TEXAS HEALTH EDUCATORS' HEALTH LITERACY COMPETENCE AND PROFESSIONAL PREPARATION: A MULTIPLE PERSPECTIVE

A Dissertation

by

LENNA MOULTIN NEE DAWKINS

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Chair of Committee,	E. Lisako J. McKyer
Committee Members,	Corliss Outley
	Lisa Wigfall
	Kelly Wilson
Head of Department,	Richard Kreider

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ABSTRACT

Limited health literacy challenges healthcare and perpetuates health disparities. Health Agencies, such as the United States Department of Health and Human Services (USDHHS) and the World Health Organization (WHO), have recommended health literacy training for all health professionals, but little is known about health education specialists' health literacy preparation and competence.

In this dissertation, qualitative and quantitative approaches were used to examine the extent to which health education specialists are prepared to support health literacy capacity building by individuals and communities. The aims of the study were to: 1) assess the data on health literacy education and training for healthcare workers in order to construct an understanding of how health literacy preparation is emerging for health professionals in general and health educators in particular; 2) evaluate the scope (breadth and depth) of health literacy content in the health education/health promotion curricula of selected Texas public universities; 3) assess health education students' health literacy knowledge and skills; and 4) capture the perceptions of practicing health education specialists regarding health literacy and the role it plays in their practice.

A systematic review of the extant literature showed even though there is no formal standard for instruction, health literacy is emerging similarly across disciplines. Instruction, however, focuses on functional level skills and there is a dearth of research on preparation for public health workers. A syllabi analysis also found health literacy is not represented in the intended curricula. Further, health education students and practitioners have limited knowledge about health literacy. There is discrepancy between

their self-reported health literacy preparation and competence, their demonstrated knowledge, and the intended content of instruction.

DEDICATION

To my family (Robert, Roberth-Ann, and Fredrique) and every individual who feels intimidated and silenced by the healthcare environment.

ACKNOWLEDGEMENTS

No human achievement is the result of individual effort; our products represent the cumulative contribution of all the people who impacted our endeavors either directly or indirectly. I feel deeply indebted to all the individuals who made this research possible. First, I am profoundly grateful to my committee chair — Dr. McKyer — and my committee members — Dr. Wilson, Dr. Outley, and Dr. Wigfall. Their expertise, critical reviews, and recommendations were invaluable. I demanded much, but they continually gave.

I also owe a debt of gratitude to the participants, staff, and administrators of the institutions that participated in the study. Their willingness to facilitate the research activity was truly remarkable.

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Dr. Andrea McDonald provided contribution as a second reviewer in Chapter 2 and a second coder in Chapter 3.

All other work conducted for the dissertation was completed by the student independently.

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CHAPTER I

INTRODUCTION

Limited health literacy challenges preventative healthcare and perpetuates health disparities. As a result, health literacy is a central concern for health education. Health literacy refers to an individual's ability to seek health information, understand health information, and use the information to improve health and wellbeing throughout the life course (HLS-EU Consortium, 2012). Many individuals, however, have difficulty carrying out these tasks. The most recent National Assessment of Adult Literacy (2003) survey found approximately one-third or almost 90 million American adults had deficient health literacy skills (Kutner *et al*, 2006). The results of the survey also showed health literacy is linked to poor health outcomes and is disproportionately higher among older adults, individuals with limited language proficiency, individuals living below the poverty level, and individuals with fewer years of formal education (Berkman *et al*., 2011; Kutner *et al*, 2006).

Following on the National Assessment of Adult Literacy (NAALS) survey, the Institute of Medicine (IOM) declared health literacy a public health challenge (Nielsen-Bohlman, Panzer, & Kindig, 2004). In its report, the IOM noted limited health literacy widens the gap between knowledge and practice and increases healthcare cost. The report stressed that "without improvements in health literacy, the promise of many scientific advances to improve health outcomes will be diminished" (p.26).

National Burden of Low Health Literacy

Individuals with limited health literacy experience greater difficulty managing chronic diseases such as heart disease, cancer, and stroke. These diseases are on the rise

and are the leading causes of death in many countries including the United States of America. The cost associated with treating chronic diseases has also spiraled in recent years. An estimated 86% of all healthcare expenditure are spent treating chronic diseases and 70% of deaths each year are caused by one or more chronic diseases (Centers for Disease Control and Prevention, 2016). The healthcare cost and mortality rates are even higher among individuals with limited health literacy (Wolf, Feinglass, Thompson, Baker, 2010; McNaughton *et al*., 2015). For example, one study found low-literate patients with congestive heart failure had threefold higher all-cause mortality than patients with higher health literacy skills (Peterson *et al*., 2011).

The national burden of low health literacy is probably best highlighted by the numbers: approximately 90 million adults have inadequate health literacy skills, nine out of ten adults have difficulty understanding health information provided to the public, and between $106 and $238 billion in annual health expenditure are attributed to low health literacy (Nielsen-Bohlman, Panzer, & Kindig, 2004; Vernon, Trujillo, Rosenbaum, & DeBuono, 2007). Vernon and colleagues (2007) estimated that "when one accounts for the future costs of low health literacy that result from current actions (or lack of action), the real present day cost of low health literacy is closer in range to $1.6 trillion to $3.6 trillion" (p.1).

An analysis of healthcare data retrieved from the Veterans Health Administration showed that over a three-year period the estimated cost to treat veterans with marginal and inadequate health literacy was $143 million more than the cost to treat their counterparts with adequate health literacy (Haun, Patel, French, Campbell, Bradham, & Lapcevic, 2015). The Higher healthcare cost is attributed to the fact that low health

literacy is associated with lower medication adherence, higher rates of hospitalization and hospital readmission, and reduced likelihood to seek preventative care (Nielsen-Bohlman, 2004; McNaughton, Cawthon, Kripalani, Liu, Storrow, & Roumie, 2015).

Health Literacy Recommendations and Initiatives

The disease and financial burden of low health literacy has led a number of agencies and institutions to develop recommendations and initiatives to address the issue. The Institute of Medicine (IOM) has asserted health literacy is informed by a conflation of education, health services, and sociocultural factors. This assertion enjoys broad acceptance across the field (Brach *et al*. 2012). The National Action Plan to Improve Health Literacy affirms everyone has a right to health information, and health services should be delivered in a manner that is understandable and beneficial to patients (USDHHS, 2010). The action plan also calls on all health professionals to use research-based health literacy techniques to improve information and services they provide. The Plain Writing Act of 2010 mandates all government communication must be written in simple language that is easy to understand. While not specific to health literacy, the Act covers government agencies providing healthcare and health related services. The Agency for Healthcare Research and Quality has developed a Health Literacy Universal Precautions Toolkit. Universal precaution assumes all patients may have difficulty understanding health information. The toolkit, therefore, provides evidence-based strategies that health professionals can use to simplify communication and help patients manage their health (Agency for Healthcare Research and Quality, n.d.). The Affordable Care Act also implicitly and explicitly recognizes health literacy as an important area of focus in promoting health and access to care (Somers & Mahadevan, 2010). The Act does

not set out a systematic plan to improve health literacy, but its provisions call for shared decision-making in health contexts that accommodate diverse literacy needs (Somers & Mahadevan, 2010).

Health Literacy in Professional Preparation and Practice

In spite of these initiatives, recommendations, and legislations, health literacy does not occupy a prominent position in the preparation of many health professions. In addition, many health professionals have limited understanding of health literacy and do not routinely integrate the construct into their practice (Cafiero, 2012; Coleman, 2011; Coleman & Appy, 2012). While early studies of health literacy in professional preparation have established a firm knowledge-base about health professionals' health literacy competence, these studies are limited in their scope. For the most part, they focused almost exclusively on medicine, nursing, and pharmacy (Coleman, 2011). The studies did not include health educators, so the obscurity surrounding this professional group is even greater. Very little, if anything, is known about the professional preparation of health education specialists as it relates to health literacy, and information about how health literacy factors into the practice of health education specialists is absent from the literature.

Need for Health Education Health Literacy Research

The gap in the literature underscores the need for research that clarifies how health literacy informs and is informed by health education practices. Specifically, it would be useful to know how health literacy is incorporated into professional preparation of health educators and the extent to which health education specialists are competent to apply health literacy in their practice.

Purpose and Structure of Dissertation

This dissertation is an initial attempt at clarifying these issues. The purpose of the dissertation is to better understand the scope of health education specialists' health literacy preparation and elucidate health education specialists' perceptions of their health literacy knowledge and skills. The overarching research question is as follows: Are health education specialists adequately prepared to support health literacy capacity building in individuals and communities?

The dissertation is structured in a journal article format and is composed of six chapters:

Chapter I provides an introduction to the overall research. The chapter presents an overview of the central construct being studied, identifies gaps in research, and outlines rationale for the current study. It also outlines the overarching theoretical framework for the study.

Chapter II is a critical appraisal of the literature to illuminate how health literacy is conceptualized and taught in current research on health professionals' education and training.

Chapter III is a content analysis of health syllabi to determine the scope (breadth and depth) of health literacy in the learning objectives of health education/health promotion courses and to evaluate alignment with CHES competencies in Texas public universities.

Chapter IV is a case study that explores health education specialists' perception of their health literacy preparation and the role health literacy plays in the context of their practice.

Chapter V is a quantitative study that examines the health literacy knowledge and skills of advanced health education students who intended to become certified health education specialists.

Chapter VI offers a summary of the entire dissertation, identifies interconnections among the studies, and discuss implications of the findings for professional preparation, practice, and research.

Chapters II, III, IV, and V are written as independent/stand-alone manuscripts to be submitted for publication in peer-reviewed journals.

Theoretical Framework

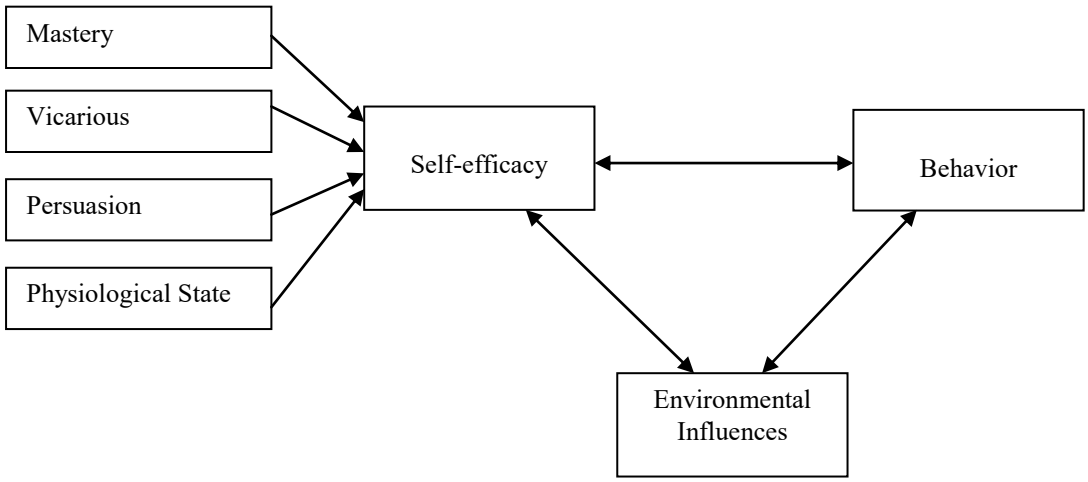
Social cognitive theory (SCT) was used to inform study design and data interpretation. Social Cognitive Theory posits behavior is a function of a dynamic, bidirectional interaction among behavior, personal factors, and environmental influences (Bandura, 1998, 2001). In other words personal factors and the environment produce behavior, and are also products of behavior and one another.

Social cognitive theory has been widely used in health behavior research (Luszczynska, Scholz, & Schwarzer, 2005), but has been criticized for being too complex and difficult to operationalize in its entirety. In light of the limitation, a single construct —self-efficacy — was selected to guide this research. Bandura (1998) defined self-efficacy as the belief in one's ability to carry out an action that will lead to a specific attainment. Self-efficacy helps explain the difference in performance between individuals with similar abilities and can also be used to explain group behavior. Strong self-efficacy boosts group effort and achievement (Bandura, 2001).

As shown in Figure 1, self-efficacy is not a fixed state; rather, it responds to four social forces: mastery experiences, vicarious experiences, persuasion, and psychological state. Mastery experience is repeated success at a specific task; vicarious learning occurs when one sees others, especially peers, successfully complete a task; persuasion is the reassurance from others that one has the ability to complete a task; and psychological state refers to inner traits such as persistence and fear.

Figure 1

Theoretical Framework of Study



In the context of health, self-efficacy can be interpreted as "collective efficacy" that leads a group to take action to improve health (Bandura, 1998). For example, collective efficacy would be manifested in a group of health education specialists if the members of the group believe they possess health literacy skills necessary to improve

health outcomes. This collective perception would result in individuals, and ultimately the group, exerting greater efforts to realize a specific goal.

The amenability of self-efficacy to group efforts and SCT's consideration of environmental influences make the theory a useful frame within which this study can be structured and the findings interpreted and explained.

CHAPTER II

HEALTH LITERACY EDUCATION AND TRAINING FOR CLINICAL AND PUBLIC HEALTH PROFESSIONALS: A SYSTEMATIC LITERATURE REVIEW

Background

The National Action Plan to Improve Health Literacy affirms access to health information is the right of everyone and health services should be delivered in a manner that is easy to understand and useful (U.S. Department of Health and Human Services, 2010). The action plan also calls on all health professionals to use research-based health literacy (HL) techniques to improve information and services they provide the public.

