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ABSTRACT

Health Literacy Competencies for Registered Nurses: An e-Delphi Study

by Coleen E. Toronto

In the United States, only 12% of adults possess proficient health literacy skills. Individuals with low health literacy skills experience poorer health outcomes. Failure of registered nurses to consider health literacy in communication with patients can significantly affect an individual’s ability to understand and therefore, follow health advice. The Institute of Medicine’s (IOM) *Health Literacy: A Prescription to End Confusion* (2004) landmark report recommends that health professionals be trained to effectively communicate with patients with limited health literacy. There is an absence of nurse competencies that explicitly address the needs of patients with low health literacy. Therefore the purpose of this study was to identify a set of core health literacy competencies for registered nurses in any work setting. A three round e-Delphi design was used to elicit essential health literacy competencies for registered nurses with a national group of nurse health literacy experts (n=41). Based on partial replication of prior work by Coleman, Hudson, and Maine (2013), a final list of 50 nursing health literacy core competencies were identified in round two. Descriptive statistics were used to analyze data. A competency that reached 90% agreement in round two was retained. The remaining competencies were then prioritized in round three. The final list of prioritized competencies generated in this study, can provide a starting point for enhancement of health literacy educational content in practice and schools of nursing.
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CHAPTER ONE: INTRODUCTION

Introduction to Study

Health literacy and its relationship to health are recognized nationally and internationally (United States Department of Health and Human Services [USDHHS], 2010a; World Health Organization [WHO], 1998). Health literacy, or “how individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions” has become a priority in the delivery of health care (Berkman, Davis & McCormack, 2010, p. 16). Individuals with low health literacy skills experience poorer health outcomes (Agency for Healthcare Research and Quality [AHRQ], 2010; Brach et al., 2012; Berkman et al., 2011; Institute of Medicine [IOM], 2004). In the United States, only 12% of adults possess proficient health literacy skills (Kutner, Greenberg, Jin, & Paulson, 2006). Individuals regularly confront situations that involve important decisions about their health. However, the majority of health information is presented in a way that is not understandable for most people (AHRQ, 2010; Brach et al., 2012; IOM, 2004; USDHHS, 2010a).

Failure to consider health literacy in communication with patients can significantly affect an individual’s ability to understand and therefore follow health advice (USDHHS, 2010a). Inability to comprehend health care instructions can lead to difficulty taking medications and other health care behaviors. Low health literacy has been linked to adverse health outcomes such as higher rates of emergency room visits; decreased capacity to manage chronic disease; lower rates of medication adherence and higher rates of hospitalization and death (Berkman et al., 2011). Low health literacy places patients, healthcare professionals and the healthcare system at risk for adverse
events and poor patient outcomes because of limited patient understanding of health information (Brach et al., 2012; Murphy-Knoll, 2007; Parnell, 2015). Moreover, healthcare expenditures due to low health literacy skills are estimated to cost the United States $238 billion annually (Vernon, Trujillo, & Rosenbaum 2007).

The Institute of Medicine’s (IOM) Health Literacy: A Prescription to End Confusion (2004) landmark report recommends that health professionals be trained to effectively communicate with patients with limited health literacy (IOM, 2004). Contrary to the IOM recommendations, healthcare organizations and schools of nursing often fail to specifically educate registered nurses on how to assess, communicate with, and effectively educate patients struggling with limited health literacy (Coleman, 2011; Cormier & Kotrilk, 2009; Macabasco-O’Connell & Fry-Bowers, 2011; McCleary-Jones & Voncella, 2012). A partial solution to this education-practice gap is to recognize core health literacy competencies for a registered nurse that nurses in professional development and nurse educators can use to guide curricular development in education programs (Coleman, 2011; Parnell, 2015; Toronto & Weatherford, 2015).

Nationally, health literacy is a concept that has become a priority in the delivery of safe and quality health care (AHRQ, 2010; Brach et al., 2012). Safe practice in health care depends on effective communication (Murphy-Knoll, 2007; USDHHS, 2010a). Improving communication skills in healthcare professionals has been identified as part of the 2015 National Patient Goals (The Joint Commission [TJC], 2015). The goals and objectives of Healthy People 2020 and the National Action Plan to Improve Health Literacy also recognize the importance of effective health communication between healthcare professionals and patients to decrease adverse events and improve patient
outcomes (USDHHS, 2010a; USDHHS, 2010b). In nursing education, the Quality and Safety Education for Nurses (QSEN) links communication knowledge, skills and attitudes of nurses to improved patient outcomes and quality of care (Cronenwett et al., 2007).

Despite the emergence of health literacy as a priority concern for safe and quality health care, significant education and practice gaps exist in attitudes, skills, and knowledge among nurses, physicians and other health professionals (Coleman, 2011; Cormier & Kotrlik, 2009; Jukkala, Duepree, & Graham, 2009; Macabasco-O'Connell, & Fry-Bowers, 2011; Payne, 2009; Schwartzberg et al., 2007). Healthcare professionals often underestimate the information needs of their patients and overestimate the health literacy of their patients (Dickens et al., 2013; Kelly & Haidet, 2007). Researchers also suggest that healthcare professionals may overestimate their own health literacy knowledge (Kennedy-Sheldon & Hilaire, 2015; Mazart, Ball, & Lopez, 2011). One study surveyed registered nurses and advanced practice nurses in California and revealed that 20% of nurses surveyed were not familiar with the term health literacy, less than half had any type of formal health literacy training, and 56% of nurse participants viewed health literacy as a low priority (Macabasco-O’Connell & Fry-Bowers, 2011).

These findings suggest that there is a gap in health literacy knowledge, skills and attitudes among some nurses. Narrowing the disparity between health literacy skills of persons receiving care and the healthcare professionals providing care will enhance patient health outcomes (Murphy-Knoll, 2007; Parnell, 2015; USDHHS, 2010a; Zarcadoolas, Pleasant, & Greer, 2006). Nurses in professional development, in practice and nurse educators in schools of nursing need developed competencies to address the
deficient knowledge, skills, and attitudes among nurses (Coleman, 2011; Parnell, 2015; Toronto & Weatherford, 2015). Given the extent of low health literacy in the United States, improved health literacy education in schools of nursing and in healthcare organizations is critical to the development of competent registered nurses who can help limit the negative effects of limited health literacy among patients (IOM, 2004; USDHHS, 2010b). Most Americans do not possess adequate health literacy skills. Since low health literacy has been linked to poor health outcomes there is a need for nurses to consider health literacy when communicating with patients. There is an absence of nurse competencies that explicitly address the needs of patients with low health literacy. Competencies will provide a starting point for enhancement of health literacy educational content in practice and schools of nursing. Therefore the purpose of this study was to identify a set of core health literacy competencies for registered nurses.

**Background and Significance**

Registered nurses’ competence is an essential factor for assuring safe and quality healthcare to patients in all practice settings. This requires a continuous evaluation of registered nurses’ knowledge, skills and attitudinal competencies to effectively meet patients’ needs. With rapid changes in science and technology, the healthcare environment, patient demographics and regulations, registered nurses are challenged to maintain competence throughout their careers (Brunt, 2014; IOM, 2011a). As the recognition and understanding of low health literacy has increased over the last decade it is timely to examine the profession’s response to assuring registered nurses have the competencies necessary to care for patients with low health literacy.
Health literacy is fundamental to maintenance of health and wellbeing in modern society. Health information is often presented in a complex manner and American’s today are expected to navigate complicated healthcare systems. Becoming a health literate person in today’s society is a challenge to many (IOM, 2004).

The term “health literacy” was first used in 1974 in the proceedings of a health education conference discussing health education as a social policy issue (Frisch, Camerini, Diviani & Schulz, 2011). Health literacy’s relevance across health disciplines has developed over time. The evolution of the concept has created considerable variation in the ways “health literacy” is defined and conceptualized. Health literacy has more than 17 definitions and 12 conceptual frameworks (Sorenson et al., 2012). In nursing, there are two published concept analyses that address this elusive phenomenon (Mancuso, 2008; Speros, 2005). Both concept analyses identify four common individual characteristics associated with health literacy: reading skills, comprehension skills, numeracy skills, and communication skills. When an individual adequately possesses these skills, they are prepared to make informed decisions regarding health care (Mancuso, 2008; Speros, 2005).

Despite not having a “gold standard” definition and theoretical framework, health literacy is an integral part of the national health platform. In addition, health literacy is a priority focus of many professional organizations and government agencies to increase awareness of health literacy among healthcare professionals (AHRQ, 2010; Centers for Disease Control [CDC], 2011; IOM, 2004; USSDHHS, 2010a; USSDHHS, 2010b).

Clifford Coleman, a nationally recognized leader in health literacy education has drawn attention to the lack of integration of health literacy in health professions’
curricula (Coleman, 2011; Coleman & Appy, 2012). In response, Coleman and colleagues (2013) established preliminary health literacy educational competencies for healthcare professionals using a modified Delphi method with participants representing various health professions. The consensus meetings resulted in the identification of 62 potential educational competencies for health professionals and educators to consider in practice and education. Coleman, Hudson and Maine (2013) recommended further work to prioritize the competencies and the need for closer examination to consider discipline specific competencies.

Competencies for nursing practice are defined as an expected level of performance that integrates knowledge, skills, abilities and judgment (American Nurses Association [ANA] & National Nursing Staff Development Organization [NNSDO], 2010). Nurses, nurse leaders, and nurse educators need to reach consensus on essential nurse competencies, so that nurses can provide quality patient centered-care (IOM, 2011a). There is a need for identified health literacy core competencies for registered nurses by nurses, nurse leaders and nurse educators.

Statement of Problem

Patients do not always effectively understand, interpret, and communicate about health related information. Contributing to this problem is the failure of nurses to assess patients’ abilities to understand health information and inability to communicate health information clearly to patients. An important part of the solution to this issue is the identification of health literacy core competencies that address education and training needs for registered nurses. In 2011, a review of the literature identified the lack of published educational competencies in health literacy as a major barrier to the integration
of health literacy curricula in health professions schools (Coleman, 2011). Moreover, the existing literature on health literacy education for health professions is primarily focused in medicine and pharmacy (Coleman, 2011; Toronto & Weatherford, 2015). It is not clear in the literature what core health literacy competencies registered nurses are expected to possess or what nursing educational programs provide as didactic or clinical learning experiences in the area of health literacy (Coleman, 2011; Coleman et al., 2013; Toronto & Weatherford, 2015). Health professions programs should educate graduates with the competencies necessary to anticipate and respond to the health literacy issues of individuals and communities (Coleman, 2011; IOM, 2004; Parnell, 2015). It is critical that registered nurses be competent in recognizing when low health literacy is a factor impeding patients’ understanding of health information and use actions that help patients overcome the challenges of low health literacy.

**Theoretical Basis of Study**

The rationale for workplace and instructional competencies is explained in the MACH model, which is a logic map that signifies the associations among the development of workforce competencies, organizational performance, individual performance and instructional competencies. The MACH model contains eight main components: workforce competencies; defining elements; instructional competencies; curriculum process; individual performance; organizational performance; credentialing and accreditation; and intervening variables. Many of the components are cyclical and reinforce one another. The MACH model demonstrates the reciprocal relationship shared between individual performance and organizational performance. The fundamental
assumption is that once enhanced individual performance is achieved, organizational performance will improve (Miner et al., 2005).

The MACH model illustrates how customized standard competencies in the workforce lead to competency-based training and education of the employees resulting in improved individual performance. The MACH model also identifies two types of need in the workplace: those of the employee with skill deficits for specific tasks, which can be met through training; and those of the workplace with deficiencies in the work environment which can be met through improved management practices and organizational priorities.

According to Miner and colleagues (2005) within the competency development of the workforce, two distinct paths have emerged. Those for whom competencies are used primarily in the development of curricula and training use the first path. Those for whom competencies are used for the creation of job roles and job descriptions use the second path. Applying the MACH model to the currently bi-furcated practice of competency-led workforce development allows administrators, practitioners and educators to integrate these two approaches into one comprehensive plan for educating and training the workforce.

Workforce competencies as described by the authors of the MACH model combine a series of different skills into one broad statement. These statements are meant to define a wide scope of work, and generally include multiple actions, and responsibilities such as a job description (Miner et al., 2005). Workforce competencies are based on who the employees are, the context in which they perform their job, and the specific skills the employees need to perform their job.
An example of a workplace competency for registered nurses is the expectation that nurses will use the nursing process and evidence-based practice to promote quality patient care (Newton Wellesley Hospital [NWH], 2013). Another example of a workplace competency for registered nurses is that they are expected to update their knowledge and skills of populations served to meet current patient care needs (NWH, 2013). Workforce competencies often do not outline specific knowledge, skills and attitudes that are required to complete workplace responsibilities. To date, there is a lack of an explicit description in the literature of what attributes a health-literate health professional should possess to help inform workplace competencies. Minnesota Health Literacy Partnership (2016) describes a health-literate health professional as a provider who can deliver health information to patients effectively. Another description is a health professional that presents information in ways that improve understanding and ability of people to act on the information (Coleman, 2011). And the Ten Attributes of Health Literate Organizations describes a health literate workforce as one that uses health literacy strategies in all interpersonal communications with patients and confirms patient understanding at all points of contact (Brach et al., 2012).

Instructional competencies within the MACH model are modeled after Bloom’s taxonomy (Bloom et al., 1956). Taxonomy is a system that describes, identifies, and classifies groups. In education, taxonomies classify three domains of learning: cognitive, affective and psychomotor (McDonald, 2014). The MACH model’s instructional competencies address the cognitive (knowledge), psychomotor (skills), and affective (attitude) domains of learning. The cognitive learning domain addresses the development of intellectual abilities and skills (Bloom et al., p.7). The psychomotor domain is
concerned with the development of physical abilities and skills that result from the input of information and content (Bloom, et al., p. 7). And the affective domain involves knowledge that deals with the individual’s values, attitudes and feelings (Bloom et al., 1956). Through the MACH model’s approach, identified competencies can address both instructional and workforce needs.

Competencies required for nursing practice are defined as an expected level of performance that integrates knowledge, skills, abilities and judgment (American Nurses Association [ANA] & National Nursing Staff Development Organization [NNSDO], 2010). This study will address the need for core health literacy competencies in registered nurses that include essential knowledge, skills, and attitudes in caring for low health literate individuals.

The creation of core nursing competencies based on patient needs, recommended best practices, and consensus by professional nurse leaders and educators help ensure quality patient care in the workplace. The identification of core competencies is an important process for any discipline, as competencies define the expected capacities of individuals and are complementary to the performance standards for organizations (Gebbie et al., 2002). The study design will show the association of instructional competencies to individual performance. Once core competencies have been identified, nurse educators and nurses in professional development can use these competencies as a guide for training and education through the curriculum process that is a central part of the MACH model (Miner et al., 2005).
Purpose of Study

Several studies demonstrate limited health literacy knowledge among nurses and nursing students suggesting that nurses enter the workforce with knowledge gaps related to identifying patients with low health literacy and essential actions that assist patients’ understanding of health information (Cormier & Kotrilik, 2009; Knight, 2011; Macabasco-O’Connell & Fry-Bowers, 2011). The purpose of this study is to address the education and practice gaps related to health literacy education and to identify explicit core competencies for registered nurses. The goal of establishing core competencies is to have a defined standard for education and professional development needs: such as practice guidelines, training curricula, and criterion that address the health literacy knowledge, skills and attitudes needed for professional practice. Strengthening registered nurses’ health literacy knowledge, skills, and attitudes will help enhance patient outcomes.

Based on partial replication of prior work by Coleman, Hudson, and Maine (2013), a set of nursing health literacy core competencies will be identified through nurse expert consensus using a three-round Delphi method. Recruitment for Delphi nurse experts will be achieved by contacting health literacy nurse experts directly who have published in the field of health literacy.

Research Questions

The following research questions will be addressed:

1. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy knowledge in caring for patients?
2. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy skills in caring for patients?

3. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy attitudes in caring for patients?

**Definition of Terms**

The following terms are used throughout this study:

**Health literacy.** “Is the degree to which an individual can obtain, process, understand, and communicate, about health-related information needed to make informed health decisions” (Berkman, Davis & McCormack, 2010, p.16).

**Health literate workforce.** A health literate workforce uses health literacy strategies in all interpersonal communications with patients and confirms patient understanding at all points of contact (Brach et al., 2012).

**Competency.** An expected level of performance that integrates knowledge, skills, abilities, and judgment (American Nurses Association [ANA] & National Nursing Staff Development Organization [NNSDO], 2010. p.43).

**Core competency.** A defined fundamental level of knowledge, ability, skill, or expertise that is essential to a particular job (ANA & NNSDO, 2010, p.43).

**Workplace competencies.** Are a series of different skills combined into one broad statement. These statements are meant to define a wide scope of work, and generally include multiple actions, and responsibilities such as a job description (Miner et al., 2005).

**Instructional competencies.** Modeled after Bloom’s taxonomy (Bloom et al., 1956). Larger skills are broken down into basic steps that build on and reinforce one
another, leading to higher levels of learning. Provides detailed information of what is expected of, and can be demonstrated by the learner or specific members of the workforce (Miner et al., 2005).

**Methodology**

A common method to identify competencies is the utilization of the Delphi method to reach consensus with expert participants. Some characteristics of the Delphi method include anonymity of participants to the group, multistage iteration, exploration of consensus via statistical group response, and the use of experts. These characteristics enhance validity of the study design and the quality of the responses (Goodman, 1987).

A set of core competencies was identified through nurse expert consensus using a Delphi method. A three-round Delphi method was used to identify and prioritize core health literacy competencies for registered nurses. Recruitment for the three-round Delphi study was through accessing health literacy nurse experts who have demonstrated expertise by publishing in the field of health literacy in the United States. The criteria for selection of nurse experts for this study included: registered nurses in the U.S. who have first authored peer reviewed literature in the field of health literacy; have an accessible email address; and willingness to participate.

The literature is ambiguous about sample size in studies using the Delphi method sample. A consensus panel usually consists of 15 to 30 participants from the same discipline (De Villiers, De Villiers, & Kent, 2005). Literature supports that having more than 30 participants does not appear to improve results (De Villiers, De Villiers, & Kent, 2005; Fink, et al., 1984). The aim was to invite a minimum of 60 nurse experts since questionnaire research has less than 50% response rate (Polit & Beck, 2012).
Statistical analysis of demographics and response data included central tendency and level of dispersion. Descriptive statistics were applied to the data using the Statistical Package for Social Sciences (SPSS v.23). There is no standard threshold for consensus in the Delphi literature. Reported consensus thresholds range from 51%-80% (Keeney, Hasson and McKenna, 2006). Consensus for round three was set at 80% because it was hypothesized by the investigator that there would be strong consensus agreement on most competency items and the credibility of the study would be strengthened using a higher consensus level (Gebbie et al., 2002).

For this Delphi study, a target sample size of 30 nurse health literacy experts were asked to rate a questionnaire that was delivered via Survey Gizmo ©, an online platform in three rounds. Each participant who met inclusion criteria and agreed to participate was included, even if the initial sample size exceeded 30 to allow for attrition as the study progressed. Starting in round one, nurse experts were asked to rate a 62-item questionnaire of health literacy educational competencies for health professionals developed by Coleman, Hudson and Maine (2013) for relevancy as nursing competencies. The questionnaire used a 5-point Likert scale to evaluate each item (1, not important; 2, somewhat important; 3, important; 4, very important; 5, extremely important). In round one, the nurse experts were also invited to enter additional health literacy educational competencies that are specific to nursing. During rounds one and two, nurse experts were asked to rate included questionnaire items. Items that were rated less than 90% in round two were dropped and resulted in the final core instructional competencies. In round three, nurse experts were asked to prioritize/rank order
remaining competencies. Nurse experts were given two weeks for each round to respond. In each round, reminder emails were sent out to nurse experts that had not responded. Confidentiality was maintained and other nurse experts did not know the names of other members participating in the Delphi rounds.

**Significance of Study**

The significance of this study impacts five specific areas related to nursing. These areas include nursing education, practice, policy, theory, and patient outcomes.

**Education.** The information generated by this study, identified core health literacy competencies for registered nurses in any work setting. This provides a starting point for the integration of health literacy content in practice and schools of nursing. Next steps as identified in the MACH model are to plan relevant training that address these prioritized core competencies. Nurses in professional development and nurse educators in nursing schools will need to determine how many of these 50 health literacy competencies to focus on. Educators also will need to design effective pedagogical approaches to use when introducing these competencies to registered nurses and nursing students. Future research of these approaches will provide an understanding of which evidence based strategies to use to educate nursing students and nurses in practice. Research will also be needed to determine if using these identified health literacy competencies for registered nurses in practice and education improves individual and organizational performance in the workplace. Lastly, research is needed to support how a better-educated workforce using these prioritized health literacy competencies for registered nurses influence patient outcomes.
The information generated by this study, identifying health literacy core competencies for registered nurses will provide a starting point for enhancement of health literacy educational content in practice. Once core competencies have been identified, nurses in professional development and nurse educators can use these competencies as a guide to develop, deliver and evaluate effective health literacy training for registered nurses and nursing students.

**Practice.** Nurses are the largest group of healthcare providers in the United States, totaling more than three million (HRSA, 2010). In general, nurses spend the majority of their time with patients and are in a key position to facilitate the communication processes that are associated with promoting health literacy. Development of health literacy core competencies will assist healthcare organizations with defining criterion and practice guidelines that address health literacy knowledge, skills and attitudes expected for professional practice in registered nurses. Assessment and evaluation of these health literacy core competencies in registered nurses is anticipated to improve registered nurses’ professional performance with patients with low health literacy, and ultimately improve healthcare organizational performance.

**Policy.** Competencies in healthcare are driven by major policy initiatives. *Healthy People 2020, National Action Plan to Improve Health Literacy,* and IOM, have all called for increased health literacy competency development of nurses (IOM, 2004; USSDHS, 2010a; USSDHS, 2010b). Public policy plays an important role in addressing low health literacy and its effects. The failure to act carries high costs in terms of individual health, and healthcare spending. Improving health outcomes by meeting the needs of patients with low health literacy appropriately will require a major commitment
of resources in education and system reforms (USSDHS, 2010b). Educators, licensing, credentialing, and accreditation organizations play a critical role in shaping the training and practice standards for registered nurses. Accreditation agencies such as the American Association of Colleges of Nursing (AACN), Accreditation Commission for Education in Nursing (ACEN), and the Joint Commission on Accreditation of Healthcare Organizations (JACHO) can lead the way in changing how health literacy education and practice are addressed in schools of nursing and healthcare organizations. Findings from this study will inform policy makers, organizational leaders, and accreditation agencies of essential health literacy core competencies necessary for registered nurses.

**Theory.** As the field of nursing continues to evolve, there is a need to periodically assess and develop or revise competencies necessary for nurses to function effectively in the healthcare environment. Application of the MACH model in this study will build upon previous research that utilized the conceptual model as a rationale for the need for competencies in nursing (Hewett, 2012; Kotowski, 2015).

**Patient outcomes.** The potential benefits of investing in health literacy competency development in nursing include: more patients taking advantage of preventative health measures, fewer patients with chronic illnesses, better patient management of chronic illness, less hospital visits, lower costs, improved quality and safety, and an overall patient-centered approach to healthcare (Brach et al., 2012; IOM, 2004). When well-informed patients and healthcare professionals effectively communicate and collaborate on a treatment plan, patients often take a more active role in their care resulting in improved health outcomes (Cronenwett et al., 2007; USDHHS, 2010a; Zarcadoolas, Pleasant, & Greer, 2006).
CHAPTER TWO: REVIEW OF THE LITERATURE

A review of the literature is presented in chapter two to provide context for this dissertation study. This chapter offers an overview of the concept of health literacy including its historical origin, definitions and conceptual models found in the review of the literature, and commonly used health literacy measurement and screening instruments. The purpose of this study is to address the education-practice gap related to health literacy education and to identify explicit core competencies for registered nurses. The concepts of competency and competencies will also be explored. The chapter will provide a review and synthesis on empirical literature related to the study’s purpose. Lastly, chapter two presents the conceptual framework for this study, the MACH model (Miner et al., 2005).

Overview

Low health literacy has been linked to adverse health outcomes such as higher rates of emergency room visits, poorer skills in taking medications, decreased capacity to manage chronic disease, less ability (among older adults) to recall information after a clinic visit, higher rates of hospitalization and death, increased rates of hospital readmission with 30 days of discharge, and less frequent use of preventive services (Berkman et al., 2011; IOM, 2004). Research suggests that low health literacy skills in individuals are a stronger predictor of health status than age, income, education level, or racial/ethnic group (Sudore et al., 2006). Poor health outcomes contribute to escalating healthcare costs. Low levels of health literacy in the United States have significant financial impact as patients with low health literacy exhibit less self-management skills
and therefore incur higher medical costs. Health care expenditures due to low health literacy in Americans are estimated to cost the United States $238 billion annually (Vernon, Trujillo, & Rosenbaum, 2007).

**Historical Overview of Health Literacy**

The term “health literacy” was first used in 1974 in the proceedings of a health education conference discussing health education in the school setting (Frisch, Camerini, Diviani & Schulz, 2011). Its relevance to healthcare has developed over time. The terms “literacy” and “health literacy” have been defined, refined, and measured in a variety of ways over the years, responding to changing demands in an increasingly complex society (Berkman, Davis, & McCormack, 2010).

Between the mid-1800s through the mid-1930s, the United States Census Bureau merely asked individuals if they could read and write in any language (Berkman, Davis, & McCormack, 2010). In 1992, the Department of Education conducted the National Adult Literacy Survey (NALS), the first attempt to construct a complete profile of adult literacy in the United States, which included prose, document, and quantitative literacy. Over 40 million American adults scored within the lowest literacy categories, which mean that they cannot read or have difficulty with reading (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993). Although the concept of literacy was not new, the prevalence of low literacy skills in the United States came to the forefront in the aftermath of the 1992 NALS report (Parker, Baker, Williams, & Nurss, 1995).

