both nurse practitioners and physicians used a simple question such as: “Do you understand the instructions” or “Do you have any questions”, both closed-end type of questions. Yet, almost every provider reported using at least one technique to help patients with low health literacy,
despite 78% of the providers reporting no formal health literacy education or training. These respondents reported that the top five perceived barriers to having health literacy programs in their facilities were: lack of time to screen patients, health literacy being a low priority, lack of money, lack of time to implement a health literacy program and lack of knowledge about health literacy. The implications of these studies are that best practice health literacy training and interventions should be incorporated into healthcare education.

This section has provided the data to support the need for undergraduate nursing students to attain the health literacy knowledge, skills and attitudes to fulfill the Institute of Medicine and the Quality Safe Education for Nurses initiatives for patient-centered and safe care.

**Independent Variables**

Health Literacy in Nursing Education

Patient education has been recognized as an important role of professional nurse, yet nurses are often not prepared or knowledgeable about assessing health literacy and adapting patient education to meet the individual needs of the patient in the nurse’s care (Coleman, 2011; Bastable, 2008). Most of the literature has focused on the patient, with relatively little emphasis on the communication skills of the providers, including nurses.

Speros (2011) makes a case for nurses to address the epidemic of low health literacy in the United States. Today’s professional nurse must learn and believe that telling is not teaching, and that one cannot assume that all patients understand what is taught to them. She offers simple strategies to promote health literacy and provide clear purposeful, patient-centered communication. These strategies include using health literacy Universal Precautions, having
nurses communicate with every patient as if the patient has difficulty understanding and to avoid medical jargon.

Over the past two decades, there has been a growing awareness in the healthcare community that health literacy has a significant impact on health promotion, disease prevention and patient outcomes in the United States (IOM, 2011). To ensure meeting the needs of patients, future health care professionals and those currently in practice must have health literacy competencies (Cotugna & Vickery, 2003). These findings were also supported by DeCaro, et al. (2015) who completed a narrative review of health literacy and its importance for nursing. The results showed that although the concept of health literacy is well disseminated, nurses pay little attention to the topic because of the lack of awareness of the effect of health literacy on patient outcomes. They conclude that educational modules should be developed and incorporated into nursing education and the necessary tools made available for consumers to improve their health.

The health care system in the United States is undergoing radical changes due to the Affordable Care Act, changing economics and demographics and the integration of technology, such as the electronic health records. The U.S. health care system has been described as complex, confusing and disjointed (Paasche-Orlow & Wolf, 2007) and research has shown that adequate health literacy is a basic, important component of quality healthcare and management of disease (Heinrich, 2012). It has been proven that the United States healthcare system provides some of the world’s best health care but is also known as the world’s costliest healthcare system, and yet Americans experience poorer healthcare outcomes when compared to people in other developed countries (Chernichovsky & Liebowitz, 2010).

The practice of nursing is also being affected in that nurses must be prepared to work effectively in the changing healthcare environment. These facts denote implications for nursing
educators to prepare competent, caring and safe practitioners to achieve optimum health outcomes for their patients. The nurse is commonly aware of the educational needs of patients, but they may not have the knowledge (education), skills and awareness of what health literacy is and how it impacts effective nurse-patient communication. Empowering future nurses with the tools needed to assess and address health literacy with the completion of a health literacy education module may fill the health literacy knowledge, skills and attitude gap in the nursing profession Torres & Nichols (2014) & Scott (2016).

Coleman (2011) conducted an extensive review of the literature of the health education programs for health care professionals, but he found that there was minimal evaluation of the curricula, and none at all for nursing. Additionally, he found that all of the health professions are developing health literacy curricula, but the nursing literature does not report integration of health literacy into curricula. Coleman (2011) notes nursing literature continues to report the lack of health literacy knowledge, skills and attitudes in nurses, but little research has been done to show actual implementation and evaluation of health literacy education in nursing. Coleman (2011) was able to determine the state of the field of health literacy education from this research and concluded that health literacy is not being adequately addressed in healthcare education. Coleman suggests that health professions’ curricula include evidence-based tools to be used in patient teaching. A study by Hazzard, Dabrow, Celano, McFadden-Garden & Melhado et al. (2000) used a quasi-experimental approach with pediatric residents. Pre and post-test design study showed a statistically significant improvement in the residents’ health literacy knowledge, skills, and attitudes. The study was replicated with medical students with similar results. Even more significant, a follow-up assessment showed that the residents reported significant improvement in their health literacy knowledge, skills, and awareness in their patients.
Numerous studies have been done that have focused on the health literacy knowledge of nursing students in both associate and baccalaureate degree programs (Sand-Jecklin, Murray, Summers and Watson, 2010; DeSilets & Dickerson, 2009; Speros, 2009; and Torres & Nichols, 2014). Vernon et al. (2007) and Pawlak, (2005) found that other healthcare professionals also have not been adequately educated in identifying and communicating with patients with low health literacy levels. To date, much of the research on health literacy has focused on assessing the patient’s skills and their ability to understand health information. There has not been as much focus on the teaching methods, the quality of the health teaching programs and the competencies (KSAs) of the providers in teaching effectively. It is known that nurses play a key role in the education of their patients, but is enough being done in the classroom to prepare nurses to provide effective nurse-patient communication and teaching. That is why health literacy needs to be integrated into all nursing curricula (Cormier & Kotrlik, 2009; McCleary-Jones, 2012; Sand-Jecklin et al., 2010; Torres & Nichols, 2014; Zanchetta et al., 2013).

The aim of Scott’s (2016) study was to determine the prevalence of health literacy education in nursing programs. She is the first to explore health literacy content and teaching strategies on a national level in 57 nursing programs. Scott’s descriptive study used the Health Literacy Survey developed by Coleman (2011). It had been developed to obtain information on how health literacy was being taught in medical schools and was modified for nursing for this study. Results showed that 63% of the participants had health literacy in the curricula which is consistent with the National Plan to Improve Health Literacy, and that almost two thirds of the respondents wanted to see more health literacy training in their programs. Scott supports the earlier recommendations of Torres & Nichols (2014) that nursing students should learn about health literacy before rather than after they have graduated.
Scheckel, Emery and Nosek (2010) used an interpretive phenomenological approach to describe undergraduate nursing students’ experiences of learning and providing patient education. This study showed that the eight students interviewed did possess health literacy competencies but suggested that educators design better tactics for health literacy in the classroom. Similar findings were reported in a qualitative study by Zanchetta, et al. (2013) in that the students were competent as health promoters in teaching hospitals but were not as successful in settings that did not support health education. These students also recommended more theoretical and experiential learning activities to empower them to be effective health educators in the clinical settings.

Shieh, Belcher & Haberman (2013) analyzed 59 narratives written by undergraduate nursing students describing their experiences caring for patients with low health literacy. The authors report that the students were able to identify cues that implied low health literacy and were also able to promote patient understanding by using basic tools: simplifying language, teach-back and giving written information. The students were not proficient in using health literacy assessment tools, assessing the readability of written materials which may be useful in developing patient-centered teaching plans. Suggestions were to integrate health literacy into patient education in the nursing curricula.

Sand-Jecklin, et al. (2014) describe how they incorporated health literacy material into their nursing curriculum and the evaluation process of the impact of the teaching. The post analysis showed a significant increase in the students’ (n=103) knowledge and ability to apply these concepts into clinical practice. They concluded that health literacy education (HLE) should be threaded throughout the nursing curriculum, and even a short educational session could have an impact on the students. The authors listed best practice tools that have been developed and

The literature reveals the lack of knowledge among undergraduate and practicing nurses on health literacy and the importance of assessing, planning and implementing patient teaching (Sand-Jecklin, et al. (2014), Cormier & Kotrlik, (2009).

One of the QSEN competencies is interprofessional collaboration and improving health literacy is a common goal among the professions. Any provider that has contact with a patient should be cognizant of the health literacy needs. For example, Cotugna & Vickery (2003) designed a unique health literacy module for their nutrition students. The students were to develop the teaching plan for the module and they used active learning strategies such as role playing, evaluating reading materials, assessing written materials and strategies for enhancing communication. The feedback was very positive, with the students saying that by teaching others about health literacy, they learned even more.

There have been numerous studies of health literacy training programs in the different disciplines, such as medicine, pharmacy and pediatrics. Rosenthal, Werner and Dubin (2004) and Hazzard, et al. (2000) conducted studies in residency health literacy training programs. Literacy promotion program improved the residents’ self- reported literacy knowledge, positive attitudes and practices and resulting in improved communication with the children and the parents. Training in this area increased the likelihood of the residents addressing literacy issues.

Coleman, Nguyen, Garvin, Sou & Carney (2016) did the first national survey of health literacy teaching in U.S. family residency programs (n=138). The study results revealed that that healthcare professionals lack adequate health literacy assessment skills and knowledge even though health literacy is a national priority. Although general guidelines and content suggestions
exist to develop the knowledge, skills and attitude competencies of healthcare providers, this survey showed that residency programs will need to develop curricula to address health literacy. The participants overwhelmingly agreed that better health literacy training would be helpful. Coleman, et al. (2016) suggest that faculty health literacy workshops, role playing for skills development and direct clinical observation for assessing effective and clear communication could be integrated into the curriculum. Devraj, Butler, Gupchup & Poirier, (2010) created various active-learning strategies, such as role playing patient counseling sessions and rating the readability of drug information to develop health literacy knowledge and skills in a cultural competency, health literacy and health belief pharmacy course. The students reported increased confidence in their ability to assess and care for patients with low health literacy. Nursing could borrow from these findings and apply some of these strategies to its curricula.

One interesting study looked at the impact of a faculty train-the-trainer model for health literacy training (Evans, et al., 2014). Faculty participants from 11 disciplines, including nursing attended a week long program that included the core competencies of HLE with the goal of improving health care professionals’ competence in the teaching of health literacy. The training had positive results in the participants reported self-confidence and knowledge, skills and attitudes. The important takeaway for nursing faculty is that faculty training programs and workshops in health literacy may be beneficial to those who are going to develop learning modules for nursing students and practicing nurses.