Health literacy as a system problem. The focus on professional training reflects a paradigm shift in how health literacy is conceptualized. Health literacy was initially viewed as an individual deficit, but more recent investigations have framed health literacy as more a system problem than an individual deficit (Brach *et al.*, 2012; Rudd, 2013). Researchers now believe the complex healthcare structure is largely responsible for the challenges many people experience when trying to access care (Rudd, 2013). The United States health system, for example, is comprised of a constellation of healthcare providers and federal and private insurers that interact nonlinearly with one another (Lipsitz, 2012). The Institute of Medicine (IOM) highlighted the complexity of the system by juxtaposing healthcare and other industries:

> If home building were like health care, carpenters, electricians, and plumbers each would work with different blueprints, with very little coordination… If shopping were like health care, product prices would not be posted, and the price charged

would vary widely within the same store, depending on the source of payment… (Smith, Saunders, Stuckhardt, & McGinnis, 2013, pp. 5-6).

The problem is further exacerbated by health professionals who tend to use linguistic structures and medical jargons that undermine the clarity of their communication (Deuster, Christopher, Donovan, & Farrell, 2008).

A systems approach to improving health literacy. The change in how health literacy is viewed has prompted a number of health organizations to recommend a systems approach to dealing with limited health literacy. The World Health Organization (WHO) has proposed what it calls a "whole-of-society" approach. The WHO proposal is grounded in the premise that in modern society health literacy is central to health and well-being. The WHO argues that health literacy is both contextual and relational; as such, efforts aimed at improving health literacy should focus on the individual as well as the environments that support health (WHO, 2013).

The U.S. Department of Health and Human Service (USDHHS) has also called on "Every organization and professional group involved in the development and dissemination of health information and services [to] have specific goals, objectives, strategies, policies, guidelines, and metrics to ensure that their actions improve health literacy" (U.S. Department of Health and Human Services & Promotion, 2010, p. 4).

The Institute of Medicine (IOM) has also hinged success in improving the quality of healthcare and reducing health disparities and costs on the health literacy environment. In their frequently cited report, "Health Literacy: A Prescription to End Confusion," the IOM urged public health and healthcare systems, the education system, the media, and

individuals to work together to improve the health literacy of the nation and subsequently health outcomes (Nielsen-Bohlman, Panzer, & Kindig, 2004).

Health literacy in health profession education and training. In response to these calls for a systems approach to health literacy, some health profession schools have begun to integrate health literacy into their curricula. However, there is an absence of clarity about the structure and effectiveness of these initiatives (Coleman, Nguyen, Garvin, Sou, & Carney, 2016) . A cross-sectional survey of medical schools found 75.4 percent of the schools that completed the survey reported teaching health literacy either in required or elective courses. The survey, however, was restricted to medicine. Subsequently, it did not illuminate practices in other health fields. In addition, the response rate was low (45.9%) and the authors pointed out it is plausible the schools that did not respond were not teaching health literacy (Coleman & Appy, 2012).

Toronto and Weatherford (2015) completed a more comprehensive examination using an integrative review to analyze health literacy education across health profession schools. Their review provides a good insight into the pedagogical approaches being used to teach health, but the synthesis included nine studies from three professions only (nursing, pharmacy, and medicine). In addition, the integrative methodology emphasized themes and did not disaggregate the data by profession. The design of the review, also, excluded health literacy training provided through professional development activities.

Health literacy in health educator preparation. Neither the survey conducted by Coleman and Appy (2012) nor the review by Toronto and Weatherford (2015) included health educators or other public health professionals. This reflects a general trend in health literacy research to focus disproportionately on the medical setting

(Coleman, 2011; Peerson & Saunders, 2009). As a result, the obscurity about professional preparation is even greater for health educators and other public health professionals. Further, it is not clear if and how preparation programs for clinical and public health professionals merge and diverge.

The purpose of this review was to closely examine the data on health literacy education and training for healthcare workers in order to construct an understanding of how health literacy preparation is emerging for health professionals in general and health educators in particular. The review is guided by three research questions: 1) How is health literacy conceptualized in current research on health profession education/training? 2) How is health literacy taught to health professionals? and 3) What are the points of convergence and divergence in health literacy training and education for health educators and clinical health professionals? A search of Cochrane database, Prospero, and Google Scholar revealed no other ongoing or completed systematic review addressing health literacy preparation for public health and clinical professionals. Therefore, it was concluded this is the first synthesis of the evidence.

Methods

This study used the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher, Liberati, Tetzlaff, & Altman, 2009) to inform data extraction, analysis, and reporting.

Eligibility criteria. In order to answer the research questions, I focused only on original articles that described an intervention or approach used to teach health literacy to health professionals. The search was designed to capture only articles that were published between January 2000 and April 2016. This timeframe was selected because the notion of

health literacy as a systems problem gained momentum in the early 2000's with the publication of the National Assessment of Adult Literacy Survey (2003) and the IOM's 2004 report on health literacy. Other inclusion criteria for the selection of articles were 1) must be about health professionals' health literacy — not patients'; 2) must focus on overall HL, not a subset such as mental health literacy; 3) outcome measure must be health literacy knowledge, skills, attitude, or behavior; organizational practices; or patient outcomes; 4) must be original research; 5) must be published in a scholarly database 6) must be published in English. Articles could either be peer-reviewed or non peer-reviewed (e.g. dissertations and theses). Systematic reviews, meta-analyses, conference abstracts, editorials, and commentaries were excluded from the analysis.