The results of the NALS report prompted a follow-up assessment of adult literacy in America a decade later. In 2003, the National Assessment of Adult Literacy (NAAL) was commissioned to identify how many individuals had “below basic literacy skills” and
needed basic adult education (Kutner, Greenberg, Jin, & Paulson, 2006). The NAAL was the first large-scale national assessment to contain a component to measure health literacy in U.S. adults (Berkman, Davis & McCormick, 2010). The survey sample included over 19,000 adults ages 16 and older in homes and over 1,000 inmates in state and Federal prisons across the country. Populations excluded in the 2003 NAAL survey were individuals in institutionalized settings (except for prisons) and the homeless population (Kutner, Greenberg, Jin, & Paulson, 2006).

The 2003 NAAL survey provided valuable information on the state of adult health literacy in the United States. According to the survey report, only 12 percent of U.S. adults have “proficient” health literacy, meaning they understand and use health information effectively (Kutner, Greenberg, Jin, & Paulson, 2006). In terms of healthcare, these results suggest that adults with low literacy scores do not possess basic skills required to function within the 21st century healthcare system. This includes completing basic tasks such as reading prescription drug labels, reading appointment cards for follow-up appointments with healthcare providers, and interpreting instructions on childcare (Parnell, 2015; Zarcadoolas, Pleasant, & Greer, 2006). The NAAL survey provided additional information by identifying at risk populations. Populations most at risk for low health literacy are older adults, adults with low education levels and low socioeconomic status, minorities, and individuals with limited English proficiency (Kutner, Greenberg, Jin, & Paulson, 2006).

An increasing body of evidence demonstrates that health literacy is linked to health status. The Agency for Healthcare Research and Quality (AHQR) published a systematic review on literacy and health outcomes, which further supported the
deleterious effect of low literacy on health (Berkman et al., 2004). More health literate individuals report better health (Zarcadoolas, Pleasant, & Greer, 2006). The IOM produced a landmark publication *Health Literacy: A Prescription to End Confusion* that brought awareness of the consequences of low health literacy. In the report, health literacy was further defined and recommendations were made to address the influence of health literacy on health (IOM, 2004).

In 2004, a health literacy workgroup under the supervision of the Office of Disease Prevention and Health Promotion in the United States was formed. The goal of this workgroup was “to identify the most important public health issues and research needs in health literacy from a variety of perspectives, including those of health care organizations and providers, the research community, and educators “(Office of the Surgeon General [U.S]; Office of Disease Prevention and Health Promotion [U.S], 2006, p. 4). The workgroup members formed a steering committee and led the Surgeon General’s workshop on health literacy. The Surgeon General’s workshop attendees included healthcare organizations, clinicians, investigators, and educators. The workshop efforts identified two major issues that need to be addressed in order to improve health literacy of Americans. First, health professionals need to competently provide clear and understandable health information to consumers of healthcare in order for individuals to follow healthcare advice adequately. And health literacy must be addressed not only at individual level, but also, across social, cultural, educational, and public health systems. (Office of the Surgeon General [U.S]; Office of Disease Prevention and Health Promotion [U.S], 2006).
Low health literacy skills of adults in the United States once thought to be a problem with consequences affecting only individuals is now viewed as a broader societal issue. As a result, health literacy has become an integral part of the national health platform outlined in *Healthy People 2020* (USDHHS, 2010a). Additionally, many professional organizations and government agencies have promoted health literacy as a healthcare and research priority (AHRQ, 2010; CDC, 2011; IOM, 2004; TJC, 2015).

Between 2010-2012 two important documents were published: the *National Action Plan to Improve Health Literacy* (USDHHS, 2010b) and the *Ten Attributes of Health Literate Organizations* (Brach et al., 2012). The purpose of the *National Action Plan to Improve Health Literacy* is to create and sustain a health literate nation by engaging organizations, professionals, policy makers, and communities in a connected effort to improve health literacy. The vision informing the plan is of a society that: provides Americans with access to accurate and actionable health information; delivers patient-centered health information and services; and supports lifelong learning and skills to promote health. The plan contains seven goals to improve health literacy in the United States:

1. Develop and disseminate health and safety information that is accurate, accessible, and actionable.
2. Promote changes in the health care system that improves health information, communication, informed decision making, and access to health services.
3. Incorporate accurate, standards-based, and developmentally appropriate health and science information and curricula in childcare and education through the university level.
4. Support and expand local efforts to provide adult education, English language instruction, and culturally and linguistically appropriate health information services in the community.

5. Build partnerships, provide guidance, and change policies.

6. Increase basic research for the development, implementation, and evaluation of practices and interventions to improve health literacy.

7. Increase the dissemination and use of evidence-based health literacy practices and interventions (USDHHS, 2010b, pp. 1-2).

The National Action Plan to Improve Health Literacy explicitly advocates for improvement in the delivery of health information and communication to the health care consumers in healthcare systems (USDHHS, 2010b). In response to this recommendation, nurses need to become competent in delivering health information to patients that is clear and understandable using best practices that promote patient understanding. However, those practices are not explicitly developed.

The Ten Attributes of Health Literate Organizations document was developed to be broadly applied to healthcare providers, healthcare organizations, and health insurance plans to help healthcare consumers to navigate, understand, and use the health information and services provided (Brach et al., 2012). The document lists ten essential attributes for an organization to be health literate:

1. Has leadership that makes health literacy integral to its mission, structure, and operations.

2. Integrates health literacy into planning, evaluation measures, patient safety, and quality improvement.
3. Prepares the workforce to be health literate and monitors progress.

4. Includes populations served in the design, implementation, and evaluation of health information and services.

5. Meets the needs of populations with a range of health literacy skills while avoiding stigmatization.

6. Uses health literacy strategies in interpersonal communications and confirms understanding at all points of contact.

7. Provides easy access to health information and services and navigation assistance.

8. Designs and distributes print, audiovisual, and social media content that is easy to understand and act on.

9. Addresses health literacy in high-risk situations, including care transitions and communications about medicines.

10. Communicates clearly what health plans cover and what individuals will have to pay for services (Brach et al., 2012, p. 3).

The *Ten Attributes of Health Literate Organizations* document contains attributes that recommend the need for organizations to prepare a health literate workforce that uses health literacy strategies in all interpersonal communications with patients and confirms patient understanding at all points of contact. However, recognized core health literacy competencies for registered nurses are needed so that nurses in professional development and nurse educators can use these to guide curricular development in education programs and evaluation efforts related to health literacy training.
In summary, the history of literacy and the evolution of health literacy in the United States reflect the country’s shift from an agricultural society to an information-based one. An American living in the early 1900s could function in society without possessing the ability to read or write. During the industrial age, literacy demands on Americans began to increase. The ability to read, write and possess basic numeracy skills was necessary for most workplace and healthcare encounters. Today’s information-based society places an even higher burden on consumers of healthcare to understand written, spoken, and numeric material, in addition healthcare consumers must translate, communicate and act upon complex health information (Berkman, Davis, & McCormick, 2010).

Health Literacy Definitions

The definitions and measurement of literacy have changed, becoming more representative of the literacy skills needed to function in today’s society. Individuals with similar educational achievement can differ in their reading and numeracy skills; educational attainment is not a reliable indicator of health literacy level (Berkman, et al., 2004; Parker et al., 1995). Educational achievement can be an unreliable measure of individuals’ baseline reading and numeracy skills when evaluating differences in health outcomes or the effectiveness of health interventions (Berkman, Davis, & McCormick, 2010). This acknowledgment has led to awareness for the need to more directly conceptualize the term health literacy (Berkman, Davis, & McCormick, 2010). The evolution of the concept has led to considerable variation in the ways health literacy is defined and conceptualized. Despite increasing research on health literacy over the past several decades there is not a single, unanimously accepted definition for this term. In
2012, Sorenson and colleagues identified that health literacy had more than 17 definitions (Sorenson et al., 2012). The following seven health literacy definitions were selected to demonstrate how health literacy has evolved as a concept.

Table 1

Definitions of Health Literacy

<table>
<thead>
<tr>
<th>Organization</th>
<th>Year</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>World Health Organization (WHO)</td>
<td>1998</td>
<td>“The cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information that promote and maintain good health” (WHO, 1998, p.10)</td>
</tr>
<tr>
<td>American Medical Association (AMA)</td>
<td>1999</td>
<td>“The constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the healthcare environment” (AMA, 1999, p. 553)</td>
</tr>
<tr>
<td>Nutbeam</td>
<td>2000</td>
<td>“The personal, cognitive, and social skills which determine the ability of individuals to gain access and understand, and use information to promote and maintain good health” (Nutbeam, 2000, p. 263)</td>
</tr>
<tr>
<td>Institute of Medicine (IOM)</td>
<td>2004</td>
<td>“The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make health decisions” (IOM, 2004, p.32)</td>
</tr>
<tr>
<td>Zarcadoolas, Pleasant and Greer</td>
<td>2006</td>
<td>“Wide range of skills that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce risks and increase quality of life” (Zarcadoolas, Pleasant, &amp; Greer, 2006, p. 55)</td>
</tr>
<tr>
<td>Mancuso</td>
<td>2008</td>
<td>“An evolving lifetime process that includes attributes of capacity, comprehension, and communication.” (Mancuso, 2008, p. 250)</td>
</tr>
<tr>
<td>Berkman, Davis and McCormack</td>
<td>2010</td>
<td>“The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions” (Berkman et al., 2010, p.16).</td>
</tr>
</tbody>
</table>
Early definitions of health literacy focused on functional skills of an individual that include the ability to read and perform medical tasks specific to the health care environment (AMA, 1999; IOM, 2004; WHO, 1998). Recent discussions among health literacy experts and organizations highlight the importance of moving away from an individual focus, and to consider health literacy as an interaction between the demands of society, health systems and the skills of individuals (Sorenson et al., 2012). In 2011, the IOM stated that health literacy affects all healthcare efforts and is based on the interaction of an individual’s skills with healthcare and education systems, and broad cultural and social determinants at home, work and the community (IOM, 2011b). More recent definitions of health literacy incorporate a more complex set of abilities, such as reading and acting upon written health information, communicating needs to health professionals, and understanding health instructions, all linked to the core value of citizen/public empowerment (Sorenson et al., 2012).

Over the years, there has been much debate about whether health literacy is static or dynamic. Some definitions view health literacy as a single attribute linked to health risks. Others believe patient and healthcare professional’s health literacies are dynamic assets characterized by existing experiences and life skills within a wide range of contexts (Mancuso, 2008; Nutbeam, 2008; Zarcadoolas, Pleasant, & Greer, 2006).

Berkman, Davis and McCormack (2010) provide a health literacy definition that includes more than “basic” health information: “The degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions” (p.16). This definition highlights understanding and communication as critical elements with major implications for an individuals’ health.
One major focus of this study is on the registered nurse’s ability to communicate health information in a way that promotes patient understanding and for this reason Berkman et al.’s definition will be chosen.

**Health Literacy Models**

The theoretical development of health literacy continues to evolve. To date, there are more than 12 conceptual frameworks (Sorensen et al., 2012). Health literacy is a multidimensional concept and consists of different components. Conceptual models not only consider key components of health literacy, but also identify the individual and system-level factors that influence a person’s level of health literacy. Frameworks refer to demographic, psychosocial, and cultural factors, as well as to proximal factors such as general literacy, individual traits, and prior experience with illness and the healthcare system. In terms of individual traits, health literacy is influenced by age, race, gender, and cultural background, as well as by meta-cognitive skills associated with reading, comprehension, and numeracy (Sorenson et al., 2012).

One of the most widely used models of health literacy was developed by the IOM (2004). The model includes a variety of components: reading, writing, numeracy, listening, speaking, and cultural and contextual knowledge. In the IOM model (2004), individual literacy skill is an important factor to health literacy development. One criticism of the model is its limited perspective on the social factors that impact individual health such as where the person lives, works and plays.

Other conceptual models go beyond reading, writing and numeracy skills to include a wider perspective of knowledge domains including the social determinants of health. A widely accepted model of health literacy is one offered by Nutbeam (2000),
which identifies the major concepts underpinning health literacy: functional, interactive, and critical skills. Functional health literacy skill consists of reading, writing, and numeracy skill for everyday use. This category includes the comprehension and communication of health facts, awareness of health services, and use of the health system. Interactive health literacy involves advanced cognitive, social and literacy skills that contribute to the development of personal skills in a supporting environment. Interactive health literacy is focused on improving individual motivation and self-efficacy that influence behaviors that improve health. Critical health literacy consists of advanced analytical, advocacy, and social skills that are geared toward analyzing broad social and political arrangements with the goal of creating positive change within communities at the societal level. An example of critical health literacy is the advancement made by Mothers Against Drunk Driving (MADD) organization. This group advocated for social and legislative change in drinking and driving behaviors. The model represents individual knowledge, skills, and attitudes that support self-efficacy and control of personal health management, but extends health literacy to include community engagement with a wider range of health literacy knowledge and skills, such as activism and advocacy that address the social determinants of health (Nutbeam, 2000; Sorenson et al., 2012).

**Concept analyses.** Concept analysis is a method to clarify a concept. Speros (2005) published the first health literacy concept analysis in nursing. The purpose was to assist in defining health literacy and to clarify the concept. The analysis defined attributes most often used in the literature, such as reading and numeracy skills, comprehension, using health information in decision-making and having health-related
experience. Previous health care experiences were shown to help a person to develop a mental picture or set of expectations that can be drawn on in future health care experiences. This means if an individual has unique knowledge about a specific health issue, such as diabetes or heart failure, this experience increases their ability to understand new information.

In 2008, Mancuso published a second concept analysis in nursing. Unlike the earlier concept analysis, the author refers to health literacy as a dynamic process that evolves over an individuals’ life span. The major attributes identified are capacity, comprehension and communication. Mancuso suggests that to attain health literacy competence, “operational, interactive, autonomous, informational, contextual and cultural domains” need to be considered (2008, p.249). Operational competence is the ability to use tools, procedures, and techniques for handling language proficiently. Interactive competence is the ability to collaborate with others for improved self-management. Autonomous competence is self-awareness that assists an individual to assume responsibility for health-related decisions. Informational competence is the ability to determine the authority and currency of health information. Contextual competence is the mastery of environment. Cultural competence is the ability to recognize and use their cultural beliefs in order to interpret an act on health information (Mancuso, 2008). Both concept analyses share four common characteristics associated with health literacy: reading skills, comprehension skills, numeracy skills, and communication skills (Mancuso, 2008; Speros, 2005).

In health literacy research, Paasche-Orlow and Wolf’s model (2007) is the most commonly used to date (Sayah & Williams, 2012). Paasche-Orlow and Wolf proposed a
conceptual model linking health literacy and health outcomes through personal and social determinants. Authors define health literacy as an individual’s possession of requisite skills for making health-related decisions, which means that health literacy must always be examined in the context of specific tasks that need to be accomplished. The model demonstrates the causal pathways that links health literacy and health outcomes. The model highlights 14 key variables of an individual and their relationship to health literacy: socioeconomic status, employment, income, culture, language, education, age, race/ethnicity, social support, and personal competencies such as vision, hearing, verbal ability, reasoning, and memory. These are considered important antecedents of health literacy. The model focuses on three main propositions which have an impact on an individual’s health outcomes: (1) navigation skills, self-efficacy and perceived barriers influence the access and utilization of healthcare; (2) knowledge, beliefs, and participation in decision-making influence patient/provider interactions; and (3) motivation, problem-solving, self-efficacy, knowledge and skills influence self-care (Paasche-Orlow & Wolf, 2007).

Osborne and colleagues (2011) sought to empirically validate part of the Paasche-Orlow and Wolf’s model. They focused on the patient self-care pathway using data from adults with hypertension who were receiving care at six primary care clinics in the United States. Data included patient demographics, health literacy, disease-related knowledge, self-efficacy, and health status. The association between health literacy and health is hypothesized to account for a sequence of intervening variables (knowledge, self-efficacy, self-care behavior). Findings revealed that demographic factors of age, education and race were directly related to health literacy. Consistent with the
framework and their hypotheses; health literacy was directly related to knowledge and self-efficacy. Knowledge and self-efficacy were directly related to self-care behavior, and self-care behavior was directly related to health status (Osborne et al., 2011). A criticism of the model is the lack of research that has studied the impact of effective versus ineffective oral exchange of health information, the communications skills of the health care provider, and the degree to which an individual is able to actively engage in health promotion activities (Hepburn, 2012).

In 2012, a systematic review of the definitions and models of health literacy was performed by Sorenson and colleagues and offered several criticisms applicable to many of the existing conceptual models. Few models are sufficiently comprehensive to include the dimensions of public health and medical health literacy concepts. Many models do not articulate the antecedents of health literacy and the consequences in a well-defined pathway. Most models are static and do not consider the processes of health literacy such as communicating and evaluating health information. Moreover, most conceptual frameworks have not been validated empirically (Sorenson et al., 2012).

Presently there is not a health literacy conceptual model that sufficiently targets the health literacy skills of the health care provider. Although the focus of this study is on health literacy, the purpose is to identify core health literacy competencies for registered nurses. The assumption is that when nurses apply these competencies during encounters with patients with low health literacy, the encounter will result in the promotion of positive patient outcomes.
Health Literacy Measurement

Many feel that measurement tests such as the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test of Functional Health Literacy in Adults (TOFHLA) should be reserved for research purposes (Osborne, 2013; Paasche-Orlow & Wolf, 2008). While others feel formally assessing health literacy of a patient can assist the clinician to guide selection and development of patient education material (IOM, 2009).

The following description of health literacy measurements and screening measures will be limited to instruments most commonly reported in the literature, and those that have published measures’ psychometric properties. There is discussion among investigators and clinicians about whether to routinely provide literacy screening in the clinical setting. For many individuals, literacy difficulties are a great source of shame (Paasche-Orlow & Wolf, 2008; Parikh et al., 1996).

Originally developed to measure the literacy level of patients, the REALM is one of the oldest and most widely used instruments to measure the construct of health literacy. In 1991, Davis and colleagues created the first screening instrument to estimate patient literacy in the primary care setting. The instrument is designed as a rapid-screening instrument to assess how well patients read common medical and lay terms that adult primary care patients are expected to recognize; to help clinicians in identifying patients with limited reading skills and in estimating the appropriate level of patient education written and oral.

In 1993, the REALM instrument was shortened reducing administration time to less than five minutes. The REALM is only available in English. The REALM is a word-recognition test, in which patients are presented with a list of 66 medical words
beginning with easy words (e.g., fat, flu, pill) and progressing to more difficult words (e.g., osteoporosis, impetigo, potassium). Patients are asked to read through the list and pronounce each word out loud. The examiner scores the patient on the number of words pronounced correctly. It is important to note that no attempt is made to determine if patients actually comprehend the meaning of the words, an important component of many of the health literacy models described earlier. The content of the shortened REALM was derived from sampling words from medical forms and patient education material. Psychometrics for the REALM demonstrates excellent test-retest reliability ($r = 0.99$), and internal consistency with reported Cronbach’s alpha of 0.98. Evidence for concurrent validity was obtained by correlating the REALM with scores from three reading tests: Peabody Individual Achievement Test-Revised, the Wide Range Achievement Test-Revised, and the Slosson Oral Reading Test-Revised. The validity coefficients were excellent ranging from $r = 0.88$ to $r = 0.97$ (Davis et al., 1993).

Dumenci and colleagues examined the validity of the REALM as a measure of health literacy in a sample of $N=1,037$ participants with a cancer diagnosis. Findings revealed that the REALM provides highly reliable data with a Cronbach’s alpha of 0.98, but results from the analysis revealed that the REALM items minimally cover the health literacy domains of the IOM (2004) and other definitions of health literacy. Specifically the test provided no coverage on three primary content areas of health literacy: comprehension of printed health materials, numeracy, and information seeking/navigation (Dumenci et al., 2013).

The need to measure the ability of patients to perform health-related responsibilities requiring reading and computational skills prompted the development of
the Test of Functional Health Literacy in Adults (TOFHLA) in 1994. The TOFHLA was developed using actual hospital materials. The TOFHLA is a timed test consisting of a 50-item reading comprehension and 17-item numerical ability test, taking up to 22 minutes to administer. In adults, the TOFHLA has shown excellent internal consistency reliability with Cronbach’s alpha of 0.98 and adequate content validity. It also has strong concurrent validity when compared to two widely used word recognition-based assessments: the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Wide Ranging Achievement Test-Revised (WRAT-R), with correlations of 0.84 and 0.74 respectively (Parker et al., 1995). The TOFHLA has a shortened version called the S-TOFHLA that takes between 7-12 minutes to complete. There is also a Spanish version of the S-TOFHLA. Criticism for both the REALM and TOFHLA is that they are not open-access instruments for clinicians and investigators to use and need to be purchased.

In 2005, Weiss and colleagues developed the Newest Vital Sign (NVS) an open-access tool used to screen for limited health literacy and to elicit information about the patient, allowing providers to adapt their communication practices. The instrument is available in English and Spanish, and patients typically complete the NVS assessment in about three to four minutes. The NVS presents patients with a nutrition label (from a container of ice cream) specifically designed and tested as part of NVS development. The examiner asks the patient six questions about the content on the nutrition label. Answering the questions correctly requires the ability both to read and understand the content on the nutrition label (e.g., to determine if the list of ingredients on the ice cream label contains a substance to which the patient is allergic) and also to perform computations [e.g., numeracy to calculate the number of calories in a serving of ice
consistency reliability with Cronbach’s alpha for the English and Spanish versions 0.76 and 0.69 respectively and criterion validity for the English and Spanish versions were $r = 0.59$ and $r = 0.49$ (Weiss et al., 2005).

**Health Literacy Screening**

Despite the existence of health literacy assessment instruments, barriers exist to routine screening. A major barrier experienced by patients is feeling ashamed of their limited literacy. This may result in individuals attempting to hide their difficulties from health professionals (Osborne, 2013; Paasche-Orlow & Wolf, 2008; Parikh et al., 1996). The length of the formal health literacy instruments also limits its feasibility in the clinical setting. Therefore, some investigators have attempted to evaluate health literacy with simple screening questions. A self-report measure that could efficiently screen patients for low health literacy would help increase the ability to assess a patient’s health literacy in the busy healthcare setting. Several studies researched the efficacy of clinicians asking health literacy screening questions such as “How confident are you filling out medical forms by yourself?” (Wallace et al., 2006) and “How often do you have someone help you read hospital material?” (Chew et al., 2004). Both questions demonstrated higher accuracy than demographic characteristics such as age, race/ethnicity, and educational attainment to screen for limited health literacy. In 2006, Morris and colleagues developed another single-item literacy screener with the goal of identifying adults who needed assistance with reading. The screening question asked was “How often do you need to have someone help when you read instructions, pamphlets, or other written material from your doctor or pharmacy?” Authors reported that the
sensitivity of the tool for detecting patients with borderline reading levels was low [54%] (Morris et al., 2006).

The trend to test patients’ literacy skills began at the time The Joint Commission (TJC) added guidelines to their patient education standards. TJC require health professionals to consider patients’ literacy levels when providing education. However, TJC standards do not require or endorse testing of literacy levels in patients (Cornett, 2009). Cornett (2009) makes a persuasive argument about health literacy measurement in the clinical setting. Unless healthcare professionals are trained to communicate effectively with patients with low health literacy, knowing a patient’s literacy level will not improve patient care. Also, having standards that include specific guidelines for healthcare professionals to provide patient education based on literacy levels do not exist and are a focus of this study.

Recognizing that most available health literacy assessment and screening instruments have limitations, the AHRQ developed the Health Literacy Universal Precautions Toolkit, which encourages healthcare providers to treat all patients as though they have low health literacy (AHRQ, 2010). The AHRQ description of “Universal Precautions” is when healthcare providers perform certain practices that assume all patients have low health literacy. Without a formal assessment method, it is often not always clear if a patient has low health literacy. Even well educated patients can have low health literacy during certain health encounters. The goal of the toolkit is to create a shame-free environment that promotes patient understanding. Universal precautions practices include use of plain language, teach-back, and highlighting need-to-know health
information. The toolkit emphasizes that it requires a team effort in mitigating low health literacy in patients (AHRQ, 2010; Parnell, 2015).

The wide range of health literacy definitions, the continued discussions on whether health literacy is an individual or system skill, and if it is stagnant or dynamic, all contribute to the challenges of continued research, consistent measurement, educational efforts of health professions’ educators and organizations, and possible interventions to enhance low health literacy in individuals and populations.

Nationally, health literacy is an issue that has become a priority in the delivery of safe and quality health care in organizations (Brach et al., 2012; USDHHS, 2010a; USDHHS, 2010b). Seven objectives of Healthy People 2020 specifically focus on health providers’ communication skills; (1) increasing the proportion of persons who report their health care provider always gave them easy-to-understand instructions about what to do to take care of their illness or health condition; (2) increasing the proportion of persons who report their health care provider always asked them to describe how they will follow the instructions; (3) increasing the proportion of persons who report that their health care providers always listened carefully to them; (4) increasing the proportion of persons who report that their health care providers always explained things so they could understand them; (5) increasing the proportion of persons who report that their health care providers always showed respect for what they had to say; (6) increasing the proportion of persons who report that their health care providers always spent enough time with them; and (7) increasing the proportion of persons who report that their health care providers always involved them in decisions about their health care as much as they wanted (USDHHS, 2010a). These objectives charge health professionals to determine
when lack of understanding exists, and to provide health information in a format that patients can understand. The goals and objectives of *Healthy People 2020*, the *National Action Plan to Improve Health Literacy*, and the *Ten Attributes of Health Literate Organizations* initiatives support the need for effective health communication between health care providers and patients to decrease adverse events and improve patient outcomes (Brach et al., 2012; USDHHS, 2010a; USDHHS, 2010b).