Coleman, Hudson and Maine (2013) have developed a list of health literacy practices and a set of measurable educational competencies for health care professionals. Coleman et al. (2013) have done extensive research in the area of health literacy and have been instrumental in identifying the key health literacy educational competencies to increase and improve education
for health care professionals. Despite all of the initiatives promoting health literacy there are still no widely accepted guidelines for content or structure for health education. Coleman, et al. (2013) invited members of the Federation of Associations of Schools of the Health Professions (FASHP) to participate in a Delphi study on health literacy. Nursing had two representatives in the study. The hope is that the results of the study can be used to develop a standardized common core course to teach health professionals and health educators about health literacy.

**Chapter Summary**

A review of the literature reveals a void in the current approach to educating all pre-licensure nursing students on health literacy assessments and interventions. Previous studies have mainly assessed nursing students, nurses and nurse practitioners knowledge, skills and perceptions of health literacy. There is a wealth of data supporting the need for nursing education to include health literacy in the curricula. National organizations such as the Institute of Medicine, the American Medical Association, the Quality and Safe Education for Nursing Institute (QSEN), the Joint Commission and the National Action Plan to Improve Health Literacy are the driving forces behind improving health literacy competencies in all healthcare professions.

Just as nurses follow standard precautions for blood-borne diseases, health care providers could adopt universal precautions for health literacy. This study hopes to build on previous nursing studies, research and the national initiatives to begin to fill the void in nursing education and to give future nurses the tools to make every patient encounter a meaningful teaching moment.
Chapter 3

Methodology

Introduction

The purpose of this study is to assess the health literacy knowledge, skills and attitudes in pre-licensure baccalaureate nursing students using a pretest/post-test to measure the effectiveness of the Borrero Health Literacy Education Module (HeLM). The study of what nursing students know about health literacy and its connection to patient outcomes may guide future practicing nurses to using health literacy skills in every patient encounter. This chapter will present the methodology, research design, selection of participants, the instrument used, description of the Borrero HeLM and data collection procedures and analysis.

Research Design

This was a quasi-experimental pre & post-test study that will analyze the data in order to determine the effectiveness of a health literacy education module for pre-licensure nursing students. The data was collected and measured through the use of the Health Literacy Knowledge and Experience Survey, Part I and 2, developed by Catherine Cormier, (2006). A sample size of 180 has been calculated through the use of G* Power. Demographic data was collected from all participants and included age, gender and educational preparation.

Before conducting the full scale study, a pilot study was performed using a sample of 10 volunteer participants who met the criteria for inclusion. The purpose of the pilot study was to test the tools and the Borrero HeLM and to assure the appropriateness and quality of both. It also provided data for the need to refine to module to fit a different time frame. The researcher was able to complete the module within a one session, two hour time frame which allowed for a 100% retention rate.
**Selection of Participants**

The target populations for the study were pre-licensure baccalaureate nursing students currently in an undergraduate registered nurse program. Parameters for inclusion of voluntary participants were: Pre-licensure nursing students in a baccalaureate nursing program, male and female genders, and no age limitations, ability to speak and read English without need of interpreter services and agreement to attend a two hour educational session presented by the researcher. The participants needed to be enrolled in a clinical nursing course, where they may be engaged in patient communication and education. Nursing students were invited to participate in the study via an introductory and notification letter to the school of nursing administrator of a metropolitan New York baccalaureate nursing program. After receiving permission to proceed with the study by the administrator, the researcher asked for the contact information of faculty teaching clinical nursing courses to arrange meeting times with the students.

Participation in the study was voluntary, with an incentive of an Amazon gift card raffle prize for each group of participants who completed the education session and the pre and post intervention survey instruments. All participants also received a certificate of completion of the Borrero HeLM education module.

**Instruments**

The Health Literacy Knowledge and Experience Survey (HL-KES) was created by Cormier (2006) for her doctoral dissertation study entitled Health Literacy: The Knowledge and Experiences of Senior Level Baccalaureate Nursing Students (Appendix A). Content validity index (CVI) rating of the survey was reported as .98 compared with a CVI standard of .80 (Davis, 1992). These results indicate that there was 98% agreement among content experts on the content validity of the instrument. There are three sections included in the instrument: health
literacy knowledge and health literacy experiences, the third section collecting demographic data has been modified to reflect the population used in this study (Appendix B). Permission has been obtained from Dr. Cormier to use the HL-KES in this study (Appendix C).

To date, the Cormier HL-KES has been used in five studies, including the original study by Cormier (2006). Knight (2011) used the HL-KES instrument in her dissertation study to evaluate the health literacy knowledge and experience of registered nurses in Georgia. Cafiero (2012) used the instrument in her dissertation study of nurse practitioners' knowledge, experience, and intention to use health literacy strategies in practice. Hartman (2014) also used the HL-KES survey instrument in her dissertation that studied patient education nursing skills in senior level baccalaureate nursing students. Torres and Nichols (2014) adapted the HL-KES for use in an associate degree nursing program and found the Cronbach’s alpha = .82, an acceptable range.

The reported reliability for the HL-KES was found to be adequate in the studies with an average Cronbach’s alpha of 0.81. Part 1 of the HL-KES consists of 29 multiple choice questions in the following content areas: guidelines for presenting written healthcare information, basic facts on health literacy, health literacy screening, consequences associated with low health literacy and evaluating the effectiveness of healthcare information. Cognitive levels for the development of the questions were based on Bloom’s Cognitive Levels (Nilson, 1998) of knowledge, comprehension, and application. Part 2 of the HL-KES was designed to gather information related to the health literacy experiences of senior level nursing students. The nine questions relate to the participant’s experiences in conducting health literacy screenings and giving healthcare information. A four-point Likert-type scale was developed for this section.
Part 3 collects the demographic data of the participants: gender, age, ethnicity, prior educational experiences, certifications, grade point average and the frequency of interaction with healthcare providers for their personal healthcare needs or the healthcare needs of a significant other.

A thorough review of previously published studies revealed no other validated instruments measuring the variables of interest. Thus, the decision was made to use the HLKES Parts I and II in this study.

**Borrero HeLM**

The Borrero health literacy education module (HeLM) has been developed based on Knowles’ Adult Learning Theory and the QSEN competencies in nursing education. The learning objectives reflect the QSEN competencies: Knowledge, Skills and Attitudes. The education module consists of two components which include a PowerPoint format and active learning strategies. The didactic information is primarily in part 1, and part 2 contains active learning strategies, building a health literacy “toolkit” and participation in scenarios and return demonstrations. The evidence-based “tools” have been obtained from sources such as the CDC, AHRQ, and the IOM. The module was presented over a two hour time span.

The Borrero HeLM was reviewed by two content and education experts in the field of health literacy and nursing education. It was distributed to the reviewers with an evidence-based feedback form developed by the researcher (Billings & Halstead, 2016; Caputi, 2010).

Additionally, a pilot study was conducted with a group (n=10) of baccalaureate nursing students enrolled in a school of nursing with the approval of the school’s administrator.
Data Collection

The researcher contacted the administrator of the college named in the IRB application. The researcher was invited to attend a faculty meeting to distribute a recruitment flyer (Appendix D). The researcher was then invited into various nursing classes to distribute the flyers and to schedule dates and times that would accommodate the participants. The participants were each given a packet that included a consent form (Appendix E), a demographic data sheet, and two copies of the HL-KES part 1 (labeled pre and post tests), one copy of the HL-KES part 2, the HeLM PowerPoint handouts and a blank certificate of completion. During the scheduled session, the participants completed complete the HL-KES as a pre-test (approximately 15-20 minutes) and then were introduced to the Borrero HeLM module. During the second half of the presentation, the students participated in active learning strategies that enabled them to build their own health literacy “tool kit” to use in future patient encounters. Upon completion of these learning activities, the students completed the HL-KES as a post-test, and they received a certificate of completion for their records and a raffle ticket for an Amazon gift card.

Data Analysis

Internal Consistency and Construct Validity of HL-KES

The internal consistency of the 29 multiple-choice questions assessing knowledge was tested with Cronbach’s alpha statistic. If the test generated an alpha coefficient in the low or moderate range, I would have used exploratory factor analysis (or alternatively, principal components analysis) to investigate the presence of multiple domains within the larger construct. Previous research has approached the HL-KES in a similar manner. In the original study of the development of the HL-KES (Cormier, 2006), the content validity index was 0.98 which
indicates 98% agreement among the content experts on the content validity of the HL-KES, Part I. The nine-item Health Literacy Experience Scale possessed exemplary reliability (α = 0.82) and explained 42.11% of the variance. According to Robinson et al. (1990) subscales of Parts I & II demonstrated extensive reliability with Cronbach’s alpha results of 0.79 and 0.76. (Cormier & Kotrlik, 2009).

Univariate Statistical Analysis

Means (of continuous variables) and proportions (of categorical variables) were generated and are presented. Univariate statistics are presented for the study’s outcome (HL-KES) and all potential covariates (demographic variables).

Bivariate Analysis

Pre-post testing was performed with analysis of variance techniques. Traditional ANOVA models and bivariate regression models were fitted. Gain scores (raw differences in the HL-KES outcomes) were treated as the outcome of interest, with the assumption (null hypothesis) of zero gain associated with exploring the Borrero HeLM model.

Multivariable Analysis

Multivariate models were built to adjust for the presence of covariance (i.e., to correct post-test HL-KES means for pre-test differences among observed groupings). Both ANCOVA and multiple regression models were explored. An iterative procedure was employed to eliminate variables that were not contributing to explained variance. More specifically, a fully specified model—with all covariates controlled—was estimated first and individual-variable t-tests were generated and analyzed. Variables that were not significantly associated were removed from the analysis individual, according to their relative level of significance. Model goodness of fit (R-square) was evaluated after each elimination of an explanatory variable. This procedure
continued until all non-significant variables were removed from the fitted models. Nevertheless, model parsimony was weighed against theoretical justification for inclusion of a particular variable.