Figure 2
CINAHL Search Syntax

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((MH "Health Literacy") OR TI "health literacy" OR AB "health literacy") AND ((MH "Education, Continuing+") OR TI ( curriculum or continuing education or in service training ) OR AB ( curriculum or continuing education or in service training )) AND ((MH "Health Manpower+") OR TI ( (health w1 (personnel or professional)) or nurse* or nursing or doctor* or physician* or pharmacist* or health educator* or allied health ) OR AB ( (health w1 (personnel or professional)) or nurse* or nursing or doctor* or physician* or pharmacist* or health educator* or allied health))
```

Search strategy. Between March 24 and April 6, 2016, an initial electronic search of Ovid Medline, Embase, and CINAHL (ebsco) was conducted. The search included various combinations of the following words and phrases: "health literacy",

"education", "continuing education", "inservice training", "curriculum", "health personnel", "health professional" "nurse", "nursing", "doctor", "physician", "pharmacist", "health educator", and "allied health". After the initial search was conducted, subsequent searches were refined to include new terminologies identified in the first articles.

Reference lists of all selected articles were also examined to identify studies relevant to the review that were missed in the database search. Figure 2 above is an example of the syntax used to search one database.

Study selection. All articles captured in the initial search were exported to Covidence, a free online tool developed specifically to screen and manage articles for a systematic literature review.[1] Two reviewers (LD-M and AM) worked independently to screen titles and abstracts for relevance. Each article was given a "yes" or "no" vote to indicate alignment between the title/abstract and the study criteria. Articles that received a "yes" vote were entered for full text review. During full text review, each article was read completely by both reviewers for satisfaction of inclusion criteria. Articles that met the criteria were selected to be included in the final review. In instances where there were differences between the two reviewers, consensus was achieved through deliberation.

Data extraction. A coding form was developed based on health literacy literature and the research questions (Brown, Upchurch, & Acton, 2003). The coding form captured the four basic categories included in coding instruments: (1) methodological and substantive features, (2) study quality, (3) intervention descriptors, and (4) outcome

[1] Covidence has since changed to a paid subscription service.

measures (Brown *et al*., 2003). Data extracted from the studies included names of author(s), year of publication, country of publication, sample size, study population, study setting (academic or practice), study design, independent variable, health literacy concept(s) taught, duration of course, course structure (integrated/ stand-alone, one-time intervention/ recurring), instructional approach, investigator characteristics, and main findings. Coder reliability was checked by using simple random sampling to select 30% of articles for recoding. Results from the first and second coding were compared (Lipsey & Wilson, 2001). Reliability of 100% was considered satisfactory.

Quality appraisal. The quality of quantitative studies was appraised using the Medical Education Research Study Quality Instrument (MERSQI). The MERSQI (See Appendix A) is a validated instrument developed to assess the methodological quality of research in medical education (Reed *et al*., 2007). The tool does not measure methodological rigor; rather it is used to assign scores based on the presence or absence of features captured under six domains: study design, sampling, type of data, validity of evaluation instrument, data analysis, and outcomes. The maximum possible score is 18 (3 points for each domain). A study that receives a score of less than 40 percent of the 18 points is considered poor; 40-75 percent, fair to good; and more than 75 percent, excellent.

The instrument is widely used in medical education Research (Goldenberg, Garbens, Szasz, Hauer, & Grantcharov, 2017; Johnson, Smyer, & Yucha, 2012; Min, Morales, Orgill, Smink, & Yule, 2015; Wasson *et al*., 2016) and has been recommended by at least one journal editor as a useful tool to assure high quality medical education research (Sullivan, 2011). MERSQI was selected as an appropriate tool for this review

because it is specific to health education research, is amenable to observational studies; includes a comprehensive, numeric scoring system; incorporates Kirkpatrick's hierarchy of learning[2]; and is supported by validity evidence (Sullivan, 2011). In addition to the MERSQI domains, we also used a two-dimension (yes – no) checklist to assess researcher attempt to minimize bias related to confounding variables and assessor blinding and to assess the use of theory.

Qualitative studies were appraised using Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist (National Collaborating Centre for Methods and Tools, 2011). The CASP (See Appendix B) was developed collaboratively by the Public Health Resource Unit of the National Health Service, the United Kingdom Centre for Evidence Based Medicine, and the Birmingham Critical Appraisal Skills Programme (Hannes, Lockwood, & Pearson, 2010).This checklist comprises 10 questions: the first two questions are for screening purpose; questions 3-8 assess trustworthiness; question 9, results; and question 10, relevance to practice (National Collaborating Centre for Methods and Tools, 2011). Response options are "yes", "no", or "can't tell". For the purpose of this research, "yes" responses were assigned a score of 1 and "no" and "can't tell" responses were assigned 0. This score assignment provided a quantitative way to compare studies. With this scoring system, a study could receive a score ranging from 0 to 10.

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[2] Kirkpatrick's hierarchy of learning is a four-step approach for evaluating training interventions (Yardley, Dornan, Sarah, & Tim, 2012). The first step (reaction) evaluates the extent to which participants are satisfied with the training. The second step (learning) measures the extent to which the training altered participants' knowledge, skills, attitude and willingness to change. The third step (behavior) measures application of training on the job; and the fourth step (results) evaluates the extent to which training led to targeted practice outcomes (Kirkpatrick Partners, n.d.).

Both quantitative and qualitative appraisals involved two members (LD-M and AM) reading the studies independently and assigning values. One researcher (LD-M) reviewed the completed appraisal sheets for disparities in scoring. Differences were resolved through discussion between the two scorers.

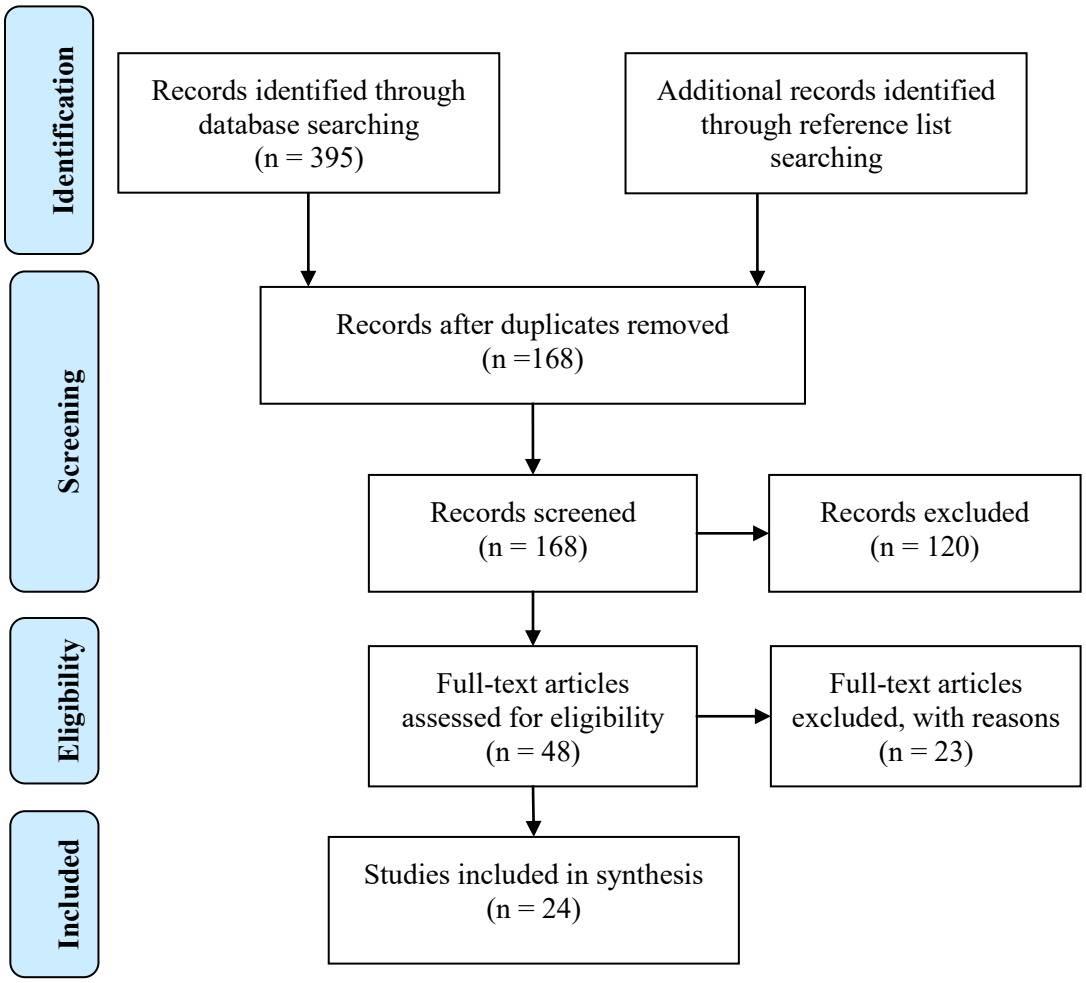
Data synthesis. The research questions guided data synthesis. After the studies were coded and appraised, they were reorganized in an Excel spreadsheet. Articles were grouped in the first column by study population. Each of the subsequent columns contained information related to a major study variable. This format facilitated efficient comparison of studies within and across professions. The data were examined for emerging patterns, similarities, and differences. Associations between two or more variables were also explored and noted. Both reviewers met, reviewed, and discussed the conclusions drawn from the Excel table to ensure conceptual leaps and biases were minimized.

Results

As stated previously, the purpose of this review was to examine the data on health literacy education and training for healthcare workers in order to construct an understanding of how health literacy preparation is emerging for health professionals in general and health educators in particular. The database search produced 395 articles and a hand-search of reference lists (i.e. purling) found an additional 8 relevant articles. Figure 3 outlines the search procedure that identified the studies to be synthesized. The final synthesis was comprised of 24 articles from 24 studies. Two articles were aggregated because they were from the same study and were similar across most assessment categories. Articles were excluded during full text review for the following

reasons: wrong intervention (n = 2), conference abstracts (n = 4), editorial/opinion article (n = 6), systematic review (n = 1), not an instructional program (n = 4), wrong outcomes (n = 5), and wrong population (n = 1).

Figure 3
Flowchart Showing Search Procedure



Setting and design. All the studies in the review were conducted in the USA in both academic (n = 18) and practice settings (n = 6). Eight studies were done in medicine,

seven in pharmacy, three in nursing, four in multiple disciplines, and one each in dental hygiene and health care management and policy. Except for six studies, all interventions were conducted in a single site and used convenience samples. Most studies were quantitative (n = 22) and used single group pre-post design (n = 12). The other quantitative studies either used comparative groups (n = 5) or did not explicitly report the design (n = 5). Two articles (Price-Haywood, Roth, Shelby, & Cooper, 2010; Price-Haywood, Harden- Barrios, & Cooper, 2014) that reported the use of comparative groups were from the same study and were merged for analysis. A few articles provided descriptions of instructional approaches or teaching activities, but reported little detail regarding research methodology.

Of the two qualitative studies, one (Chen, Noureldin, & Plake, 2013) used content analysis to examine the data, while the other (Riley, Cloonan, & Rogan, 2008) did not identify an approach for data collection and analysis. The researchers in the second study reported excerpts from students' reflective journals.

Sample size. The total sample size across the 24 studies could not be calculated since a few articles did not report the specific number of participants in the studies. Two articles reported estimates of the typical class enrollment; one reported "all students" participated; and the fourth reported the number of students who completed the pretest and the post test, but did not report the number of students who completed both tests. The reported sample sizes ranged from 14 to 371.

Quality rating quantitative studies. The highest possible rating a study could receive on the MERSQI scale was 18. The MERSQI score for the 22 quantitative studies ranged from 5 to 16 (mean = 9.48; s = 2.67). Two studies were rated excellent (received

more than 75 percent of the 18 points), 17 fair to good, and three were poor (received less than 40 percent of the 18 points). Both excellent studies were conducted in practice settings and were the only studies that used randomization. One (Bilotta, 2012) of the two excellent studies was a dissertation.

The three studies that scored poorly (Cotugna & Vickery, 2003; Hess & Whelan, 2009; Jackson, Lorinda, Hughes, & Eckert, 2010) were carried out in academic settings. They measured participants' satisfaction with health literacy curriculum, level of comfort using health literacy assessment tools, and health literacy knowledge. None of the studies reported the study design and one (Hess & Whelan, 2009) did not explicitly report the number of participants.

Most studies performed best in the data analysis domain (mean = 2.64). This domain appraised studies based on whether or not the analysis was appropriate for the design or data, and whether or not the analysis moved beyond descriptive presentation. Of 3 possible points a study could receive on MERSQI, 16 studies gained full score, four gained two, and two gained one. No study received a score of zero in this domain.

The domain in which the studies had the lowest scores was validity of evaluation instrument (mean = .36). In this domain, points were allocated based on whether or not the study reported the internal structure of the instrument, content validity, and relationship to other variables. Most studies used researcher-developed instruments and

did not provide validity information. As a result, of a possible 3 points, 16 studies scored zero in this section, four scored 1 point, and 2 scored 2 points.

Bias and theory were not addressed in most studies. Eighteen of the 22 quantitative studies did not report how confounders were treated, 21 did not report assessor blinding, and 14 provided no evidence a theory or model was applied in the research.

Quality rating qualitative studies. The two qualitative studies were assessed across three domains – trustworthiness, results, and relevance to practice – using Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist. One study received a quality score of 4 out of a possible score of 10; the other study received a score of 9. Studies were weak in the area of trustworthiness. The study that received the lower score failed to explicitly identify a design or qualitative methodology, discuss the relationship between researcher and participants, or provide a description of the analytic process.

Table 1
MERSQI Quality Rating for Quantitative Studies

Study ID	Study Design	Sampling		Data Type	Validity of Instrument			Data Analysis		Outcome	Assessor Blinded	Confounding Addressed	Theory	TOTAL SCORE (18)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
Cotugna *et al*., 2003	1	0.5	0.5	1	0	0	0	0	1	1	No	No	NR	5
Sicat *et al*., 2005	1.5	1	1.5	3	1	0	0	1	2	1.5	No	No	NR	12.5
Kripalani *et al.* 2006	1	0.5	1.5	1	0	0	0	1	1	1.5	No	No	Adult learning principles	7.5
Harper *et al.*, 2007	1	0.5	0.5	3	0	0	0	1	1	2	No	No	NR	9
Hess *et al*., 2009	1	0.5	1.5	1	0	0	0	0	1	1	No	No	NR	6
Jackson *et al*., 2010	1	0.5	0.5	1	0	0	0	1	1	1	No	No	NR	6
Devraj *et al*., 2010	1	0.5	0.5	1	0	0	0	1	2	1.5	No	No	NR	7.5
Sandjecklin *et al*., 2010	1.5	0.5	1.5	3	0	0	0	1	2	1.5	No	No	NR	11

Table 1 Continued

Study ID	Study Design	Sampling		Data Type	Validity of Instrument			Data Analysis		Outcome	Assessor Blinded	Confounding Addressed	Theory	TOTAL SCORE (18)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
Mackert *et al*., 2011	1.5	1.5	0.5	1	0	0	0	1	2	1	No	No	NR	8.5
Sullivan *et al*., 2011	1.5	1.5	0.5	1	0	0	0	1	2	1	No	Yes	Commit-ment to Change Approach	8.5
Bilotta 2012	3	0.5	0.5	3	1	1	0	1	2	2	No	Yes	Theory of formative assessment	14
McCleary-Jones, 2012	1.5	0.5	1	3	1	1	0	1	2	1.5	No	No	ARCS Model	12.5
Roberts *et al*., 2012	1.5	0.5	n/a	3	0	1	0	1	2	1.5	No	No	Robert Gagne's 9 events of learning	10.5
Wilcoxen *et al*., 2013	2	0.5	0.5	1	1	0	0	1	2	1	No	Yes	Theory of Planned Behavior	9

Table 1 Continued

Study ID	Study Design	Sampling		Data Type	Validity of Instrument			Data Analysis		Outcome	Assessor Blinded	Confounding Addressed	Theory	TOTAL SCORE (18)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
Price-Haywood *et al*., 2014	3	1.5	1.5	3	1	0	0	1	2	3	No	Yes	NR	16
Green *et al*., 2014	1.5	0.5	0.5	3	0	0	0	1	2	1.5	No	No	NR	10
Ha *et al*., 2014	1.5	0.5	n/a	3	0	0	0	1	2	1.5	No	No	NR	9.5
Evans *et al*., 2014	1.5	1.5	n/a	1	0	0	0	1	1	2	No	No	NR	8
Coleman *et al*., 2015	1.5	0.5	1.5	1	0	0	0	1	2	1	No	No	NR	8.5
Trujillo *et al*., 2015	2	0.5	0.5	3	0	0	0	1	2	1.5	No	No	Multiple active-learning strategies	10.5

Table 1 Continued

Study ID	Study Design	Sampling		Data Type	Validity of Instrument			Data Analysis		Outcome	Assessor Blinded	Confounding Addressed	Theory	TOTAL SCORE (18)
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	
Bloom-Feshbach *et al*., 2015	2	0.5	1	3	0	0	0	1	2	1.5	Yes	Yes	NR. Used model for workshop for medical students to decide on learning activities	11
Coleman *et al*., 2016	1.5	0.5	0.5	1	0	0	0	1	2	1	n/a	n/a	NR	7.5

Note. Q – question; NR – none reported

Health literacy conceptualization. Apart from few variations, Table 2 shows health literacy was conceptualized and taught similarly across health disciplines represented in this synthesis. All the studies conceptualized health literacy as limitations in patients' ability that are exacerbated by health professional's communication skills. The definition of health literacy most frequently cited in the studies was the IOM's. Three studies (Bilotta, 2012; Roberts *et al*., 2012; Sicat & Hill, 2005) used definitions that were grounded in traditional literacy and numeracy, and six studies did not provide a definition but listed the consequences of low health literacy.

Content of health literacy instruction. There were five recurring content foci across studies: health literacy definitions and terminology (13 studies), causes of low health literacy (4), strategies to address low health literacy (22 studies), formal and informal assessment of patients' health literacy (17 studies), and prevalence and impact of low health literacy (16 studies). Every study explicitly identified at least two of these topics as the content of interest, with most studies identifying all five. One study (Coleman & Fromer, 2015) included universal precaution as a content focus and another (Riley *et al*., 2008) examined the complexity of the health care system and the challenge it poses to users. There was no marked difference in the content of the studies based on discipline or setting (practice or classroom).

Learning activities. All the studies combined both didactic and experiential activities to teach health literacy. Standardized patients were frequently used in medicine, but not the other disciplines. Disciplines outside of medicine frequently used some form of role play. Other learning activities included whole and small group discussion, video presentation, case study, and document revision. One study (Riley *et al*., 2008) had

students assess the health care system, while two (Evans *et al*., 2014; Hess & Whelan, 2009) employed a train the trainer approach in which students prepared and taught health literacy information to other groups. In most cases (n=16), health literacy instruction was integrated into existing courses or training modules.

Outcomes. Most studies (n= 22) had outcomes that fell at the two lowest levels (reaction and learning) on Kirkpatrick's hierarchy. Most studies in this review measured participants' satisfaction, knowledge, skills, and intention to change practice behavior. One study (Evans *et al*., 2014) did a 6 month follow-up telephone interview to assess actual implementation of change, and another (Price-Haywood, Harden-Barrios, & Cooper, 2014) had outcome set at level 4 (results). Price-Haywood and colleagues examined how health literacy training of physicians impacted patients' cancer screening behavior. This study took place in a practice setting.