The need for health literacy training of health professionals is highlighted in the literature. Studies show that healthcare professionals often underestimate the information needs of their patients and overestimate the health literacy of their patients (Dickens et al., 2013; Kelly & Haidet, 2007). Healthcare professionals may also overestimate their own health literacy knowledge (Coleman & Fromer, 2015; Kennedy-Sheldon & Hilaire, 2015; Makert, Ball, & Lopez, 2011). The Institute of Medicine (IOM) *Health Literacy: A Prescription to End Confusion* (2004) landmark report recommends that health professionals be trained to effectively communicate with patients with limited health literacy (IOM, 2004). Health professional schools and healthcare organizations often fail to adequately educate students on how to assess, communicate with, and effectively educate patients struggling with limited health literacy (Coleman, 2011). There are many competing demands for time and space in the curricula of health professional schools, which include schools of nursing, medicine, dentistry, pharmacy, and public health. Few accrediting requirements or curricula address health literacy in schools of professional health (IOM, 2004). Identifying health literacy competencies for registered nurses and including health literacy education in workplaces and nursing programs will contribute to
a nursing workforce that is adequately prepared to take of care of patients with low health literacy.

Competencies in healthcare are driven by major policy initiatives. The *National Action Plan to Improve Health Literacy*, the *Ten Attributes of Health Literate Organizations*, *Healthy People 2020*, and IOM have all called for an increase in health literacy training of healthcare professionals (IOM, 2004; USSDHS, 2010a; USSDHS, 2010b). Major barriers to implementation of these recommended national health literacy policy initiatives are that there are no economic, social, or political incentives, and no timeline to evaluate the effectiveness of the recommendations (French, 2015). The failure to act, however, carries high costs in terms of individual health, and healthcare spending. Eliminating low health literacy requires a major commitment of resources in education of healthcare professionals and system reforms (USSDHS, 2010b).

**Nurses in Practice**

Safe practice in health care depends on effective communication (Murphy-Knoll, 2007; TJC, 2015; USDHHS, 2010a). In general, nurses spend the majority of their time with patients and are in a key position to assess when low health literacy is interfering with a patients’ understanding of health information and utilize interventions that promote patient comprehension.

A review of empirical literature was conducted on peer-reviewed publications and dissertations that included registered nurses in its sample. The literature selected was comprised of studies that directly or indirectly assessed registered nurses’ knowledge about health literacy and identified health literacy strategies registered nurses use with patients. In 2007, Schwartzberg and colleagues investigated the communication
techniques used by healthcare professionals. The aim of the study was to describe self-reported communication techniques used by physicians, nurses and pharmacists. The frequency of use of each communication technique by profession was listed and compared. Investigators used a survey instrument that was first piloted in 2000 by the AMA using a convenience sample of physicians attending a professional meeting. Between 2001 and 2002 questionnaire data was collected \((N=356)\) using a convenience sample of healthcare professionals in a series of workshops across the United States. The interdisciplinary sample \((N=307)\) included physicians \((n=99)\), nurses \((n=87)\), and pharmacists \((n=121)\). Information about the participants (i.e. qualifications, how many) was not provided. The 14 teaching strategies included asking patients to repeat information (teach back), speaking slowly, presenting two to three concepts at a time and checking for understanding, asking patients how they will follow instructions at home, using simple language, reading aloud instructions, providing written materials, underlying key points in written materials, drawing pictures, using models to explain, follow-up with office staff to review instructions, follow-up with a phone call to check understanding and adherence, and asking if the patient would like a family member included during the discussion. A 5-point Likert scale was used to indicate frequency of use of each technique (never, rarely, occasionally, most of the time, and always). The health professionals were asked to report how often they used these 14 teaching strategies within the past week. Investigators gathered demographic data on participants’ profession only.

Investigators reported that wide ranges of strategies were used and the degree of use varied among professions. The study revealed that routine use of simple words,
speaking slowly and providing written material were common methods used by all healthcare professionals (92-98%) to mitigate low health literacy. Physicians (55.1%) were more likely to distill complicated health information down into two to three concepts in comparison with nurses (42.5%) and pharmacists (36.4%). Pharmacists were more likely to read written health information to patients (70%) in comparison with nurses (57.6%) and physicians (46.9%). Nurses were twice as likely to ask patients to repeat information (60.5%) in comparison with physicians (35.4%) and pharmacists (27.7%). However practices that include drawing pictures, using models, having patients follow up with office staff to review instructions, and following up with telephone call to patients to check understanding/adherence were not used in most clinical settings (Schwartzberg et al., 2007). Study strengths were the use of multiple sites and a pilot tested survey instrument. Limitations include the use of a convenience sample with participants attending a conference on patient safety and quality that may be more educated on the topic of health literacy thus limiting generalizability.

Demographic data regarding age, gender, race/ethnicity, geographic location, previous health literacy education, years in practice and work settings were lacking making it difficult to draw conclusions from the results of the study. Authors did not report on reliability and validity of instrument nor if a power analysis was performed to ensure adequate sampling. Use of self-report provided the potential for social desirability. Some of the wording for the teaching strategies was ambiguous and participants may have misunderstood some questions. An example is one survey question that asks participants if they had the patient repeat information (using teach-back technique). Repeating information and the use of teach-back are not the same. In the
teach-back method, the patient is asked to repeat back what was instructed as if they were talking to a friend or family member. The healthcare professional may frame this request by telling the patient that they want to assess if they did a good job explaining the information to the patient. The underlying premise is that this approach shifts the responsibility to how well the provider explained something rather than how well the patient understood (Schillinger et al., 2003). It is unclear if the participants were aware of the difference. Also some teaching practices seem more relevant to physicians or pharmacists (i.e. follow-up with office staff to review instructions, reading aloud instructions).

Payne (2009) sent a mailed written survey to a random sample of 1000 registered nurses in Texas with 259 (26%) registered nurses completing the questionnaire. The purpose of the survey was to determine registered nurses’ use of specific communication and teaching strategies used with patients with low health literacy. The investigator used a modified AMA instrument to questionnaire nurses. Face validity of the modified instrument was done with one leading expert in the health literacy field and the investigator’s dissertation committee (qualifications of members were not provided). Based on the panel’s recommendations certain questions were removed that were more relevant to physicians, such as follow-up with office staff to review instructions and follow-up with a phone call to check understanding. The follow-up questions were replaced with one item that asked the frequency for following up on subsequent shifts or visits to confirm understanding. Another modification made was changing only 1-2 concepts at a time instead of 2-3 concepts. The adaptation was based on current literature recommendations at the time. Other modifications included use of visual aids such as
pictures, models and videos, asking if the nurse referred the patient to an educator/class in the hospital or community, and if nurses assessed what the patient already knows.

A pilot study with the modified instrument was not performed. The investigator asked participants an open-ended question about how they learned to provide patient education. Study findings were similar to Schwartzberg et al. (2007) study results. New or adapted questions in the instrument revealed that most nurses assess what the patient already knows (88.4%) and present 1-2 concepts at a time (71.5%). Following up in subsequent shifts or visits to confirm understanding was reported more than half of the time (55.2%). Strategies such as referring the patient to an educator/class either in the facility or community (33.2%) and use of visual aids (28.8%) were used infrequently. A major strength of this study was capturing more detailed demographic information on participants that allowed the investigator to perform correlations among certain key demographic variables. Study variables of level of education, years of experience and work setting showed statistically significant correlations with only a few of the listed teaching techniques. However, the investigator did not obtain demographics on age, gender, and race/ethnicity, or report percentages for level of education, years of experience and work setting. Qualitative findings revealed that most nurses learned how to teach by observing other nurses role model patient education on the job and not from previous nursing education. The sample was randomized to decrease risk of bias. Limitations of the study included the use of self-reporting and the risk for social desirability. Power analysis for the sample nor the reliability and validity of the instrument were reported. The study had less than a 30% response rate (Payne, 2009).
Jukkala and colleagues (2009) surveyed health care providers \((N=230)\) that included nurses \((n=82)\) dentist \((n=15)\) and physicians \((n=31)\) and college students regarding their general knowledge of low health literacy and its impact on individuals and the healthcare system prior to a conference. The convenience sample was attending a presentation on health literacy at an academic setting. Investigators created an eight question multiple-choice questionnaire entitled Limited Literacy Impact Measure (LLIM) to assess participants’ health literacy knowledge. Face validity of the instrument was performed with experts in the field of nursing, medicine and health literacy. It is unclear how many experts were used. Authors chose not to report on reliability of the instrument since it was not intended to be a scale. Pilot testing of the instrument was not performed. Findings indicated that participants had limited knowledge about the prevalence of low health literacy and its impact on patient outcomes. Only 12% of participants correctly identified the percent of individuals in the U.S. not proficient in health literacy. Some participants (25%) thought they could use demographic data as indicators of limited health literacy. Results indicated that 37% of participants had never heard of health literacy. Study findings revealed that nurses reported the lowest rate of prior knowledge about health literacy when compared to colleagues in medicine and dentistry. Nurses scored lowest on items that included knowledge of; health literacy prevalence in the U.S. \((8.5\%)\), limited health literacy is estimated to cost $30 to $73 billion per year \((18.3\%)\) and the average consent form is written at the 10th grade reading level \((20.7\%)\). A major strength of this study was the high response rate \((86\%)\) of participants. Limitations include not performing a power analysis to ensure adequate sampling, and lack of instrument pilot testing. Study demographics related to age, gender, race/ethnicity,
educational level, years of professional healthcare experience and work setting were not obtained. The use of a convenience sample with participants attending a conference on health literacy may also introduce bias and impact generalizability of findings (Jukkala, Deupree, & Graham, 2009).

Macabasco-O’Connell and Fry-Bowers (2011) sent an electronic survey to 270 randomly selected nurses to assess the knowledge and perceptions of health literacy among nursing professionals. Less than 30% ($n=76$) nurses participated. Most nurses were White (60%) and worked in acute care settings (59%). In contrast to Payne’s study sample, the study included both registered nurses (47%) and advanced practice nurses (42%) licensed in California. Investigators developed a 47-item instrument to measure health literacy knowledge and perceptions titled the Nursing Professional Health Literacy Questionnaire (NPHLS) using items from the LLIM measure (Jukkala, Deupree, & Graham, 2009) and another instrument (Schlichting et al., 2007). Content validity of the instrument was confirmed using experts in the field of nursing. Authors did not provide further description of the experts (how many, knowledge about health literacy) or if the newly created instrument was pilot tested. The instrument also included an open-ended question that asked participants to define health literacy using their own words.

Findings revealed that more than 80% of nurses reported that they never assess health literacy in patients with a validated instrument. Most nurses (60%) reported using their “gut” feeling to assess patients’ level of health literacy and only 30% ask patients if they have difficulty reading medical information. Most respondents (80%) were familiar with the term health literacy. More than half of the nurses (59%) reported never having health literacy taught in their nursing education program, and 56% of nurse participants
viewed health literacy as a low priority compared to other patient problems. Similar to Jukkala et al., (2009), only 17% of nurses were aware of the financial burden to the country as a result of the prevalence of low health literacy. Health literacy definitions provided by participants varied and primarily related to an individual’s knowledge of disease and medical terminology, and ability to understand patient education material. The limited definitions provided by participants were similar to findings in another study performed with registered nurses (Richey, 2012). Study participants were asked to define the term “health literacy” and findings in that study revealed that none of the participants’ descriptions of the term appeared to be complete in understanding the elusive concept of health literacy (Richey, 2012). Limitations for the study include the small sample size and low response rate. Also, there was a lack of reporting reliability and validity of the instrument and if a power analysis was performed (Macabasco-O’Connell & Fry-Bowers, 2011).

Toronto and Weatherford’s (2016) qualitative descriptive study explored RN-BSN students’ prior experiences with patients with low health literacy. Participants were enrolled in a research class held at a university in the Northeast. Sixteen of 19 (84%) students agreed to participate in the study. The majority of participants were Caucasian (75%), female (88%), and between the ages of 32-48 years. More than half the nurses reported no prior exposure to health literacy education (56%). Nurses’ work settings varied which included inpatient, outpatient, and surgical settings as well as across diverse populations of patients. Nurses were provided the IOM (2004) health literacy definition “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions”
(IOM, 2004, p.32), and were asked to write about a time they took care of a patient they thought had low health literacy and where they felt they made a difference.

Several themes were discovered. Narratives revealed that most nurses identified the need to promote trust first with their patients. The patient-centered approach often elicited important information from the patient that helped improve the plan of care for that patient. Participants also identified gaps in understanding of health information when patients were given the opportunity to ask and respond to questions. Nurses found certain populations most challenging when providing health information: low income, uninsured, and minorities. Different cultures, beliefs, languages, and values among patients posed additional challenges for participants. Additionally, evaluation of patient’s understanding of health information was often obtained through patient self-report and several nurses appeared to use close-ended questions such as “Do you understand?” based on descriptions provided. Strength of the study was capturing robust demographics that included assessing for prior exposure to health literacy in participants’ previous education. Another strength of the study were analysis procedures which attempted to minimize possible subjectivity by having investigators analyze the data independently and then validate as a team. Limitations of the study include a small convenience sample, which limit generalizability of findings. The investigator and faculty member were present when students wrote their narratives and there is potential for social desirability in participants’ responses (Toronto & Weatherford, 2016).

The empirical literature reported in this review was conducted in the United States. Most studies used questionnaire designs with low response rates. The sample sizes in descriptive studies using survey methods ranged between 76-356 conveniently
selected participants and did not report power analysis. All samples included registered nurses and several included other health professionals. A majority of studies used investigator-developed instruments and did not report pilot testing or psychometric analysis for the newly developed instruments. Expert panels evaluated survey instruments but limited information was provided of criteria used to classify a panel member as an expert. Demographic data is purported to influence health literacy in several models but was not reported in many studies. The lack of rigorous methodology and consistent validated measures limits the interpretability and generalizability of studies (Jukkala, Deupree, & Graham, 2009; Macabasco-O’Connell & Fry-Bowers, 2011; Payne, 2009; Schwartzberg et al., 2007; Toronto & Weatherford, 2016).

To date, empirical research that assessed registered nurses’ health literacy knowledge and practices with patients with low health literacy reveals that there is a gap in knowledge of health literacy principles and practices among registered nurses and supports the need for practice guidelines, training curricula, and criterion that address the health literacy knowledge, skills and attitudes needed for professional practice. Although studies revealed that nurses are using some health literacy practices that help patients to understand health information, study results demonstrate that nurses’ knowledge of health literacy is incomplete.

**Nursing Education**

The wide range of health literacy definitions and the continued discussions on whether health literacy is an individual or system skill, contribute to the challenges of educational efforts. Moreover, the IOM has identified compressed curricula as a major reason for lack of health literacy inclusion in schools of nursing (IOM, 2004). Health
literacy is also minimally addressed in accrediting recommendations. The American Association of Colleges of Nursing (AACN) briefly lists within the *Essentials of Baccalaureate Education for Professional Nursing Practice* the recommendation that baccalaureate nursing programs need to prepare graduates to assess the health literacy of individuals, families, and groups (2008).

Most nursing curricula address the patient education process, but do not specifically target health literacy (Cornett, 2009). When nursing students are asked to define low health literacy, their responses typically consider only an individual’s inability to read, and not comprehension, numeracy, and communication skills or their ability to act upon health information (Cornett, 2009). In 2011, Coleman’s review of the literature identified minimal empirical data to inform health professions educators on what to teach and how and when to teach health literacy. Coleman cited that there were no published guidelines for the recommended structure of health literacy curricula for health professionals. Coleman (2011) identified the lack of published educational competencies in health literacy as a major barrier to the implementation and evaluation of health literacy curricula in health professions schools. Coleman (2011) also points out that the existing literature on health literacy education for health professions is primarily focused in medicine and pharmacy. Another review that explored health literacy education in health professions schools also found that many health literacy education studies involve non-nursing students (Toronto & Weatherford, 2015). Most of the educational studies in the Toronto and Weatherford’s (2015) review included pharmacy students and only three included nursing students (McCleary-Jones, 2012; Sand-Jecklin et al., 2010; Shieh, Belcher, & Habermann, 2013). Based on their findings, authors advocated for the
development of explicit health literacy competencies for nurses to guide teaching and evaluation methods that address knowledge, skills and attitudes (Toronto & Weatherford, 2015). The review of empirical literature suggests that nursing education and accrediting agencies need to be more responsive to national policy initiatives that advocate for training health professionals on how to competently communicate with patients with limited health literacy. 

**Concept of Competency**

The terms competency and core competency are commonly used in health professional literature, healthcare practice settings, health professions education programs, and credentialing agencies (Di Leonardi & Biel, 2012). Competency focuses on one’s actual performance in a situation. The American Nurses Association defines nursing competency as an expected level of performance that integrates knowledge, skills, and abilities and judgment (ANA & NNSDO, 2010). Core competencies are more specific. In practice, core competencies are defined as the fundamental level of knowledge, ability, skill, or expertise that is essential to a particular job (ANA & NNSDO, 2010). Similar to workplace competencies described in the MACH model, competency and core competencies must not be viewed as static states. These terms are in constant evolution due to changes in the healthcare environment based on patients’ needs, technological advancements, professional responsibilities and expanded knowledge. There is a need to constantly update competencies by integrating new evidence (Di Leonardi & Beal, 2012).

Continued competency is demonstrated by the acquisition of new knowledge and skills. The individual nurse has a professional and ethical responsibility for maintaining
professional competence. The responsibility for competency development needs to be shared with the nursing profession, professional organizations, credentialing and regulatory agencies, healthcare organizations/workplaces, and nursing programs (DiLeonardi & Beal, 2012; Scott-Tilley, 2008). The MACH model demonstrates these relationships.

Determining which competencies are most essential, at what level they should be mastered, and how to teach them remains uncertain (Scott-Tilley, 2008). It is also unclear if competencies should come from education or practice. The literature reveals identification of competencies either for practice or education and sometimes both (AACN, 2010; Hewitt, 2012; Jenkins & Calzone, 2007; Kotowski, 2015). Clinical competencies define nursing practice and form the basis for curriculum development, measurement of student and program outcomes, and program accreditation. Currently there are no nationally recognized essential health literacy competencies in nursing. Development of nursing competencies for health literacy has trailed behind progress of clinical competencies in other areas in nursing, such as genetics and genomics, and the care of the older adult (AACN, 2010; Jenkins & Calzone, 2007). Lack of explicit health literacy competencies results in curricula or educational programs that are devoid or inconsistent regarding health literacy content (Coleman, 2011).

**Health Literacy Competencies**

Clifford Coleman, a nationally recognized leader in health literacy education has drawn attention to the lack of integration of health literacy in health professions’ curricula (Coleman, 2011; Coleman & Appy, 2012). In response, Coleman and colleagues established preliminary health literacy competencies for healthcare
professionals using a modified Delphi method with 23 health professions education experts representing various health professions. The consensus meetings resulted in the identification of 62 potential health literacy educational competencies for health professionals and educators to consider in practice and education. Limitations of the study include that the 62 competencies predetermined at the 70% consensus level may not have been discriminating enough. The study also used a convenience sample and the participants were not all health literacy experts. The panel was created from educational leaders of the Federation of Associations of Schools of the Health Professions who could invite up to 4 others from their organization to attend the meeting. The final panel consisted mostly of pharmacist educators and nursing was noticeably underrepresented. It is not clear whether the two nurses included were health literacy experts or just interested in the topic. Authors recommended further work to prioritize the competencies especially those with the greatest potential effect on patient outcomes and the need for closer examination of these competencies that are discipline specific (Coleman, Hudson & Maine, 2013).

The development of competencies is an important process for any discipline, as competencies define the expected capacities of individuals and are complementary to the performance standards for organizations (Gebbie et al., 2002). Once core health literacy competencies have been identified, nurse educators and nurses in professional development can use these competencies as a guide to create instructional competencies for training and education through the curriculum process.
Conceptual Framework

**MACH model.** The need for competencies is explained in the MACH model, which is a logic map that signifies the associations among the development of workforce competencies, instructional competencies, individual performance and organizational performance.

![MACH Model Diagram](image)


The model stresses the need to define competency first for both individual and organizational performance. Without defining competencies that are necessary for a given job, it is not possible to train or evaluate workers with the requisite skills. The
The MACH model contains eight main components: workforce competencies; defining elements; instructional (educational) competencies; curriculum process; individual performance; organizational performance; credentialing and accreditation; and intervening variables. The fundamental assumption is that once enhanced individual performance is achieved, organizational performance will improve (Miner et al., 2005).

The model was developed at Emory University, Rollins School of Public Health, in response to the Centers for Disease Control and Prevention (CDC) imperative in 2003 to develop a competent and sustainable workforce (Miner et al., 2005). The primary outcome for the model is organizational performance achieved through a system that targets the training needs of individual workers (Miner et al., 2005). The MACH model assists the reader in understanding how identifying workplace competencies and instructional competencies are vital to ensuring both individual and organizational performance. Those identified competencies inform education and training curricula, quality assurance measures, professional credentialing criteria as well as organizational accreditation criteria.

The MACH model identifies two types of need in the workplace: those of the employee with skill deficits for specific tasks, which can be met through training; and those of the workplace with deficiencies in the work environment which can be met through improved management practices and organizational priorities. According to Miner and colleagues (2005) within the competency development of the workforce, two
distinct paths have emerged. Those for whom competencies (instructional) are used primarily in the development of curricula and training use the first path. Those for whom competencies (workplace) are used for the creation of job roles and job descriptions use the second path. Applying the MACH model to the currently bifurcated practice of competency-led workforce development allows administrators, practitioners and educators to integrate these two approaches into one comprehensive plan for educating and training the workforce. Through the MACH model’s approach, identified competencies can be used to fulfill both instructional and workforce needs.

Workforce competencies as described by the authors of the MACH model combine a series of different skills into one broad statement. These statements are meant to define a wide scope of work, and generally include multiple actions, and responsibilities such as a job description (Miner et al., 2005). Workforce competencies are based on who are the employees, in what context they perform their job, and what specific skills the employees need to perform. An example of a workplace competency for registered nurses is the expectation that nurses will use the nursing process and evidence based practice to promote quality patient care. Another example of a workplace competency for registered nurses is that they are expected to update their knowledge and skills of populations served to meet current patient care needs.

Workforce competencies often do not outline specific knowledge, skills and attitudes that are required to complete workplace responsibilities. However, competencies required for nursing practice are defined as an expected level of performance that integrates knowledge, skills, abilities and judgment (ANA & NNSDO, 2010). The focus of this study is on the need for registered nurses to improve their
knowledge, skills, and attitudes in caring for low health literate individuals. The MACH model that addresses developing core competencies that inform both workplace and instructional competencies will guide this research. Once competencies have been identified, nurses in professional development and nurse education can use these competencies as a guide for developing instructional competencies and administering education and training through the curriculum process, which is a central part of the MACH model (Miner et al., 2005).

Two studies have utilized the MACH model to identify core competencies in nursing (Hewitt, 2012; Kotowski, 2015). One study primarily focused on population-based competencies for nurses in practice and the other on competencies for nursing students. The first study sought to develop core competencies for family planning public health nurses (FP-PHN) in practice utilizing the Delphi method. The need for the study was driven by the lack of identified FP-PHN competencies in the literature. The rationale for using the MACH model was to show the process for how workplace priorities are identified and the processes used to develop a competent workforce. The model explains the association between competence development and a competent and sustainable workforce. The author states that the model helps the reader to understand how identifying workforce competency is critical to ensuring individual and organizational performance. The author concludes that by identifying FP-PHN competencies will then inform workplace training curricula, quality assurance measures, and organizational accrediting criteria. A major implication of the study was that core competencies for the FP-PHN might be used to help guide curriculum development in schools of nursing and continuing education nursing programs. The author stated that the MACH model
demonstrates how the identified core competencies might be used as a framework for quality assurance programs used by family planning programs to assess the job performance of their FP-PHN professionals (Hewitt, 2012; Hewitt, Roye, & Gebbie, 2014). Notably absent was the impact of competent FP-PHN nurses on promoting positive outcomes in families and populations. Limitations of the study were that the expert nurse participants were disproportionately distributed by role (administrator, clinician, and academic) and geographic area (federal regions).

The second study aimed to develop a set of instructional competencies for assessing and managing suicide risk for baccalaureate nursing students utilizing a modified Delphi method. The rationale for using the MACH model was to show the association between workplace and instructional competencies that ultimately lead to improved individual performance. The author sought to identify explicit suicide workplace competencies since it is expected in the workplace that nurses need to be competent in assessing and managing suicide risk. The author states that since there is a lack of adequate suicide training content in baccalaureate nursing education this supports the need for identifying instructional suicide competencies in baccalaureate nursing education. Limitation of the study was that the final 42 instructional competencies identified might be difficult to integrate into content-laden nursing curricula in nursing schools. Implications cited in the study were linked to the MACH model and suggested that the instructional competencies might be used to guide curriculum development which is a central part of the MACH model in baccalaureate schools of nursing and in nursing orientation programs within healthcare organizations. This ultimately will lead to improved individual performance, which will then lead to improved workplace
performance. Both studies discussed how the MACH model provides a rationale for identifying workplace and instructional competencies and how this impacts individual and organization performance.

The process of review and updating core competencies involves some combination of best practices description and expert consultation. One approach that harnesses nurse expert knowledge, current evidence and seeks consensus is the Delphi method. It has been used as an approach to identify practice guidelines and core competencies in nursing (Hewett, 2012; Jenkins & Calzone, 2007; Kotowski, 2015; Melnyk et al., 2014). Participants are specifically selected for their knowledge and experience with the topic of interest. In the traditional Delphi method, a structured anonymous conversation between participants is facilitated, via an iterative questionnaire process. The aim of structuring discussion in this manner is to promote consensus opinion and highlight areas of disagreement, using a process that mitigates the influence of group dynamics. The underlying premise is that the opinion of a group is more useful than that of an individual. To assure competent “health literate” registered nurses in the workforce requires nurses, nursing leaders, and nurse educators to collaboratively agree on what are essential health literacy competencies needed for workforce training that promotes quality patient centered-care (IOM, 2011a).