Statistical Correction for Clustering

The analysis of data that are clustered at the college level requires correction for inter-subject correlation. In my study, inter-subject correlation arose because the HL-KES responses of individuals within a college are assumed to be correlated, which violates the statistical assumption of independence. The statistical models were adjusted for correlation of observations at the college level.

Assumption of Normality: HL-KES

Tests of normality of HL-KES residuals were also conducted. If the residuals were highly skewed, the analysis of variance techniques was also be performed with non-parametric procedures that account for the shape of the residuals’ distribution. SPSS and SAS include several procedures that accommodate non-normal, clustered data.

Chapter Summary

The research methodology was presented in Chapter 3. The sample population and inclusion criteria are detailed. The HL-KES instrument that was used to measure health literacy knowledge, skills and attitudes of pre-licensure nursing students was presented, together with the reliability and validity of the tool. Description of the Borrero HeLM and the process for content validity by experts has been given. The pilot study process has also been discussed. I have also presented the data collection and analysis process that were used. The statistical results of the study will be discussed in chapter 4.
Chapter 4

Results

The purpose of this study was to assess the health literacy knowledge, skills and attitudes in pre-licensure baccalaureate nursing students using a pretest/post-test to measure the effectiveness of the Borrero Health Literacy Education Module (HeLM). The study of what nursing students know about health literacy and its connection to patient outcomes may guide future practicing nurses to use health literacy skills in every patient encounter. The results of this study may also support curriculum changes in pre-licensure nursing programs, as research has shown that effective patient teaching and retention will lead to better patient outcomes. Nurses who are better prepared to provide effective patient education may have a positive effect on patient outcomes.

Data collection took place in the spring 2017 semester. This chapter reports the finding of the pilot and the larger study and presents the statistical test results of both. It includes a psychometric analysis of the Health Literacy Knowledge and Experience Survey (HL-KES) Parts 1 & 2, a description of the Borrero HeLM education module and characteristics of the study sample. During this time a total of 190 pre-licensure baccalaureate students consented to participate in the study. The chapter presents the empirical data to address the research question and then provides an analysis and discussion of the findings of the research question. SPSS statistical software was used to analyze the data in both the pilot study and the larger study.

Pilot Study and Data Analysis

The pilot study was conducted with a group of pre-licensure baccalaureate students (n=10) who consented to participate in the study. The purpose of the pilot study was to conduct a trial run of the study to assess and refine any modifications needed to be made. At the
conclusion of the pilot, it was determined that the larger study could be conducted in a one session two hour time frame. The pilot study was successful in that there were minimal changes to refine it. The education module included a PowerPoint presentation, imbedded YouTube videos and active learning components. The module was completed in a two hour time-frame, instead of the original plan to run the study over two separate occasions. This allowed for 100% retention of the students who began the study.

The students for the pilot study (n=10) were recruited as a random convenience group sample of nursing students at a local university and all met the inclusion criteria. The students signed the consent form, completed a pretest, attended the education module and completed the post-test. The student population for the pilot was all female, and fifty percent were minority students: Black, Asian and other. The education module was scheduled over a two-hour period, which was enough time to complete all three components of the study. After the post-tests were completed, the students received a certificate of completion and a chance to win an Amazon gift certificate.

The pilot data were analyzed with correlation analysis to determine whether there was sufficient variation in participant responses to knowledge items on: (a) the pre-test; and (b) from pretest to posttest. Lack of variation (i.e. exceedingly high correlation) at the pre-test could signal that a HeLM question was either too easy or too difficult, and should therefore be modified for the final experiment. Lack of variation across the two measurements could suggest a null effect of the intervention, either because the module did not address a particular knowledge gap or because a limited knowledge gap was present at the baseline (pre-test). The results indicated sufficient variation (i.e. statistically reasonable correlation) at both pretest and
Psychometric Analysis of the HL-KES Parts 1 & 2

The Health Literacy Knowledge and Experience Survey Parts 1 & 2 were developed by Dr. Catherine Cormier (2006) as part of her dissertation on health literacy to assess the knowledge and experiences of senior level baccalaureate nursing students. Permission was obtained from Dr. Cormier to use the HL-KES for this study (Appendix F). Dr. Cormier developed 29 questions for Part 1 in five content areas: guidelines for presenting written healthcare information (11 items), basic facts on health literacy (6 items), health literacy screening (6 items), consequences associated with low health literacy (4 items) and evaluating the effectiveness of healthcare information (2 items). She also categorized the 29 items according to three of Bloom’s cognitive levels: knowledge, comprehension and application. Part 2 of the HL-KES included nine Likert style questions to gather information on the students’ health literacy experiences.

Five content experts evaluated the HL-KES instrument for content validity. The content validity index (CVI) represents the agreement that the expert panel has on the content of the items of an instrument being reviewed. It guides tool construction and relevancy of the items to the concept being studied. The panel of content experts gave the HL-KES an overall CVI of .98, which is above the recommended .80 (Polit & Beck, 2006).

Description of the Borrero HeLM (Health Literacy Module) Education Module

The researcher developed the Borrero HeLM education module based on the review of the literature and a realization of the gap in nursing education and the need for this study to address the lack of integrating health literacy in patient education. Since the beginning of this
research process, there continues to be little or no standardization of health literacy teaching in the curriculum. The research study suggests that the use of the Borrero HeLM will result in a significant statistical difference in the knowledge, attitudes and skills of nursing students and can be used in nursing curriculums. The objectives correlate with the questions of the HL-KES instrument.

The learning objectives of the Borrero HeLM Education Module are:

1. To identify and describe key elements of health literacy.
2. Explain and discuss the importance of nurses having health literacy knowledge, skills and attitudes.
3. To examine factors that influence a patient’s health literacy.
4. To investigate the effects of effective and ineffective patient communication and teaching.
5. To examine and hypothesize the role of health literacy in patient outcomes.
6. To list various tools that impact a nurse’s health literacy knowledge, skills and attitudes.

The study was organized in the following manner. A recruitment flyer was distributed to multiple nursing classes (Appendix D). Presentation times were scheduled based on the student availability. Inclusion criteria were met based on discussion of course syllabi with instructors. Smart classrooms were made available for the researcher. Study packets included consent form, pre & post-tests, demographic data sheet, PowerPoint presentations and certificate of completion. The HL-KES was administered as both a pre and a post-test to the nursing students. It took approximately 15-20 minutes to complete each test. The researcher implemented all of the education modules for each session. Group sizes ranged from 6- 30 students per session,
dependent upon student availability and class schedules. The PowerPoint presentation consisted of 2 parts. Part 1 included the knowledge and awareness components and Part 2 consisted of the skills components: active learning strategies, building health literacy “toolkit” and group participation activities. After the post test was completed, the students received a certificate of completion and a raffle ticket for an Amazon gift certificate. The duration of the entire presentation was approximately two hours, with the larger groups the researcher enlisted the assistance of her son and colleague to collect and sort the pre/posttests.

Final Data Collection

The larger study was conducted in the spring of 2017. The data collected by means of pre- and post-test questionnaires were analyzed to answer the following research questions:

1. What knowledge, skills and attitudes do pre-licensure baccalaureate nursing students have of health literacy?

2. What is the effect of a health literacy education module (HeLM) on the health literacy knowledge, skills and attitudes of pre-licensure baccalaureate nursing students?

This chapter will present the demographic descriptions of the participants, the statistical analysis of the data and the major findings based upon the data and the above research questions.

Characteristics of the Sample

The data from the pre and posttest questionnaires and the Borrero HeLM intervention were gathered from pre-licensure baccalaureate nursing students in three different programs in the New York City and Long Island areas. The students were all enrolled in clinical nursing courses at the time of the study.

The demographics of the student population are described below. There were 142 female participant and 38 male participants in the study which is consistent with regional trends in
nursing education (National League for Nursing, 2014). Table 4.1 presents the number of males and females in the intervention group.

Table 4.1 Gender

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th></th>
<th>Male</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td></td>
<td></td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>Percent</td>
<td>78.9%</td>
<td></td>
<td>Percent</td>
<td>21.1%</td>
</tr>
<tr>
<td>142</td>
<td></td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The participants were asked to write in their age in years. Therefore, age was a continuous variable; the mean was 25.0 with a standard deviation of 7.1.

In Table 4.2 the prior educational experience demographics are presented. Of the 180 students, 114 students had completed high school, 62 students had at least one undergraduate degree before entering nursing school and 4 students had at least one master’s degree before entering the nursing program.

Table 4.2 Prior educational experience

<table>
<thead>
<tr>
<th>Education prior to nursing school</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School</td>
<td>114</td>
<td>63.3%</td>
</tr>
<tr>
<td>Undergraduate degree</td>
<td>62</td>
<td>34.4%</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>4</td>
<td>2.2%</td>
</tr>
</tbody>
</table>
Table 4.3 presents the distribution of race among the study participants. There were 17 students who identified themselves as Asian, 47 identified as Black or African American, 78 students identified as White. A number of students (19) identified themselves as belonging to more than one race and 19 students reported their race as other.

Table 4.3 Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>17</td>
<td>9.4%</td>
</tr>
<tr>
<td>Black/African American</td>
<td>47</td>
<td>26.1%</td>
</tr>
<tr>
<td>White</td>
<td>78</td>
<td>43.3%</td>
</tr>
<tr>
<td>Multi-race</td>
<td>19</td>
<td>10.6%</td>
</tr>
<tr>
<td>Other race</td>
<td>19</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

Table 4.4 presents the responses to the following question on the demographic data sheet.

How often do you interact with healthcare providers (HCP) for your own personal health care needs or the healthcare needs of a significant other?
Table 4.4 Interactions with Healthcare Provider (HCP)

<table>
<thead>
<tr>
<th>Interacts with HCP</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than once a year</td>
<td>107</td>
<td>59.4%</td>
</tr>
<tr>
<td>Once a year or fewer</td>
<td>73</td>
<td>40.6%</td>
</tr>
</tbody>
</table>

Research Question One

What knowledge, skills and attitudes do pre-licensure baccalaureate nursing students have of health literacy?

Research question one investigated the responses of the pre-licensure nursing students based on the pretests. Table 4.5 presents the results of Part 1 of the HL-KES pretest responses of all student participants (n=180).