Table 2
Summary of Quantitative Studies

Profession	Author	HL Focus	Instructional approach	Course Structure	Study design	Sample Size	Setting	Outcome Level (Kirkpatrick)
Nursing	Sand-Jecklin *et al*., 2010	PAS	Didactic and experiential	Independent	pre-post	103	Academic	2 (Knowledge)
	Bilotta, 2012 (Dissertation)	DPACS	Didactic and experiential	Integrated	pre-post with cluster randomization	371	Practice	2, 3 (Knowledge, skills, practice)
	McCleary-Jones, 2012	DPAS	Didactic and experiential	integrated	Pre-post	53	Academic	2 (Knowledge)
Medicine	Kripalani *et al*., 2006	DPAS	Didactic and experiential	Integrated	not explicitly stated	81	Academic	1 (Satisfaction)
	Harper *et al*., 2007	PS	Didactic and experiential	Integrated	not explicitly stated; comparative study implied	Not explicitly stated	Academic	2 (Skills)
	Hess & Whelan, 2009	PA	Didactic and experiential	Integrated	Not explicitly stated	Not explicitly stated	Academic	1 (Satisfaction)

Table 2 Continued

Profession	Author	HL Focus	Instructional approach	Course Structure	Study design	Sample Size	Setting	Outcome Level (Kirkpatrick)
Medicine	Roberts *et al*., 2012	DPAS	Didactic and experiential	Integrated	Pre-post	Not explicitly stated	Academic	2 (knowledge, skills, attitude)
	Green *et al*., 2014	DS	Didactic and experiential	independent	Pre-post	31	Academic	2 ,3 (knowledge, practice)
	Price-Haywood *et al*., 2010, 2014	S	Didactic and experiential	independent	cluster RCT	18	Practice	3, 4 (practice, patient behavior
	Bloom-Feshbach *et al*., 2016	AS	Didactic and experiential	Integrated -	comparison groups	101	Academic	2 (attitude, skills)
	Coleman *et al*., 2016	PS	Didactic and experiential	Integrated	Pre-post	48	Academic	2, 3 (knowledge, intended behavior

Table 2 Continued

Profession	Author	HL Focus	Instructional approach	Course Structure	Study design	Sample Size	Setting	Outcome Level (Kirkpatrick)
Pharmacy	Sicat & Hill, 2005	DPAS	Didactic and experiential	Integrated	Pre-post	pre-test - 101 post-test-105 Doesn't report number that did both tests	Academic	2 (knowledge, comfort)
	Devraj *et al*., 2010	AS	Didactic and experiential	Integrated	Retrospective pre-post	76	Academic	2 (knowledge, confidence)
	Chen *et al*., 2013	DPAS	Didactic and experiential	Independent	Qualitative - content analysis	303 across 2 cohorts	Academic	2 (perception, knowledge, skills)
	Wilcoxen & King, 2013	PAS	Didactic and experiential	Integrated	Pre-post control group design	82 (42 control; 40 experi-mental)	Academic	2, 3 (attitude, perceived behavioral control, intention to communicate effectively)

Table 2 Continued

Profession	Author	HL Focus	Instructional approach	Course Structure	Study design	Sample Size	Setting	Outcome Level (Kirkpatrick)
Pharmacy	Ha & Lopez, 2014	DPACS	didactic and experiential	integrated	Pre-post	97	Academic	2 (perception, knowledge, skills)
	Trujillo, 2016	AS	Didactic and experiential	Integrated	pre-post control group design	162	Academic	2 (attitude, knowledge, confidence)
Dietetics	Cotugna & Vickery, 2003	DAC	Didactic and experiential	integrated	Not explicitly stated	24	Academic	2 (knowledge)
Health Care Management & Policy	Riley *et al*., 2008	PC	didactic and experiential	Independent	Qualitative (reflective journals)	14	Academic	2 (awareness and appreciation of the impact of low HL)
Dental Hygiene	Jackson *et al*., 2010	PS	Didactic and experiential	Independent	Not explicitly stated	48	Academic	1 (level of comfort assessing patients' HL; perception of length of time required to administer S-TOFHLA

Table 2 Continued

Profession	Author	HL Focus	Instructional approach	Course Structure	Study design	Sample Size	Setting	Outcome Level (Kirkpatrick)
Multiple Disciplines	Mackert *et al.*, 2011	DPAS	Didactic and experiential	Independent	Pre-post	166	Practice	2, 3 (perceived knowledge, intention to use communication techniques)
	Sullivan *et al.*, 2011	DPS	Didactic and experiential	Integrated	retrospective pre-post	116	Practice	2, 3 (confidence, knowledge, commitment to change)
	Evans, 2014	DPAS	Didactic and experiential	Integrated	retrospective pre-post	34	Practice	1, 2, 3 (satisfaction, attitude, perceived knowledge, skills, practice behavior
	Coleman & Fromer, 2015	DPS	Didactic and experiential	Independent	pre-post	45	Practice	2, 3 (knowledge, skill, intended behavior)

Note. **D** – HL definition; **P –** prevalence/significance/impact of low HL; **A** – HL assessment/screening; **C** – causes of low HL; **S** – strategies to address low HL

Discussion

This systematic review set out to answer three main questions: 1) How is health literacy conceptualized in current research on health profession training and education? 2) How is health literacy taught to health professionals? and 3) What are the points of convergence and divergence in health literacy training and education for health educators and medical health professionals?

Overall assessment. The results indicated commonality across disciplines in how HL is conceptualized and taught. Most studies in the synthesis focused on functional health literacy, conceptualizing it as a problem patients have that health professionals need to address. As a result, 17 of the 25 interventions taught participants how to formally or informally identify patients with limited health literacy. Current literature, however, discourages patient assessment because most assessment tools do not capture the full scope of health literacy difficulties and the tools are difficult to administer (Baker, 2006; Paasche-Orlow & Wolf, 2008). Universal precautions has been proposed as a more efficient way to ensure all patients' health literacy needs are accommodated, but only one study (Coleman & Fromer, 2015) in this review included instruction on universal precautions. Universal precautions assume all patients may have difficulty understanding health information; therefore health professionals always use plain language and communication strategies that promote comprehension (Agency for Healthcare Research and Quality, n.d.).

The focus on health literacy as a patient deficit may be attributed to the fact that work on developing the pedagogy for health literacy is being carried out primarily in clinical settings (Coleman *et al*., 2016; Peerson & Saunders, 2009). In this review, only

one study included public health professionals (health educators), but these professionals made up less than 10 percent of the sample.

This review, therefore, highlights an important gap in how health literacy education and training are being constructed. Health literacy in the public health context is different in orientation from clinical or medical health literacy (Pleasant & Kuruvilla, 2008). Health literacy in public health is connected to health promotion and is concerned with empowerment and community development (Estacio, 2013; Nutbeam, 2000, 2008; Pleasant & Kuruvilla, 2008). It focuses on primary prevention and acknowledges the impact on health of the social ecology. Freedman and colleagues (2009) defined public health literacy as "the degree to which individuals and groups can obtain, process, understand, evaluate, and act on information needed to make public health decisions that benefit the community" (Freedman *et al.*, 2009, p. 448). The central tenets of their definition are critical consciousness, individual and collective agency, civic engagement, and social context.

Medical health literacy, on the other hand, is concerned with improving patient compliance with treatment regimens (Pleasant & Kuruvilla, 2008) after the onset of disease. This approach to health literacy often decontextualizes the individual and ignores social determinants of health (Freedman *et al*, 2009; Rudd, 2013). These important distinctions point to a possible danger in subsuming public health literacy under medical instructional approaches. In this review, the dearth of studies that included public health practitioners suggests there is need for research efforts that recognize and address the similarities and differences between the two literacies.

Except the use of standardized patients almost exclusively in medicine, all the health disciplines in this review employed similar instructional approaches to teach health literacy and covered similar content. All the studies employed didactic and experiential approaches to teach about four key content areas: health literacy assessment, strategies to address low health literacy, prevalence and impact of low literacy, and HL definitions and terminology. This is consistent with the findings in other reviews (Coleman *et al*., 2016; Toronto & Weatherford, 2015). Coleman and colleagues 2016 examined the literature for nursing, medicine, and allied health to identify techniques and tools used to teach health literacy. They found instruction across disciplines combined a variety of didactic and experiential approaches. Similarly, the integrative review by Toronto and Weatherford (2015) found multiple modalities were used to teach about health literacy assessment and clear communication. This merging of lecture and student-centered approaches aligns with best practices for adult and medical education (Stahl & Davis, 2011).

Quality of the evidence. Similar to an earlier review (Coleman, 2011) that found health literacy pedagogy research lacks rigor and consistency, this study identified a number of omissions and wide variations in how the studies were conducted and reported. The two qualitative studies did not outline the analytic process adequately to engender trust in the results. Scholars (Creswell *et al.*, 2011; Merriam, 2015) have suggested qualitative researchers should employ strategies that build trust in the findings of their work. Strategies include details about how the data were collected, analyzed, and presented (Creswell *et al.*, 2011; Merriam, 2015). These procedural details were sparse or missing from both qualitative studies.

Among the quantitative articles, some studies applied the traditional scientific research format while others were more descriptive, putting greater emphasis on reporting the teaching strategy rather than the research methodology. Other inconsistencies included not clearly identifying a research design and failing to clearly delineate the research methods. These omissions make definitive statements or comparisons across studies difficult and are contrary to guidelines for reporting social science or education research. The American Educational Research Association (AERA) (2006) has suggested report of education research should be logical and coherent, and should provide sufficient evidence to justify the results and conclusions.

Sampling was also an issue for several of the studies reviewed. For the most part, sample sizes varied widely and were determined by class enrollment. Further, 76 percent of the studies were carried out in a single site. However, multisite studies — in spite of the implementation challenges they pose — are preferred to single site studies. Samples drawn from different settings are more diverse and usually result in greater statistical power to detect small differences (Flynn, 2009; Weinberger *et al*., 2001). The preponderance of single site studies in this review undermines the representativeness of the findings reported in these studies.

Another quality concern in the evidence is how outcomes were measured. More than half of the studies used researcher-developed instruments with no reported validity evidence. The absence of information about the reliability and validity of the instruments raises questions about measurement errors and the extent to which results can be generalized. The use of tools that have no validation support is no doubt the result of a void in research on health professionals' health literacy. While a number of tools have

been developed to assess patients' health literacy, there are very few validated instruments for measuring the health literacy competence of practitioners. One of the more widely used tools (Cormier & Kotrlik, 2009) was validated for use among nurses. Its transferability to other populations has not been explored.

In addition to using tools without validation, effect size was not reported in any of the studies except the dissertation conducted by Bilotta (2012). It is, therefore, not clear if the differences reported in the quantitative studies were statistically meaningful. While statistical significance (p-value) is a useful measure of the difference between two groups, the magnitude of the difference is captured by effect size (Coe, 2002), and this magnitude (combined with the p-value) drives policy decisions (McCartney & Rosenthal, 2000). Also, failure to report effect size makes it difficult to meta-analyze the findings of research in the field (Coe, 2002).

Finally, most studies (96%) did not attempt to measure how health literacy education for professionals translated into improved health outcomes for patients or the population. While interventions in the academic setting may be constrained by limited student/patient interactions, practice settings provide a good opportunity to assess patient impact. Only one of the seven studies set in practice sites, however, included patient impact as an outcome. In a climate where return on investment is valued, it might be prudent for health literacy pedagogy research to show a clear pathway between HL training for health professionals and population health. Establishing this link will help to validate the research and make it more attractive for funding.

Completeness of the evidence. While this review adds to the evidence-base, it is not representative of the range of health professionals. Nursing, medicine, and pharmacy accounted for 72 percent of the articles reviewed. The absence of studies that included public health professionals made it impossible to answer the third question in this synthesis: What are the points of convergence and divergence in health literacy education and training for health educators and clinical health professionals?

Limitations

Like all studies, this review has a number of limitations that should frame how the results are interpreted. First, the search was specific to health literacy. There may be other articles on topics (such as health communication) that intersect with health literacy, but were not captured because of the scope of our search. Other attempts at synthesizing the evidence-base could consider broadening the search criteria to include related fields of study since health literacy often overlaps other fields.

A second limitation of the review is that it represents only studies that were published in English in electronic scholarly databases. Studies archived in offline data storage or paper format and studies published in other languages were not captured in this review. These restrictions may partially account for all the studies in the synthesis being conducted in USA.

Conclusion and Recommendations

This review expands the existing literature by further clarifying the trajectory of health literacy education and training for health professionals. While other reviews have examined health literacy instruction in profession schools, this study adds to the body of knowledge by disaggregating the data based on academic and practice setting, and public

health and medical practitioners. It also captures work carried out under theses and dissertations. The results show even though there is no standard curriculum for health literacy education and training for health professionals and the concept is missing from most professional accreditation competencies (Coleman, 2016), health literacy is emerging similarly across clinical health disciplines. The approach to teaching, however, is grounded in a deficit model of health literacy that focuses exclusively on functional level skills. Intervention for public health workers is missing from the literature, so it is unclear how pedagogy and training techniques for public health and clinical professionals merge and diverge.

Public health practitioners meet people in different contexts from clinicians. For the most part, doctors, nurses and pharmacist meet people in a curative context after the onset of diseases. On the converse, public health workers meet people in preventative contexts that span the social ecology. The difference in contexts may make the information sharing dynamics different, and may warrant alternative approaches. Therefore, there is urgent need for research on how to integrate health literacy into the education and training of public health professionals.

In building this body of research, care should be taken to ensure health literacy teaching approaches are developed in tandem with health literacy research and best practices in research methodology. Health literacy is still in its developmental stage. As a result, understanding of key concepts is constantly being refined. In this dynamic environment, it is easy to construct a curriculum around views that were once popular, but have since evolved. For example, this synthesis shows many health profession schools are teaching students to use assessment instruments such as REALM and

TOFHLA to identify patients with low literacy, but current research is promoting universal precautions instead (Agency for Healthcare Research and Quality, n.d.; Paasche-Orlow & Wolf, 2008).

In the same vein, the strength of the evidence on which the pedagogy and training techniques are built is crucial. It would be useful to develop minimum standards or guidelines for conducting and reporting research on health literacy instructional approaches. Such standards would add rigor and make it easier to synthesize and evaluate the database. Further, since not all reports of classroom activities are necessarily scientific research, it might be useful for reports of studies that are intended for generalizations to be identified as such. Distinguishing between education reports and empirical research activities will make it easier to apply research standards without unfairly discriminating against works that are not intended for generalization or replication.

Finally, although the nature of the classroom makes convenience sample and single site studies easier to conduct, I recommend researchers consider collaborating across institutions to implement interventions. This will give a more representative sample and provide a better sense of the extent to which the findings are applicable in different populations. Research also needs to focus on measuring population level outcomes and developing validated instruments for use among the range of health professionals.