Summary

In summary, this chapter provides an overview of the concept of health literacy including its historical origin, definitions and conceptual models found in the review of the literature, and commonly used health literacy measurement and screening instruments. Foundational information has been provided on the concepts of competency
and competencies. The chapter highlights gaps in our understanding of registered nurses’ health literacy knowledge, skills, and attitudes reflected in the empirical literature. The review also demonstrates that there is a need for identified knowledge, skill, and attitudinal health literacy competencies for registered nurses. The chapter presents the conceptual framework for this study, the MACH model. This model provides a rationale for why there is a need for registered nurses health literacy competencies in the workplace.

The creation of health literacy competencies for registered nurses using the Delphi method based on patient needs, recommended best practices, and consensus by professional nurse leaders and educators will assist nurse educators how best to educate nurses on to communicate effectively with patients with low health literacy. The next chapter will provide a detailed description of the research design and methodology. The chapter will describe the study’s setting, sampling, data collection methods, and plan for data analysis.
CHAPTER THREE: METHODOLOGY

Discussion of Methods

In this chapter a discussion of the Delphi research design will include a
description of the setting, sample and size, inclusion criteria to select experts, description
of data collection and analysis procedures, and ethical considerations. Limitations and
methodological steps to ensure rigor of the study will be highlighted throughout the
chapter.

The Delphi method is a multi-staged approach that involves a series of
questionnaires or “rounds” that are distributed to an “expert panel.” The purpose is to
achieve consensus of opinions among the expert panel. The Delphi method employs a
number of rounds in which questionnaires are sent out and used until consensus had been
reached. In each round, a summary of results (individual and group) of the previous
round are included and evaluated by the expert panel. This feedback allows participants
to reflect on their responses and change them if desired in each subsequent round
(Keeney et al., 2011).

The Delphi method was used to obtain consensus from selected health literacy
nurse experts on a set of core health literacy competencies for registered nurses. The
Delphi method was a way of obtaining a collective view from individuals where expert
opinion is important (Thangaratinam & Redman, 2005). It is suitable to use when the
issue explored does not lend itself solely to analytical techniques but can benefit from
intuitive interpretation of evidence on a collective basis (Thangaratinam & Redman,
2005). The main premise of the Delphi method is based on the belief that group expert
opinion was more reliable and valid than individual expert opinion (Keeney et al., 2011).
There was a lack of consensus in the literature regarding what health literacy competencies were essential for registered nurses to utilize when caring for patients with low health literacy. Consensus by experts is a recognized method for competency identification for health professional education, for example the Delphi method was used in a study of 23 health professionals that sought consensus for health literacy competencies for health professionals (Coleman et al., 2013).

In this study, the use of the Delphi method, allowed the investigator to systematically elicit consensus from a group of nurse health literacy experts using a modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire employed in the Delphi study by Coleman et al. (2013). Because the questionnaire was not developed by a nurse there was the potential that there may be missing health literacy competencies that are specific to nursing. In round one, health literacy nurse experts were asked to rate each item in the Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) and identify additional health literacy competencies specific to registered nurses that were not included. Research questions that guided the study follow.

1. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy knowledge in caring for patients?
2. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy skills in caring for patients?
3. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy attitudes in caring for patients?
Health literacy knowledge is the theoretical or practical understanding of health literacy. Health literacy skills are interventions or practices developed through training or experience. Health literacy attitudes involve knowledge that deals with the nurse’s values, beliefs and feelings about health literacy.

**Research Design**

The conceptual roots of the Delphi design can be traced back to the legend of the Greek Delphi oracle. The oracle used a number of informants to deliver the “truth” which was enhanced as a result of data derived from multiple sources (Baker, Lovell, Harris, 2006). During the 1950s, the U.S. Air Force sponsored the “Project Delphi” which was created to predict the outcome of a hypothetical Russian nuclear attack on the United States. The methodology used a small group of participants to make independent opinions that led to reliable conclusions (Baker et al., 2006). Over the last 60 years the Delphi method has shifted from use in commerce and government to widespread use in healthcare (Baker et al., 2006; Keeney, Hasson, & McKenna, 2011).

The fundamental features of the Delphi method include the use of questionnaire rounds, controlled feedback of responses, the opportunity for participants to modify their responses, and anonymity among expert participants (Thangaratinam & Redman, 2005). The use of experts provides an accessible source of information that can be harnessed to gain opinion. Experts can provide knowledge when more traditional empirical research has not been undertaken (Baker et al., 2006). There are three types of Delphi methods commonly used in research: the Classical Delphi, Modified Delphi and e-Delphi (Keeney et al., 2011). The Classical Delphi method consists of two or more rounds of questionnaires administered to an expert panel using email or postal mail. The first
questionnaire asks the expert panel for their opinions on a certain issue using an open-ended approach. These results are qualitatively analyzed and synthesized into statements. A second questionnaire is sent that asks the participants to rank the statements according to expert opinion. Rounds are continued until group consensus is achieved. A Modified Delphi usually replaces the first round with face-to-face interviews or focus groups.

Subsequent rounds send questionnaires to expert panel participants using email or postal mail and continue until consensus has been achieved. The e-Delphi is a similar process to the Classical Delphi method but the questionnaire is administered using an online survey platform (Keeney et al., 2011). The use of Delphi studies is agreeable to the Internet platform where iterative collection of data can be made more efficient (Donohoe, Stellefson & Tennant, 2011). The e-Delphi method is also a way to combine the expertise of a geographically scattered group (De Villiers, De Villiers, & Kent, 2005; Polit & Beck, 2012). Potential expert participants for this study are located across the United States. The e-Delphi method was chosen for its efficiency and ability to access a geographically distant group of nurse health literacy experts to identify core health literacy competencies for registered nurses.

Setting

The e-Delphi method provides comparable information to the Classical or Modified Delphi method (Keeney, Hasson, & McKenna, 2011). The e-Delphi relies on an online-based platform for organizing, controlling, and facilitating communications between the investigator and participants. For this study the e-Delphi method involved online administration of a questionnaire to nurse experts using Survey Gizmo © an online survey software tool. There were several advantages of using an e-Delphi study. The
The electronic approach assisted and hastened analysis of data by importing electronic responses directly into a data management system. Reminder emails were also sent out automatically to the nurse experts. When compared to traditional pen-and-paper or face-to-face interview approaches of data collection, the e-Delphi offered convenience, time and data management advantages (De Villiers, et al., 2005; Donohoe, Stellefson & Tennant, 2011; Fink, Kosecoff, Chassin, & Brook, 1984).

The anonymity of the Internet presented concerns for research control in an e-Delphi study. To mitigate potential control limitations it was recommended that a secure hyperlink be provided to each expert participant that is unique and accessed only by each individual participant. This prevented the email from being forwarded or opened by others (Donohoe, Stellefson & Tennant, 2011). Another potential disadvantage for the e-Delphi method was the potential loss of data due to the sensitivity of computer firewalls in some organizations that may block electronic questionnaires (Keeney et al., 2011). If a participant in this study couldn’t link to the questionnaire, the investigator instructed the participant to send a different email address that did not contain a firewall.

Sample

A purposive sampling technique was used in this study. Purposive sampling is used when investigators want a sample of experts, and uses the investigators’ knowledge about the population to select the sample (Polit & Beck, 2012). A fundamental feature that sets apart the Delphi method from other forms of questionnaire research is the use of an expert panel. An expert should be representative of their professional group with sufficient expertise that cannot be disputed (Fink, et al., 1984). One important characteristic of an expert is their knowledge of a particular subject being researched.
Defining a level of expert knowledge enables the investigator to have some consistency of knowledge within the expert panel (Baker et al., 2006). The authoring of a book or peer-reviewed article demonstrates knowledge within an area and is often used as a criterion for selecting an expert in Delphi studies (Baker et al., 2006). The use of experts is fundamental to ensuring reliability in Delphi research (Baker et al., 2006). Quality of the Delphi study and its findings rests on the rigor of selection of qualified experts (Powell, 2003; Skulmoski, Hartman, & Krahn, 2007).

**Inclusion criteria.** Deciding on what constitutes expertise is critical for the validity of the Delphi method. Delphi investigators should use clear inclusion criteria to create limits for their expert panel (Keeney et al., 2011). A suitable expert was defined in the literature as someone who possesses the relevant knowledge and experience and whose opinions are respected among peers (De Villiers et al., 2005).

The inclusion criteria used for selection of health literacy nurse experts in this study were: registered nurses in the U.S. who have first authored peer-reviewed literature in the field of health literacy; have a published and accessible email address; and who were willing to participate in the Delphi study. A limitation for these identified criteria was that it limits sampling to nurses who have published in the field of health literacy. There may be nurses that were considered health literacy experts among colleagues that have not published.

**Sample size.** The literature was ambiguous about size needed for a Delphi study sample (Keeney et al., 2011). Representation was assessed by the quality of the expert panel rather than its numbers (Powell, 2003). A consensus panel usually consists of 15 to 30 participants from the same discipline (De Villiers et al., 2005; Keeney et al., 2011).
Literature supports that having more than 30 participants did not appear to improve the quality of results (De Villiers et al., 2005; Fink, et al., 1984). Another challenge in constructing and maintaining an effective panel size was related to attrition rates. Validity of a Delphi study can be jeopardized if the number of participants decreases significantly between rounds. An ideal panel size needs to be large enough to account for possible attrition between different rounds (Donohoe & Needham, 2009). Donohoe and Needham (2009) recommend that investigators recruit a higher sample than needed to compensate for potential attrition between rounds. The aim for this study was to recruit approximately 30 people that would allow for potential attrition. If more than 30 nurse experts were recruited no qualified expert would be excluded. Questionnaire research typically has less than 50% response rate (Polit & Beck, 2012). Response rates between 35%-87% have been reported in previous e-Delphi studies that have sent email invitations to identified nurse experts that have met inclusion criteria (Gephart et al., 2013; Harper et al., 2012; Logue & Effken, 2013; McIlrath et al., 2009; Valdez, 2008). Therefore a minimum of 60 nurse experts was invited to participate.

**Recruitment and retention of participants.** The goals of selection and recruitment of the participants were to obtain nurse experts in the field of health literacy to address the research questions. Nurse expert selection was done through a review of health literacy publications that identified individuals that met inclusion criteria. Nurses that had first authored peer-reviewed health literacy literature published in the U.S. between 2004 and 2015 in English were identified from electronic database searches in CINAHL, Medline and PubMed using search terms health literacy and nursing. Recruitment for the Delphi study was achieved by accessing nurse experts through their
published email addresses via publication or Google. Potential nurse experts who were interested in participating in the study clicked a secure hyperlink to the Survey Gizmo © website located on the Delphi study recruitment letter (Appendix B) and were given access to the Delphi study consent form (Appendix C). After reading the Delphi study consent form, those interested in participating clicked “Yes, I agree to participate,” and were directed to the Delphi study questionnaire instructions [Round One] (Appendix D). After one week of initial invite, if response rates were less than ten (30%), the investigator planned to implement a secondary approach by recruiting nurse experts through the investigator’s professional network, nurse authors that have published white papers on health literacy, professional health literacy listserv (http://listserv.ihahalthliteracy.org) and a nurse health literacy website (Alliance of International Nurses for Improved Health Literacy).

There are no specific guidelines for acceptable attrition rates for Delphi studies (Keeney et al., 2011). Attrition rates between 5%-28% in e-Delphi studies with invited experts that used more than one round have been described (Gephart et al., 2013; Harper et al., 2012; Logue & Effken, 2013; McIlrath et al., 2009; Valdez, 2008). Keeney and colleagues performed a review of the literature and found reported attrition rates in Delphi studies that employed multiple rounds and various recruitment methods ranged from zero to 92% and recommended a 70% response rate to maintain rigor in a Delphi study (Keeney et al., 2011).

Attrition can occur in any research study but the Delphi is more at risk since it typically involves 2-3 rounds, and can cause expert participants to fatigue, become distracted between rounds, or discouraged with the Delphi research process (Donohoe &
Needham 2009). Dropout can lead to a response rate bias if the attrition is significant (Keeney et al., 2011). There are a number of strategies that can be used by the investigator to enlist the commitment from panel members; these include:

1. At the outset provide prospective panel members with a clear explanation of the Delphi process, explaining that their commitment would involve 2-3 rounds of questionnaires and feedback and possibly extend over 2-3 months.

2. Obtain consent to the e-Delphi study by having participants click on a tab that indicates agreement to participate.

3. Provide ongoing e-mail communication, incentives and continual reminders throughout the Delphi process to retain panel members.

4. Provide quick turnaround times in data collection to keep participants engaged.

5. Limit the number of rounds to two to three to reduce participant fatigue.

6. Communicate to each panel member the importance of their individual contributions to the research process (Keeney et al., 2011).

To encourage commitment from the nurse experts, a clear explanation of the Delphi process was provided with consent to participate before completing round one. Reminder emails were also sent out automatically to the nurse experts. Quick feedback to nurse experts was provided with a summary of round one and two. The investigator used three rounds to reduce the potential for nurse expert fatigue, and provided a $25.00 Amazon eGift card incentive for nurse experts who completed all rounds.

Nurse experts in round three were asked if they were interested in receiving the $25.00 Amazon eGift card and were also asked to provide an email address for the eGift card to be sent. Email addresses were not connected to questionnaire answers.
Data Collection Instruments

**Demographics.** An investigator developed 9-item questionnaire was utilized to collect demographic sample characteristics. The demographic information included gender, age, race, ethnicity, how many years in practice as a registered nurse, highest level of nursing education, current job title, current work setting, and geographic location. These questions were derived from a review of the literature on demographic instruments used in similar Delphi research (Coleman et al., 2013; Kotowski, 2015). After the participant completed round one questionnaire, the participant was immediately directed to the Delphi study demographic questionnaire to complete (Appendix F).

**Knowledge, skills, and attitudinal-based health literacy competencies for health professionals’ questionnaire.** This study used a questionnaire used in a previous Delphi study (Coleman et al., 2013). The instrument contained 62 items that consisted of health literacy competencies for health professionals (Appendix E). Each health literacy item was categorized into an educational competency domain (knowledge, skills and attitudes). Each domain section had a definition for each category, such as the knowledge domain that addressed the development of intellectual abilities and skills. The attitudinal domain involved knowledge that deals with individual’s values, attitudes and feelings, and the skill domain was concerned with the development of physical abilities and skills that result from the input of information and content (Bloom, et al., p. 7). Items in the questionnaire were written as educational objectives similar to the format used for instructional competencies described in the MACH model. A modification of the original instrument was made to the Likert Scale. The nurse experts in this study were asked to answer each item on a 5-point Likert scale (1, not important; 2, somewhat
important; 3, important; 4, very important; 5, extremely important) instead of a 4-point Likert Scale used by Coleman and colleagues (2013).

Coleman and colleagues conducted a modified Delphi study with health professionals that were attending a conference together. The instrument used was derived from a literature review performed by Coleman in June 2010. The expert panel used in the modified Delphi study by Coleman and colleagues consisted of health education professionals who belonged to the Federation of Associations of Schools of the Health Professions (FASHP), which is an umbrella organization of 15 health education professional organizations. Experts were selected based on their leadership and experience in health professions education and their interest in the topic of health literacy. A total of 23 panel members participated in the Delphi study. A three round Delphi study was performed with the first round face to face at the FASHP conference. The second and third rounds were done electronically using an online questionnaire platform. The Delphi study results demonstrated that 62 out of 67 competencies achieved consensus. Authors required a 70% level of consensus for each item.

Since the 62-item questionnaire developed by Coleman and colleagues (2013) had been used in a previous modified Delphi study with 23 health professions education experts that used a predetermined 70% threshold for agreement for each item, a pilot study was not required to ensure clarity of questions or content and face validity. Although there was a lack of published information on the measure’s psychometric properties (Coleman et al., 2013) the very nature of the Delphi method validates the content of the instrument being evaluated. This was based on three key assumptions: first, the results stem from group opinion; therefore results are more valid than a decision
by a single person; secondly, the process is based on expert opinion providing confirmatory judgment, and third the process of the Delphi allows experts the opportunity to review and judge the appropriateness of the scale (Keeney et al., 2011).

**Revised Methods**

**Pilot testing.** The investigator pilot tested round one questionnaire, which was built in in Survey Gizmo © with five colleagues to assess for clarity, design, and flow issues. The pilot test identified an issue with the 4-point Likert scale used with the original instrument (Coleman et al., 2013). Feedback from reviewers was that the scale limited the ability to discriminate and identify essential competencies. The instrument’s Likert scale was modified to a 5-point measurement (1, not important; 2, somewhat important; 3, important; 4, very important; 5, extremely important).

The investigator created the round one questionnaire in Survey Gizmo © using a desktop. Several reviewers that took the test survey used alternative mobile devices such as iPads or smart phones, which highlighted the need to provide additional directions to nurse experts using mobile devices for moving to the next screen while taking the survey. The investigator modified the screen design by including clear directions that would help nurse experts complete the survey if they did not use a desktop.

Due to the different method used in round three, the investigator performed a pilot test with several colleagues to assess for clarity, design, and flow issues before implementing the final round. The pilot test revealed difficulty using the drop and drag feature for ranking in Survey Gizmo © due to the large amount of competencies that needed to be ranked. The ranking grid question option in Survey Gizmo © was used instead to rank competency statements. Analysis of ranking was performed for the core
competencies that met 90% consensus and were presented in relation to each of the three research questions.

**Level of agreement.** The study’s initial threshold for consensus among the nurse experts was set at 80%. After round one, analysis by the investigator revealed that many nurse experts rated the 62 competencies as a 4 or 5. The level of agreement for the study was raised to 90% to provide more discrimination for identifying core health literacy nurse competencies.

**Ethical Approval and Consent**

The investigator received approval from the University of Massachusetts Dartmouth Institutional Review Board to conduct the e-Delphi study (Appendix A). Participation in this study was voluntary and nurse experts were informed that they could withdraw at any time. Upon receipt of an email sent by the investigator via Survey Gizmo ©, the participant read the recruitment letter asking for participation in the Delphi study (Appendix B). The participant was asked to press a link to the online questionnaire and the informed consent form was shown (Appendix C). Nurse experts interested in taking part in the Delphi study read the online consent form that included a written explanation of the study, inclusion criteria, their involvement in it, how the Delphi process works, and what will be expected of them if they chose to participate. Next, the nurse experts were asked if they were registered nurses, if they responded “no” they were sent a message explaining they did not meet study criteria and were thanked for their time and consideration. If they pressed yes, invitees were asked if peers would consider them health literacy nurse experts, if they responded “no” they were sent a message explaining they did not meet study criteria and were thanked for their time and consideration. If
they pressed “yes”, they needed to press “I agree to participate” before they could proceed and participate in the Delphi study.

**Anonymity.** One of the cardinal features to characterize the Delphi method is anonymity of individual responses. Ensuring anonymity of panel members in a Delphi study encourages participants to express their opinions without being biased by knowing the identities of other participants (Goodman, 1987). The design for this study prevented nurse experts from knowing who else was participating in the study. In addition, unique codes were assigned to each expert by the investigator, and the data for each round was linked to that code. The rationale for doing this was to reduce possible bias of investigator during analysis of data.

**Protection and storage.** Each member in the Delphi study was de-identified with the assignment of a unique code provided by investigator. Both the code sheet and the downloaded data of this study was stored in a locked cabinet in the investigator’s office for three years per IRB policy and only the investigator had access to the records. Confidentiality and anonymity were ensured through the use of a protected online survey platform. Survey Gizmo © is protected by a firewall system and all transmitted data was encrypted (Survey Gizmo ©, 2015). Online questionnaire data were deleted as per Survey Gizmo © data storage procedures. Only the investigator had password access to the Survey Gizmo © research. Potential nurse experts were assured that all information obtained will be confidential and that only the investigator will have access to the data. Also nurse experts were assured that their names would not be used in any subsequent report or publication.
Data Collection

The Classical Delphi round one usually starts with an open-ended set of questions that allows panel members freedom in their responses. The number of items produced often results in large amounts of information and is difficult for the investigator to condense (Keeney et al., 2011). One recommendation to increase efficiency in the design of the Delphi study is to modify round one and provide pre-established information to participants for ranking or response (Keeney et al., 2011). The Delphi method requires a minimum of two rounds (three if round one is open-ended). Beyond that, the number of rounds is disputed. Research demonstrates that repeated rounds may lead to fatigue of participants and increased attrition (Thangaratinam & Redman, 2005). This aim of this study design was to use three rounds.

When the nurse experts clicked “Yes, I agree to participate,” they were directed to the Delphi study questionnaire instructions for round one (Appendix D) and then were directed to the Delphi round one questionnaire (Appendix E).

The first Delphi round. The goal of a Delphi method was to reach consensus on questionnaire items (Keeney et al., 2011). In the first round of this study nurse experts were asked to rate each item in the modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) using a 5-point Likert scale (1, not important; 2, somewhat important; 3, important; 4, very important; 5, extremely important). The nurse experts were asked how essential the competency is for registered nurses in any work setting. In addition, the nurse experts were encouraged to suggest health literacy competencies specific to registered nurses that were not included in Coleman et al.’s (2013) original questionnaire. There was no limit
placed on how many additional competencies each participant could add. In round one, nurse experts had two weeks to respond during which reminder emails were sent to non-responders.

**The second Delphi round.** Only nurse experts who participated in round one were sent the round two questionnaire. Nurse experts received individual and group round one results summaries (de-identified) by the investigator via a separate email at the end of round one. This allowed nurse experts to revise their opinion on items when considering the ratings by other nurse experts. Thus, no items were excluded between the first and second rounds. The investigator analyzed all ratings from the first Delphi round and distributions of scores were presented in percent for each item. In addition, proposed health literacy competencies were added to Coleman et al.’s (2013) questionnaire and categorized into appropriate learning domains (knowledge, skill or attitude). In the second Delphi round, the nurse experts were informed about the distribution of scores and added competencies from the other nurse experts produced in the first Delphi round. The nurse experts were asked to reconsider again the items presented in the first round as well as to rate the new competencies the same way as in the first round. In round two, nurse experts had two weeks to respond during which reminder emails were sent to non-responders.

**The third Delphi round.** Only nurse experts who participated in round one and two were sent a round three invitation. The investigator analyzed all ratings from the second Delphi round and distributions of scores were presented in percent for each item. Nurse experts received individual and group round two results summaries (de-identified) by the investigator via a separate email at the end of round two. In the third and final Delphi
round, only competencies that reached 90% consensus in round two were presented. Unlike the other rounds, nurse experts were asked to prioritize/rank order remaining competencies in each of the learning domains.

There is currently no agreed upon standard threshold for consensus in the Delphi literature. Reported consensus thresholds range between 51%-80% (Keeney et al., 2011). In this study, consensus was set at 90% for round two, as the investigator hypothesized that there would be strong consensus agreement on most competency items. Also the credibility of the study would be strengthened using a higher consensus level. The final core health literacy competencies for registered nurses were items that were rated 90% or higher. In round three, nurse experts had two weeks to respond during which email reminders were sent to non-responders. Data cleaning for missed data was done with each round as it was anticipated that not every participant would complete all the questions.
### Table 2

**e-Delphi Study Flow Chart**

<table>
<thead>
<tr>
<th>Actions by Investigator</th>
<th>Actions by Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on inclusion criteria investigator compiled a master list of nurse experts.</td>
<td>Nurse experts accessed link to round one questionnaire, which included informed consent, questions to validate if expert was a registered nurse and was considered a health literacy expert by peers. Nurse experts that agreed to participate in the e-Delphi study were asked to rate a 62-item health literacy competency questionnaire; add additional competencies (optional) and complete demographic questionnaire.</td>
</tr>
<tr>
<td>Based on master list invitation letter sent via Survey Gizmo © to potential nurse experts with link to round one questionnaire (2/1/16).</td>
<td></td>
</tr>
<tr>
<td>Follow-up invitation email was sent to invited nurse experts that had not responded (2/8/16). Also at that time the investigator recruited additional nurse experts via a professional health literacy listserv (<a href="http://listserv.ihahealthliteracy.org">http://listserv.ihahealthliteracy.org</a>) and nurse health literacy website (Alliance of International Nurses for Improved Health Literacy).</td>
<td></td>
</tr>
<tr>
<td>One week later round one was closed (2/15/16).</td>
<td></td>
</tr>
<tr>
<td>Analyses of round one data were conducted. ***If all competencies received 90% consensus and 4 or 5 ratings and no additional competencies were added by nurse experts, the next round would be considered the final round (see round three/final).</td>
<td></td>
</tr>
<tr>
<td>Sent round one results (individual and group responses) and instructions for round two and round two questionnaire to nurse experts that participated in round one (2/18/16).</td>
<td>Nurse experts rated round two questionnaire within two weeks.</td>
</tr>
<tr>
<td>Follow up reminders were sent to complete round two survey to nurse experts that had not responded (2/25/16 and 3/2/16).</td>
<td></td>
</tr>
<tr>
<td>Round two closed (3/3/16).</td>
<td></td>
</tr>
</tbody>
</table>

(continued on next page)
Table 2 continued

<table>
<thead>
<tr>
<th><strong>Actions by Investigator</strong></th>
<th><strong>Actions by Participant</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyses of round two data were conducted. Competencies that did not receive 90% consensus and 4 or 5 ratings were eliminated from final questionnaire.</td>
<td>Nurse experts were asked to prioritize/rank order remaining competencies in each learning domain (knowledge, skills, and attitudes). In the final round nurse experts were also asked to confirm if they would like to receive a $25 Amazon eGift card and provide an email to send it to in an open textbox found at the end of the round three/final questionnaire.</td>
</tr>
<tr>
<td>Sent round two results (individual and group responses) to nurse experts that participated in round two. Also ***round three/final instructions and round three/final questionnaire were provided. Nurse experts were asked to prioritize/rank order remaining competencies in each learning domain [knowledge, skills, and attitudes] (3/7/16).</td>
<td></td>
</tr>
<tr>
<td>Follow up reminders to complete round three/final questionnaire were sent to nurse experts that had not responded (3/14/16 and 3/20/16).</td>
<td></td>
</tr>
<tr>
<td>Round three closed (3/21/16).</td>
<td></td>
</tr>
<tr>
<td>Analyses of round three data were conducted (3/22/16).</td>
<td></td>
</tr>
<tr>
<td>After analyses were conducted a thank you letter and $25 Amazon eGift card was emailed to nurse experts that completed all rounds (3/23-3/24/16).</td>
<td></td>
</tr>
</tbody>
</table>

**Data Analysis Plan**

The Delphi method generated quantitative estimates of consensus in each round (Coleman et al., 2013). Once a round was closed, responses were exported from Survey Gizmo © to SPSS v 23.0 for analysis. The use of various statistical analyses contributed to understanding consensus or lack of consensus. Statistical analysis of demographics and response data for each questionnaire item included statistical summaries (mean, mean percentage and standard deviation scores). The mean percentage scores provided an indication of the level of agreement among nurse experts. The standard deviation provided a measure of dispersion for each item for continuous variables. Descriptive statistics were applied to the data using the Statistical Package for Social Sciences [SPSS]
Missing data points were excluded from comparative analysis list-wise as a method for handling missing data (Polit & Beck, 2012; Tolsgaard et al., 2013). Cronbach’s alpha reliability coefficients were calculated on the modified knowledge, skill, and attitudinal-based health literacy competencies for health professionals’ questionnaire instrument. In round three, nurse experts ranked the final competencies to determine a competency’s level of importance. Weighting was used as a way to analyze the differential amounts of discrimination placed by nurse experts for each competency (Polit & Yang, 2016).