The HL-KES Part 1 questions can be categorized into 5 content areas (Table 4.5).

Table 4.5 Content Areas of HL-KES Part 1

<table>
<thead>
<tr>
<th>Content Area</th>
<th># of Questions</th>
<th>Question #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Facts on Health Literacy</td>
<td>6</td>
<td>1,2,3,4,5,17</td>
</tr>
<tr>
<td>Guidelines for Written Materials</td>
<td>11</td>
<td>18,19, 20, 21, 22, 23, 24, 25, 26, 27, 28</td>
</tr>
<tr>
<td>Consequences Associated with Low Health Literacy</td>
<td>4</td>
<td>6,7,8,9</td>
</tr>
<tr>
<td>Health Literacy Screening</td>
<td>6</td>
<td>10, 11, 12, 13, 14, 15</td>
</tr>
<tr>
<td>Evaluation of Health Literacy Interventions</td>
<td>2</td>
<td>16,29</td>
</tr>
</tbody>
</table>
Table 4.6 Frequency and Percentages of Correct Responses to Items in HL-KES Part 1 Pretest

<table>
<thead>
<tr>
<th>Question</th>
<th>Content Area</th>
<th>Number Correct</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Basic Facts on Health Literacy</td>
<td>85</td>
<td>47.2%</td>
</tr>
<tr>
<td>2</td>
<td>Basic Facts on Health Literacy</td>
<td>122</td>
<td>67.8%</td>
</tr>
<tr>
<td>3</td>
<td>Basic Facts on Health Literacy</td>
<td>87</td>
<td>48.3%</td>
</tr>
<tr>
<td>4</td>
<td>Basic Facts on Health Literacy</td>
<td>114</td>
<td>63.3%</td>
</tr>
<tr>
<td>5</td>
<td>Basic Facts on Health Literacy</td>
<td>34</td>
<td>18.9%</td>
</tr>
<tr>
<td>6</td>
<td>Consequences Associated with Low Health Literacy</td>
<td>148</td>
<td>82.2%</td>
</tr>
<tr>
<td>7</td>
<td>Consequences Associated with Low Health Literacy</td>
<td>90</td>
<td>50.0%</td>
</tr>
<tr>
<td>8</td>
<td>Consequences Associated with Low Health Literacy</td>
<td>115</td>
<td>63.9%</td>
</tr>
<tr>
<td>9</td>
<td>Consequences Associated with Low Health Literacy</td>
<td>139</td>
<td>77.2%</td>
</tr>
<tr>
<td>10</td>
<td>Health Literacy Screening</td>
<td>76</td>
<td>42.2%</td>
</tr>
<tr>
<td>11</td>
<td>Health Literacy Screening</td>
<td>153</td>
<td>85.0%</td>
</tr>
<tr>
<td>12</td>
<td>Health Literacy Screening</td>
<td>94</td>
<td>52.2%</td>
</tr>
<tr>
<td>13</td>
<td>Health Literacy Screening</td>
<td>31</td>
<td>17.2%</td>
</tr>
<tr>
<td>14</td>
<td>Health Literacy Screening</td>
<td>106</td>
<td>58.9%</td>
</tr>
<tr>
<td>15</td>
<td>Health Literacy Screening</td>
<td>161</td>
<td>89.4%</td>
</tr>
<tr>
<td>16</td>
<td>Evaluation of Health Literacy Interventions</td>
<td>149</td>
<td>82.8%</td>
</tr>
<tr>
<td>17</td>
<td>Basic Facts on Health Literacy</td>
<td>120</td>
<td>66.7%</td>
</tr>
<tr>
<td>18</td>
<td>Guidelines for Written Materials</td>
<td>111</td>
<td>61.7%</td>
</tr>
<tr>
<td>19</td>
<td>Guidelines for Written Materials</td>
<td>75</td>
<td>41.67%</td>
</tr>
<tr>
<td>20</td>
<td>Guidelines for Written Materials</td>
<td>82</td>
<td>45.6%</td>
</tr>
<tr>
<td>21</td>
<td>Guidelines for Written Materials</td>
<td>56</td>
<td>31.1%</td>
</tr>
</tbody>
</table>
Table 4.6 presents the number and percentages of students who answered the pre-test questions correctly. The table also identifies which category each question belonged to. In the items asking about basic facts on health literacy, 32.2% of the students did not know that low health literacy levels are common among all ethnic groups and only 47.2% knew that low health literacy levels are most prevalent in the 65 years of age and older groups. Only 48.3% of the students knew that most individuals read three to five grade levels lower than the last year of school completed. Over 35% of the students did not think that a nurse would encounter a patient with low literacy skills while working in a public health clinic serving primarily low income minority patients. On identifying literacy as the best predictor of healthcare status, only 18.9% answered this correctly. The majority of the students chose socioeconomic status and educational levels which were incorrect. Although 66.7% of the students knew that individuals with functional health literacy would be able to read, comprehend and actively participate in decisions concerning health care, one third of the participants chose only reading and comprehension as components of being health literate.
There were 11 items in the content area of guidelines for written materials. Students responded most correctly in the questions that pertained to developing the written materials, such as including illustrations (61.7%) and presenting the information in the form of a conversation (86.7%). The majority of the students (64.4%) were unaware on how to develop culturally appropriate materials. The participants were unfamiliar with both the Fry Method for calculating word difficulty, only 31% answered this correctly and the recommended 5th grade reading level for healthcare information, correct responses at 41.67%. Over 55% of the students did not answer that finding out what the audience needs to know is the first step in developing written healthcare materials. This points toward the need to stress patient centered care in the curriculum. A majority of the students (61.1%) did not know that healthcare information should include only three or four main ideas about a disease and not all treatment options, detailed descriptions and statistics of the disease. This question tied in to another question regarding number of side effects the oncology nurse should list for a patient, 62.8% of the students correctly identified the answer as 5-6 items. In addition, only 54.4% chose the most effective wording for a heading on a brochure for hypertension. Yet, 80% of the students were correct in using the term ‘blood sugar” when giving instructions to a patient with low health literacy skills. The students (43.3%) were able to identify methods of actively engaging patients in learning such as including short answer questions and pictures in written healthcare materials, and planning a question and answer session after a learning activity.

There were four questions in the consequences associated with low health literacy content area. The students performed well in this area, 82.2% understood that low health literacy skills could lead to later diagnoses and fewer treatment options than patients with adequate health skills. The students (77.2%) recognized that people with low health literacy skills have difficulty
applying healthcare information to their health situations. They also could identify those persons with low health literacy skills may pretend to read information given to them by healthcare providers (63.9%) and will have a lack of participation in preventative healthcare (50%).

In the content area of health literacy screening tools, 42.2% of the students were familiar with the rapid Estimate of Adult Literacy in Medicine (REALM) instrument and only 17.2% knew that the test of Functional Health Literacy assesses the reading comprehension and numerical skills of an individual. Students (58.9%) were able to recognize that the strongest advantage to conducting health literacy screening will help nurses provide more effective patient teaching. There were two items that were related to therapeutic communication and the students performed very well (89.4%) on the statement that supports the best approach to initiating a health literacy screening and (50%) of the students were able to choose the correct statement that reflects the best estimate of reading skills of the patient, which is to have the patient read the label on a medication bottle. Nevertheless, 85% of the students were able to pick out the subtle cue that a patient with low health literacy skills may not admit to difficulty reading.

Evaluation of health literacy interventions included two items. The students (82.8%) were proficient in identifying a clue that the patient may not be able to read the materials and 67.2% of the students were able to choose using the teach-back method to determine how well a patient with low health literacy skills understands healthcare information.

The pretest included the HL-KES Part 2, which consisted of nine questions based on a four point Likert scale of Never, Sometimes, Frequently or Always. The questions were reflective of the participant’s health literacy experience while in nursing school and were categorized into three areas: health literacy in the nursing curriculum, use of health literacy screening tools, evaluation of healthcare information materials and use of alternate forms of
healthcare teaching strategies such as written materials, audiotapes, videotapes and computer software. Table 4.7 displays the results of the HL-KES Part 2 responses.

Table 4.7 HL-KES Part 2 Responses

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Sometimes</th>
<th>Frequently</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emphasis of HL in nursing curriculum</td>
<td>36 (20.0)</td>
<td>89 (49.4)</td>
<td>34 (18.9)</td>
<td>21 (11.7)</td>
</tr>
<tr>
<td>Use of HL screening tools</td>
<td>100 (55.6)</td>
<td>63 (35)</td>
<td>10 (5.6)</td>
<td>7 (3.9)</td>
</tr>
<tr>
<td>Evaluate written healthcare materials</td>
<td>94 (52.2)</td>
<td>60 (33.3)</td>
<td>15 (8.3)</td>
<td>11 (6.11)</td>
</tr>
<tr>
<td>Evaluate cultural appropriateness of healthcare materials</td>
<td>79 (43.9)</td>
<td>60 (33.3)</td>
<td>27 (15.0)</td>
<td>14 (7.8)</td>
</tr>
<tr>
<td>Evaluate illustrations in healthcare materials</td>
<td>71 (43.4)</td>
<td>62 (34.4)</td>
<td>36 (20.0)</td>
<td>11 (6.11)</td>
</tr>
<tr>
<td>Use of written materials to provide healthcare information</td>
<td>50 (27.8)</td>
<td>70 (38.9)</td>
<td>41 (22.8)</td>
<td>19 (10.6)</td>
</tr>
<tr>
<td>Use of audiotapes to provide healthcare information</td>
<td>143 (79.4)</td>
<td>27 (15.0)</td>
<td>5 (2.8)</td>
<td>5 (2.8)</td>
</tr>
<tr>
<td>Use of videotapes to provide healthcare information</td>
<td>131 (72.8)</td>
<td>31 (17.2)</td>
<td>10 (5.6)</td>
<td>8 (4.4)</td>
</tr>
<tr>
<td>Use of computer software to provide healthcare information</td>
<td>104 (57.8)</td>
<td>49 (27.2)</td>
<td>18 (10.0)</td>
<td>9 (5.0)</td>
</tr>
</tbody>
</table>

On the item of frequency of emphasis of health literacy in their nursing curriculum, 144 students reported (80%) reported that health literacy was emphasized in the curriculum while 36 participants (20%) reported health literacy as never being emphasized in the curriculum.
On the item of using a health literacy screening tool to assess the health literacy skills of an individual, 180 students reported. Out of a possible maximum of 180 students using health literacy screening tools, 100 or 55.6% did not use HL screening tools. This indicates that the majority of students are not using HL screening tools, although 80 students (44.4%) reported using a health literacy screening tool.