CHAPTER III

HEALTH LITERACY: A MISSING COMPETENCE IN HEALTH EDUCATION SPECIALISTS' PROFESSIONAL PREPARATION

Background

Health literacy is closely intertwined with health outcomes. Early research conceptualized health literacy as set of individual level skills that hindered or facilitated access to care. More recent studies, however, have shifted the burden for successfully managing one's health to the health care setting. Researchers have linked reduced health outcomes to the complex health care system and poor communication skills of health providers (Koo, Horowitz, Radice, Wang, Kleinman, 2016; Wynia & Osborn, 2010). In general, low health literacy is also associated with lower medication adherence, higher rates of hospitalization, reduced likelihood to seek preventative care, higher health care cost, overall poor health, and increased risk of death from chronic diseases (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; McNaughton, Cawthon, Kripalani, Liu, Storrow, & Roumie, 2015; Nielsen-Bohlman, Panzer, & Kindig, 2004; Peterson *et al*., 2011).

Role of health education specialists. In a policy statement, the American Public Health Association (APHA) noted health education specialists (HESs) are well-positioned to combat health literacy issues and promote disease prevention (American Public Health Association, 2015). This policy statement by the APHA underscores the long held view that the biomedical approach to health is necessary but insufficient to improve the health status of populations (Lalonde Report, 1974; Nutbeam, 2017). As a result, modern day health systems are two-pronged - on one prong are curative

approaches, while on the other prong are preventative approaches. Health education specialists operate from the preventative prong. At the most basic level of function, HESs are responsible for disseminating health information and developing and implementing programs that intervene before the onset of diseases (Stanfield, Cross, & Hui, 2009).

In recognition of the role of HESs in combating health literacy challenges, the APHA has urged health education preparation programs to incorporate evidence-based health literacy content into their curricula (APHA, 2010). The recommendation by the APHA adds to calls by other agencies to focus attention on health professionals' health literacy preparation (Institute of Medicine, 2004; United States Department of Health and Human Service, 2010; World Health Organization, 2013).

Gap in the literature. In spite of the recommendations and the negative health outcomes associated with health literacy deficits, there is obscurity about the extent to which health literacy is integrated into the preparation of health education specialists. Previous studies that examined health literacy in the health curricula focused exclusively on clinical programs (Coleman, 2011). A review of the literature identified no study that attempted to quantify the health literacy coverage in health education/promotion courses.

Health literacy in HES's professional accreditation. Apart from being absent from the literature, health literacy is also missing from credentialing requirements for health education specialists. The National Commission for Health Education Credentialing (NCHEC) has identified seven areas of responsibility for health education specialists. The responsibilities range from needs assessment and program planning, implementation, and evaluation to fiscal management and advocacy (NCHEC, 2015). The NCHEC, however, does not mention "health literacy" as required skill for certified

health education specialists (National Commission for Health Education Credentialing - NCHEC). The Commission's accreditation document mentions the ability to assess literacy levels, but ability to read and write or years of schooling are not good proxies of health literacy (Kickbusch, 2001). While there are links between traditional literacy and health literacy, health literacy is context dependent and dynamic and demands skills that transcend traditional literacy (Kickbusch, 2001; Nielsen-Bohlman, Panzer, & Kindig, 2004). These skills include the ability to read and understand consent documents, decipher medical jargons, comprehend the specialized language of medicine labels and nutrition information, and use the information to make health decisions (Kickbusch, 2001; Nielsen-Bohlman, Panzer, & Kindig, 2004).

There is no formal documentation, therefore, of the health literacy competencies that should be incorporated into HESs professional preparation. The only attempt to date to establish a set of HL competencies for health professionals was undertaken by Coleman and colleagues (2013). The list developed by these researchers was compiled from the extant literature and received the consensus of an expert panel (Coleman, Hudson, & Maine 2013). It covers two broad domains: educational competency (knowledge, skills and attitudes), which is made up of 62 items, and practices, which comprises 32 items.

The work by Coleman and colleagues (2013) indicates there is some general agreement on the health literacy competencies that are important for health professionals. However, the extent to which these competencies are included in health education curricula is unclear. Examining how health literacy is represented in health education specialists' preparation is important because it will identify any education gaps and

provide empirical support for curriculum review and revision. The purpose of the study, therefore, was to assess the scope (breadth and depth) of health literacy in the learning objectives of health education/health promotion syllabi of Texas public universities and to evaluate alignment with CHES competencies.

Methods

The study used quantitative content analysis. Quantitative content analysis counts the cases or elements of the text. This form of analysis is different from qualitative content analysis, which interprets the context and quality of the elements (Berg & Lune, 2012). In other words, quantitative and qualitative content analysis are not distinct approaches, but rather different degrees of analyses with quantitative being descriptive and qualitative being interpretive (Berg & Lune, 2012).

Among its many applications, content analysis is used to measure how a phenomenon aligns with an established standard. In education, content analysis has been used in curriculum assessment to measure alignment between standards, instruction, assessment, and instructional materials (Porter, McMaken, Hwang, & Yang 2011). Quantitative content analysis is an appropriate method in this study because the aim of the research is to provide a numeric description of the health literacy content included in written syllabi.

Sample selection. Websites of all Texas public universities were searched to identify institutions that offered a degree in health education or health promotion. The three institutions with the largest enrollment of undergraduate health education/health promotion majors were selected for inclusion in the study. Syllabi for health courses offered at these three institutions were included in the analysis based on the following

criteria: 1) Course is delivered entirely through face-to-face mode and 2) Course is health-related. That is, the course code begins with "HLTH" or similar abbreviation denoting inclusion in health-education related curricula.

Instrumentation. A modified version of a relevance assessment instrument (Table 3) developed by Gomez and colleagues (2007) was used to assess the syllabi. With this instrument, the content being assessed is given a score that indicates the strength (no, weak, considerable, strong) of the link it shares with the standard. Gomez and colleagues (2007) did not provide descriptors of "weak," "considerable," and "strong" link. For the purpose of this study, the labels "weak," "considerable," and "strong" were replaced with "low level," "intermediate level," and "high level." The six cognitive domains in Bloom's Revised Taxonomy (Krathwohl, 2002) were also adopted as descriptors of low, intermediate, and high level.

Table 3
Modified Relevance Assessment Instrument

Score	Strength of Link	Descriptors based on Bloom's Taxonomy
0	No link	No relevance to any competence
1	Low level link	Requires learners to **remember** and **understand**
2	Intermediate level link	Requires learners to **apply** and **analyze**
3	High level link	Requires learners to **evaluate** and **create**

Bloom's Revised Taxonomy (See Appendix D) is a continuum of thinking skills organized from the least to the most cognitively demanding. The skills are "remember,"

"understand," "apply," "analyze," "evaluate," and "create" (Krathwohl, 2002). In this study, remember and understand = low level link; apply and analyze = intermediate level link; and evaluate and create = high level link. In cases where a single objective placed demands at more than one cognitive level on Bloom's taxonomy, each cognitive level was treated as an independent objective.

Table 4
Bloom's Taxonomy Table of Verbs. Reprinted from (Anderson & Krathwohl, 2001)

Cognitive Domain	**Related Verbs**					
Create	compose produce design assemble create	plan invent formulate collect set up	propose develop arrange construct organize	originate derive write propose	generalize document combine relate	prepare predict modify tell
Evaluate	judge assess compare evaluate	conclude measure deduce	argue decide choose	rate select estimate	validate consider appraise	value criticize infer
Analyze	analyze compare probe	inquire examine contrast	differentiate contrast investigate	detect survey classify	experiment scrutinize discover	inspect dissect discriminate
Apply	apply relate develop	translate use operate	organize employ restructure	interpret illustrate demonstrate	practice calculate show	exhibit dramatize
Understand	restate locate report	recognize explain express	identify discuss describe	Illustrate interpret draw	represent differentiate conclude	review infer
Remember	know identify	relate list	define recall	memorize repeat	record name	recognize acquire

Syllabi extraction and coding procedure. The full list of health courses (core and electives) was determined from each program's degree plan and syllabi were

accessed through institutions' syllabus repository. Two raters worked independently using the modified relevance assessment instrument to code each syllabus. The objectives were read to identify implicit or explicit references to the health literacy competencies compiled by Coleman and colleagues (2013). Where references were found, the language of the objective was cross-matched with a Bloom's Taxonomy table of verbs (Table 4) to determine the cognitive level of the objective.

Each syllabus was assigned a 3-digit code that represented the number of links it shared with the competencies and the cognitive demand of the links. Where coder incongruence was identified, the affected syllabi were re-coded by each coder. If the incongruence persisted, a resolution was reached through deliberation between both coders.

Data reduction and representation. Data in the coding matrix were used to produce indicators of the intensity [Int (O_j)] and density [Dens (O_j)] of the objectives in each syllabus. Intensity (O_j) = (p_{3j}, p_{2j}, p_{1j}) = number of links of strength associated with a syllabus. For example, an intensity indicator of (0,1,1) showed the objectives of a particular syllabus had no link at strength 3 (high level link), 1 link at strength 2 (intermediate level link), and 1 link at strength 1 (low level link). Similarly, an intensity indicator of (0,0,0) showed the objective had no link at each of the three levels. Density (Oj) = number of competencies linked to objectives in the syllabus. Objectives were compared based on the number of high level links they had (intensity) and the number of competencies to which they contributed (density).

Results

A total of 50 syllabi representing 45 health courses and 412 objectives were analyzed for the study. Five health classes were offered at the 200 level, 22 were offered at the 300 level, and 23 were offered at the 400 level (Table 5). Course levels indicate degree of complexity or the demand courses place on students' Comprehension (Texas Higher Education Coordinating Board, 2012). Courses numbered 100–199 are at freshman level complexity; 200–299 are sophomore level; 300–399 are junior level; and 400–499 are at senior level complexity.

Table 5
Enrollment and Distribution of Syllabi across Universities

Institution	Health Program Enrollment	Course Classification				Total number of syllabi	Number of linked objectives
		100	200	300	400		
001	371	-	-	6	9	15	2
002	288	-	1	8	8	17	0
003	456	-	4	8	6	18	1
Total	1115	0	5	22	23	50	3

Density of health literacy inclusion. Of the 412 objectives, only three shared links with the health literacy competencies developed by Coleman and colleagues (2013). This represents less than one percent of the sample. All three linked objectives were integrated into 400-level courses in two schools. Two of the objectives that shared a link with the competencies were in the same syllabus, but the syllabus did not explicitly identify health literacy. Instead, a single objective identified different areas of the CHES

competencies as learning outcomes. The outcomes included Area VII, which deals with the responsibility to develop and communicate messages. Alignment was found between CHES Responsibility 7.1.1 ("Create messages using communication theories and/or models") and Coleman *et al* (2013) health literacy competency S3 ("demonstrate ability to follow best-practice principles of easy-to-read formatting and writing in written communication with patients"). Responsibility 7.1.3 ("tailor messages for intended audience") aligned with health literacy competency S7 (demonstrate 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"). CHES competency responsibility 7.1.2 explicitly referenced literacy ("identify level of literacy of intended audience"), but none of the health literacy competencies requires professionals assess individuals' literacy or health literacy levels. The phrase "health literacy" did not appear in any of the objectives analyzed.

The third objective required learners to use SMOG formula to evaluate communication methods for specific populations. This objective was linked to health literacy competency S4 (demonstrate ability to recognize plain language principles in written materials produced by others).

Intensity / cognitive level of health literacy inclusion. No objective had a link at strength one (low level) or strength 2 (intermediate level). All three objectives were linked at strength 3 (high level). The two objectives that cited the CHES competencies were linked at the highest level (create) on the revised Bloom's taxonomy. The other objective was linked at "evaluate."

Discussion

The goal of this study was to produce indicators of how health literacy competencies are represented across the objectives of health course syllabi. The aim was to show the breadth of the intended coverage as well as the cognitive demand or strength of each alignment. The results indicated health literacy as a topic of study is missing from the health syllabi of the institutions included in this study. Of the 50 syllabi analyzed, only two syllabi alluded to health literacy: one by citing the CHES competencies as a learning target and the other by referencing a readability formula. In addition, the phrase "health literacy" did not appear in any of the syllabi. The findings in this study are consistent with other studies that have reported little or inadequate emphasis on health literacy in the curricula of various health profession schools (Ali, 2013; Coleman, 2011).

Recently, some professional schools — primarily those that prepare nurses, pharmacists, and medical doctors — have made attempts to integrate health literacy into their curricula (Coleman & Appy, 2012; Toronto, 2015). A search of the literature showed no such attempt for health education. The implication of this absence of health literacy in health educator preparation is of concern especially when viewed against the call by private and government organizations for all health professionals, including health educators, to apply health literacy principles to their practice.

Health literacy is an outcome of health education and is best served by health education/promotion activities (WHO, 2013; Nutbeam, 2017). In a discussion paper developed in collaboration with the World health Organization, Nutbeam (2017) asserts health education needs to shift from merely promoting compliance to activities aimed at empowerment and engagement in individual and collective actions to improve health.

This paradigm shift will no doubt demand deliberate attention to health literacy and a change in health educators' professional preparation.

Health educators who have not received formal health literacy instruction may lack the skill and self-efficacy to apply HL in their practice. HL strategies are not learned by chance; rather, professionals need deliberate instruction to build their knowledge, skill and confidence (Ali, Ferguson, Mitha, & Hanlon, 2014). Deliberate Practice theory suggests a solid knowledge base and practice are crucial in developing expertise in applied fields (Ericsson, Krampe, Tesch-Römer, 1993). Further, Bandura (1998) contends self-efficacy, or the belief in one's ability to carry out a task and manage life's events, will moderate performance of the task. Self-efficacy is informed by experiences of success with the specific task, seeing peers succeed at the task, encouragement, and the individual's physiological orientation. Yet, the findings in this study show students are not being provided opportunities to develop expertise and self-efficacy in supporting individuals and communities to achieve the full range of health literacy skills. When the data are examined through the theoretical lens of deliberate practice and self-efficacy, it can be deduced that health education and ultimately health outcome will be compromised by the absence of health literacy from the curricula used to train health education specialists.

Together, the three schools in this study represented almost 50 percent of the population of students enrolled in health education programs in Texas during Fall 2015. If this enrollment data represent the trend across semesters, it can be concluded that most health educators who received their professional preparation in Texas may not be equipped to apply the principles of health literacy to their practice.