In rounds one and two the nurse experts were asked to rate each of the health literacy competencies listed in the questionnaire. The ratings were done using a 5-point Likert scale (1, not important; 2, somewhat important; 3, important; 4, very important; 5, extremely important).

**Research questions.**

1. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy knowledge in caring for patients? To answer research question one, a competency in round two that obtains 90% agreement or 4 and 5 ratings on the 5-point Likert Scale by the group was retained.

2. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy skills in caring for patients? To answer research question two, a competency in round two that obtains 90% agreement or 4 and 5 ratings on the 5-point Likert Scale by the group was retained.
3. What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy attitudes in caring for patients? To answer research question three, a competency in round two that obtains 90% agreement or 4 and 5 ratings on the 5-point Likert Scale by the group were retained.

In round two, a competency that reached a consensus level of 90% or higher was retained and used in the third or final round where nurse experts were asked to prioritize/rank order remaining competencies in each learning domain. In round three the final score computed for each competency statement in each learning domain was the sum of all the nurse experts’ weighted values. In summary, a competency that passed round two with 90% agreement or 4 and 5 ratings on the 5-point Likert Scale by nurse experts was retained to form the core list of competencies. The final round consisted of competencies that achieved consensus and were prioritized/ranked ordered by the nurse experts.

Rigor

The literature is not always clear how reliability and validity should be established in Delphi studies since each study’s design, sample, and consensus process varies. Delphi findings only represent one step in knowledge and are applicable to that moment in time and for that particular expert group. Alternate ways have been suggested to demonstrate the validity and credibility of Delphi findings. The results of one study can be tested or confirmed in another study with a different sample as a means of validation (Keeney et al., 2011; Thangaratinam & Redman, 2005). A major strength of this study was building on previous findings obtained from a prior Delphi study with health
professionals (Coleman et al., 2013). The aim of this study was to further refine and add to Coleman et al.’s results and determine what the health literacy nurse experts consider to be core health literacy competencies for registered nurses.

In chapter three, characteristics of the Delphi method have been described, which include use of, nurse experts, anonymity of nurse experts to the group, multiple iterations, and examination of consensus via statistical group response. Critical steps to ensure rigor in the proposed Delphi study were achieved through the use of an instrument validated in a previous Delphi study (Coleman et al., 2013), identification of justifiable consensus levels, establishing clear criteria for expert selection, implementing strategies to reduce attrition, and use of rigorous data analysis procedures. These steps were considered necessary to enhance validity of the study design and the quality of the study’s responses (De Villiers et al., 2005; Goodman, 1987).

Limitations

This study utilized an e-Delphi design and purposive sampling procedures. A limitation was the high degree of uncertainty of knowing the true identity of the nurse expert. To mitigate this issue, the study provided nurse experts a secure hyperlink. Attrition is a major concern in Delphi studies. Asselin and Harper (2014) report obtaining informed consent, limited number of rounds, limited time between rounds, frequent communication with expert participants, and short questionnaires may reduce attrition. To minimize attrition in this study; the first round used a list of previously identified health professional health literacy competencies; reminder emails were sent to nurse experts to complete rounds one, two and three, and nurse experts were offered a $25.00 Amazon eGift card after completing all rounds. Lastly, the purposive sampling
method may provide a nurse expert sample, but it limits sampling to nurses who have published in the field of health literacy. There are nurses that may be considered health literacy experts by colleagues but have not published.
CHAPTER FOUR: RESULTS

Introduction

The purpose of this study was to have health literacy nurse experts identify and prioritize a set of core health literacy competencies for registered nurses in any work setting using the e-Delphi method. This partial replication study builds on previous Delphi study’s findings identifying 62 health literacy competencies for health professionals (Coleman et al., 2013). Data collection for this three round e-Delphi study occurred over a two-month period (February 2016 through March 2016). All three rounds were done through Survey Gizmo ©. This chapter presents the results of the study. Demographics are described and key findings are highlighted.

Descriptive statistics were computed for demographic variables, competency ratings. Means and standard deviations were reported on continuous variables. Frequencies and percentages were reported on nominal demographic variables and agreement with competency ratings. Cronbach’s alpha reliability coefficients were presented for round one and two subscales and complete questionnaires. All data were analyzed for missing data. Missing data were excluded during Cronbach’s alpha list-wise analyses of questionnaires used in rounds one and two. In round three, nurse experts’ collective judgments about relative importance of each of the 50 final competencies were achieved through weighting (Polit & Yang, 2016). Lastly, prioritized core competencies that met 90% consensus were presented in relation to each of the three research questions asked.
Characteristics of Study Sample

A total of 127 nurse health literacy experts that met the study’s inclusion criteria were invited to participate in the study. Of these, 122 were identified through literature searches in CINAHL, Medline and PubMed, four from a study invitation posted on a professional health literacy listserv (http://listserv.ihahealthliteracy.org), and one from a study invitation posted on a nurse health literacy website (Alliance of International Nurses for Improved Health Literacy). A total of 41 nurse health literacy experts participated in round one representing a response rate of 32.3%.

Demographic characteristics. The nurse experts completed the demographic questionnaire at the end of round one. Demographic data collected in round one were: gender, age, race, ethnicity, number of years in practice as a registered nurse, highest level of nursing education, current job title, current work setting, and geographic location.

In summary, the average age of nurse health literacy experts was 55 ± 8.5 years; all nurse experts were female and the majority of nurse experts were White (88%). Average years in practice as a registered nurse were 32 ± 10.3 years and ranged between 3-50 years ((See Table 3). The majority of nurse experts reported PhD (53.7%) as highest level of nursing education; identified current job title as nurse educator (46. 3%); and identified work setting as college/university (63.4%). Each geographic region of the U.S. was represented (See Table 4).
Table 3

Demographics of Experts (N=41)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>40</td>
<td>55.5</td>
<td>8.5</td>
</tr>
<tr>
<td>Years as a Registered Nurse</td>
<td>37</td>
<td>32.5</td>
<td>10.3</td>
</tr>
</tbody>
</table>

Table 4

Demographic Characteristics of Experts (N=41)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>41</td>
<td>100.0</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Black/African American</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>White</td>
<td>36</td>
<td>87.8</td>
</tr>
<tr>
<td>Missing Data</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>2</td>
<td>4.9</td>
</tr>
<tr>
<td>Not Hispanic/Latino</td>
<td>36</td>
<td>87.8</td>
</tr>
<tr>
<td>Missing Data</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Highest Level of Nursing Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>4</td>
<td>9.8</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>7</td>
<td>17.1</td>
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<tr>
<td>DNP degree</td>
<td>5</td>
<td>12.2</td>
</tr>
<tr>
<td>PhD degree</td>
<td>22</td>
<td>53.7</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>7.2</td>
</tr>
<tr>
<td>Current Job Title</td>
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<td></td>
</tr>
<tr>
<td>Nurse Manager</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Nurse Practitioner</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Clinical Nurse Specialist</td>
<td>1</td>
<td>2.4</td>
</tr>
<tr>
<td>Professional</td>
<td>1</td>
<td>2.4</td>
</tr>
</tbody>
</table>
Table 4 (cont.)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development Specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurse educator</td>
<td>19</td>
<td>46.3</td>
</tr>
<tr>
<td>Nurse Researcher</td>
<td>6</td>
<td>14.6</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>24.4</td>
</tr>
<tr>
<td>Work Setting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>3</td>
<td>7.3</td>
</tr>
<tr>
<td>Clinic</td>
<td>3</td>
<td>63.4</td>
</tr>
<tr>
<td>College/University</td>
<td>26</td>
<td>22.0</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Geographic Region</td>
<td></td>
<td>24.4</td>
</tr>
<tr>
<td>Northeast</td>
<td>10</td>
<td>24.4</td>
</tr>
<tr>
<td>Southeast</td>
<td>10</td>
<td>22.0</td>
</tr>
<tr>
<td>Midwest</td>
<td>9</td>
<td>14.6</td>
</tr>
<tr>
<td>Southwest</td>
<td>6</td>
<td>14.6</td>
</tr>
<tr>
<td>West</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Survey Recruitment</td>
<td></td>
<td>87.8</td>
</tr>
<tr>
<td>Survey Gizmo ©</td>
<td>36</td>
<td>9.8</td>
</tr>
<tr>
<td>Listserv</td>
<td>4</td>
<td>2.4</td>
</tr>
<tr>
<td>Website</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Round One

A total of 41 nurse experts completed round one through Survey Gizmo © an online survey platform. Nurse experts were given two weeks for each of the three rounds to respond. In round one, an email reminder was sent to all invited nurse experts that had not completed the survey. They were asked to rate how essential the competency was for registered nurses in any work setting for each of the 62 competencies listed in the modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013). A 5-point Likert scale (1, not important; 2, somewhat important; 3, important; 4, very important; 5, extremely important) was used for measurement. In addition, the nurse experts were encouraged to
suggest health literacy competencies specific to registered nurses that were not included in Coleman and colleagues’ (2013) questionnaire.

The nurse experts in round one rated sixty-two health literacy competencies and suggested 29 additional health literacy competencies for registered nurses. Based on feedback from nurse experts in round one, 29 additional health literacy competencies for registered nurses in any work setting were suggested and grouped as knowledge \([n=22]\), skills \([n=16]\), and attitudes \([n=12]\). Competencies suggested by nurse experts and all 62 competencies listed in the modified Knowledge, Skills, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) resulted in 91 knowledge, skills and attitudinal health literacy competencies that moved on to round two (See Appendix K).

**Round Two**

Nurse experts \((n=41)\) who participated in round one were invited to participate in round two. Round two email reminders were sent out on days seven and 13 during the data collection period to nurse experts that had not completed the round through Survey Gizmo ©. The response rate for round two was 93% \((n=38)\).

In round two, nurse experts were emailed their individual scores and group summary scores from round one. Nurse experts were asked to review their results prior to rating the 91-items in round two. Round two included the original 62-items in the modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013), and 29 new health literacy competencies added by experts in round one. Fifty percent of items rated in round two achieved consensus of 90% or higher, the threshold set for the study (See Appendix K).
The 38 knowledge competencies rated in round two revealed a wide variance in consensus, which ranged from 22.2% to 100%. Twenty-four of the 38 (63%) knowledge competencies were from Coleman et al.’s (2013) original list. These ranged from 65.8% to 100% agreement. Fourteen of the knowledge competencies were new (37%). Consensus ranged from 22.2% to 100%.

The 37 skills competencies also varied widely from 18.9% to 100%. Twenty-seven of the 37 (73%) skills competencies were from Coleman et al.’s (2013) list. These ranged from 60.5% to 100% agreement. Ten health literacy skills competencies added by nurse experts were rated in round two with consensus ranging from 18.9% to 94.8%.

Consensus for the 16-attitudinal competencies ranged from 81.6% to 97.4%. Eleven of the 16 (69%) attitudinal competencies were from Coleman et al.’s (2013) original list. These had little variance in agreement and ranged from 89.5% to 97.4%. The remaining five attitudinal health literacy competencies added by nurse experts also did not reveal wide variability in agreement ranging from 81.6% to 97.4%. Based on the results of this round, 50 health literacy competencies (knowledge \( n=22 \), skills \( n=16 \), and attitudes \( n=12 \)) reached 90% consensus by the nurse experts and were retained and moved on to round three.

**Round Three**

In the third and final round of this study, the nurse experts participating in round two of this study \( n=38 \) were invited to participate. Similar to round two, email reminders were sent out on days seven and 13 to nurse experts that had not completed the third round through Survey Gizmo ©. The response rate for round three was 87% \( n =33 \).
The 50 health literacy competencies that achieved 90% consensus in round two were included in the final round. The final health literacy competencies provide a comprehensive list of knowledge, skills and attitudes, which health literacy nurse experts feel nurses should possess. While this set of competencies marks an important milestone in efforts to identify essential health literacy nurse competencies, the list of competencies arrived at through the consensus process is too long and lacks the prioritization needed to be useful to nurse educators. Therefore round three aimed to prioritize the broad list, which can then serve as the foundation for a list of essential health literacy competencies for nurses in any work setting.

For this round, nurse experts were asked to review the final 50 competencies (knowledge \([n=22]\), skills \([n=16]\), and attitudes \([n=12]\)) and rank each competency through Survey Gizmo © based on order of importance for each educational domain. The most important competency would receive a one and the least important would receive the lowest rating possible in that learning domain. The 50 prioritized core health literacy competencies are presented in relation to each of the three research questions guided this study.

**Research Questions**

**Research question 1.** *What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy knowledge in caring for patients?*

Eight of the 22 knowledge competencies were new competencies added by nurse experts in the final round. Nurse experts were asked to rank order 22 knowledge competencies with the first rated as most important and the last rated least important. Weighting of items provide differential amounts of discrimination and emphasis given to
different items on a measure, and commensurate with the importance of the item (Yang & Polit, 2016). Items ranked first by nurse experts were given a higher value or "weight." For example, of the 22 knowledge competencies listed, if a participant rated a knowledge competency as a one or most important it would receive a weight of 22.

Table 5 reflects the final rank ordered knowledge competencies and the score (sum of all weighted values) for each knowledge competency.

Table 5

Score and Weight for Each Health Literacy Knowledge Competency

<table>
<thead>
<tr>
<th>Knowledge Domain</th>
<th>n=22</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows that everyone, regardless of literacy level, benefits from and prefers clear plain language communication.</td>
<td>504</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Knows that “you can’t tell who has low health literacy by looking.”</td>
<td>448</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Knows which kind of words, phrases, or concepts may be jargon to patients.</td>
<td>443</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Knows best practice principles of plain language and clear health communication for oral and written communication.</td>
<td>437</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Knows that adults with low literacy tend to experience shame, and hide their skills from healthcare professionals.</td>
<td>436</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Recognizes “red flag” behaviors, which may suggest a patient has low health literacy.</td>
<td>431</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Knows that patients learn best when a limited number of concepts are presented at any given time.</td>
<td>414</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Knows that communication involves both talking and listening effectively.</td>
<td>413</td>
<td>*8</td>
<td></td>
</tr>
</tbody>
</table>

(cont. on next page)
<table>
<thead>
<tr>
<th>Knowledge Domain n=22</th>
<th>Competency Statement</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Knows the need to never assume patient’s understanding about a disease or medication even if they have been diagnosed/ have taken the medication for many years.</td>
<td>411</td>
<td>*9</td>
</tr>
<tr>
<td></td>
<td>Knows that health literacy is context-specific; individuals with high general literacy may have low health literacy.</td>
<td>396</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Knows the rationale for and mechanics of using teach back or show me technique to assess patient understanding.</td>
<td>394</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Knows difference between the ability to read, and reading comprehension, and why general reading levels do not ensure patient understanding.</td>
<td>393</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Knows that health literacy may decrease during times of physical or emotional stress.</td>
<td>387</td>
<td>13 (tie)</td>
</tr>
<tr>
<td></td>
<td>Knows using a combination of educational materials (verbal, written, pictures, video etc.) may increase patient understanding.</td>
<td>387</td>
<td>*13 (tie)</td>
</tr>
<tr>
<td></td>
<td>Knows that cultural and linguistic differences between patients and healthcare professionals magnify health literacy issues.</td>
<td>358</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Knows that bringing family members/friends to healthcare encounters may help to reinforce the information provided by the healthcare provider/seek clarification when needed.</td>
<td>322</td>
<td>*15</td>
</tr>
<tr>
<td></td>
<td>Knows that transition points, or “hand offs” in healthcare (i.e. moving from in-patient to out-patient settings) are especially vulnerable to patient communication errors.</td>
<td>315</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Knows that a patient may refuse a plan or treatment due to fear, lack of resources or misunderstanding.</td>
<td>303</td>
<td>*17</td>
</tr>
<tr>
<td></td>
<td>Knows patient’s ability to navigate complex health systems, is influenced by patient’s health literacy level.</td>
<td>281</td>
<td>*18</td>
</tr>
<tr>
<td></td>
<td>Knows patient and provider communication is influenced by patient’s health literacy level.</td>
<td>275</td>
<td>*19</td>
</tr>
</tbody>
</table>

(cont. on next page)
Table 5 (cont.)

<table>
<thead>
<tr>
<th>Knowledge Domain n=22</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knows examples of the direct relationship between health literacy and knowledge about one’s chronic disease(s) and medications, adherence to medications and treatment plans, Receipt of preventative health services, and health outcomes and risk of harm.</td>
<td>270</td>
<td>20</td>
</tr>
<tr>
<td>Knows that providing written materials in a person’s native language may not ensure comprehension of health information</td>
<td>212</td>
<td>*21</td>
</tr>
</tbody>
</table>

* Competency added by expert panel (n=8)

**Research question 2.** What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy skills in caring for patients?

In the final round nurse experts were asked to rank order 16 skills competencies in the same manner as described for research question one. The nurse experts in round one added three of the 16 skills competencies. Table 6 reflects the final rank ordered skills competencies and their scores (sum of all weighted values). Weighting occurred in the same manner as described in the first research question.

Table 6

**Score and Weight for Each Health Literacy Skill Competency**

<table>
<thead>
<tr>
<th>Skills Domain n=16</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates ability to speak slowly and clearly with patients.</td>
<td>431</td>
<td>1</td>
</tr>
<tr>
<td>Demonstrates ability to use common familiar lay terms, phrases and concepts, and appropriately define unavoidable jargon, and avoid using acronyms in oral and written communication with patients.</td>
<td>391</td>
<td>2</td>
</tr>
</tbody>
</table>

(cont. on next page)
<table>
<thead>
<tr>
<th>Skills Domain n=16</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates ability to use verbal and non-verbal active listening techniques when speaking with patients.</td>
<td>368</td>
<td>3</td>
</tr>
<tr>
<td>Demonstrates effective uses of teach back or show me technique for assessing patients’ understanding.</td>
<td>349</td>
<td>4</td>
</tr>
<tr>
<td>Demonstrates ability to elicit patients’ prior understanding of their health issues in a non-shaming manner (i.e. asks “what do you already know about high blood pressure?”).</td>
<td>325</td>
<td>5</td>
</tr>
<tr>
<td>Demonstrates ability to recognize, avoid and/or constructively correct the use of medical jargon, as used by others in oral and written communication with patients.</td>
<td>315</td>
<td>6</td>
</tr>
<tr>
<td>Demonstrates ability to “chunk and check” by giving patients small amounts of information and checking for understanding before moving to new information.</td>
<td>280</td>
<td>7</td>
</tr>
<tr>
<td>Demonstrates ability to effectively elicit questions from patients using a “patient-centered” approach (i.e. asks “what questions do you have?” rather than “do you have any questions?”)</td>
<td>267</td>
<td>8</td>
</tr>
<tr>
<td>Demonstrates the ability to use action-oriented statements to help patients know what they need to do.</td>
<td>234</td>
<td>10</td>
</tr>
<tr>
<td>Demonstrates ability to orally communicate accurately and effectively in patients’ preferred language, using medical interpreter services.</td>
<td>217</td>
<td>11 (tie)</td>
</tr>
<tr>
<td>Demonstrates the ability to provide written material at a level of the patient's understanding.</td>
<td>217</td>
<td>*11 (tie)</td>
</tr>
<tr>
<td>Demonstrates the ability to select culturally and socially appropriate and relevant visual aids, including objects and models, to enhance and reinforce oral and written communication with patients.</td>
<td>211</td>
<td>12</td>
</tr>
</tbody>
</table>

(cont. on next page)
Table 6 (cont.)

<table>
<thead>
<tr>
<th>Skills Domain n=16</th>
<th>Score (sum of all weighted values)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrates ability to make instructions interactive, such that patients engage the information, to facilitate retention and recall.</td>
<td>205</td>
<td>13</td>
</tr>
<tr>
<td>Demonstrates the ability to select developmentally age-appropriate visual aids (including objects, pictures and models) to reinforce oral and written communication with patients.</td>
<td>173</td>
<td>*14</td>
</tr>
<tr>
<td>Demonstrates the ability to provide resources for patients who may have disabilities (low vision, hearing impairment, etc.).</td>
<td>160</td>
<td>*15</td>
</tr>
</tbody>
</table>

* Competency added by expert panel (n=3)

**Research question 3.** *What core competencies are needed for registered nurses to promote nursing practice that utilizes health literacy attitudes in caring for patients?*

In the final round nurse experts were asked to rank order 12 attitudinal competencies using the same method described for previous research questions. Two of the 12 attitudinal competencies were new. Table 7 reflects the final rank ordered attitudinal competencies and score (sum of all weighted scores) for each competency. Weighting occurred in the same way as the previous research questions.
Table 7

Score and Weight for Each Health Literacy Attitudinal Competency

<table>
<thead>
<tr>
<th>Attitudinal Domain ( n=12 )</th>
<th>Score (sum of all weighted scores)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhibits the attitude that all patients are at risk for communication errors, and that one cannot tell who is at risk of communication errors simply by looking, or through typical healthcare interactions-a universal precautions approach is required with all patients.</td>
<td>304</td>
<td>1</td>
</tr>
<tr>
<td>Expresses the attitude that effective communication is essential to the delivery of safe high quality healthcare.</td>
<td>303</td>
<td>2</td>
</tr>
<tr>
<td>Expresses the attitude that every patient has the right to understand their healthcare, and that it is the healthcare professional’s duty to elicit and ensure patients’ best possible understanding of their healthcare.</td>
<td>248</td>
<td>3</td>
</tr>
<tr>
<td>Expresses a non-judgmental non-shaming respectful attitude toward individuals with limited literacy (or health literacy) skills.</td>
<td>222</td>
<td>4</td>
</tr>
<tr>
<td>Acknowledges that all patients regardless of circumstances require clear communication and should not be associated with any one characteristic, demographic, etc.</td>
<td>206</td>
<td>*5</td>
</tr>
<tr>
<td>Expresses acceptance of an ethical responsibility to facilitate the two-way exchange of information in “shared decision making” to the degree and at the level desired by the patient and their family.</td>
<td>203</td>
<td>6</td>
</tr>
<tr>
<td>Expresses empathy with patients’ potential shame around low literacy (or health literacy) issues.</td>
<td>191</td>
<td>7</td>
</tr>
<tr>
<td>Acknowledges patients’ autonomous right to both informed consent, and “informed refusal” of recommended evaluations or treatments.</td>
<td>189</td>
<td>8</td>
</tr>
<tr>
<td>Acknowledges health literacy practices should aim to enhance patient health knowledge and self-efficacy to promote self-care behavior.</td>
<td>184</td>
<td>*9</td>
</tr>
</tbody>
</table>

(cont. on next page)
Table 7 (cont.)

<table>
<thead>
<tr>
<th>Attitudinal Domain n=12</th>
<th>Score (sum of all weighted scores)</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expresses empathy with the common experience of the healthcare system as a confusing, stressful, frustrating, intimidating, and frightening physical and virtual environment for many patients.</td>
<td>179</td>
<td>10</td>
</tr>
<tr>
<td>Expresses the attitude that it is the responsibility of all members of the healthcare team to be trained and proactive in addressing the communication needs of patients.</td>
<td>165</td>
<td>11</td>
</tr>
<tr>
<td>Expresses the attitude that it is a responsibility of the healthcare sector to address the mismatch between patients’ and healthcare providers’ communication skills and tactics.</td>
<td>159</td>
<td>12</td>
</tr>
</tbody>
</table>

* Competency added by expert panel (n=2)

Reliability of Measures

There was a lack of published psychometrics for the Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013). An important part of study’s findings is to report the reliability of measurements used. A common method to analyze reliability of an instrument is to utilize Cronbach’s alpha coefficients (McDonald, 2014). The normal range of Cronbach’s alpha coefficients is between .00 and +1.00 with higher values reflecting higher internal consistency (Polit & Beck, 2012). In this study, the modified Knowledge, Skill and Attitudinal Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) in round one demonstrated excellent internal consistency, with a total scale Cronbach’s alpha coefficient of 0.97 (See Table 8). Similar to round one, the 91-item modified Knowledge, Skill and Attitudinal Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) and
added competencies demonstrated excellent internal consistency, with Cronbach’s alpha reliability coefficient of 0.95 for total scale. Table 8 reports the Cronbach’s alpha reliability values for each subscale and total scale used in rounds one and two.