On the three items of the evaluation of reading levels, cultural appropriateness and use of illustrations of healthcare materials, 180 students reported. Out of a possible maximum of 180 participants, a majority of the students did not evaluate the written healthcare materials, (n=94, 52.2%), a significant number did not evaluate cultural appropriateness of healthcare materials (n=79, 43.9%) or evaluate illustrations in healthcare materials (n=71, 43.4%).

On the four items of use of written materials, audiotapes, videotapes and computer software, 180 students reported. Use of written materials for healthcare information was the most prevalent form of providing healthcare information (n=130, 72.2%). This was followed by computer software (n=76, 42.2%), then videotapes (n=49, 27.2%) and the least used were audiotapes (n=37, 20.6%).

In conclusion, the results of the pretest show that there is some health literacy content in the curriculum but that there are gaps that need to be addressed and filled in order to provide and evaluate effective patient teaching. For example, even though the use of written health care was the most common strategy using in providing healthcare information, the participants “always” evaluated written healthcare materials only 12% of the time.
Research Question Two

What is the effect of a health literacy education module (HeLM) on the health literacy knowledge, skills and attitudes of pre-licensure baccalaureate nursing students?

The effect of the HeLM intervention on health literacy was tested by comparing mean health literacy scores at pretest and posttest. A dependent-group t-test, the appropriate procedure for pre/post study designs, was used to infer whether the difference was statistically significant. The results (Tables 4.8 & 4.9) indicate that the average literacy score change was +4.97, based on the mean and median results. These results imply that the study’s mean participant answered roughly 5 more questions correctly at the posttest than at the pre-test. The 5-unit difference is statistically significant (p<.001) at the .1 level of significance. The maximum increase across testing was +21 correct responses; the minimum was a -8 correct responses. The 95% CI (4.29, 5.64) suggests that the researcher is 95% confident that the true mean difference between pre- and post-test scores falls between 4.29 and 5.64.

Table 4.8. Health literacy knowledge scores: pre- and post-intervention (n = 180)

<table>
<thead>
<tr>
<th>Total score</th>
<th>Mean*</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>IQR**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-intervention</td>
<td>16.6</td>
<td>16.5</td>
<td>4.0</td>
<td>5.0</td>
<td>25.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Post-intervention</td>
<td>21.6</td>
<td>21.0</td>
<td>4.0</td>
<td>9.0</td>
<td>29.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

*Means are rounded to one decimal place. **IQR = interquartile range.
Table 4.9 Dependent group t test: health literacy knowledge score differences (n = 180)

<table>
<thead>
<tr>
<th>Posttest - Pretest</th>
<th>Mean difference (CI)</th>
<th>Std. Dev. of diff.</th>
<th>Min diff.</th>
<th>Max diff.</th>
<th>t-statistic</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.97 (4.29, 5.64)</td>
<td>4.6</td>
<td>-8.0</td>
<td>21.0</td>
<td>14.48</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 4.10 presents the results of paired t-tests for sub scores that represent the five HL-KES content areas. To generate these results, I first created sub scores for each content area, summing the number of correct values for a given domain. I then compared the means of the sub scores before and after the HeLM intervention, assessing statistical significance with the paired t-test, as in the analysis of the full measure. The findings indicate that participants reported a significantly higher number of positive responses at post-intervention than pre-intervention for all five content areas.

Table 4.10 Dependent group t test: health literacy knowledge sub-score differences (n = 180)

<table>
<thead>
<tr>
<th>Posttest - Pretest</th>
<th>Mean difference (CI)</th>
<th>Std. Dev. of diff.</th>
<th>Min diff.</th>
<th>Max diff.</th>
<th>t-statistic</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guidelines for Written HC Materials</td>
<td>1.51 (1.18, 1.83)</td>
<td>2.21</td>
<td>-4.0</td>
<td>8.0</td>
<td>9.16</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Basic Facts on Health Literacy (HL)</td>
<td>1.86 (1.62, 2.11)</td>
<td>1.67</td>
<td>-2.0</td>
<td>6.0</td>
<td>14.98</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
<td>------</td>
<td>-----</td>
<td>-----</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>Consequences of Low HL</td>
<td>0.29 (0.12,0.46)</td>
<td>1.16</td>
<td>-4.0</td>
<td>4.0</td>
<td>3.34</td>
<td>0.001</td>
</tr>
<tr>
<td>HL Screening</td>
<td>0.97 (0.78,1.16)</td>
<td>1.29</td>
<td>-3.0</td>
<td>5.0</td>
<td>10.09</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Evaluation of HL</td>
<td>0.30 (0.20,0.40)</td>
<td>0.67</td>
<td>-1.0</td>
<td>2.0</td>
<td>5.95</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

The researcher also conducted tests to determine whether factors other than the HeLM intervention were associated with the change in health literacy scores from pretest to posttest. Bivariate linear regressions were therefore estimated wherein the change in health literacy was regressed on each of the other study variables, and variable-specific t-tests were generated. Age was treated as a continuous independent variable, whereas all other variables were entered to the regression equation as dummy variables (referent category indicated in Table 4.11). The results indicated one statistically significant correlate of change in health literacy scores: other race. The regression coefficient (beta = 3.90) suggests that student-participants who self-classified as other race had increases in health literacy that were +3.9 points higher than participants who self-classified as white. This difference is significant at the .1 level of significance (t-statistic = 3.42, p<.001).
Table 4.11 Association between health literacy knowledge score differences and study variables
(n=180)

<table>
<thead>
<tr>
<th>Regression</th>
<th>Estimated coefficient (SE)</th>
<th>Estimated coefficient (SE)</th>
<th>Estimated coefficient (SE)</th>
<th>Estimated coefficient (SE)</th>
<th>Estimated coefficient (SE)</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.72 (1.30)</td>
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<tr>
<td>Age</td>
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<td>Sex</td>
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<tr>
<td>Intercept</td>
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<td>6.11 (0.74)</td>
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<tr>
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<tr>
<td>Female</td>
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<td>-1.44 (0.84)</td>
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<tr>
<td>Education</td>
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<tr>
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<td>5.18 (0.43)</td>
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<td>-2.93 (2.34)</td>
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<td>Race</td>
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</tr>
<tr>
<td>Intercept</td>
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<td>--</td>
<td>3.73 (0.51)</td>
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<tr>
<td>Asian</td>
<td>--</td>
<td>--</td>
<td>2.15 (1.19)</td>
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<tr>
<td>Black</td>
<td>--</td>
<td>--</td>
<td>1.31 (0.82)</td>
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<td>White</td>
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<tr>
<td>Multi</td>
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<td>--</td>
<td>2.64 (1.14)</td>
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<tr>
<td>Other</td>
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<td>--</td>
<td>3.90 (1.14) **</td>
<td>--</td>
<td></td>
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<tr>
<td>Interacts  with patient</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Intercept</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>5.85 (0.53)</td>
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<td>More than once a year</td>
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<td>--</td>
<td>--</td>
<td>-1.48 (0.69)</td>
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<td>Once a year or fewer</td>
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<td>--</td>
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*not significant unless noted

**t-statistic = 3.42, p<.001

Chapter Summary

The researcher conducted a pilot study to study to assess and refine any modifications needed to be made. At the conclusion of the pilot, the only change made was that the larger study could be conducted in a shorter time frame.

The larger study (n=180) was conducted in the spring of 2017 with the researcher completing all of the education sessions. The data from the surveys were analyzed using SPSS software. The data of the variables had descriptive analyses performed to establish the frequencies and distribution. The results of the HL-KES pretest and post-test analyses showed
statistical significant differences in the average literacy score change of +4.97, the 5-unit
difference is statistically significant (p<.001) at the .1 level of significance. The questions of the
HL-KES were grouped according to five content areas, and the statistical analysis of the pre-test
and post-test scores resulted in statistically significant differences in each content area. Bivariate
linear regressions were also done on each of the other study variables, and variable-specific t-
tests were generated. Statistical analysis supports RQ1 and RQ2: that the Borrero HeLM made a
statistically significant difference in the health literacy knowledge, skills and awareness of
nursing students and that the null hypothesis was rejected.
Chapter 5
Discussion of Results, Implications for Nursing Education, Recommendations for Further Research and Conclusions

Discussion of Results

The purpose of this study is to assess the health literacy knowledge, skills and attitudes in pre-licensure baccalaureate nursing students using a pretest/post-test to measure the effectiveness of the Borrero Health Literacy Education Module (HeLM). The study of what nursing students know about health literacy and its connection to patient outcomes may guide future practicing nurses to use health literacy skills in every patient encounter. Having nurses who are better prepared to provide effective patient education may result in improved patient outcomes. The results of this study may also support curriculum changes in pre-licensure nursing programs, as research has shown that effective patient teaching and retention will lead to better patient outcomes. This chapter includes a discussion of the study findings, conclusions based on the findings, implications for practice and recommendation for further research.

Health literacy has been defined as the level to which patients are able to gather, process and understand medical and healthcare information that is needed for patients to make healthcare decisions that result in positive outcomes (NIH, 2015, Ratzen & Parker, 2000). In today’s health care environment, patients have a greater involvement and responsibility in managing their health care needs. They need the tools to help navigate a complex health care system, and having adequate health literacy can be instrumental in achieving positive outcomes in a timely and cost effective manner. Research has linked health literacy to health knowledge, health behaviors, health outcomes and costs of health care (Mancuso, 2009); therefore it is imperative that
healthcare providers have health literacy training in their education in order to provide effective patient teaching and evaluation of that teaching.