Limitations

The findings in this study should be interpreted within the limitations of the research. First, the analysis included only three public institutions in the state. While the combined enrollment represents almost half of total statewide enrollment in public universities health education/health promotion programs in Fall 2015, the data provide no information about the status of health literacy in other public universities. In addition, private institutions were excluded from the analysis. Since institutions have flexibility in setting their academic agenda, it is plausible health literacy might receive different emphasis in public and private universities.

Second, the study focused exclusively on the intended curricula; therefore, the results do not represent what was actually taught (enacted curricula) or what was learned (learned curricula). Education research indicates there is often a gap between the intent of instruction and actual instruction, but typically, the gap is not very large (Porter, 2004). Porter (2004) suggests the differences between intended and enacted usually lie in the time spent on instruction and the cognitive demand of learning activities.

The final limitation that should be considered is the exclusion of syllabi for distance education or web-based courses and internships. Syllabi from web-based courses were excluded because the learning objectives for online courses generally parallel the face-to-face equivalent of the course. It is possible, however, that there were instances where some variations existed between the online and face-to-face content. Also, this study did not include internships and practica. The data therefore, do not capture the learning intent in these training programs.

Conclusion

In spite of the limitations, the study makes an important contribution by highlighting the lack of prominence of health literacy in health education specialists' preparation. An extensive search of scholarly databases identified no other study that attempted to quantify the content coverage of HL in health education/promotion programs. This study, therefore, is the first attempt at assessing health literacy training for HESs. The study also highlights possible gaps in training and provides preliminary findings that can be used to inform future research in the area.

Future inquiries could conduct more comprehensive examinations that pull representative samples from programs across the United States. This would give a good sense of how HL stands in HESs programs nationally and provide a firm evidence-base for advocating broad curriculum revision and the development of accreditation competencies. It would also be useful to analyze the instructional materials used in the classroom (textbooks, articles, videos, etc.) and assess the learned curriculum to determine the HL skill sets HESs glean from their programs. Practica and internships could also be studied to verify if health literacy skills are being transmitted through these experiences.

In summary, health literacy is receiving increasing attention in the health field because there is a causal pathway between health literacy, health disparity, and health outcomes. Since health literacy skills are not acquired by chance, there is need for deliberate instruction. The finding that HL is not included in the curricula of the schools in this study is troubling. It suggests many health education specialists educated in Texas

may be ill-equipped to use health literacy strategies to promote health and reduce disparities.

CHAPTER IV

HEALTH LITERACY IN THE PREPARATION AND PRACTICE OF TWO HEALTH EDUCATION SPECIALISTS: A QUALITATIVE CASE STUDY

Background

Link between health literacy and health education. Health literacy and health education have emerged in the public health literature as two sides of the same coin. Nutbeam (2008) posits health literacy is the outcome of health education. He argues that the biomedical approach, which conceptualizes health literacy as a risk to be managed, is necessary but insufficient. He proposes instead an asset model that is bolstered by health education and leads to empowerment. The World Health Organization shares Nutbeam's view of health literacy (WHO, n.d.$_a$). WHO asserts "health education leads to health literacy, leading to personal and social benefit, such as by enabling effective community action, and by contributing to the development of social capital" (para. 2).

The nexus between health education, health literacy, and social capital aligns with the goal of health promotion outlined in the Ottawa Charter (WHO, n.d.$_b$). This international agreement, signed at the first international conference on health promotion held in Ottawa, Canada in 1986, outlines priority actions for health promotion in order to "achieve Health for All by the year 2000 and beyond." The agreement positions health promotion as health education activities that lead to personal and social development and increase people's control over their health and the environments that support health. While the Charter does not explicitly identify health literacy, it makes clear the connection between "education for health," knowledge, and community action.

Health literacy and health education in practice. Health literacy and health education, therefore, seem to be inextricably linked in theory, but the union is not so evident in practice. Studies that examined health literacy in the education and practice of health professionals have focused disproportionately on clinical fields (Coleman, 2011). As a result, there is a dearth of empirical evidence to inform how health education specialists (HESs) and other public health professionals experience health literacy in the context of their practice.

This research gap is worrisome because health educators are at the forefront of preventative health care. They interface directly with individuals and groups in settings such as communities, schools, workplaces, and health care facilities to develop and implement programs aimed at preventing the onset of diseases (Stanfield, Hui, & Cross, 2009). Many health educators work in populations that experience socioeconomic and linguistic challenges and health disparities. These vulnerable groups also tend to have greater health literacy challenges and worst health outcomes (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Paasche-Orlow & Wolf, 2007).

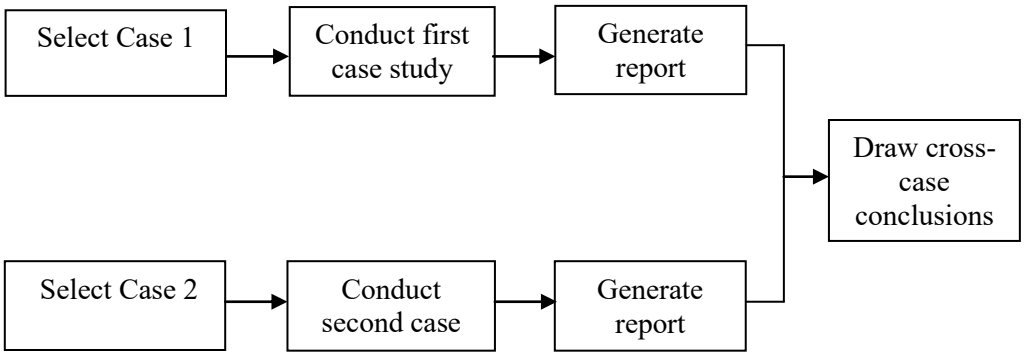
The relationship between health education, health literacy, and health outcomes (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011; Taggart *et al*., 2012) underscores the need to develop understanding of how health literacy is situated in HESs education and practice. The purpose of this study, therefore, was to answer the following questions: 1) How do health education specialists perceive their health literacy preparation? and 2) How do health education specialists perceive health literacy in the context of their practice?

Methods

This study used a two-case qualitative case study design. A case study is an inquiry into a contemporary social phenomenon (Merriam & Tisdell, 2015; Yin, 2014). It is used when the intent of the researcher is to provide answers to "how?" and "why?" questions (Yin, 2014). Unlike quantitative approaches, case study allows focus on a single unit or case and can be applied to different types of data. The goal of case study is not to develop probabilities that lead to generalizations. Rather, case study is concerned with developing analytic theories (Yin, 2014).

Figure 4

Two-case Case Study Procedure



Case study was an appropriate method of inquiry in this research because the study was concerned with gaining understanding about health education specialists' perceptions and experiences related to health literacy. A search of the literature revealed no other study that examined a similar issue. The phenomenon of the study, therefore, was novel and amenable to exploratory case study design.

Examining the issues through the eyes and experiences of primary participants provided an insider's perspective that could not be accessed otherwise. In this case study design, cases were selected and examined independently, then combined to arrive at final conclusions (See Figure 4).

Selection of cases. Two cases were selected for investigation. The cases were bounded by time (between one and five years experience), geography (completed undergraduate training in Texas), and credential (CHES certified with the highest level of education being a bachelor degree). The restriction on level of education was included to filter out potential effects from advanced education in health fields.

Instrumentation. A semi-structured interview guide was developed by the researcher. The guide was informed by literature on health literacy and social cognitive theory. It comprised 18 open-ended questions that invited participants to reflect on their preparation and share their practice experiences. Questions 1-3 asked participants to talk about their education and current job; Questions 4-12 focused on attitudes about health literacy, health literacy education, and health literacy practices; and Questions 13-18 were demographic items. Follow-up questions were introduced where necessary to clarify comments and probe for in-depth understanding.

Data collection. Initial contact was made with participants through invitation emails sent to health education specialists in Texas. Individuals who were interested in participating in the study contacted the researcher and a meeting was arranged. After eligibility was verified and the consent process completed, interviews were conducted. The Interviews lasted, on average, 20 minutes. Interview sessions were audio-taped and transcribed verbatim.

A limitation of qualitative methodology is its high level of subjectivity and susceptibility to bias. Scholars have suggested qualitative researchers integrate sufficient trustworthiness strategies into their work to build confidence in their findings (Lincoln & Guba, 1985; Merriam & Tisdell, 2015). In this study, the trustworthiness strategies employed were bracketing, peer-debriefing, and member checks. Bracketing is the process of declaring research identity and acknowledging preconceptions and philosophical orientations that may impact the rigor of the research if left unacknowledged (Tufford & Newman, 2010). Creswell and Miller (2000) recommend qualitative researchers acknowledge their biases early so readers understand the position from which they approach the research process. To minimize the effect of my biases on this study, I present in the next two paragraphs my background and philosophical orientation.

I worked as a teacher at the elementary and secondary level for many years and am currently pursuing a terminal degree in health education. My world view is informed largely by the pragmatist orientation that evaluates human actions and scientific inquiry by their practicality. In other words, pragmatists believe a reciprocal relationship exists between action and outcomes, therefore, pragmatists go beyond the "what?" to try and understand the "why?" of events (Morgan, 2014). In a social context, therefore, the relationship between action and outcome suggests strong communities are hinged to issues of fairness and social justice.

Through this philosophical frame, I see literacy - in all its forms – as a tool that facilitates understanding of the world and success in it. Literacy, therefore, is a basic right of every individual, but in our imperfect, inequitable world not everyone enjoys this

right. Therefore, social policies and systems play a crucial role in protecting individuals with less than proficient literacy skills. This protection will reduce disparities and build strong societies.

Apart from bracketing, peer-debriefing was also applied in this research. Peer-debriefing involved discussing the research questions, methodology, analysis, and findings with other colleagues who were not involved in the research. The discussion helped identify conceptual leaps in the inductive process and minimize the influence of researcher bias on the conclusions.

The final trustworthiness strategy applied was member check. This included the research participants in verifying the accuracy of the data. Each participant was emailed a copy of her interview transcript and asked to confirm the data represented her attitudes, perspectives, and experiences.

Data analysis. The data set was comprised of transcribed interviews, which were analyzed using an inductive and constant comparative approach. This form of analysis involves examining the data to identify emergent themes or patterns (Merriam, 2009). The transcriptions were read and segmented into thematic categories. Each segment was assigned a participant and a thematic code. Thematic codes were reapplied to units of data each time a similar pattern was encountered. All codes were recorded on a master code sheet to maintain an accurate audit trail. Throughout the entire data analysis process, reflective research notes were kept to record insights and thoughts about the ideas or themes that were emerging. The notes were not used as data, but were useful in facilitating sense making and developing analytic theories.

A final confirmability audit was conducted to ensure the influence of researcher biases on the findings was kept at a minimum. The confirmability audit involved cross referencing all major conclusions against the interview transcripts and the researcher reflective notes.

Findings

The purpose of this study was to explore heath education specialists' perceptions about their health literacy preparation and the role health literacy played in their practice. Two cases were selected for analysis. The interviews produced 11 pages of transcript typed in 11 point Calibri font. Data analysis revealed four central themes: role and professional preparation, health literacy attitude and perceived competence, health literacy place in practice, and health literacy preparation. To protect participants' identities, names were replaced with pseudonyms.

Case 001 – June. June identified herself as a Hispanic female in her 30's. She holds a bachelor degree in health promotion and Education with a minor in community health. She received her Certified Health Education Specialist (CHES) certification in 2012 and has been a practicing health educator since. At the time of the interview, she worked with Native American communities.

Role and professional preparation. June described her role as a dual position that encompassed "actual education" and administration. While she was the health education services manager, she also engaged in delivering health education information to residents in the communities she served.

> I play two roles: so my first role is being an actual educator. So I go out to the community and I provide health education. So sometimes we do diabetes self-

management education and other prevention programs for youth. And my second role is in management. So writing grants related to health programs, and managing the department, staff, and everything involved in the administration of a program.

June assessed her professional health education preparation as adequate, but believed it would have been helpful if she had also received training in other fields. She saw the job of a health education specialist as multifaceted and believed the structure of her health education program did not prepare her to carry out functions that are not core duties of health educators, but are nonetheless essential. She explained it in this way:

> My professional preparation, I believe, was on target. The skills that I learned are being applied currently…I understood it as being you are going to have one role and that's how your role is, but now that I have been in the community for several years you recognize that you do end up playing different roles and the more cross-trained you are in the different areas, the better you are able to fit into the various positions within that community… Most of the times health educators are used in various ways and so being flexible is one of the areas I feel is something that is not taught all of the time.

Health literacy attitude and perceived competence. June recognized health literacy as important to her practice. She defined the concept as "the communication that you have with the people you will be serving… it can be in the form of multimedia or written material or even verbal communication." In assessing her own health literacy competence, she explained that over the years she has improved and now she is

"probably at a midpoint." She identified the development of material as her area of greatest deficiency.

> I'm able to identify the companies or organizations that are specific to the creation or development of health materials and being able to purchase or utilize materials that are useful in the work that I am doing. In the actual development of health literacy, I would say minimal because I could create simple materials to promote programs, but I do not have a lot of skills in actually preparing brochures and relevant health material, articles, or things like that.

Place of health literacy in practice. In the context of her practice, June sees health literacy as a tool to negotiate support from stakeholders and get community buy-in.

> In the role of management, health literacy is important because you must be able to clearly communicate to stakeholders who are supporting your program. Health literacy is going to really promote what you want to do and what kind of information you are trying to present. With the community, I'd say health literacy is equally important just in a different context. It's important to be able to relate to them in terms of concepts, making connections -- to tie in activities you are doing and why you're doing them. And sometimes in the community, if health literacy is not there, you have to find the simplest way of relaying that information.

She conceded that, in general, health literacy is used "somewhat" in health education practice. She explained that from her observation, health literacy is applied in a fragmented manner and as a result gets lost.

Health literacy in professional preparation. While June rated her general education as on target, she perceived there were deficiencies in her preparation as it