Table 8

*Cronbach’s Alpha Reliability Analysis of Rounds One and Two Modified Knowledge, Skills, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (n = 91)*

<table>
<thead>
<tr>
<th>Domain Subscales</th>
<th>Cronbach’s Alpha Round 1</th>
<th>N of items</th>
<th>Cronbach’s Alpha Round 2</th>
<th>N of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>.93</td>
<td>24</td>
<td>.93</td>
<td>38</td>
</tr>
<tr>
<td>Skills</td>
<td>.95</td>
<td>27</td>
<td>.93</td>
<td>37</td>
</tr>
<tr>
<td>Attitudes</td>
<td>.85</td>
<td>11</td>
<td>.93</td>
<td>16</td>
</tr>
<tr>
<td>Total Scale</td>
<td>.97</td>
<td>62</td>
<td>.95</td>
<td>91</td>
</tr>
</tbody>
</table>

**Summary of Results**

The aim of this Delphi study was to identify a set of core health literacy competencies for registered nurses in any work setting by recognized nurse health literacy experts. A total of 41 health literacy nurse experts participated in round one, 38 health literacy nurse experts participated in round two, and 33 health literacy nurse experts in round three. The study extended over seven weeks using Survey Gizmo ©. The nurse experts were a homogenous sample. Demographic characteristics of nurse experts consisted of all females mostly in their mid-fifties, PhD prepared, and working in a college or university setting as a nurse educator. Experts’ averaged 32 years in practice as a registered nurse. The national sample of experts represented all geographic areas in the United States.
In round one, the experts rated a 62-item modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) and suggested \((n=29)\) additional health literacy competencies specific to registered nurses in any work setting. In round two, the expert panel reached 90% or greater consensus for fifty of the 91 competencies rated (knowledge \([n=22]\), skills \([n=16]\), and attitudes \([n=12]\)). Thirty-seven (60%) of the original 62-items in the modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) reached 90% or greater consensus in round two. Of the 29 additional health literacy competencies for registered nurses suggested by experts in round one, 44% \((n=13)\) of these competencies reached 90% or greater consensus in round two \((n=8\) knowledge competencies, \(n=3\) skills competencies, and \(n=2\) attitudinal competencies).

In round three, experts \((n=33)\) reviewed the final list of 50 core competencies that reached 90% or greater consensus in round two and ranked each based on order of importance in the knowledge, skills, and attitudinal educational domains. In Chapter five, the conclusions and recommendations for this study are discussed.
CHAPTER FIVE: DISCUSSION, RECOMMENDATIONS, AND CONCLUSION

Introduction

Chapter five briefly summarizes the results of the study before making connections between the results, research questions and the conceptual framework. Comparisons with critical literature and results are presented. Nursing implications and recommendations for education, practice, policy, theory, and research are made. Lastly, limitations for this study are highlighted.

Summary of Study Method

Nationally, only 12% of adults possess proficient health literacy skills (Kutner et al., 2006). Research supports that individuals with low health literacy experience poorer health outcomes due to limited understanding of health information received (AHRQ, 2010; Bach et al., 2012; Berkman et al., 2011; IOM, 2004). Research suggests that registered nurses are not always using evidence-based health literacy practices with patients with low health literacy (Jukkala, Duepree, & Graham, 2009; Macabasco-O'Connell, & Fry-Bowers, 2011; Payne, 2009; Schwartzberg et al., 2007).

In 2013, Coleman and colleagues undertook first steps to identify health literacy competencies for healthcare professionals. Their study resulted in the identification of 62 educational competencies by a group of health professional educators. However, only two of the Delphi participants were nurses. Another limitation of the study findings was that the 62 health literacy educational competencies lacked prioritization. There is a need to prioritize the health literacy competencies to provide a starting point for nurse educators to consider in future education efforts with registered nurses. The investigator wondered if these 62 identified competencies for healthcare professionals were specific
enough for registered nurses in any work setting and if there are health literacy competencies specifically for nurses that had not been reported. The MACH model supports the need to identify essential competencies required of employees (registered nurses) that assure a competent workforce.

Therefore, this study used an e-Delphi Study design with a national sample of health literacy nurse experts to identify and prioritize a set of core health literacy competencies specific for registered nurses in any work setting. Nurse experts that participated in this study were required to have first authored a peer reviewed health literacy publication in the United States, be a registered nurse and recognized by peers as a health literacy expert.

Experts were identified by the author through literature searches in CINAHL, Medline and PubMed and were sent emailed invitations to participate in the study through Survey Gizmo ©. Recruitment efforts also included posted invitations on a professional health literacy listserv (http://listserv.ihaliteracy.org), and nurse health literacy website (Alliance of International Nurses for Improved Health Literacy). Upon receipt of the study invitation, invitees were asked to confirm through Survey Gizmo © that they were registered nurses and that peers would consider them health literacy nurse experts before being allowed to proceed to the first round of the e-Delphi study.

In round one, nurse experts ($N=41$) rated a 62-item modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) using Survey Gizmo ©. Also in round one, experts added 29 additional health literacy competencies specific to registered nurses in any work setting. In round two, experts ($N = 38$) were asked again to rate the 62-items in the
modified Knowledge, Skill, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013) after reflecting on emailed round one individual and group summary results. Experts also rated the 29 added health literacy competencies from round one. Fifty of the 91 health literacy competencies rated by experts in round two reached the predetermined 90% or more consensus required for inclusion as a core health literacy competency in round three. In round three, (N=33) nurse experts prioritized these 50 core competencies across each educational domain.

Discussion of Study Results

The nurse health literacy experts agreed on 37 of the original 62-items (60%) in the modified Knowledge, Skills, and Attitudinal-Based Health Literacy Competencies for Health Professionals Questionnaire (Coleman et al., 2013). Nurse experts reached consensus on 13 of the 29 (44%) core health literacy competencies added by nurse experts in round one for registered nurses in any work setting. Study results support the fact that not all health professional health literacy competencies suggested by Coleman and colleagues (2013) were specific to nurses and that there are some additional competencies for nurses that were missing. Also, the competencies suggested by nurse experts may not be unique just to nursing and should be assessed by other disciplines for relevancy within their professions.

The investigator encountered a lack of support in the literature on how best to describe and present prioritized competencies. The investigator hypothesized that nurse educators would address the top prioritized competencies first when providing health literacy training to registered nurses. Thus, the investigator decided to present and discuss the top three health literacy competencies prioritized by nurse experts for each
learning domain. Discussion of study results was linked to the three research questions posed.

**Knowledge competencies.** The knowledge domain addresses the development of health literacy knowledge in registered nurses, which is the theoretical or practical understanding of health literacy. In round three, experts were asked to prioritize 22 knowledge core health literacy competencies. The top three ranked knowledge competencies were 1) Knows that all patients, regardless of literacy level, benefit from and prefer clear plain language communication, 2) Knows that “you can’t tell who has low health literacy by looking.” and, 3) Knows which kinds of words, phrases, or concepts may be jargon to patients.

The highest rated knowledge competency identified by the experts is that nurses need to know that all patients, regardless of literacy level, benefit from and prefer clear plain language communication. This is consistent with The *National Action Plan to Improve Health Literacy* and *Healthy People 2020* recommendations for health professionals to competently provide clear and understandable health information to consumers of healthcare in order for individuals to follow healthcare advice adequately (USDHSS, 2010a; USDHSS, 2010b). Research has shown that medical jargon is often used during routine healthcare provider visits and contributes to patient confusion (Roter, 2011). Research also demonstrates that patients perceive interactions with healthcare professionals more favorably when professionals use plain language (Roter et al., 2006).

Nurses often use medical jargon in the work setting, and need to be aware that medical jargon confuses patients and may contribute to patients misinterpreting health information provided (Parnell, 2015). The Health Literacy Universal Precautions Toolkit
created by AHRQ recommends the use of plain language by healthcare professionals when communicating with patients (AHRQ, 2010). Using plain language means replacing medical jargon with every day or “living room” words that people use every day in conversations with one another (Weiss, 2007).

The second highest ranked knowledge competency was “you can’t tell who has low health literacy by looking.” This is consistent with research showing that healthcare professionals tend to overestimate the health literacy levels in their patients (Dickens et al., 2013; Kelly & Haidet, 2007). To counteract this problem of overestimating the health literacy in patients, the AHRQ Health Literacy Universal Precautions Toolkit encourages healthcare providers to communicate with all patients as though they have low health literacy or what is often referred to as “universal precautions” (AHRQ, 2010).

The third ranked competency addresses the need for nurses to be aware of what words, phrases or concepts may be jargon to patients. This competency is similar to the first competency discussed. In the clinical environment, healthcare professionals regularly use the language of their discipline. Medical words are complex; patients often do not understand or misunderstand their meanings. Consequently, nurses need to be sensitive to their use of medical jargon in the workplace (Lambert & Keogh, 2014).

**Skills competencies.** The skill domain is concerned with the development of health literacy skills in registered nurses, and are practices developed through training or experience. In the final round, experts were asked to rank order 16 skills competencies. The top three ranked health literacy skill competencies were 1) Demonstrates the ability to speak slowly and clearly with patients, 2) Demonstrates the ability to use common familiar lay terms, phrases and concepts, and appropriately define unavoidable jargon,
and avoid using acronyms in oral and written communication with patients, and 3) Demonstrates the ability to use verbal and non-verbal active listening techniques when speaking with patients.

The highest ranked skill competency rated by experts is that nurses need to be able to demonstrate the ability to speak slowly and clearly with patients. Communication with patients can be improved when nurses and other health professionals speak slowly, which requires a short amount of additional time with each patient (Weiss, 2007). It is recommended that nurses speak slowly, distinctly, and deepen the pitch of their voices when communicating with their patients. Elderly patients often are hard of hearing and have trouble hearing high-pitched sounds (Speros, 2011).

The second highest ranked skill competency is that nurses need to be able to demonstrate the ability to use common familiar lay terms, phrases, and concepts, and appropriately define unavoidable jargon, and avoid using acronyms in oral and written communication with patients. This competency is consistent with previously discussed knowledge competencies that address the need for nurses to know the importance of avoiding medical jargon. It further highlights the need to avoid medical jargon both verbally and in the written word.

The third highest skill competency ranked by experts is that a nurse needs to be able to demonstrate the ability to use verbal and non-verbal active listening techniques when interacting with patients. A Healthy People 2020 objective for health professionals is increasing the proportion of persons who report that their health care providers always listened carefully to them (USDHHS, 2010a). Weiss (2007) describes health provider behaviors that promote “patient-centered” interactions that include both verbal and non-
verbal active listening techniques. Behaviors such as sitting rather than standing, listening rather than speaking, and encouraging the patient to ask questions all help to improve communication between the nurse and patient. Findings from Toronto and Weatherford (2016) study on registered nurses experiences with patients with low health literacy supports these suggested actions. Nurses who provided a patient-centered approach often elicited key information from their patients that improved the plan of care for that patient. Participants also identified problems with understanding of health information when patients were given the opportunity to ask and respond to questions.

**Attitudinal competencies.** The attitudinal domain encompasses registered nurses’ values, beliefs and feelings about health literacy. In the final round experts were asked to rank order 12 attitudinal competencies. The top three ranked health literacy attitudinal competencies were 1) Exhibits the attitude that all patients are at risk for communication errors, and that one cannot tell who is at risk of communication errors simply by looking, or through typical healthcare interactions-a universal precautions approach is required with all patients, 2) Expresses the attitude that effective communication is essential to the delivery of safe high quality healthcare, and 3) Expresses the attitude that every patient has the right to understand their healthcare, and that it is the healthcare professional’s duty to elicit and ensure patients’ best possible understanding of their health care.

The highest ranked attitudinal competency is that nurses need to exhibit the attitude that all patients are at risk for communication errors, and that one cannot tell who is at risk of communication errors simply by looking, or through typical healthcare interactions- a universal precautions approach is required with all patients. This
competency highlights much of what has been previously discussed for the other competency domains. The nurse experts in this study felt that there is the need for nurses to value that “you can’t tell who has low health literacy by looking” and to value the necessity to practice “universal precautions” with all patients encountered (Parnell, 2015).

Macabasco-O’Connell and Fry-Bowers (2011) reported that over half of the nurse participants in a study of registered nurses and nurse practitioners viewed health literacy as a low priority. If nurses do not view health literacy as a priority when interacting with their patients, then attempts most likely to develop registered nurses’ health literacy knowledge, skills and attitudes will be unsuccessful. Becoming health literate requires the health professional to recognize and value the importance of using health literacy strategies in all interpersonal communications with patients to confirm patient understanding of health information at all points of contact (Brach et al., 2012).

The second highest ranked attitudinal competency is that nurses need to express the attitude that effective communication is essential to the delivery of safe high quality healthcare. The Institute of Medicine’s Health Literacy: A Prescription to End Confusion landmark report acknowledges that poor health literacy is affects the way health information is communicated to patients (2004). Many national initiatives address the communication skills of health professionals and the relationship to the provision of safe and quality health care. In the United States, the need for effective communication between healthcare professionals and patients is a priority (AHRQ, 2010; Brach et al., 2012; Murphy-Knoll, 2007; USDHHS, 2010a). The need to improve communication skills in healthcare professionals has also been identified as part of the 2015 National
Patient Goals (TJC, 2015). Moreover, Quality and Safety Education for Nurses (QSEN) stresses the need for nursing schools to develop communication knowledge, skills and attitudes in nursing students (Cronenwett et al., 2007).

The third highest ranked attitudinal competency by experts is that nurses need to express the attitude that every patient has the right to understand their healthcare, and that it is the healthcare professional’s duty to elicit and ensure patients’ best possible understanding of their health care. Providing oral and written healthcare information that is understandable empowers an individual to make informed decisions regarding healthcare and is considered by many to be an ethical responsibility of nurses and other healthcare professionals (ANA, 2010; Lambert & Keogh, 2014; Nutbeam, 2000).

Similar to knowledge and skills, attitudes are learned. Attitudes take time to develop in learners. The affective learning domain is difficult to measure. This may be a reason educators tend to concentrate their training efforts on knowledge or skill development. However, learners’ attitudes and values have a major effect on the outcomes of knowledge and skill learning, especially related to behavioral changes. Therefore, it is important that the affective domain remains linked to the other learning domains; otherwise results of training efforts will diminish quickly (Allender, Rector, & Warner, 2014).

Some of the health literacy competencies that reached consensus and later prioritized by the nurse experts appear to overlap. Especially related to the need for registered nurses to use plain language when communicating with patients. This emphasizes how essential it is for registered nurses to avoid medical jargon with patients.
The findings in this study confirm that the health literacy competencies for health professionals that reached consensus in Coleman et al.’s study (2013) were not completely representative of essential health literacy competencies required of registered nurses in any work setting. Although the top competencies prioritized by nurse experts were from Coleman et al.’s (2013) original list, there are additional health literacy competencies that registered nurses need to possess when interacting with patients with low health literacy. The added competencies by nurse experts that reached 90% consensus favor a patient or family-centered approach by nurses when caring for patients with low health literacy; such as the need for nurses to not assume a patient’s understanding about a disease or medication, to consider involving the patient’s family or friends when providing health information to the patient, and to recognize the impact a patient’s disability, such as low vision or hearing, has on their ability to understand health information provided by the nurse. Moreover, the final prioritized competencies by the nurse experts appear to be consistent with national policy recommendations for essential communication practices provided by nurses and other health professionals when interacting with patients (USSDHS, 2010a; USSDHS, 2010b).

**Conceptual framework.** The MACH model supported the need for identification of health literacy core competencies considered necessary for individual (registered nurse) and workplace performance. In this Delphi study, nurse health literacy experts were asked to rate a comprehensive list of 91 health literacy competencies in the second round. Fifty of the 91 competencies rated by the nurse experts reached 90% consensus and were considered essential health literacy competencies for registered nurse to possess in the workplace.
The MACH model emphasizes the connection of an individual’s performance with the workplace’s performance. The literature review conducted by the investigator for this study identified that registered nurses appear to lack some of the essential health literacy knowledge, skills and attitudinal competencies identified by the nurse experts, such as the use of health literacy universal precautions, speaking slowly and clearly, verbal and non-verbal active listening, plain language and teach-back with patients. As healthcare organizations work to become health literate, organizations will need to assure a workforce (registered nurses) that is also health literate. A key assumption of the MACH model, is when (health literacy) training efforts of employees (registered nurses) are based on identified (health literacy) competencies considered essential for employees to possess in the workplace, the educational support provided to employees by the workplace will potentially lead to improve individual (registered nurse) performance and subsequently to improved performance of the organization.

Implications for Education

The information generated by this study identified core health literacy competencies for registered nurses in any work setting. This knowledge provides a starting point for the integration of health literacy content in practice settings and schools of nursing. Next steps as identified in the MACH model are to plan relevant training that addresses these prioritized core competencies. Nurses in professional development and educational settings will need to decide on which of these 50 health literacy competencies to focus. Educators also will need to design effective pedagogical approaches to use when introducing these competencies to registered nurses and nursing students. Evaluation of these methods in new nurse training programs and educational settings will
be important to future health literacy training efforts focused on improving patient outcomes.

**Implications for Practice**

As illustrated in the MACH model, the health literacy core competencies identified in this study will assist healthcare organizations with defining criterion and practice guidelines that address needed health literacy knowledge, skills and attitudes competencies for professional practice in registered nurses. Nurse managers and nurses in professional development might consider integrating the highest ranked health literacy competencies into yearly performance evaluations of registered nurses in the workplace. This may improve individual professional performance in nurses when interacting with patients with low health literacy, and potentially improve healthcare organizational performance.

The literature review for this study demonstrated that registered nurses do not understand the impact a patient’s health literacy level has on their ability to receive and comprehend health information. Low health literacy adversely affects patients’ capacity to understand and follow health care instruction correctly and can result in patients taking medications incorrectly and ineffectively managing their chronic disease(s). When nurses and other health professionals interact with patients with low health literacy competently, this results in improved patients’ confidence and ability to manage their chronic disease(s) and medications, decreased patient visits to the hospital or emergency room, and enhancement of a healthcare organization’s ability to provide safe and quality healthcare to all patients encountered (Brach et al., 2012; IOM, 2004).
Implications for Policy

Findings from this study are consistent with current national efforts and recommendations focused on improving the way healthcare professionals communicate with patients. The prioritized nurse health literacy competencies are an initial step in identifying health literacy competencies for registered nurses. The MACH model highlights that organizational performance, in addition to individual performance of its workers, is also influenced by the accreditation standards for a workplace. Accreditation of an organization is one mechanism to assess organizational performance as it relates to the required standards (Miner et. al, 2005). Accreditation standards for healthcare organizations help ensure the workforce possess the essential competencies needed to care for patients. Before these competencies can be considered as possible accreditation standards there is first the need to research how the identified competencies by nurse experts impact professional performance, organizational performance, and patient outcomes.

Implications for Theory

Application of the MACH model in this study has built on previous research that utilized the model as a rationale to identify essential competencies in nursing (Hewett, 2012; Kotowski, 2015). The MACH model shows how customized standard competencies in the workforce promote effective competency-based training of employees resulting in improved individual performance and organizational performance. The MACH model has limitations. The MACH model was developed to support the process of the development and assurance of a competent public health workforce. This may be a reason for the model’s lack of showing a relationship between identified
essential competencies required of employees in the workforce, efforts of the organization to develop these competencies in their employees on patient outcomes. There is a need to further develop translational components of the MACH model, which demonstrate how a better-educated registered (registered nurse) workforce using these prioritized health literacy competencies influence patient outcomes.

**Implications for Research**

Educational research is needed to identify which teaching strategies are most effective for nurses in professional development to use when providing health literacy training to registered nurses in the workforce. In practice, research is needed to determine how the identified health literacy competencies for registered nurses in the workforce impacts individual and organizational performance.

The benefits of evidence-based practice (EBP) in nursing are improved outcomes for patients, healthcare providers, and healthcare organizations (Grove, Burns & Gray, 2013). EBP combines best research evidence with clinical expertise, and patient preferences (Grove, Burns, & Gray, 2013). A recommendation is for research that seeks input on what patients value as essential health literacy competencies for registered nurses. A partial replication of this study with a sample of patient experts that uses a similar study design or focus groups could be used to address this research need.

**Limitations**

The response rate was 32% in round one. The rate is slightly lower in comparison to response rates cited in other e-Delphi studies, ranging between 35% and 87%, where experts were invited to participate (Gephart et al., 2013; Harper et al., 2012; Logue & Effken, 2013; McIlrath et al., 2009; Valdez, 2008). However, the response rate in this
study is similar to what is reported for traditional survey response rates (Polit & Beck, 2012). The response rate in this study was balanced by a high retention rate. Attrition rates for this study were 7% for round two and 13% for round three. This is consistent with similar e-Delphi studies using more than one round reporting attrition rates between 5% and 28% (Gephart et al., 2013; Harper et al., 2012; Logue & Effken, 2013; McIlrath et al., 2009; Valdez, 2008).

A limitation was in the design of the study, which did not allow experts to comment on lack of clarity related to the wording of competency statements included in rounds and ranking of competencies in the final round. Some competencies listed in both questionnaires appear to contain more than one behavioral objective and may have made it difficult for nurse experts to support the entire statement. The reasons why experts ranked competencies in round three the way they did was not captured.

More work is needed to refine competency statements added by experts in round one, for example using generic names instead of specific measurement tools and theories. A participant may have broadly supported the use of theoretical frameworks or measurement tools, but may not have wanted to support a specific tool or theory.

A major limitation in this study was encountered in round three. Fifty core competencies were too many and could have presented a challenge to experts when trying to rank the competencies across the three domains. Polit and Beck (2012) suggest when asking participants to rank statements, it is best to limit to 10 or less statements per category. In this study the knowledge domain contained 22 health literacy competency statements, the skill domain contained 16 health literacy competency statements and the attitudinal domain contained 12 health literacy competency statements. A
recommendation for future research efforts that seeks to identify core competencies is to have the experts identify the top ten core competencies when asked to prioritize the competency statements in a particular learning domain.

The inclusion criteria used in the study were rigorous and ensured an expert sample, but it limited sampling to nurses who had published in the field of health literacy. There were several nurses considered nurse health literacy experts by their peers that reached out to the investigator during the initial recruitment phase in round one and expressed interest in participating in the study but did not meet the inclusion criteria of having first authored a peer reviewed publication in the field of health literacy. The criteria assured nurse experts that demonstrated knowledge within the health literacy area but provided a homogenous sample. Nurse experts in practice were underrepresented based on reported demographic characteristics of the sample and may have rated and suggested different health literacy competencies.

This study supports that the e-Delphi method is suitable for developing and identifying core competencies by engaging experts with a wide range of experience from multiple locations. The method chosen was successful in having a national group of health literacy nurse experts identify essential health literacy competencies for nurses in any work setting. The process used in this study is consistent with other Delphi studies that used a similar design when developing clinical competencies and practice guidelines for nurses (Crowenwett et al., 2007; Gebbie et al., 2002; Hewett, 2012; Jenkins & Calzone, 2007; Kotowski, 2015).
Conclusion

Nationally, there is a call for registered nurses to be competent in providing clear and understandable health information to patients needed to follow healthcare advice adequately and safely. This e-Delphi study sought to confirm if the set of 62 educational health literacy competencies for health professionals identified by Coleman et al. (2013) were representative for registered nurses in any work setting. The study also pursued if there were other health literacy competencies specific to registered nurses that were not included in Coleman et al.’s (2013) original questionnaire. This three round e-Delphi study used a national sample of health literacy nurse experts and discovered that not all of Coleman et al.’s (2013) competencies were essential to registered nurses. The nurse experts identified 50-health literacy competencies specific to registered nurses in any work setting. Thirty-seven of the 50 competencies were from Coleman et al.’s (2013) original list and the remaining 13 were from the list of competencies suggested by the nurse experts in round one. In the final round, to assist nurses in professional development and nurse educators the experts prioritized the 50 core health literacy competencies to assist training efforts of nurses in practice and educational settings.
REFERENCES


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Sudore, R. L., Yaffe, K., Satterfield, S., Harris, T. B., Mehta, K. M., Simonsick, E.,…


Thangaratinam, S., & Redman, C. W. (2005). The Delphi technique. *The Obstetrician & Gynaecologist, 7*, 120-125. doi. 10.1576/toag.7.2.120.27071


Tolsgaard, M. G., Todsen, T., Sorensen, J. L., Ringsted, C., Lorentzen, T., Ottesen, B,…


APPENDIX A: IRB APPROVAL LETTER

UMass Dartmouth
OFFICE OF INSTITUTIONAL COMPLIANCE

NOTICE OF REVIEW DECISION

TO: Professor Barbara Weatherford, PhD, RN, & Coleen Toronto, RN (Student Investigator)

FROM: Andrew Karberg, Director of Institutional Compliance & Ethics


IRB # 16.003

DATE: January 29, 2016

FWA: 00000180

In accordance with Federal Regulations for review of research protocols, the Office of Institutional Compliance has reviewed the exempt status assessment of the above referenced protocol and found that it meets exempt approval under the category designated below for the following period: January 29, 2016 – January 28, 2017.

Unless otherwise required by Department or Agency heads, exempt research must fall within one of the following categories:

1. Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
   (i) research on regular and special education instructional strategies, or
   (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.
   (iii) The research is not FDA-regulated

X. 2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:
   (i) Information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
   (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subject's financial standing, employability, or reputation; or
   (iii) The research involves surveys, interviews, or observation of children (where the

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investigator does not participate in the activities being observed); (iv.) The research is not FDA-regulated

3. Research involving the use of educational tests, survey or interview procedures, or observing public behavior that is not exempt under number 2 above, if the subjects are public officials or candidates for public office or a federal statute requires that the confidentiality of personally identifiable information will be maintained throughout the research and thereafter. The research is not FDA-regulated

4. Research involving the collection or study of existing data, documents, records, pathological or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, either directly or through identifiers linked to the subjects. To qualify for exemption, the data, documents, records or specimens must be in existence before the project begins. The research is not FDA-regulated

5. Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate; or otherwise examine:
   i. Public benefit or service programs;
   ii. Procedures for obtaining benefits or services under those programs;
   iii. Possible changes in-or alternatives to those programs or procedures; or
   iv. Possible changes in methods or levels of payment for benefits or services under those programs.
   v. The program under study must deliver a public benefit (e.g., financial or medical benefits) as provided under the Social Security Act or service (e.g., social, supportive, or nutrition services as provided under the Older Americans Act).
   vi. The research or demonstration project must be conducted pursuant to specific federal statutory authority;
   vii. There must be no statutory requirement that an IRB review the project;
   viii. The project must not involve significant physical invasions or intrusions upon the privacy of participants;
   ix. The funding agency must authorize or concur with this exemption.
   x. The research is not FDA-regulated

6. Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) if a food is consumed that contains a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

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Please use the attached approved consent forms

X Waiver of Documentation of Written Consent – utilizing HTML screen for consent (attached).