This quantitative study was implemented in pre-licensure nursing students who were enrolled in a baccalaureate nursing program. The population was a convenience sample of 180 nursing students who were currently taking clinical nursing courses. Permission to conduct the study was obtained from the CUNY Graduate Center Internal Review Board Committee (Appendix F). Participation in the study was voluntary and the students were guaranteed anonymity. The pilot study was conducted with 10 pre-licensure baccalaureate students and minimal changes were made to the learning module, prior to the larger study. The primary researcher conducted the data collection during the spring of 2017. The study was conducted both during time periods that had been agreed upon during the recruitment phase, where the students were given a flyer (Appendix D) and also received a brief description of the purpose of the study. During the presentation time slot, the students were given a packet containing the consent, the pre-test and posttest, and the Borrero HeLM PowerPoint. Upon completion of the session, the students were given a certificate of completion and a raffle ticket for an Amazon gift card.

The Health Literacy Knowledge and Experience Survey (HL-KES) Parts 1&2 were used as a pre-test and Part 1 was used as a posttest. Permission to use the survey was obtained from the author, Dr. Catherine Cormier. The HL-KES had an overall CVI (Content Validity Index) of .98 when it was developed for Dr. Cormier’s original study (Cormier, 2006). Part 1 of the HL-KES survey had 5 content areas of health literacy: guidelines for presenting written healthcare information (11 items), basic facts on health literacy (6 items), health literacy screening (6
items), consequences associated with low health literacy (4 items), and evaluating the effectiveness of healthcare information (2 items).

Part 2 of the HL-KES had 9 questions designed to gather information on the health literacy experiences of the participants. The answers to Part 2 were presented in a four point Likert scale. The five variables of demographic data were collected on a separate form. Included in this section were: age, gender, education prior to nursing school, race and the frequency of interactions with healthcare providers for their own personal healthcare needs or the healthcare needs of a significant other.

The Borrero HeLM Education module was developed by the researcher and was reviewed by two nurses with expertise in the areas of nursing education and health literacy. The experts submitted their recommendations for editing the HeLM and the appropriate modifications were made. The content experts were asked to review the Borrero HeLM education module using a checklist to assess meeting the learning objectives, accurate, evidence-based current information, appropriate coverage of information, innovative and varied teaching, learning, evaluation strategies, logical presentation of ideas and information, and appropriate format for targeted audience. The reviewers made some suggestions to streamline the content in the PowerPoint presentation, but overall the reviewers were satisfied with the HeLM presentation in that it met the learning objectives.

After the study was completed, an analysis of the data was performed using the statistical program SPSS. The findings showed a statistically significant improvement in the post test scores in all five content areas: guidelines for presenting written healthcare information, basic
facts on health literacy, health literacy screening, consequences associated with low health literacy, and evaluating the effectiveness of healthcare information.

The study sought to answer the following research questions:

Research Question 1: What knowledge, skills and attitudes do pre-licensure baccalaureate nursing students have of health literacy? The students had a pre-intervention mean health literacy score of 16.6 with a Standard Deviation of 4.0. This result indicates that the pre-licensure nursing students that participated in the study may have some basic knowledge of health literacy but there may be specific gaps in the three areas of knowledge, skills and awareness. A separate analysis of each of the five content areas was conducted to identify the specific areas that need to be addressed in nursing education.

When asked about basic facts of health literacy, over 50% of the students did not know it was most prevalent in the 65 years of age and older population and 33% did not expect to find low health literacy skills in all ethnic groups. Even though the students did not know the most common cause for low health literacy, which is literacy, they did know that they could frequently encounter patients with low health literacy skills.

The students reported some proficiency in health literacy screening, in that more than 50% of the participants were able to identify the simplest method of screening which is to ask the patient to read a label on the medication bottle. They were unfamiliar with the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test of Functional Health Literacy (TOFHLA) screening instruments.

The majority of the questions on the HL-KES were related to guidelines for presenting written healthcare information. About 50% of the participants answered the items that related to
preparing written education materials, such as adding illustrations, limiting information to three or four main ideas about the disease and presenting information in the form of a conversation. The students were unfamiliar with the Fry Method, which is a readability formula to calculate word difficulty in a written document (Osborne, 2013).

The students also performed poorly in the area of developing culturally competent teaching materials. Perhaps additional questions could be added to the questionnaires to assess cultural awareness and competency. Cultural awareness and competency are essential components of effective nurse-patient communication. These competencies can help improve the quality of the care delivered to patients from diverse cultural backgrounds. The United States population is becoming more diverse, and nurses need to be prepared to provide effective communication. Nurses and all healthcare professionals will need to learn how to better communicate in a way that every patient understands the information that is shared with them. Cultural competence has been identified as a key component of effective patient communication by numerous agencies, such as The Joint Commission (2010), Health People 2020 and The National Institute of Health (2016).

The participants scored best in the area of consequences associated with low health literacy. They understood that patients with low health literacy skills would have poorer patient outcomes because they were often diagnosed late and had fewer treatment options than patients with adequate health literacy skills. The majority of the nursing students knew that patients with low health literacy skills would not be able to apply the information that was given to them to their own health situations. This should alert nursing students that the patient education they deliver must be meaningful and applicable to the individual they are educating.
It was interesting to note that two thirds of the participants were already familiar with the teach-back method of evaluating patient teaching. As reported in HL-KES, Part 2, 70% of the students reported never to sometimes having had health literacy emphasized in the curriculum and 85% reported that never to sometimes being taught how to evaluate healthcare materials. Teach back is a relatively simple way of evaluating patient teaching which may have made it easier to remember if it was mentioned when patient education was discussed in nursing curriculums. The questions in the survey do not reflect the actual use of any specific tools to improve health literacy or specific methods of evaluation, such as the teach-back method.

2. What is the effect of a health literacy education module (HeLM) on the health literacy knowledge, skills and attitudes of pre-licensure baccalaureate nursing students?

There was a statistically significant difference between the means of the pre-test (16.1) and posttest (21.6) after the students completed the Borrero HeLM presentation. The mean difference between the pre and posttests was 4.97, with a p < .001. The findings indicate that participants reported a significantly higher number of positive responses at post-intervention than pre-intervention for all five content areas. These results may support the use of the Borrero HeLM or another health literacy learning module to improve the knowledge, skills and attitudes in the nursing curriculum.

The learning module was developed based on specific learning objectives that would give the students health literacy background information, the importance of health literacy screening in every patient encounter and the consequences that patients may develop because of low health literacy. Part 1 of the learning module included information and activities that addressed healthcare providers’ attitudes toward health literacy, in a way that would alert them to using
universal health literacy precautions in every encounter. Part 2 of the Borrero HeLM included active learning strategies in a “toolkit” format to encourage the students to become familiar with a variety of health literacy tools, such as teach-back method, the Newest Vital Sign, “Ask Me 3” and others. Both parts of the Borrero HeLM encompasses the health literacy knowledge component, which was the basis for the need for this study.

The results of this study support the review of the literature that reports that the nursing curriculum does not include health literacy in the nursing curriculum. Even though a large component of nursing practice includes patient education, nursing students lack the health literacy knowledge and skills to give effective patient education that includes identifying patients with low health literacy and being able to evaluate the patient teaching being offered to patients. The findings suggest that health literacy content is not included in the nursing curricula and that nursing students do not have competency in health literacy assessments and knowledge of interventions for effective patient teaching.

**Implications for Nursing Education**

The Quality and Safety Education for Nurses (QSEN) initiative identified health literacy as a learning competency in the delivery of patient-centered care (Kennard, 2016). Based on a review of the literature on health literacy and nursing education, there is a significant gap in nursing education and the topic of health literacy. The results of this study support evidence in the nursing literature that health literacy is not regularly included in the nursing curriculum, and therefore nursing students do not have the knowledge, skills and attitudes to deliver effective patient education and evaluation (McCleary-Jones, 2016, Parnell, 2013, Coleman, 2012).
These findings also support the findings of previous studies in health literacy and nursing education. Hartman (2014) found that undergraduate nursing students had limited knowledge of the importance of health literacy and how to assess health literacy in the patients they encountered. Cormier & Kotrlik (2009) discovered that nursing students had some proficiency in addressing and assessing health literacy in certain populations, but that they had limited experience in conducting health literacy screenings and assessing the appropriateness of written educational materials available for their patients.

Coleman (2011) found there was little emphasis on communication skills and practices of healthcare personnel. His findings showed that there are significant gaps in knowledge, awareness and clinical recognition of low health literacy. Studies by Cormier & Kotrlik (2009); Jukkala, Deupree and Graham, (2009); Schwartzberg, Cowett, Van Geest & Wolf, (2007) and an earlier study by Bourhis, Roth & MacQueen (1989) found that healthcare providers do not possess the health literacy competencies to assess health literacy levels in order to communicate effectively with their patients. Cafiero (2012) found that 75% of participants reported “never” or only “sometimes” having health literacy emphasized in the curriculum.

Nurses are involved with patient teaching at every level of practice. It would be beneficial to include health literacy concepts starting in the pre-licensure education of nursing students. Even though most nursing curricula do include patient teaching, there continues to be little or no mention or inclusion of health literacy concepts. At the start of the start of this research study, I also had little knowledge of health literacy. As an advanced nurse practitioner and an educator for many years, I have rarely read about or knew much about health literacy.
Nursing education may include a variety of nursing theorists to guide the curriculum. Many of them are adaptable to the concept of health literacy. The theoretical framework for this study was based on Knowles, Holton and Swanson (2015) adult learning theory. The six assumptions of this theory were adopted into the education module and they guided the development of the study. One of the assumptions is that adults need to know why they need to learn something and this was supported by the review of the literature on health literacy and the statistics showing the prevalence of low health literacy in the United States. The participants received this information in part 1 of the Borrero HeLM.