relates to health literacy. She noted there was no health literacy course; rather health literacy was integrated into the other health courses.

> I took a minor in community health and a lot of those topics were discussed. So for example creating community, there was a little bit of health literacy in that, so, how to choose the best material, but not necessarily how to create it.

June believes a designated health literacy class would be useful. When asked about ways to improve health literacy in the health education/promotion program at her former school, she recommended teaching skills that pertain to developing education materials. She argued that commercially produced materials sometimes lack cultural relevance. When this happens, health education specialists are forced to create their own materials even though they lack expertise. She suggested training in software use and readability strategies would be beneficial.

Case 002 – Shelly. Like June, Shelly occupied a supervisory role. She was lead health educator at a private company that provided workplace wellness support to organizations on a contractual basis. She self-identified as Caucasian between 36 and 40 years old. At the time of the interview, she had been practicing in the field of health education for four years, but has been a certified health education specialist for three years.

Role and professional preparation. Shelly described her role as a health screener, educator, and coach. A typical day at work involves conducting wellness screenings (cholesterol, BMI, hemoglobin A1C, etc.) on job sites, discussing with employees the meaning of their screen results, and recommending lifestyle changes to improve health. Shelly believed her academic preparation was very comprehensive and effectively

prepared her for the professional role she occupied. In reflecting on her education, she noted,

> I think that I learned a lot… I had to do mock presentations; I had to do course assignments, going out in the field and actually give health education presentation to people on health. It goes from teaching about the health education process all the way to …you know everything from environmental factors to what community I'm in and what I need to focus on and how I can better meet the needs of people in that community.

Unlike June who identified job demands that her formal education did not adequately prepare her to carry out, Shelly was very satisfied with the thoroughness of her preparation.

Health literacy attitude and perceived competence. Similar to her perception about her general health education preparation, Shelly expressed confidence in her health literacy knowledge. She explained she took "numerous courses on health literacy and we went through the entire process as far as health education [process]." She defined health literacy as "basic understanding of your health needs and being able to get those across to people where they actually can understand and a difference can be made in their overall wellness and wellbeing."

Place of health literacy in practice. Shelly embraces health literacy as central to her practice. It is particularly important in her role as health educator/health coach:

> I believe health literacy comes into all of that because I really have to understand everything about wellness and health to be able to explain it to them… Just really

> that entire time I kind of have to be aware of how to educate people on their health and how to get them to explain it from a layman's point of view.

In terms of specific health literacy strategies that she applied to her practice, Shelly said she relied heavily on the experience she accumulated over the years:

> You can kinda get a feel for people once you're talking to them, you are sitting there with them; you can get a feel for people. That's really it – really experience from working with various types of people.

She also pointed out she worked with colleagues who shared her "desire to educate people on their health and promote wellness," so the choice of health literacy strategies sometimes emerged from team consultation about appropriate approaches.

> They look and they try to understand who we are working with. We may even have a meeting about it: this is the population we are working with today, so we need to focus on getting it across to them this way. This way is probably better.

Health literacy in professional preparation. Similar to her view on her health education preparation, Shelly believed health literacy was given comprehensive treatment in the program in which she was enrolled. She explained,

> …the health education program that I did emphasized so much on dealing with everyone. We had to focus on so many things: we had to focus on people's backgrounds, where they come from, their views, their community's views, their beliefs; because those all make such a difference… [the university] focused so much on all of that that there is really not anything I can think of.

Discussion

This case study set out to understand how two health education specialists perceived their health literacy preparation and the role health literacy played in their practice. The findings show Shelly's and June's perceptions merged and diverged in important ways. Both participants evaluated their preparation programs favorably and reported health literacy content was included in the curricula. Shelly, however, saw no room for improvement, while June believed more could be done to prepare health education specialists to create their own education materials. The differences in perception could be a function of real differences in instructional content or differences in the job responsibility of each participant. In her capacity as education services manager in a minority population, June would be more keenly aware of issues of cultural relevance associated with commercially prepared materials. This experience no doubt informed her assessment of her preparation program.

Although the participants reported health literacy instruction was included in their respective programs, they were unable to identify specific health literacy strategies or to speak cogently about health literacy. They spoke instead about needs assessment and the importance of getting messages across to their audience. Even when participants were asked to talk about health literacy strategies they used or observed their peers using, neither June nor Shelly provided specific answers.

These health education specialists' discussion of health literacy in their practice suggests health literacy is either subsumed under or is being used interchangeably with needs assessment and message tailoring. Both June and Shelly spoke about the

importance of assessing their audience and finding what June describes as the "the simplest way of relaying information."

While message tailoring, needs assessment, and health literacy share some similarities, there are also sharp differences among the three. Message tailoring is a construct drawn from health communication. It involves modifying communication so it aligns more closely with individual - usually demographic - characteristics and, therefore, is more acceptable to the audience (Hawkins, Kreuter, Resnicow, Fishbein, & Djkstra, 2008). Needs assessment is the process of identifying health problems in a population and locating available resources and capacity to address the problems (Smith, Tang, & Nutbeam, 2006). Health literacy, in the health promotion context, also identifies needs and tailor messages, but it goes beyond these basic functions to address issues of empowerment and social action related to health (Nutbeam, 2000, 2008; Peerson & Saunders, 2009; Pleasant and Kuruvilla, 2008). This broader social goal of health literacy was not acknowledged explicitly by either participant. Rather participants' understanding seemed to be grounded in the biomedical orientation that focuses on plain language and effective communication.

The participants' biomedical view of health literacy is not surprising when examined against credentialing requirements for health education specialists and the trajectory of health literacy research. The National Commission for Health Education Credentialing (NCHEC), the body responsible for health educator credentialing, does not specify health literacy as a requisite skill for health education specialists. Rather, NCHEC lists the ability to identify literacy level of intended audience and appropriately tailor messages (National Commission for Health Education Credentialing, 2015). Since

credentialing standards usually drive professional preparation (Greenberg, 2002; Jacobs, 2004), the omission of health literacy from credentialing no doubt lowers its priority status in health education programs and blurs the line between traditional literacy and health literacy.

Traditional literacy and health literacy, however, are not synonymous (Kickbusch, 2001; Nielsen-Bohlman, Panzer, & Kindig, 2004). Even individuals with proficient reading skills can experience health literacy challenges because of unfamiliar medical terminologies or even anxiety (Kickbusch, 2001; Nielsen-Bohlman, Panzer, & Kindig, 2004). It is important, therefore, that health education specialists understand the difference between the two literacies and how they relate to practice.

Further, health literacy research has not fully explored public heath literacy (Freedman *et al*., 2009; Pleasant, 2014). While extensive research has been done to identify pathways between health literacy and health outcomes (Berkman *et al*., 2011; DeWalt *et al*., 2004; Paasche-Orlow & Wolf, 2007), develop tools to assessing patients' HL (Chew, Bradley, & Boyko, 2004; Davis *et al*. 2006; Parker, Baker, Williams, & Nurss, 1995; Sørensen *et al.* 2013; Weiss *et al*., 2005), and devise strategies for successful doctor-patient communication (Egbert & Nanna, 2009; Paasche-Orlow, 2011), mechanisms for applying health literacy beyond its functional use have been largely neglected. Some attempts have been made to distinguish between public health literacy and clinical/medical health literacy (Dawkins-Moultin, McDonald, & McKyer, 2016; Nutbeam, 2000, 2008; Peerson & Saunders, 2009, Pleasant & Kuruvilla, 2008), but more work needs to be done to identify specific approaches to using health literacy to guide health promotion interventions.

June's use of health literacy to negotiate with funding agencies and gain community support points to one way in which health literacy can serve its interactive and critical functions. If individuals and communities can be galvanized and supported to identify the causes of health problems and to advocate on their own behalf to influence health outcomes, both health literacy empowerment goal and the underlying purpose of health education would be achieved. The WHO (n.d.$_b$) asserts the purpose of health education is "not only to increase knowledge about personal health behaviour but also to develop skills that demonstrate the political feasibility and organizational possibilities of various forms of action to address social, economic and environmental determinants of health"(p. 60). Health education specialists, therefore, need mechanisms whereby they can shift the center of power from professionals to individuals and communities.

June's and Shelly's perception that health literacy was important in health education practice is encouraging. If their perception is reflective of general perception in health promotion, it could be leveraged to increase the adoption of new ideas for incorporating health literacy into health promotion practice (Rogers, 2003).

Limitations

The findings in this study should be understood within the context of the limitations of the research. First, the study design prevents any form of population level generalization. The purpose of the case study was to provide in-depth understanding about the two cases selected for analysis. While the findings from these cases can be used to inform analytic theories, they cannot be used to generate probabilities (Yin, 2014). Another limitation is that an objective measure of participants' health literacy was not undertaken. Conclusions about the health literacy competence of health education

specialists were deduced from the general discussion. It is plausible there may be discrepancies between their actual skill set and our qualitative deductions.

Conclusion

The role health literacy plays in improving health professionals practice and population health outcomes has been receiving growing attention in health care, but the preparation, perspective, and experience of health educators are missing from the research. The findings suggest health education specialists in this case study understand the connection between health literacy and communication, but their understanding of health literacy does not advance beyond the functional level. In health promotion, health literacy is conceptualized as an asset with sociopolitical implications. The ultimate aim of health literacy, therefore, is to help individuals and communities gain control over their health and health environments.

Participants' seeming limited understanding of this broader goal of health literacy aligns with the emphasis the National commission on Health Educator Credentialing (NCHEC) places on health literacy. The commission does not mention health literacy skills in the standards that are used as an assurance of professional competence. Any inference of health literacy in the credentialing document would have to be drawn from the competencies and sub-competencies related to literacy. The omission of health literacy may undermine its importance in professional preparation and reduce it to issues of clear communication. I believe, however, if health literacy is only used in health promotion to ensure messages are clear, health literacy is merely an unnecessary duplication of health communication. The relevance of health literacy in health promotion resides in the broader goal of social capital and empowerment.

This study adds to the sparse literature on health education specialists' health literacy and signals promising areas for future inquiry. Other studies could examine the extent to which the perceptions of health education specialists in this study reflect perceptions in the general population of health educators. This would clarify health educators' readiness for change and inform professional development approaches targeted at changing practice behaviors related to health literacy. Quantitative or mixed method approaches could also be used to examine the health literacy knowledge, skill, and practice of a large sample of health education specialists. The analysis should include teasing out the effect of experience and an advanced health education degree on how health literacy is applied in health promotion activities. Such understanding would be helpful in determining how best to prepare health education specialists to achieve the functional, interactive, and critical goals of health literacy.

CHAPTER V

HEALTH LITERACY COMPETENCE OF HEALTH EDUCATION STUDENTS

Background

Health literacy as a public health challenge. Preparing health education students to integrate health literacy into their practice is crucial. At the most basic level of function, health education specialists are responsible for developing and implementing programs that promote health and disseminating health information (Stanfield, Cross, & Hui). Research shows, however, that very few (12%) American adults possess sufficient health literacy skills (Kutner *et al*, 2006) to benefit from this information. The widespread limitations in health literacy have resulted in the deficit being identified as a public health threat (Nielsen-Bohlman, 2004). Low health literacy is associated with negative health outcomes and increased health care costs, and impacts individuals at various education levels. The negative effects are even greater among racial and linguistic minorities, the uneducated, and the poor (Kutner *et al*, 2006).

Further, the fluid nature of health literacy makes it difficult to assess. An individual may have intermediate health literacy in one context, but basic skills in another, depending on the demands of the situation (USDHHS, 2010). Many individuals with limited health literacy also experience shame and often hide their limitations (Wolf *et al*. 2007), making it even more challenging for health personnel to identify their needs. It is important that health workers understand these complexities and the implications for health, and are competent to effectively address health literacy issues.

Health professionals' health literacy competence. The precise competence health professionals should possess is not formally delineated in the literature. A

comprehensive literature search identified only one attempt to compile recommended knowledge, skills and attitudes into a single document. In this attempt, a Delphi panel of health experts identified a list (See Table 6) of knowledge, skills, and attitude-based health literacy competencies health professionals should possess if they are to respond appropriately to the challenges of limited health literacy (Coleman, 2013).

Table 6
Example of Competencies Identified by Delphi Panel reprinted from Coleman, Hudson, & Maine (2013).

Domains	**Sample Competencies**
Knowledge	1. recognize 'red-flag' behaviors which may suggest a patient has low health literacy 2. know that the average US adult reads at an 8th–9th-grade reading level, but that most patient education materials are written at a much higher reading level
Skill	1. demonstrates ability to follow best-practice principles of easy-to-read formatting and writing in written communication with patients 2. demonstrates effective use of a *teach back* or "show me" technique for assessing patients' understanding
Attitude	1. expresses empathy with patients' potential sense of shame around low literacy (or health literacy) issues 2. 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 health care interactions—a *universal precautions* approach is required with all patients

When the list was compared with current research, the comparison showed aspects of the health literacy competencies had received some attention in clinical education, but have been largely neglected in health education research and teaching. As

a result, little is known about the health literacy knowledge and skills of health education students who are being trained to become certified health education specialists.