Waiver of Informed Consent

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report immediately to the OIC any unanticipated problems.

(2) Proposed changes in approved research during the period for which OIC approval cannot be initiated without OIC review and approval, except when necessary to eliminate apparent immediate hazards to participant. Changes in approved research initiated without OIC review and approval to eliminate apparent immediate hazards to the participant must be promptly reported to the OIC, and reviewed under the unanticipated problems policy to determine whether the change was consistent with ensuring the participants continued welfare.

(3) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.

(4) If relevant to your study, please use only a currently approved consent form (remember approval periods are for 12 months or less).

(5) Protect the privacy and confidentiality of all persons and personally identifiable data, and train your staff and collaborators on policies and procedures for ensuring the privacy and confidentiality of participants and information.

(6) Submit for review and approval by the OIC all modifications to the protocol or consent form(s) prior to the implementation of the change.

(7) Please note that this office will NOT send out a reminder prior to the end of your approval period (typically at the end of the 12 months). At that time we will ask you to give us an update on whether the study is still in progress and/or has had any changes that need to be reviewed for approval.

(8) Notify the OIC when the study has been completed and complete the Final Report Form.

(9) Please help us help you by including the above protocol number on all future correspondence relating to this protocol.

University of Massachusetts Dartmouth • 285 Old Westport Rd • N. Dartmouth • MA 02724
Ph: 508 [redacted] • [redacted]@umassd.edu
Thank you for your help in this matter.

Sincerely,

Andrew Karberg, MA, JD
Director, Office of Institutional Compliance
TO: Professor Barbara Weatherford, PhD., RN & Coleen Toronto, RN (student investigator)

FROM: Andrew Karberg, Director of Institutional Compliance & Ethics


IRB # 16.003

DATE: March 4, 2016

FWA: 00000180

APPROVAL DATES: March 4, 2016 – January 28, 2017

Your amendment received exempt review. The changes do not alter the risk to participants – all modifications are minimal risk. Your amendment was approved by the OIC. Specifically this amendment includes: modification to methodology.

This study expires on January 28, 2017 and should you wish to continue it beyond the expiration date you must submit a continuing review prior to the expiration date.

Amendment does not change approved consent form.

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report immediately to the IRB any unanticipated problems.

(2) Proposed changes in approved research during the period for which IRB approval cannot be initiated without IRB review and approval, except when necessary to eliminate apparent immediate hazards to the participant. Changes in approved research initiated without IRB review and approval initiated to eliminate apparent immediate hazards to the participant must be promptly reported to the IRB, and reviewed under the unanticipated problems policy to
determine whether the change was consistent with ensuring the participants continued welfare.

(3) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.

(4) Insure that only persons formally approved by the IRB enroll subjects.

(5) Use only a currently approved consent form (remember approval periods are for 12 months or less).

(6) Protect the confidentiality of all persons and personally identifiable data, and train your staff and collaborators on policies and procedures for ensuring the privacy and confidentiality of participants and information.

(7) Submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change.

(8) Submit a Continuing Review Report for continuing review by the IRB. Federal regulations require IRB review of on-going projects no less than once a year. Please note, it is the primary responsibility of the PI not to exceed the expiration date in collection of any information. Finally, it is the responsibility of the PI to submit the Continuing Review report before the expiration period.

(9) Notify the IRB when the study has been completed and complete the Final Report Form.

(10) Please help us help you by including the above protocol number on all future correspondence relating to this protocol. Thank you for your help in this matter.

Thank you,

Andrew Karberg, MA, JD.
Director Office of Institutional Compliance
APPENDIX B: INTERNET RECRUITMENT LETTER

You are invited to participate in a survey entitled “Health Literacy Competencies for Registered Nurses: An e-Delphi Study”

The study is being conducted by PhD doctoral candidate Coleen E. Toronto, PhD Candidate, RN, CNE for partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Barbara Weatherford PhD, RN, CNE of The University of Massachusetts Dartmouth, College of Nursing is the Principal Investigator (PI).

PI contact information: UMass Dartmouth, 285 Old Westport Rd., N. Dartmouth, MA 02747. Phone number: (508) [redacted]. [email redacted]

You have been identified as an expert in health literacy as evidenced by publication in the field of health literacy. This study’s inclusion criteria is:

- First authored peer review literature in the field of health literacy.
- Must be a registered nurse in the United States.

Your participation in the study will contribute to a better understanding of what health literacy nurse experts consider to be essential health literacy competencies for registered nurses in any work setting. This e-Delphi study will conduct a two or three-round survey. The study will be conducted over approximately two months to achieve consensus. We estimate the participation in the e-Delphi study will take about 35-70 minutes of your time to participate in all Delphi rounds. You are free to contact the investigator at the above address and phone number to discuss the survey.
Risks to participants are considered minimal. There will be no costs for participating, nor will you benefit from participating. Identification codes associated with email addresses will be kept during the data collection phase for tracking purposes only. A limited number of research team members will have access to the data during data collection. This information will be stripped from the final dataset. In addition, you will remain anonymous to the other participants (or experts) throughout the Delphi study and only the principal investigator will be able to identify your specific answers.

Your participation in this survey is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time without penalty. If you wish to withdraw from the study or have any questions, contact the investigator listed above.

If you have any questions or would like us to email another person for your institution or update your email address, please call Coleen Toronto student (Co-PI) at 508- or send an email to @umassd.edu. You may also request a hard copy of the survey from the contact information above. Use your contact information here as you are signing the letter.

To complete the survey, click on the link below:

[HTTP://LINK TO SURVEY URL]

If you do not want to receive any more reminders, you may email us at @umassd.edu

This study has been reviewed and approved by The University of Massachusetts Dartmouth Institutional Review Board. If you have questions about your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may
contact - anonymously, if you wish - the Institutional Review Board by phone at (508) [redacted] or email at [redacted]@umassd.edu.

IRB Approval Number: [#16.003]

Thank you.

**Student Co-Principal Investigator:**

Coleen E. Toronto PhD Candidate, RN, CNE

College of Nursing

University of Massachusetts Dartmouth

[redacted]@umassd.edu

(508)-[redacted]
APPENDIX C: INFORMED CONSENT LETTER

Informed Consent to Participate in Research

The University of Massachusetts Dartmouth

You are being asked to participate in a research study. This form provides you with information about the study. Please feel free to call or email the student Co-principal investigator to ask questions about anything you don’t understand before deciding whether or not to take part in the study. Your participation is entirely voluntary. You have the right to withdraw at any time. Please read the information below.

Title of Research Study: Health Literacy Competencies for Registered Nurses: An e-Delphi Study

Student Co-Principal Investigator:

Coleen Toronto PhD Candidate, RN, CNE

Doctoral student

College of Nursing

University of Massachusetts Dartmouth

@umassd.edu

(508)-

Principal Investigator-Faculty Sponsor:

Barbara Weatherford PhD, RN, CNE

Faculty, Program Director- Diversity Nursing Scholars Program

Nursing Department

College of Nursing

University of Massachusetts Dartmouth
What is the purpose of this research? To identify core health literacy competencies for registered nurses in any work setting.

Why have I been chosen? You have been asked to take part because you have been identified as an expert in this area. The study’s inclusion criteria is as follows:

1. Registered nurse in the U.S.
2. First authored peer-reviewed literature in the field of health literacy
3. Has a published and accessible email address
4. Willing to participate in the Delphi study.

What will be done if you take part in this research?

1. You will be asked to indicate that you understand your rights and voluntarily agree to participate in the research study by selecting “I agree to participate” at the bottom of this page.
2. Simple and specific instructions will be provided for each round (questionnaire). In round one you will provide informed consent, rate a modified 62-item health literacy competencies questionnaire, add additional competency items if needed, and complete a 9-item demographic questionnaire. In rounds that follow you will be asked to rate an updated 62 or more item (Likert Scale 1-5) questionnaire, and in the final round (either 2nd or 3rd) you will be asked to prioritize the competencies that reached consensus.
The Project Duration:

The e-Delphi study duration is approximately two months. Your participation includes participating in two to three rounds (questionnaires) over two months where you will rate a health literacy competency questionnaire. The amount of time necessary for completion of each questionnaire (or rounds) will vary with each participant, but should range from approximately 15-30 minutes for round one, 10-20 minutes round two, and 10-20 minutes in round three (if needed). The approximate total time commitment for this study is 35-70 minutes.

What are the possible discomforts and risks?

There are no anticipated serious risks or discomforts. Likelihood, of physical, psychological, social, legal, or other risks are minimal. However, the minimal risk of loss of the confidentiality of survey responses is minimized through the use of a password protected survey platform and computer servers that are protected by high-end firewall systems, encryption of transmitted data, and the deletion of data following a period of three years.

Indicate the specific sites or agencies involved in the research project. Not applicable.

What are the possible benefits to you or to others?

No direct benefit to you for participating in this study. However, the data will help to identify core health literacy competencies for registered nurses in any work setting. Nurses in professional development and nurse educators can use these competencies as a guide to develop, deliver, and evaluate effective health literacy education for registered nurses.
If you choose to take part in this study, will it cost you anything?

There is no cost to you for participating in this study. However, you will be asked to use personal time to participate in the Delphi study, which includes filling out the questionnaire information in each of the rounds.

Will you receive compensation for your participation in this study?

You will receive a $25 dollar Amazon eGift card for your participation if you complete all rounds (questionnaires) of the Delphi Study.

What if you are injured because of the study?

There are no physical risks associated with this study.

If you do not want to take part in this study, what other options are available to you?

Your participation in this study is entirely voluntary. You are free to refuse to answer any questions in the questionnaires or demographic questionnaire. You are free to refuse to be in the study, and your refusal will not influence current or future relationships with the University of Massachusetts Dartmouth or the investigators.

How can you withdraw from this research study and whom should you call if you have questions?

You have the right to withdraw from this research study at any time, and for any reason. If you have any questions you can contact the student co-principal investigator (Co-PI), Coleen Toronto. Her phone number is 508[redacted] and email address is [redacted]@umassd.edu. There are no adverse consequences associated with withdrawal from the study.
If you have questions about your rights as a study participant, or are dissatisfied at any
time with any aspect of this study, you may contact - anonymously, if you wish - the
Institutional Review Board by phone at (508) or email at
@umassd.edu.

How will your privacy and the confidentiality of your research records be
protected?

1. Confidentiality and anonymity will be ensured through the use of Survey Gizmo
© online survey platform. Survey Gizmo © servers are protected by high-end
firewall systems and transmitted data is encrypted. Both the code sheet and the
downloaded data of this study will be stored securely in a locked cabinet in the
PI’s office for three years per IRB policy and only the PI will have access to the
records. Online questionnaire data will be deleted as per Survey Gizmo © data
storage procedures.

2. Only Coleen Toronto, student Co-principal investigator will have password access
to the Survey Gizmo © research suite.

3. Any information that you provide will be confidential. Your name will not be
recorded on any rounds; instead, you will be allocated a unique code that can only
be identifiable to the student Co-principal investigator. You will remain
anonymous to the other participants (or experts) throughout the Delphi study and
only the principal investigator will be able to identify your specific answers. Also
expert participants will be assured that their name will not be used in any
subsequent report or publication.
4. If in the unlikely event it becomes necessary for the Institutional Review Board to review your research records, then The University of Massachusetts Dartmouth will protect the confidentiality of those records to the extent permitted by law. Your research records will not be released without your consent unless required by law or a court order. The data resulting from your participation may be made available to other researchers in the future for research purposes not detailed within this consent form. In these cases, the data will contain no identifying information that could associate you with it, or with your participation in any study.

**Will the student Co-principal investigator benefit from your participation in this study?**

The student Co-principal investigator will receive course credit towards her PhD in Nursing.

As a representative of this study, I have presented the purpose, procedures, benefits, and the risks that are involved in this research study.

Sincerely,

**Student Co-Principal Investigator:**

Coleen Toronto PhD Candidate, RN, CNE

Doctoral student

College of Nursing

University of Massachusetts Dartmouth

@umassd.edu

(508)-
Dear expert participant,

The first round lists 62 knowledge, skills, and attitudinal-based health literacy educational competencies for health professionals. You will see a scale beside each competency statement. This scale is numbered 1 to 5. Please click the appropriate circle that demonstrates to what extent you believe the listed health literacy competency is essential for registered nurses to provide safe, high quality, holistic nursing care in any work setting.

These numbers correspond to a response as shown below:
1- not important
2- somewhat important
3- important
4- very important
5- extremely important

The 62 competencies are organized into three learning domains (knowledge, skills and attitudes). In this round only, you are encouraged to add additional health literacy competencies specific to registered nurses. Once you finish the 9-item demographic questionnaire, please press submit and exit the questionnaire. Please respond by 2/15/16.

Thank you for your participation in round one of this study. On 2/18/16 you will receive round one summary results, the Delphi instructions for round two questionnaire, and round two questionnaire. I look forward to your continued participation in this important effort. If you have any questions please contact me at ColeenToronto@umassd.edu or (508) 123-4567

Yours sincerely,
Coleen E. Toronto, PhD Candidate, RN, CNE
Student / Co-PI
APPENDIX E: KNOWLEDGE, SKILLS, AND ATTITUDINAL-BASED HEALTH LITERACY COMPETENCIES FOR HEALTH PROFESSIONAL QUESTIONNAIRE

<table>
<thead>
<tr>
<th>Knowledge Items- the knowledge domain addresses the development of intellectual abilities and skills. Health literacy knowledge is the theoretical or practical understanding of health literacy.</th>
<th>To what extent do you believe the listed health literacy competency is essential for registered nurses to provide safe, high quality, holistic nursing care in any work setting.</th>
</tr>
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<tbody>
<tr>
<td><strong>K1</strong> Knows one or more definitions of health literacy.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>K2</strong> Knows the basic literacy skill domains (reading, writing, speaking, listening, numeracy), and gives examples of healthcare related demands put on patients for each domain, including difficulties navigating healthcare systems.</td>
<td>1 2 3 4 5</td>
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<td><strong>K3</strong> Knows difference between the ability to read, and reading comprehension, and why general reading levels do not ensure patient understanding.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>K4</strong> Knows that years of educational attainment are an inadequate marker for health literacy skill.</td>
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<tr>
<td><strong>K5</strong> Knows which kind of words, phrases, or concepts may be <em>jargon</em> to patients.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>K6</strong> Estimates the prevalence of low health literacy among U.S. adults, and knows that certain subgroups are at increased risk.</td>
<td>1 2 3 4 5</td>
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<tr>
<td>K7</td>
<td>Knows that the average U.S. adult reads at the 8th-9th grade reading level, but that most patient education materials are written at a much higher reading level.</td>
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<tr>
<td>K8</td>
<td>Knows that cultural and linguistic differences between patients and healthcare professionals magnify health literacy issues.</td>
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<td>K9</td>
<td>Knows that adults with low literacy tend to experience shame, and hide their skills from healthcare professionals.</td>
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<tr>
<td>K10</td>
<td>Knows that “you can’t tell who has low health literacy by looking.”</td>
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<tr>
<td>K11</td>
<td>Recognizes “red flag” behaviors, which may suggest a patient has low health literacy.</td>
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<tr>
<td>K12</td>
<td>Knows that tools are available for estimating individuals’ health literacy skills, but that routine screening for low health literacy has not been proven safe or acceptable.</td>
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<tr>
<td>K13</td>
<td>Knows that health literacy is context-specific; individuals with high general literacy may have low health literacy.</td>
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<tr>
<td>K14</td>
<td>Knows that health literacy may decrease during times of physical or emotional stress.</td>
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<tr>
<td>K15</td>
<td>Knows that everyone, regardless of literacy level, benefits from and prefers clear <em>plain language</em> communication.</td>
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<tr>
<td>K16</td>
<td>Knows that transition points, or “hand offs” in healthcare (i.e. moving from in-patient to out-patient settings) are especially vulnerable to patient communication errors.</td>
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<tr>
<td>K17</td>
<td>Knows rationale for, and principles underpinning the need for <em>universal precautions</em> approach to all health</td>
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</tbody>
</table>
**K18** Knows best practice principles of *plain language* and *clear health communication* for oral and written communication.

**K19** Knows that patients learn best when a limited number of concepts are presented at any given time.

**K20** Knows examples of the direct relationship between health literacy and
- Knowledge about one’s chronic disease(s) and medications
- Adherence to medications and treatment plans
- Receipt of preventative health services
- Health outcomes and risk of harm.

**K21** Recognizes potential legal implications for inadequately conveying health information to patients with low literacy or health literacy.

**K22** Knows that low health literacy has been associated with excess healthcare costs.

**K23** Knows the rationale for and mechanics of using *teach back* or *show me* technique to assess patient understanding.

**K24** Knows that community resources exist for helping adults improve their general literacy skills.

***Please identify additional health literacy knowledge competencies that are specific to registered nurses not identified on questionnaire (optional)***

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**Skill items** - The skill domain is concerned with the development of physical abilities and skills that result from the input of information and content. Health literacy skills are interventions or practices developed through training or experience.
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<tr>
<td><strong>S1</strong> Demonstrates ability to use common familiar lay terms, phrases and concepts, and appropriately define unavoidable jargon, and avoid using acronyms in oral and written communication with patients.</td>
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<td><strong>S2</strong> Demonstrates ability to recognize, avoid and/or constructively correct the use of medical jargon, as used by others in oral and written communication with patients.</td>
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<td><strong>S3</strong> Demonstrates ability to follow best-practice principles of easy-to-read formatting and writing in written communication with patients.</td>
<td>1</td>
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<td><strong>S4</strong> Demonstrates ability to recognize plain language principles in written materials produced by others.</td>
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<td><strong>S5</strong> Demonstrates the ability to put information into context by using subject headings in both written and oral communication with patients.</td>
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<td><strong>S6</strong> Demonstrates the ability to write at approximately the 5th-6th grade reading level.</td>
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<td><strong>S7</strong> Demonstrates the ability to perform English-to-English translation of information from a non-plain language format into a scientifically accurate low-literacy plain language format.</td>
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<td><strong>S8</strong> Demonstrates ability to speak slowly and clearly with patients.</td>
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<td><strong>S9</strong> Demonstrates ability to use verbal and non-verbal active listening techniques when speaking with patients.</td>
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<td><strong>S10</strong> Demonstrates the ability to use action oriented statements to help patients know what they need to do.</td>
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<td>S11</td>
<td>Demonstrates the ability to select culturally and socially appropriate and relevant visual aids, including objects and models, to enhance and reinforce oral and written communication with patients.</td>
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<td>S12</td>
<td>Demonstrates ability to make instructions interactive, such that patients engage the information, to facilitate retention and recall.</td>
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<td>S13</td>
<td>Demonstrates ability to elicit the patient’s full set of concerns at the outset of the encounter.</td>
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<td>S14</td>
<td>Demonstrates ability to negotiate a mutual agenda for the encounter at the outset of the encounter.</td>
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<td>S15</td>
<td>Demonstrates ability to elicit patients’ prior understanding of their health issues in a non-shaming manner (i.e. asks “what do you already know about high blood pressure?”).</td>
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<td>S16</td>
<td>Demonstrates ability to non-judgmentally elicit root causes of non-adherent health behaviors.</td>
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<td>S17</td>
<td>Demonstrates effective uses of teach back or show me technique for assessing patients’ understanding.</td>
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<td>S18</td>
<td>Demonstrates ability to “chunk and check” by giving patients small amounts of information and checking for understanding before moving to new information.</td>
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<td>S19</td>
<td>Demonstrates ability to effectively elicit questions from patients using a “patient-centered” approach (i.e. asks “what questions do you have?” rather than “do you have any questions?”)</td>
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<td>S20</td>
<td>Demonstrates ability to orally communicate accurately and effectively in patients’ preferred language, using medical</td>
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<td><strong>S21</strong> Demonstrates the ability to use written communication to reinforce important oral information.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>S22</strong> Demonstrates ability to emphasize one to three “need-to-know” or “need-to-do” concepts during a patient encounter.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>S23</strong> Demonstrates the ability to convey numeric information, such as risk, using low numeracy approaches, such as through examples, in oral and written communication.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>S24</strong> Demonstrates ability to write or re-write (“translate”) unambiguous medication instructions (i.e. “take 1 tablet by mouth every morning and evening for high blood pressure, “ rather than “take one table by mouth twice daily”).</td>
<td>1 2 3 4 5</td>
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<td><strong>S25</strong> Demonstrates ability to assess usability of web-based patient resources.</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>S26</strong> Demonstrates ability to ask patients about their learning style preferences (i.e. ask patients, “what is the best way for you to learn new information?”).</td>
<td>1 2 3 4 5</td>
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<tr>
<td><strong>S27</strong> Demonstrates ability to use examples or analogies to improve patients’ comprehension.</td>
<td>1 2 3 4 5</td>
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</table>

***Please identify additional health literacy skill competencies that are specific to registered nurses not identified on questionnaire (optional)***

**Attitudinal items** - The attitudinal domain involves the nurse’s values, beliefs and feelings about health literacy.
| A1 | Expresses the attitude that effective communication is essential to the delivery of safe high quality healthcare. |
| A2 | Exhibits the attitude that all patients are at risk for communication errors, and that one cannot tell who is at risk of communication errors simply by looking, or through typical healthcare interactions- a universal precautions approach is required with all patients. |
| A3 | Expresses the attitude that because the “culture” of healthcare included special knowledge, language, logic, experiences and explanatory models of health and illness, every patient encounter can be considered a cross-cultural experience. |
| A4 | Expresses acceptance of an ethical responsibility to facilitate the two-way exchange of information in “shared decision making” to the degree and at the level desired by the patient and their family. |
| A5 | Acknowledges patients’ autonomous right to both informed consent, and “informed refusal” of recommended evaluations or treatments. |
| A6 | Expresses empathy with patients’ potential shame around low literacy (or health literacy) issues. |
| A7 | Expresses a non-judgmental non-shaming respectful attitude toward individuals with limited literacy (or health literacy) skills. |
| A8 | Expresses empathy with the common experience of the healthcare system as a confusing, stressful, frustrating, intimidating, and frightening physical and virtual environment for many patients. |
A9 Expresses the attitude that every patient has the right to understand their healthcare, and that it is the healthcare professional’s duty to elicit and ensure patients’ best possible understanding of their health care.

A10 Expresses the attitude that it is a responsibility of the healthcare sector to address the mismatch between patients’ and healthcare providers’ communication skills and tactics.

A11 Expresses the attitude that it is the responsibility of all members of the healthcare team to be trained and proactive in addressing the communication needs of patients.

***Please identify additional health literacy attitudinal competencies that are specific to registered nurses not identified on questionnaire (optional)***

<table>
<thead>
<tr>
<th>1</th>
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<td>1</td>
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</tr>
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</table>
APPENDIX F: DEMOGRAPHIC QUESTIONNAIRE

1. What is your gender?
   a) Female
   b) Male
   c) Transgender

2. What is your age (in years)?

3. What is your race (select all that apply)?
   a) American Indian or Alaska Native
   b) Asian
   c) Black or African American
   d) Native Hawaiian or Other Pacific Islander
   e) White

4. What is your Ethnicity?
   a) Hispanic or Latino
   b) Not Hispanic or Latino

5. How many years have you practiced as a registered nurse?

6. What is your highest level of education?
   a) Diploma degree
   b) Associate’s degree
   c) Bachelor’s degree
   d) Master’s degree
   e) DNP degree
   f) PhD degree
   g) Other

7. Which option best describes your current job title?
   a) staff nurse
   b) nurse manager
   c) nurse practitioner
   d) clinical nurse specialist
   e) professional development specialist
   f) nurse educator
   g) nurse researcher
   h) other
8. Which option best describes your work setting?
a) hospital  
b) clinic  
c) college/university  
d) organization  
e) other  

9. How would you best describe your geographic region?
a) Northeast  
b) Southeast  
c) Midwest  
d) Southwest  
e) West
Dear Delphi Study Panel Member,

This is a reminder to consider completing round one questionnaire for the Delphi study “Health Literacy Competencies for Registered Nurses: An e-Delphi Study”. This study aims at identifying core health literacy competencies for registered nurses. Please click this link in order to complete the round one questionnaire. Please respond by 2/15/16.

I look forward to your assistance in this important effort. The results of round one will be made available to you on 2/18/16.

If you have any questions, please contact me at @umassd.edu or 508-.

Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE
Student / Co-PI
APPENDIX H: ROUND ONE NURSES EXPERTS’ ADDED COMPETENCIES

Knowledge Competencies

1. Knows “Ask Me 3™” is a patient education program designed to promote communication between health care providers and patients.

2. Knows that health literacy is considered the sixth vital sign—along with temperature, pulse, respiration, blood pressure, and pain level.

3. Knows that bringing a family member/friend to healthcare encounters may reinforce the information provided by the healthcare provider/seek clarification when needed.

4. Knows using a combination of educational materials (verbal, written, pictures, video etc.) may increase patient understanding.

5. Knows the tone and volume of how health information is communicated to patients impacts their understanding.

6. Knows the need to never assume patient’s understanding about a disease or medication even if they have been diagnosed/have taken the medication for many years.

7. Knows that providing written materials in a person's native language may not ensure comprehension of health information.