Based on the findings of this study, the Borrero HeLM may be an effective learning module for nursing programs to adopt into their curricula. Nursing faculty can certainly agree that the best place to include health literacy concepts is in nursing education. The review of the literature revealed both a lack of health literacy concepts in nursing education and a continued prevalence of low health literacy in the United States population. Although the literature acknowledges that patient communication and education are included in nursing curricula, there is a deficiency of health literacy concepts. These concepts include the prevalence of low health literacy, at risk groups, health literacy assessments and patient evaluation.

**Recommendations for Further Research**

Healthcare is becoming more and more complex and patients need to have the ability to navigate the healthcare system. Nurses have most of the responsibility of patient education and yet nursing is one of the disciplines that is most lacking in knowledge, skills and awareness about health literacy. Providing nursing students with the necessary tools to assess patient health literacy and to assess their own patient teaching is a vital component of patient education.
Nurse educators can develop simple health education modules that are based on QSEN competencies. There is an abundance of health literacy education modules on the Agency for Healthcare Research and Quality Related (www.ahrq.gov) and the Centers for Disease Control (www.cdc.gov) websites that educators can complete to familiarize themselves with health literacy concepts. They can be imbedded in course management systems as a required module that students have to complete as part of their coursework. A certificate of completion may further motivate students to complete the module and they can include it in their resumes when job hunting after graduation.

It may be necessary to do a follow-up study or questionnaire to investigate if the students used some of the tools in the module as they continued in the nursing program. Research on methods to improve and include health literacy education of nursing students and all other healthcare professions should be continued so that all providers have the knowledge, skills and awareness of health literacy universal precautions.

It is also recommended that this study be replicated in associate degree nursing programs to see if similar results are found. All pre-licensure nursing students sit for a national entry into practice exam (NCLEX) and are prepared to perform as entry level nurses upon passing the exam. All nursing programs do include patient education as part of the curricula, and adding a formal health literacy component may make a difference in the effectiveness of patient education. Perhaps the study could be replicated in the practice settings as part of the hospital orientation for new staff nurses. Orientation includes documentation of patient teaching in the electronic health record.
Improved knowledge and awareness of the effects of limited health literacy on patient outcomes may lead to standardized inclusion of health literacy concepts in health professions curricula. And the added skill of adequately assessing health literacy as the $6^{th}$ Vital Sign may result in effective patient education.

One other recommendation is to add an additional question to the data form to identify which semester of the nursing program is the student currently enrolled in. Perhaps graduating students will have different results than the novice students. The Borrero HeLM may be used throughout the nursing curriculum, but it is recommended to be scheduled before or during the first clinical experience when patient communication begins.

Conclusions

The importance of having health literacy knowledge, skills and awareness has been supported through a review of the literature. It is necessary for nurse educators to prepare future nurses that are competent in effective patient education and evaluation. An education module, such as the Borrero HeLM has been shown to be effective in teaching nursing students the health literacy skills, knowledge and awareness that can be used in patient encounters. This study supports the effectiveness of a health literacy education module on nursing students’ knowledge, skills and attitudes in this area.

Nurses should be taught how to provide effective healthcare information to patients with low health literacy skills. There are over three million nurses in the United States, and they impact patient care along the entire health-illness continuum. Clear communication skills, including cultural awareness and respect will benefit patients, improve patient outcomes and may lead to reduced health disparities in the future.
Chapter Summary

This quantitative study was done to assess the effectiveness of the Borrero Health Literacy Education Module (HeLM) on the health literacy knowledge, skills and attitudes in pre-licensure baccalaureate nursing students. Although some of the students knew what health literacy was, there were some significant gaps in the area of prevalence of low health literacy, assessing health literacy and knowing which tools were available to provide effective patient teaching and evaluation.

This chapter has discussed the findings of the study and implications for nursing education. Recommendations for further research and conclusions were presented. Nurses must be prepared to effectively teach and communicate with their patients. This study suggests that participation in a health literacy education module can be an effective technique to improve health literacy knowledge, skills and awareness in the nursing classroom.
Introduction: Health Literacy is the ability to read, understand and make informed decisions about health care. The purpose of this study is to assess the health literacy knowledge and experiences of baccalaureate nursing students.

Your participation in the study will contribute to the body of knowledge on health literacy and provide valuable information to nursing faculty responsible for developing a nursing curriculum that prepares nursing students with the skills needed to provide healthcare to individuals with low health literacy skills.

Your responses will be kept anonymous and in no way affect your grade in any nursing course. I encourage you to participate in this research study, however participation is optional for all students. You have the right to withdraw from the study at any time. If you choose to participate I encourage you to answer all questions but you have the right to refuse to answer any question on the survey. Informed consent is implied with completion of the survey.

Part 1: Health Literacy Knowledge

Directions: Questions 1-29 are multiple-choice questions. Choose the best answer and record only one response for each question.

1. Low health literacy levels are most prevalent among which of the following age groups?
   a. 16 to 24 years of age.
   b. 25 to 34 years of age.
   c. 35 to 44 years of age.
   d. 45 to 54 years of age.
   e. 65 years of age and older.

2. Low health literacy levels are common among:
   a. African Americans.
   b. Hispanic Americans.
   c. White Americans.
   d. All ethnic groups.

3. The research on health literacy indicates that:
   a. the last grade completed is an accurate reflection of an individual’s reading ability.
   b. most individual’s read three to five grade levels lower than the last year of school completed.
   c. if an individual has completed high school they will be functionally literate.
   d. if an individual has completed grammar school they will be functionally literate.

4. What is the likelihood that a nurse working in a public health clinic, primarily serving low-income minority patients, will encounter a patient with low health literacy skills?
   a. almost never
   b. occasionally
   c. often
   d. very often
5. The best predictor of healthcare status is:
   a. socioeconomic status.
   b. literacy.
   c. gender.
   d. educational level.

6. Patients with low health literacy skills:
   a. rate their health status higher than those with adequate literacy skills.
   b. experience fewer hospitalizations than those with adequate health literacy skills.
   c. are often prescribed less complicated medication regimes than those with adequate health literacy skills.
   d. are often diagnosed late and have fewer treatment options than those with adequate health literacy skills.

7. Health behaviors common among patients with low health literacy skills include:
   a. lack of participation in preventative healthcare.
   b. disinterest in learning about healthcare problems.
   c. an unwillingness to make lifestyle changes necessary to improve health.
   d. the inability to learn how to correctly take prescribed medications.

8. Patients cope with low health literacy skills by:
   a. asking multiple questions about healthcare instructions they do not understand.
   b. exploring treatment options before signing surgical consent forms.
   c. relying heavily on written healthcare instructions.
   d. pretending to read information given to them by healthcare providers.

9. The nurse should keep in mind that individuals with low health literacy levels:
   a. can understand written healthcare information if they are able to read it.
   b. will not be able to learn about their healthcare needs.
   c. have lower intelligence scores than average readers.
   d. have difficulty applying healthcare information to their health situation

10. The Rapid Estimate of Adult Literacy in Medicine is an instrument utilized to:
    a. determine the reading level of written healthcare information.
    e. assess the math skills of an individual required for medication administration.
    c. evaluate the overall quality of written health care information.
    d. assess the ability of an individual to read common medical terms.

11. When working with individuals who have low health literacy skills the nurse should keep in mind that these individuals:
    a. may not admit that they have difficulty reading.
    b. will readily share that they need assistance with written information.
    c. will frequently ask questions about information they do not understand.
    d. should not be expected to manage their healthcare since they cannot read.

12. Which of the following questions would provide the nurse with the best estimate of reading skills of the patient?
    a. “What is the last grade you completed in school?”
    b. “Do you have difficulty reading?”
    c. “Would you read the label on this medication bottle for me?”
    d. “Do you need eye glasses to read?”
13. Which statement best describes the Test of Functional Health Literacy? This instrument is:
   a. used to assess the reading comprehension and numerical skills of an individual.
   b. only available in English and therefore has limited use with immigrants.
   c. an effective tool for assessing the reading level of individuals.
   d. recommended for determining the reading level of written healthcare materials.

14. What is the strongest advantage to conducting health literacy screenings? Health literacy screenings:
   a. provide nurses with a good estimate of the educational level of individuals.
   b. will help nurses to be more effective when providing healthcare teaching.
   c. can be used to diagnose learning difficulties that serve as barriers to patient teaching.
   d. assist healthcare agencies to comply with educational standards established by the Joint Commission on Accreditation of Health Organizations.

15. Which of the following statements, made by the nurse, would be the best approach to initiating a health literacy screening with a patient?
   a. “It is necessary for me to assess your reading level; this will take a few minutes and it is very important.”
   b. “I need to conduct a test to see if you can read, please read these words for me.”
   c. “I want to make sure that I explain things in a way that is easy for you to understand; will you help me by reading some words for me.”
   d. “I need to administer a reading test to you, if you cooperate this will not take long.”

16. After providing written healthcare information to a patient he states, “Let me take this information home to read.” This may be a clue to the nurse that the patient:
   a. is in a hurry and does not have time for instruction.
   b. is not interested in learning the information.
   c. is noncompliant with healthcare treatments.
   d. may not be able to read the materials.

17. An individual with functional health literacy will be able to:
   a. follow verbal instructions but not written healthcare instructions.
   b. read healthcare information but have difficulty managing basic healthcare needs.
   c. read and comprehend healthcare information.
   d. read, comprehend, and actively participate in decisions concerning healthcare.

18. Which of the following is true with regards to written healthcare information?
   a. Most healthcare information is written at an appropriate reading level for patients.
   b. Illustrations can improve a patient’s understanding of written information.
   c. Patients are usually provided with information that they think is important to know about their healthcare status.
   d. Overall patients comprehend written information better than verbal instructions.
19. The recommended reading level for written healthcare information is:
   a. 5th grade.
   b. 8th grade.
   c. 10th grade.
   d. 12th grade.

20. The first step in developing written healthcare information is to:
   a. outline the content.
   b. list the learning objectives.
   c. find out what the audience needs to know.
   d. research the content area.

21. Which of the following statements best describes the Fry Method?
   a. This formula is used to calculate word difficulty in a written document.
   b. This method calculates the readability level of a written document by counting selected syllables and sentences within the document.
   c. It is an effective tool used for measuring how well a patient understands healthcare information.
   d. This instrument is used to evaluate the cultural appropriateness of written healthcare instructions.