8. Knows patient and provider communication is influenced by patient’s health literacy level.

9. Knows patient’s ability to navigate complex health systems, is influenced by patient’s health literacy level.

10. Knows that communication involves both talking and listening effectively.

11. Knows that a patient may refuse a plan or treatment due to fear, lack of resources or misunderstanding.

12. Knows patients need to be able to demonstrate the ability to incorporate an activity into their daily routine (patient activation) by asking questions such as "Where will you keep this medication so you can remember to take it?"; “How will you remember to get it refilled?”; "What will you do if you forget a dose?" etc.
13. Knows the Medagogy model provides an overarching conceptual framework nurses can use to provide a defined, methodical approach to patient education.

14. Knows the PITS (Pathophysiology-Indications-Treatment-Specifics) model offers a standardized communication method for the delivery of patient education.

**Skills Competencies**

15. Demonstrates the ability to assist patients to locate essential information in written material by highlighting key health information and actionable items regardless of the readability level.

16. Demonstrates relational skills such as empathy to promote/facilitate communication.

17. Demonstrates the ability to select developmentally age-appropriate visual aids (including objects, pictures and models) to reinforce oral and written communication with patients.

18. Demonstrates the ability to provide written material at a level of the patient's understanding.

19. Demonstrates the ability to provide resources for patients who may have disabilities (low vision, hearing impairment, etc.).

20. Demonstrates the ability to identify when to use additional resources such as health educators, etc. depending on their institutionally defined roles.

21. Demonstrates ability to adjust health education approach to patient’s learning style (visual, auditory, kinesthetic etc.).

22. Demonstrates the ability to encourage patients to speak up if there is a lack of understanding during communication.

23. Demonstrates the ability to assess patients for health literacy using a single-item literacy screener (Morris et al., 2006), or other single-item screener tools.

24. Demonstrates the ability to use the Understanding Personal Perception (UPP) Scale to signify clarity of patient understanding.
Attitudinal Competencies

25. Acknowledges that one's own cultural background may bias one's perceptions of who might be low health literate.

26. Acknowledges that patients’ personal beliefs may influence health literacy.

27. Acknowledges the need to listen to the patient with an “open mind.”

28. Acknowledges health literacy practices should aim to enhance patient health knowledge and self-efficacy to promote self-care behavior.

29. Acknowledges that all patients regardless of circumstances require clear communication and should not be associated with any one characteristic, demographic, etc.
Dear Delphi Study Panel Member,

Thank you for participating in the first round of this three-round Delphi study. Twenty-nine competencies were added based upon feedback from participants. Attached you will find your individual scores and the group scores from the first round. Please click the link in order to complete the round two questionnaire. Please respond by 3/3/16.

I look forward to your continued assistance in this important effort. The results of round two will be made available to you on 3/7/16.

If you have any questions, please contact me at @umassd.edu or at (508) Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE
Student / Co-PI
APPENDIX J: ROUND TWO QUESTIONNAIRE REMINDER

Dear Delphi Study Panel Member,

This is a reminder to complete round two questionnaire for the Delphi study aimed at identifying core health literacy competencies for registered nurses. Please click this link in order to complete round two questionnaire. Please respond by 3/3/16.

I look forward to your continued assistance in this important effort. The results of round two will be made available to you on 3/7/16.

If you have any questions, please contact me at c.etoronto@umassd.edu or 508.

Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE
Student / Co-PI
# APPENDIX K: ROUND ONE AND TWO HEALTH LITERACY RESULTS

<table>
<thead>
<tr>
<th>Knows one or more definitions of health literacy.</th>
<th>Round One $n$</th>
<th>Consensus</th>
<th>Round Two $n$</th>
<th>Consensus</th>
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<tbody>
<tr>
<td>41</td>
<td>78%</td>
<td>38</td>
<td>76.3%</td>
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| Knows the basic literacy skill domains (reading, writing, speaking, listening, numeracy), and gives examples of healthcare related demands put on patients for each domain, including difficulties navigating healthcare systems. | 41 | 87.8% | 38 | 81.6% |

| Knows difference between the ability to read, and reading comprehension, and why general reading levels do not ensure patient understanding. | 41 | 97.5% | 38 | *97.4%|

| Knows that years of educational attainment are an inadequate marker for health literacy skill. | 41 | 95.2% | 38 | 86.9% |

| Knows which kind of words, phrases, or concepts may be jargon to patients. | 41 | 97.6% | 38 | *100.0% |

| Estimates the prevalence of low health literacy among U.S. adults, and knows that certain subgroups are at increased risk. | 41 | 70.7% | 38 | 68.4% |

<p>| Knows that the average U.S. adult reads at the $8^{th}$-$9^{th}$ grade reading level, but that most patient education materials are written at a much higher reading level. | 41 | 85.4% | 38 | 79.0% |
| Knows that cultural and linguistic differences between patients and healthcare professionals magnify health literacy issues. | 41 | 90.3% | 38 | *97.4% |
| Knows that adults with low literacy tend to experience shame, and hide their skills from healthcare professionals. | 41 | 92.7% | 38 | *97.4% |
| Knows that “you can’t tell who has low health literacy by looking.” | 40 | 95.0% | 38 | *100.0% |
| Recognizes “red flag” behaviors, which may suggest a patient has low health literacy. | 41 | 95.1% | 38 | *100.0% |
| Knows that tools are available for estimating individuals’ health literacy skills, but that routine screening for low health literacy has not been proven safe or acceptable. | 41 | 63.4% | 38 | 65.8% |
| Knows that health literacy is context-specific; individuals with high general literacy may have low health literacy. | 41 | 87.8% | 38 | *92.1% |
| Knows that health literacy may decrease during times of physical or emotional stress. | 41 | 87.8% | 38 | *100.0% |
| Knows that everyone, regardless of literacy level, benefits from and prefers clear <em>plain language</em> communication. | 40 | 97.5% | 38 | *100.0% |</p>
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<tr>
<th>Statement</th>
<th>Round One $n$</th>
<th>Consensus</th>
<th>Round Two $n$</th>
<th>Consensus</th>
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<tr>
<td>Knows that transition points, or “hand offs” in healthcare (i.e. moving from in-patient to out-patient settings) are especially vulnerable to patient communication errors.</td>
<td>40</td>
<td>92.7%</td>
<td>37</td>
<td>*97.3%</td>
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<tr>
<td>Knows rationale for, and principles underpinning the need for universal precautions approach to all health communication interactions.</td>
<td>41</td>
<td>97.5%</td>
<td>38</td>
<td>89.5%</td>
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<tr>
<td>Knows best practice principles of plain language and clear health communication for oral and written communication.</td>
<td>41</td>
<td>100.0%</td>
<td>36</td>
<td>*97.2%</td>
</tr>
<tr>
<td>Knows that patients learn best when a limited number of concepts are presented at any given time.</td>
<td>41</td>
<td>95.2%</td>
<td>38</td>
<td>*100.0%</td>
</tr>
<tr>
<td>Knows examples of the direct relationship between health literacy and • Knowledge about one’s chronic disease(s) and medications • Adherence to medications and treatment plans • Receipt of preventative health services • Health outcomes and risk of harm.</td>
<td>41</td>
<td>85.4%</td>
<td>37</td>
<td>*91.9%</td>
</tr>
<tr>
<td>Recognizes potential legal implications for inadequately conveying health information to patients with low literacy or health literacy.</td>
<td>41</td>
<td>80.5%</td>
<td>38</td>
<td>86.9%</td>
</tr>
<tr>
<td>Knows that low health literacy has been associated with excess healthcare costs.</td>
<td>41</td>
<td>70.7%</td>
<td>38</td>
<td>73.7%</td>
</tr>
<tr>
<td>Statement</td>
<td>Round One n</td>
<td>Consensus</td>
<td>Round Two n</td>
<td>Consensus</td>
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<tr>
<td>Knows the rationale for and mechanics of using <em>teach back</em> or <em>show me</em> technique to assess patient understanding.</td>
<td>41</td>
<td>90.2%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Knows that community resources exist for helping adults improve their general literacy skills.</td>
<td>41</td>
<td>53.6%</td>
<td>38</td>
<td>77.8%</td>
</tr>
<tr>
<td>Knows “Ask Me 3™” is a patient education program designed to promote communication between health care providers and patients.</td>
<td>**</td>
<td></td>
<td>38</td>
<td>60.5%</td>
</tr>
<tr>
<td>Knows that health literacy is considered the sixth vital sign-along with temperature, pulse, respiration, blood pressure, and pain level.</td>
<td>**</td>
<td></td>
<td>38</td>
<td>78.9%</td>
</tr>
<tr>
<td>Knows that bringing a family member/friend to healthcare encounters may reinforce the information provided by the healthcare provider/seek clarification when needed.</td>
<td>**</td>
<td></td>
<td>38</td>
<td>*100.0%</td>
</tr>
<tr>
<td>Knows using a combination of educational materials (verbal, written, pictures, video etc.) may increase patient understanding.</td>
<td>**</td>
<td></td>
<td>38</td>
<td>*100.0%</td>
</tr>
<tr>
<td>Knows the tone and volume of how health information is communicated to patients impacts their understanding.</td>
<td>**</td>
<td></td>
<td>38</td>
<td>89.4%</td>
</tr>
<tr>
<td>Knows the need to never assume patient’s understanding about a disease or medication even if they have been diagnosed/ have taken the medication for many years.</td>
<td>**</td>
<td></td>
<td>37</td>
<td>*97.3%</td>
</tr>
<tr>
<td></td>
<td>Round One n</td>
<td>Consensus</td>
<td>Round Two n</td>
<td>Consensus</td>
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<td>-------------------------------------------</td>
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</tr>
<tr>
<td>Knows that providing written materials in a person's native language may not ensure comprehension of health information.</td>
<td>**</td>
<td>37</td>
<td>*97.3%</td>
<td></td>
</tr>
<tr>
<td>Knows patient and provider communication is influenced by patient’s health literacy level.</td>
<td>**</td>
<td>36</td>
<td>*94.4%</td>
<td></td>
</tr>
<tr>
<td>Knows patient’s ability to navigate complex health systems, is influenced by patient’s health literacy level.</td>
<td>**</td>
<td>37</td>
<td>*94.6%</td>
<td></td>
</tr>
<tr>
<td>Knows that communication involves both talking and listening effectively.</td>
<td>**</td>
<td>38</td>
<td>*97.4%</td>
<td></td>
</tr>
<tr>
<td>Knows that a patient may refuse a plan or treatment due to fear, lack of resources or misunderstanding.</td>
<td>**</td>
<td>38</td>
<td>*100.0%</td>
<td></td>
</tr>
<tr>
<td>Knows patients need to be able to demonstrate the ability to incorporate an activity into their daily routine (patient activation) by asking questions such as &quot;Where will you keep this medication so you can remember to take it?&quot;; &quot;How will you remember to get it refilled?&quot;; &quot;What will you do if you forget a dose?&quot; etc.</td>
<td>**</td>
<td>38</td>
<td>86.8%</td>
<td></td>
</tr>
<tr>
<td>Knows the Medagogy model provides an overarching conceptual framework nurses can use to provide a defined, methodical approach to patient education.</td>
<td>**</td>
<td>37</td>
<td>18.9%</td>
<td></td>
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<tr>
<td></td>
<td>Round One $n$</td>
<td>Consensus</td>
<td>Round Two $n$</td>
<td>Consensus</td>
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</tr>
<tr>
<td>Knows the PITS (Pathophysiology-Indications-Treatment-Specifics) model offers a standardized communication method for the delivery of patient education.</td>
<td>**</td>
<td>36</td>
<td>22.2%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates ability to use common familiar lay terms, phrases and concepts, and appropriately define unavoidable <em>jargon</em>, and avoid using acronyms in oral and written communication with patients.</td>
<td>41</td>
<td>97.6%</td>
<td>37</td>
<td>*97.3%</td>
</tr>
<tr>
<td>Demonstrates ability to recognize, avoid and/or constructively correct the use of medical <em>jargon</em>, as used by others in oral and written communication with patients.</td>
<td>41</td>
<td>87.8%</td>
<td>38</td>
<td>*100.0%</td>
</tr>
<tr>
<td>Demonstrates ability to follow best-practice principles of easy-to-read formatting and writing in written communication with patients.</td>
<td>41</td>
<td>87.8%</td>
<td>38</td>
<td>*92.1%</td>
</tr>
<tr>
<td>Demonstrates ability to recognize <em>plain language</em> principles in written materials produced by others.</td>
<td>41</td>
<td>80.5%</td>
<td>38</td>
<td>84.2%</td>
</tr>
<tr>
<td>Demonstrates the ability to put information into context by using subject headings in both written and oral communication with patients.</td>
<td>41</td>
<td>70.8%</td>
<td>38</td>
<td>84.2%</td>
</tr>
<tr>
<td>Demonstrates the ability to write at approximately the $5^{th}-6^{th}$ grade reading level.</td>
<td>41</td>
<td>73.2%</td>
<td>38</td>
<td>84.2%</td>
</tr>
<tr>
<td>Demonstration</td>
<td>Round One $n$</td>
<td>Consensus</td>
<td>Round Two $n$</td>
<td>Consensus</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Demonstrates the ability to perform English-to-English translation of information from a non-plain language format into a scientifically accurate low-literacy plain language format.</td>
<td>41</td>
<td>75.6%</td>
<td>38</td>
<td>86.9%</td>
</tr>
<tr>
<td>Demonstrates ability to speak slowly and clearly with patients.</td>
<td>41</td>
<td>87.8%</td>
<td>38</td>
<td>*100.0%</td>
</tr>
<tr>
<td>Demonstrates ability to use verbal and non-verbal active listening techniques when speaking with patients.</td>
<td>41</td>
<td>90.2%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Demonstrates the ability to use action-oriented statements to help patients know what they need to do.</td>
<td>40</td>
<td>87.5%</td>
<td>38</td>
<td>*97.3%</td>
</tr>
<tr>
<td>Demonstrates the ability to select culturally and socially appropriate and relevant visual aids, including objects and models, to enhance and reinforce oral and written communication with patients.</td>
<td>41</td>
<td>78.1%</td>
<td>38</td>
<td>*92.1%</td>
</tr>
<tr>
<td>Demonstrates ability to make instructions interactive, such that patients engage the information, to facilitate retention and recall.</td>
<td>41</td>
<td>75.6%</td>
<td>38</td>
<td>*94.8%</td>
</tr>
<tr>
<td>Demonstrates ability to elicit the patient’s full set of concerns at the outset of the encounter.</td>
<td>41</td>
<td>68.3%</td>
<td>38</td>
<td>73.7%</td>
</tr>
<tr>
<td>Demonstrates ability to negotiate a mutual agenda for the encounter at the outset of the encounter.</td>
<td>41</td>
<td>70.7%</td>
<td>38</td>
<td>68.4%</td>
</tr>
<tr>
<td>Demonstrates ability to elicit patients’ prior understanding of their health issues in a non-shaming manner (i.e. asks “what do you already know about high blood pressure?”).</td>
<td>41</td>
<td>90.2%</td>
<td>37</td>
<td>*91.9%</td>
</tr>
<tr>
<td>Demonstrates ability to non-judgmentally elicit root causes of non-adherent health behaviors.</td>
<td>41</td>
<td>85.4%</td>
<td>37</td>
<td>86.5%</td>
</tr>
<tr>
<td>Demonstrates effective uses of teach back or show me technique for assessing patients’ understanding.</td>
<td>41</td>
<td>92.7%</td>
<td>38</td>
<td>*94.8%</td>
</tr>
<tr>
<td>Demonstrates ability to “chunk and check” by giving patients small amounts of information and checking for understanding before moving to new information.</td>
<td>41</td>
<td>92.7%</td>
<td>38</td>
<td>*92.2%</td>
</tr>
<tr>
<td>Demonstrates ability to effectively elicit questions from patients using a “patient-centered” approach (i.e. asks “what questions do you have?” rather than “do you have any questions?”)</td>
<td>40</td>
<td>97.7%</td>
<td>38</td>
<td>*92.1%</td>
</tr>
<tr>
<td>Demonstrates ability to orally communicate accurately and effectively in patients’ preferred language, using medical interpreter services.</td>
<td>41</td>
<td>97.6%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Demonstrates the ability to use written communication to reinforce important oral information.</td>
<td>40</td>
<td>87.5%</td>
<td>38</td>
<td>89.5%</td>
</tr>
<tr>
<td>Task</td>
<td>Round One <code>n</code></td>
<td>Consensus</td>
<td>Round Two <code>n</code></td>
<td>Consensus</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>---------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Demonstrates ability to emphasize one to three “need-to-know” or “need-to do” concepts during a patient encounter.</td>
<td>41</td>
<td>90.3%</td>
<td>38</td>
<td>79.0%</td>
</tr>
<tr>
<td>Demonstrates the ability to convey numeric information, such as risk, using low numeracy approaches, such as through examples, in oral and written communication.</td>
<td>41</td>
<td>82.9%</td>
<td>38</td>
<td>86.8%</td>
</tr>
<tr>
<td>Demonstrates ability to write or re-write (“translate”) unambiguous medication instructions (i.e. “take 1 tablet by mouth every morning and evening for high blood pressure, “ rather than “take one table by mouth twice daily”).</td>
<td>41</td>
<td>92.7%</td>
<td>38</td>
<td>89.5%</td>
</tr>
<tr>
<td>Demonstrates ability to assess usability of web-based patient resources.</td>
<td>41</td>
<td>51.3%</td>
<td>38</td>
<td>60.5%</td>
</tr>
<tr>
<td>Demonstrates ability to ask patients about their learning style preferences (i.e. ask patients, “what is the best way for you to learn new information?”).</td>
<td>41</td>
<td>75.6%</td>
<td>38</td>
<td>76.3%</td>
</tr>
<tr>
<td>Demonstrates ability to use examples or analogies to improve patients’ comprehension.</td>
<td>41</td>
<td>85.4%</td>
<td>38</td>
<td>86.8%</td>
</tr>
<tr>
<td>Demonstrates the ability to assist patients to locate essential information in written material by highlighting key health information and actionable items regardless of the readability level.</td>
<td>**</td>
<td>38</td>
<td>**</td>
<td>71.0%</td>
</tr>
<tr>
<td></td>
<td>Round One n</td>
<td>Consensus</td>
<td>Round Two n</td>
<td>Consensus</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Demonstrates relational skills such as empathy to promote/facilitate communication.</td>
<td>**</td>
<td>38</td>
<td>84.2%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to select age-appropriate visual aids (including objects, pictures and models) to reinforce oral and written communication with patients.</td>
<td>**</td>
<td>38</td>
<td>*92.1%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to provide written material at a level of the patient's understanding.</td>
<td>**</td>
<td>37</td>
<td>*94.6%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to provide resources for patients who may have disabilities (low vision, hearing impairment, etc.).</td>
<td>**</td>
<td>38</td>
<td>*94.8%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to identify when to use additional resources such as health educators, etc. depending on their institutionally defined roles.</td>
<td>**</td>
<td>37</td>
<td>72.9%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates ability to adjust health education approach to patient’s learning style (visual, auditory, kinesthetic etc.).</td>
<td>**</td>
<td>37</td>
<td>81.1%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to encourage patients to speak up if there is a lack of understanding during communication.</td>
<td>**</td>
<td>38</td>
<td>86.9%</td>
<td></td>
</tr>
<tr>
<td>Demonstrates the ability to assess patients for health literacy using a single-item literacy screener (Morris et al., 2006), or other single-item screener tools.</td>
<td>**</td>
<td>37</td>
<td>40.5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Round One n</td>
<td>Consensus</td>
<td>Round Two n</td>
<td>Consensus</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Demonstrates the ability to use the Understanding Personal Perception (UPP) Scale to signify clarity of patient understanding.</td>
<td>**</td>
<td>37</td>
<td>18.9%</td>
<td></td>
</tr>
<tr>
<td>Expresses the attitude that effective communication is essential to the delivery of safe high quality healthcare.</td>
<td>41</td>
<td>100.0%</td>
<td>37</td>
<td>*97.3%</td>
</tr>
<tr>
<td>Exhibits the attitude that all patients are at risk for communication errors, and that one cannot tell who is at risk of communication errors simply by looking, or through typical healthcare interactions- <em>a universal precautions</em> approach is required with all patients.</td>
<td>41</td>
<td>100.0%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Expresses the attitude that because the “culture” of healthcare included special knowledge, language, logic, experiences and explanatory models of health and illness, every patient encounter can be considered a cross-cultural experience.</td>
<td>41</td>
<td>90.3%</td>
<td>38</td>
<td>89.5%</td>
</tr>
<tr>
<td>Expresses acceptance of an ethical responsibility to facilitate the two-way exchange of information in “shared decision making” to the degree and at the level desired by the patient and their family.</td>
<td>41</td>
<td>97.5%</td>
<td>38</td>
<td>*92.1%</td>
</tr>
<tr>
<td>Acknowledges patients’ autonomous right to both informed consent, and “informed refusal” of recommended evaluations or treatments.</td>
<td>41</td>
<td>90.3%</td>
<td>38</td>
<td>*92.1%</td>
</tr>
<tr>
<td></td>
<td>Round One $n$</td>
<td>Consensus</td>
<td>Round Two $n$</td>
<td>Consensus</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-----------</td>
<td>---------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Expresses empathy with patients’ potential shame around low literacy (or health literacy) issues.</td>
<td>40</td>
<td>90.0%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Expresses a non-judgmental non-shaming respectful attitude toward individuals with limited literacy (or health literacy) skills.</td>
<td>41</td>
<td>100.0%</td>
<td>38</td>
<td>*97.4%</td>
</tr>
<tr>
<td>Expresses empathy with the common experience of the healthcare system as a confusing, stressful, frustrating, intimidating, and frightening physical and virtual environment for many patients.</td>
<td>41</td>
<td>90.2%</td>
<td>37</td>
<td>*91.9%</td>
</tr>
<tr>
<td>Expresses the attitude that every patient has the right to understand their healthcare, and that it is the healthcare professional’s duty to elicit and ensure patients’ best possible understanding of their health care.</td>
<td>41</td>
<td>100.0%</td>
<td>37</td>
<td>*94.6%</td>
</tr>
<tr>
<td>Expresses the attitude that it is a responsibility of the healthcare sector to address the mismatch between patients’ and healthcare providers’ communication skills and tactics.</td>
<td>40</td>
<td>97.5%</td>
<td>38</td>
<td>*94.8%</td>
</tr>
<tr>
<td>Expresses the attitude that it is the responsibility of all members of the healthcare team to be trained and proactive in addressing the communication needs of patients.</td>
<td>41</td>
<td>100.0%</td>
<td>38</td>
<td>*94.8%</td>
</tr>
<tr>
<td>Competency</td>
<td>Round One n</td>
<td>Consensus</td>
<td>Round Two n</td>
<td>Consensus</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Acknowledges that one's own cultural background may bias one's perceptions of who might be low health literate.</td>
<td>**</td>
<td>38</td>
<td>81.6%</td>
<td></td>
</tr>
<tr>
<td>Acknowledges that patients’ personal beliefs may influence health literacy.</td>
<td>**</td>
<td>38</td>
<td>84.2%</td>
<td></td>
</tr>
<tr>
<td>Acknowledges the need to listen to the patient with an “open mind.”</td>
<td>**</td>
<td>37</td>
<td>86.5%</td>
<td></td>
</tr>
<tr>
<td>Acknowledges health literacy practices should aim to enhance patient health knowledge and self-efficacy to promote self-care behavior and positive health outcomes.</td>
<td>**</td>
<td>38</td>
<td>*92.1%</td>
<td></td>
</tr>
<tr>
<td>Acknowledges that all patients regardless of circumstances require clear communication and should not be associated with any one characteristic, demographic, etc.</td>
<td>**</td>
<td>38</td>
<td>*97.4%</td>
<td></td>
</tr>
</tbody>
</table>

* = Competency that achieved 90% or greater consensus and moved forward to round three.

**= Competency added following round one
APPENDIX L: QUESTIONNAIRE INSTRUCTIONS ROUND THREE AND FINAL ROUND

Dear Delphi Study Panel Member,

Thank you for participating in the second round of this three-round Delphi study in order to identify core health literacy competencies for registered nurses. Fifty of the 91 competencies reached 90% consensus. Attached you will find your individual scores and the group scores from the second round. In this survey you will be asked to prioritize or rank order each item that reached 90% consensus. Please make sure to confirm the email address you would like your $25 Amazon eGift card to be sent to for acknowledgement of your participation at the end of the survey. Please click the link in order to complete the round three questionnaire. Please respond by 3/21/16.

If you have any questions, please contact me at @umassd.edu or 508

Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE

Student / Co-PI
APPENDIX M: ROUND THREE QUESTIONNAIRE REMINDER

Dear Delphi Study Panel Member,

This is a reminder to complete round three questionnaire for the Delphi Study aimed at identifying core health literacy competencies for registered nurses. Please make sure to confirm the email address you would like your $25 Amazon eGift card to be sent to for acknowledgement of your participation at the end of the survey. Please click this link in order to complete round three questionnaire. Please respond by 3/21/16.

If you have any questions, please contact me at [email]@umassd.edu or 508 [phone].

Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE
Student / Co-PI
APPENDIX N: THANK YOU LETTER

Dear Delphi Study Panel Member,

You recently participated in a three round Delphi study to identify core health literacy competencies for registered nurses. Attached is a $25 Amazon eGift card for acknowledgement of your participation. I would like to thank you for your participation in this research project, and inform you that these research findings will be disseminated by presenting at nursing research conferences and publication. This could not have been possible without your participation.

If you have any questions please contact me at [email protected] or 508 [redacted]

Sincerely,

Coleen E. Toronto, PhD Candidate, RN, CNE

Student / Co-PI
APPENDIX O: PERMISSION TO USE MACH MODEL

Hello Coleen,
You are granted permission to use the MACH model for your framework. Attached is the .pdf of the article from which you can extract the image.

Best,
Erin

Erin K. Williams | Publications Coordinator, Public Health Reports
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Tel: 202 , ext. | Fax: 202 | Email:

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