22. Recommendations for developing written healthcare materials include:
   a. use dark colored papers for printing.
   b. presenting information in the form of a conversation.
   c. including abbreviations when possible to save space.
   d. printing words in fancy script.

23. When listing side effects for a handout on chemotherapy the oncology nurse should limit the list to:
   a. 2-3 items.
   b. 5-6 items.
   c. 10-12 items.
   d. 15-20 items.

24. Written healthcare information provided to a patient related to a specific disease should include:
   a. only three or four main ideas about the disease.
   b. all treatment options available to manage the disease.
   c. a detailed explanation of the pathophysiology of the disease.
   d. statistics on the incidence of the disease.

25. Which of the following would be the most effective wording for a heading in a brochure on hypertension?
   a. HYPERTENSION: THE SILENT KILLER
   b. Symptoms of high blood pressure
   c. How do I know that I have high blood pressure?
   d. What factors contribute to hypertension?
26. The best way to ensure that a breast cancer prevention brochure is culturally appropriate is to:
   a. review research on the community’s culture.
   b. obtain input from nurses who have worked in the community.
   c. explore the types of materials currently available.
   d. include community members in the design of the brochure.

27. Which of the following instructions on the management of diabetes would be best understood by an individual with low health literacy skills?
   a. Check your blood sugar every morning.
   b. Insulin should be taken as directed by your physician.
   c. Diabetes is a disease of energy metabolism.
   d. Complications associated with insulin include hypoglycemic reactions.

28. Which of the following approaches to patient education provides minimal opportunity for the patient to actively engage in learning?
   a. Incorporating short answer questions periodically throughout written healthcare materials and providing space for the patient to write responses.
   b. Instructing the patient to watch a video after providing written healthcare instructions.
   c. Planning a question answer session in small groups after completing a learning activity.
   d. Providing pictures for the patient to circle in response to questions asked in a healthcare brochure.

29. The most effective way for a nurse to determine how well a patient with low health literacy skills understands healthcare information is to:
   a. Utilize a pre-test before instruction and a post-test following instruction.
   b. Ask the question, “Do you understand the information I just gave you?”
   c. Have the patient teach back the information to the nurse.
   d. Verbally asking the patient a series of questions following instructions.
Health Literacy Knowledge and Experience Survey, Part II
Health Literacy Experience Scale

Directions: Questions 30-38 ask you to describe how often you use learning activities related to health literacy. Choose the response that best describes your health literacy experiences while in school and circle your answer.

30. How frequently was health literacy emphasized in your nursing curriculum?
   A= Never          B= Sometimes     C= Frequently       D= Always

31. How often do you use a health literacy screening tool to assess the health literacy skills of an individual?
   A= Never          B= Sometimes     C= Frequently       D= Always

32. How often do you evaluate the reading level of written healthcare materials before using them for patient teaching?
   A= Never          B= Sometimes     C= Frequently       D= Always

33. How often do you evaluate the cultural appropriateness of healthcare materials, including written handouts, videos, audiotapes, before using them for patient teaching?
   A= Never          B= Sometimes     C= Frequently       D= Always

34. How often do you evaluate the use of illustrations in written healthcare materials before using them for patient teaching?
   A= Never          B= Sometimes     C= Frequently       D= Always

35. How often do you use written materials to provide healthcare information to an individual or community group?
   A= Never          B= Sometimes     C= Frequently       D= Always

36. How often do you use audiotapes to provide healthcare information to an individual or community group?
   A= Never          B= Sometimes     C= Frequently       D= Always

37. How often do you videotapes to provide healthcare information to an individual or community group?
   A= Never          B= Sometimes     C= Frequently       D= Always

38. How often do you use computer software to provide healthcare information to an individual or community group?
   A= Never          B= Sometimes     C= Frequently       D= Always
Appendix B

Demographic Data Sheet

1. Gender
   a. Male
   b. Female

2. Prior educational experience
   a. High School
   b. At least one undergraduate degree before entering nursing school
   c. At least master's degree before entering nursing

3. Race/Ethnicity
   a. American Indian/Alaska Native
   b. Asian
   c. Native Hawaiian or other Pacific Islander
   d. Black or African American
   e. White
   f. More than one race
   g. Unknown

4. How often do you interact with health care providers for your own personal health care needs or the healthcare needs of a significant other?
   a. More than once a year
   b. At least once a year
   c. Less than once a year

5. Please enter your age in years ______
Appendix C
PERMISSION TO USE HL-KES SURVEY

Dr. Georges,

January 25, 2018

The letter is to inform you that Joy Barrero has my permission to use the Health Literacy Knowledge and Experience Survey for her dissertation.

Sincerely,

Dr. Cathy Cormier, PhD, CNE, RN

[Signature]
Appendix C
PERMISSION TO USE HL-KES SURVEY

Catherine Cormier <ccormier@lsua.edu>
Wed 3/16/2016, 6:56 PM
Joy attached is the survey with answer key. You have my permission to use the survey for your study.
Best
Dr. Cormier

Joy Borrero
Good evening, Dr. Cormier:
I am a nursing PhD student at the City University Grad Center (CUNY) and am preparing my proposal for my intended quasi-experimental study entitled:
'A Study of the Effect of a Health Literacy Module (HeLM) on the Health Literacy Knowledge, Attitudes and Skills of Pre-Licensure Nursing Students '

The CUNY email system changed over to Outlook and all emails from early 2015 were deleted. Therefore I am re sending my request for permission to use the Health Literacy Knowledge and Experience Survey (HL-KES) as part of my pre/post test intervention assessment.
I would love to talk to you sometime this semester about my proposed study and hear of any advice, details, etc you could offer in using your instrument.
Thank-you again
Joy Borrero.
“What did the Nurse say?”

Putting Nursing Students at the HeLM:

Health Literacy Module

Student nurses are needed to participate in a quantitative study to determine the effect of a health literacy education module on their health literacy Knowledge, Skills and Attitudes. Participation in the study is voluntary and there is no cost or payment to participate. Time commitment: About 2 hours. Participants will receive a certificate of completion and a chance to win an Amazon gift card.

Thank-you for your consideration and support.

Joy Borrero, RN, PhD (c)
borrerj@sunysuffolk.edu
Appendix E

INFORMED CONSENT RELEASE
I am Joy Borrero, RN, PhD(c) and a doctoral candidate at the CUNY Graduate Center, New York and am conducting a research study entitled” Nursing Students at the HeLM: A Study of the Effect of a Health Literacy Module (HeLM) on the Health Literacy Knowledge, Skills and Attitudes of Pre-licensure Baccalaureate Nursing Students”
I am seeking baccalaureate nursing students who are enrolled in a clinical course to be volunteer participants in this research. All participants will receive a certificate of completion and an opportunity to win an Amazon gift card. The participant will be will be given one copy of this signed form.

Consent for Participation in Research
I volunteer to participate in a research project conducted by Joy Borrero, PhD(c) from the CUNY Graduate Center, New York University. I understand that the project is designed to gather information about health literacy knowledge, skills and attitudes of baccalaureate nursing students.
1. My participation in this project is voluntary. I understand that I will not be paid for my participation. I may withdraw and discontinue participation at any time without penalty. If I decline to participate or withdraw from the study, no one on my campus will be told and will not affect my grade.
2. I understand that most participants will find the training interesting and valuable to their education.
3. Participation involves attending a 2hr education session at my college by Joy Borrero. The students will complete the Health Literacy Knowledge, Experience Survey (HL-KES) at the start of the first education session and at the end of the education session.
4. I understand that the researcher will not identify me by name in any reports using information obtained from this training, and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.
5. I understand that this research study has been reviewed and approved by the Institutional Review Board (IRB) for Studies Involving Human Subjects: Behavioral Sciences Committee at the CUNY Graduate Center and Lehman College. The contact is Zoltan Boka, Zoltan.boka@lehman.cuny.edu .
For questions regarding this study, you may reach Joy Borrero at jborrero@gc.cuny.edu or 631-851-6439.
7. I have read and understand the explanation provided to me. I have had all my questions answered to my satisfaction, and I voluntarily agree to participate in this study.
8. I have been given a copy of this consent form.

<table>
<thead>
<tr>
<th>Print Participant Name</th>
<th>Date</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joy Borrero, RN, PhD(c)</td>
<td>Date</td>
<td></td>
</tr>
</tbody>
</table>
Appendix F

University Integrated Institutional Review Board
205 East 42nd Street
New York, NY 10017
http://www.cuny.edu/research/compliance.html

Approval Notice
Initial Application
11/14/2016
Joy Borrero,
The Graduate School & University Center
RE: IRB File #2016-1326
Nursing Students at the HeLM: A Study of the Effect of a Health Literacy Module (HeLM) on the Health Literacy Knowledge, Skills and Attitudes of Pre-Licensure Baccalaureate Nursing Students

Dear Joy Borrero,

Your Initial Application was reviewed and approved on 11/14/2016. You may begin this research.

Please note the following information about your approved research protocol:

Protocol Approval Period: 11/14/2016 - 11/14/2019
Protocol Risk Determination: Minimal
Expeditied Categor(ies): (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.)

Documents / Materials:

Type Description Version # Date
Survey(s) Cormier HL KES Part 1.pdf 1 09/08/2016
Survey(s) Cormier HL KES Part 2.pdf 1 09/08/2016
Informed Consent Document HeLM Consent.docx 1 11/07/2016
CITI Completion Report 1 11/07/2016
http://www.cuny.edu/research/compliance.html
Please remember to:
- Use the IRB file number 2016-1326 on all documents or correspondence with the IRB concerning your research protocol.
- Review and comply with CUNY Human Research Protection Program policies and procedures. The IRB has the authority to ask additional questions, request further information, require additional revisions, and monitor the conduct of your research and the consent process.
If you have any questions, please contact:
Zoltan Boka
718-960-4108
ZOLTAN.BOKA@lehman.cuny.edu
References


http://www.health.gov/communication/resources/.