Benefits of health literacy preparation. Health professionals' health literacy competence has the potential to impact practice and health outcomes. Evans and colleagues (2014) reported health literacy training that used a faculty dissemination model resulted in improvements in health professionals' self-reported knowledge, skills, and attitudes related to health literacy and ethnogeriatrics (HLE). Following the training, 91 percent of the participants, who were from different health disciplines, either disseminated the HLE curriculum through seminars conducted at their home sites or implemented projects related to HLE in their local communities. Similarly, a health literacy intervention for internal medicine residents resulted in improved knowledge, attitude, and practice (Green, Gonzaga, Cohen, & Spagnoletti, 2014). Residents reported increased familiarity with health literacy concepts, heightened sense of the importance of health literacy, more frequent consideration of health literacy in patient care, and greater confidence in communicating with low literacy patients. There was also an increase in residents' use of plain language (Green, Gonzaga, Cohen, & Spagnoletti, 2014).

The practice benefits of health professionals' health literacy competence makes it imperative to assess what students who are being prepared to enter the workforce know. The assessment will highlight knowledge gaps and identify weaknesses and strengths in professional preparation. The purpose of this study, therefore, was to assess the health literacy knowledge and experience of advanced health education students.

Methods

This study used a cross-sectional survey design to assess health literacy knowledge and experience of a sample of health education students. The sample was drawn from three public universities in Texas. Two of the three universities are classified as Highest research activity (R1) under the Carnegie Classification of Institutions of Higher Education, and the third is classified Higher research activity (R2) (The Carnegie Classification of Institutions of Higher Education, n.d.). The universities were selected because, among public universities in Texas, they had the three highest enrollments of health education students.

Participant selection. Purposive sampling was used to recruit students for this study. Sample size estimates were calculated using the confidence interval-based formula: $n = (z/p)^2 \pi(1-\pi)$; where n = sample size, p = tolerable error, π = population proportion, and z = z value from the normal distribution table for the desired confidence interval (Charan & Biswas, 2013). Since no health literacy competence population proportion was available for health educators, the health literacy proficiency proportion for college graduates (27%) (Kutner *et al*, 2006) was used as a proxy. The estimates suggested a sample of 303 was adequate to yield reliable results.

Eligibility criteria required students to be juniors or seniors enrolled in a health education program at one of three Texas public universities. Eligibility was restricted to these two student classifications to ensure participants were exposed to a considerable number of health core courses. In addition, students had to have the intention to take the Certified Health Education Specialists (CHES) examination.

Instrumentation. A modified version of the Health Literacy Knowledge and Experience Survey (HL-KES) (Cormier & Kotrlik, 2009) was used to collect data. The original instrument was validated among nurses and is growing in popularity among nursing researchers (Cafiero, 2012; Knight, 2011; Torres & Nichols, 2014). Validity evidence for the instrument range from Cronbach alpha = 0.57 to Cronbach alpha = 0.82 (Cafiero, 2012; Cormier & Kotrlik, 2009; Knight, 2011; Torres & Nichols, 2014).

The original form of the HL-KES is divided into three parts. Part 1 has 29 multiple choice items covering five content areas: basic health literacy facts, health literacy screening, consequences of low health literacy, guidelines for writing health care materials, and evaluation strategies for health literacy interventions. Part 2 has nine Likert scale items divided into two subscales. The items assess how frequently students participate in health literacy learning activities. Part 3 has seven demographic questions (Cormier & Kotrlik, 2009).

The HL-KES was not validated among health educators, but was considered an appropriate tool to use in this population because the items in the questionnaire cover topics generic to all health professions. Also, the HL-KES is the only available validated instrument that measures health literacy knowledge and experience of health professionals.

In adopting the HL-KES to use among health educators, slight modifications were made to the wording of the original instrument to make it applicable to the sample in the current study. The word “nursing” or “nurse” was changed to “health educator” or “health” and “patient” was changed to “individual.” In addition, two items were added to the demographic section of the questionnaire and two items (one queried students’

previous health care certification and the other Grade Point Average) were inadvertently omitted. The instrument was also converted from its original paper and pencil format to an electronic format administered through Qualtrics (See Appendix F).

Procedure. After ethics approval was granted, emails were sent out to upper division health students inviting them to participate in the study. The invitation emails outlined purpose and benefits of the study, inclusion criteria, and students' rights as participants. They also contained a link that took students who were willing to participate to a screening page that checked eligibility. Eligible participants were automatically routed to the questionnaire. After completing the questionnaire, students were sent a final thank you note and an electronic Amazon gift card worth $10.

A forced-response format was used to eliminate the problem of missing cases in the dataset. In forced-response questionnaires, participants have to answer a question in order to advance to the next question (Albaum, Wiley, Roster, & Smith, 2011; Stieger, Reips, & Voracek, 2007). Forced response has been described as a quality versus quantity tradeoff (Albaum *et al*., 2011). While the approach improves the completeness of datasets, it also has the potential to compromise data quality. Research shows that forcing response can cause frustration and result in random and false information, especially when respondents cannot honestly provide an answer or the questions are sensitive (Dillman, Smyth, & Christian, 2014; Stieger *et al.*, 2007).

In spite of the possible danger inherent in forced-response, the format was used in this study because it was fiscally prudent and because of the non-sensitive, objective nature of the questions on the HL-KES. The knowledge items had only one correct answer; therefore, students either knew the correct answer or they did not. Not answering

a question would be equivalent to supplying the wrong answer. Similarly, the experience questions asked students to report the frequency with which they engaged in different health literacy activities. The response options ranged from "never" to "always" and, therefore, could be answered with ease and a high degree of honesty.

Data analysis. Data on students' health literacy knowledge and experience were analyzed using Statistical package for the Social Science (SPSS) 22.0. After duplicates were removed, 250 questionnaires were included in the final analyses. Responses to the 29 Knowledge items were recoded as "1" (correct) or "2" (incorrect), and knowledge scores were calculated for each participant. The nominal data captured by the experience items were also recoded as "never" = 1, "sometimes" = 2, "frequently" =3, and "always" = 4.

Descriptive analyses were conducted to capture respondent characteristics, frequency of specific responses, and measures of central tendency. The Knowledge data were further disaggregated by the five content foci covered by the HL-KES to highlight areas of strengths and weaknesses in what participants knew about health literacy.

In order to examine the data for relationships, a scatterplot was generated. The data did not satisfy assumptions regarding linearity, outliers, and normal distribution, therefore, Spearman's rho was used instead of Pearson's R to check for evidence of association.

Since the HL-KES was being used for the first time in a sample of health education students, validity testing was also carried out. The internal consistency of the overall scale and of each subscale was determined using Cronbach's alpha.

Results

Across the three institutions included in this study, an average of 844 juniors and seniors were enrolled in community health tracks during Fall 2016 – Spring 2017. Of this enrollment, 250 students participated in the survey.

Table 7
Participants' Demographics

Demographics	**Frequency**	**Percent (%)**
Gender		
Female	205	82
Male	45	18
Age (years)		
18-20	80	32
21-23	139	56
24-26	15	6
>26	16	6
Race/Ethnicity		
American Indian/Alaska Native	3	1.2
Asian	36	14.4
Black or African American	51	20.4
White	114	45.6
More than one race	31	12.4
Unknown	15	6.0
Education		
No prior degree	214	85.6
At least one undergraduate	34	13.6
At least a master's degree	2	0.8
Classification		
Junior	107	42.8
Senior	143	57.2

Demographics. Most respondents were white females with no prior academic degrees. More than half the students were classified as seniors and over 90 percent

reported interacting with the health care system for their personal health needs between one and four times per year (see Table 7).

Reliability of Health Literacy Knowledge and Experience Scale (HL-KES). Results from test of internal consistency presented in Table 8 indicated the HL-KES had acceptable reliability for both the knowledge (Cronbach's alpha = .77) and experience (Cronbach's alpha =.81) scale.

Table 8

Reliability Measures for Modified HL-KES

	Subscales	Items	Cronbach Alpha
Part 1 Knowledge	Basic health literacy facts	1 – 5	.31
	Consequences of low health literacy	6 – 9	.45
	Health literacy screening	10 – 17	.52
	Guidelines for writing health care materials	18 – 25	.41
	Evaluation strategies for health literacy interventions	26 – 29	.47
Part 2 Experience	Core health Literacy experience	30 – 35	.77
	Technology health literacy experience	36 – 38	.69
Part 3 Demographics		39 – 46	

The five subscales or domains on the knowledge component of the instrument had Cronbach alphas ranging from .31 to .52, and the two subscales on the experience component of the instrument had alphas of .69 and .77.

Health literacy knowledge. The descriptive analyses showed students' composite score on the 29-item knowledge scale ranged between 3 and 28 (mean = 15.6; SD =4.97). Most students (84%) scored below 70 percent and approximately five percent of the sample scored above 80 percent on the instrument. Item level analysis revealed students had greatest difficulty with knowledge Items 1, 2, 5, 10, 13, 19, 20, 24, 26, and 28. Majority of students answered these questions incorrectly. The poorest performance was on Knowledge Item 5, which queried the best indicator of health status. Eighty-eight percent of the sample selected one of the three distractors. The most popular distractor was socioeconomic status (68%). Only 12 percent of respondents selected the correct response, "literacy." The question that posed the least difficulty for students was item 22 that assessed students' knowledge of recommendations for developing written health care materials. Eighty-two percent of participants selected the correct response.

Domain level analyses were also conducted to identify patterns in performance across the five content areas that constitute HL-KES knowledge.

Basic health literacy facts. In the basic Health literacy facts domain, students performed poorly on three of the five items. The proportion of students who selected wrong responses on the three low scoring items ranged from 62 percent to 88 percent. These items asked about the populations most at risk for low health literacy and the best predictor of health status. The other two items had 56 percent and 64 percent of students answering them correctly.

***Consequences of low health literacy*.** Overall, students performed best in this domain with majority of students answering all four questions correctly. The proportion of students who selected correct responses to each of the four items ranged from 54

percent to 79 percent. Question 8, which fell at the lowest end of the range, asked about coping skills for patients with low health literacy, and question 6 which fell at the upper end queried the impact of low health literacy on diagnosis and treatment.

Health literacy screening. Health literacy screening was the largest domain and was composed of 18 items. Proportion of students answering each question correctly ranged from 27 percent to 79 percent. Two items (Item 10 and Item 13) were particularly challenging for most students. Seventy-three percent of the students did not know the purpose of the Test of Functional Health Literacy (Item 13) and approximately 50 percent of participants did not know what the Rapid Estimate of Adult Literacy in Medicine (Item 10) was used to assess.

Guidelines for writing health care materials. Eight items made up this domain. Two items (items 19 and 24) were answered incorrectly by most students. Almost 75 percent of the sample did not know the recommended reading level for written health care material and 60% did not know the number of main ideas that should be included in written health care information about specific diseases. Each of the other six items in the domain was answered correctly by approximately 50 percent of the respondents. Overall, the highest proportion of students answering a question correctly was 61 percent and the lowest proportion was 26 percent.

Evaluation strategies for health literacy interventions. This last domain was made up of four questions, three of which were problematic for most participants. Most students answered incorrectly the questions on teachback (57%), community involvement in developing health materials (70%), and opportunities for active learning (52%). The

fourth question, which was concerned with clarity of health information, was answered correctly by 73 percent of participants.

Table 9
Response Frequency on HL-KES Experience Scale

Questions	Always (%)	Frequently (%)	Sometimes (%)	Never (%)
health literacy emphasized in your health education curriculum	12	44	38	6
use health literacy screening tool to assess health literacy skills	4	16	47	33
evaluate reading level of written health care materials	6	17	44	33
evaluate the cultural appropriateness of health care materials	14	30	40	16
evaluate the use of illustrations in written health care materials	11	28	45	16
use written materials to provide health care information	10	38	37	15
use audiotapes to provide health care information	2	11	30	57
use videotapes to provide health care information	3	18	42	37
use computer software to provide health care information	8	26	41	25

Health literacy experience. The experience component of the HL-KES was made up of nine questions divided into two domains: core health literacy experience (6 items) and technology health literacy experience (3 items). Table 9 presents participants' rating of their health literacy experience on a 4-point Likert scale that ranged from "never" to "always".

Most students reported health literacy was emphasized in their health education curriculum either sometimes (38%), frequently (44%), or always (12%). Only 6 percent of participants said health literacy was never emphasized. Few participants reported "always" or "frequently" engaging in activities such as using health literacy screening tools, evaluating the reading level of health care materials, or evaluating the cultural appropriateness of health care materials.

Relationship among variables. Spearman's rho correlation was computed to test for evidence of relationship between health literacy knowledge and six other variables on the HL-KES. The data in Table 10 indicate four out of six correlations were statistically significant ($p < .05$).

Table 10
Correlations between HL Knowledge and Other Variables

		Age	Classification	HL experience	HLTH system use	Prior degree	HL in Program
HL Knowledge	Spearman's rho coefficient	-.016	**.243**	**-.189**	**.126**	**-.211**	.065
	Sig. (2-tailed)	.801	.000	.003	.046	.001	.307
	N	250	250	250	250	250	250

Note. Coefficients in bold are significant ($p < .05$)

In general, the results suggest health literacy knowledge was neither associated with students' reports of the emphasis health literacy received in their health education curriculum, nor students' age. On the other hand, students who engaged with the health care system for personal reasons or who were more advanced in the health education

program tended to have better health literacy knowledge than their counterparts. Interestingly, prior academic degree was negatively correlated with health literacy knowledge ($\rho = -.211$, $p < .05$) and there was a negative correlation between health literacy knowledge and health literacy experience ($\rho = -.189$, $p < .05$).

Discussion

The health literacy knowledge and experience of advanced health education students is an obscure area in health literacy research. This study, therefore, is an important addition to the meager body of literature. The study identified weaknesses and gaps in the health literacy knowledge of students, most of who were in the final phase of their professional preparation. Many students had incomplete knowledge of basic health literacy facts such as prevalence of HL and populations that are most at risk for low HL. Students also demonstrated limited understanding of evaluation strategies and popular screening tools. These findings are consistent with other studies that found many health professionals, particularly in the clinical fields, have inadequate health literacy knowledge (Coleman, 2011; Cormier & Kotrlik, 2009; Lambert *et al.,* 2014).

Deficits in students' health literacy knowledge will no doubt impact if and how they integrate health literacy into their practice when they enter the workforce. It is unrealistic to expect health education specialist or other health professionals to effectively use a construct they do not fully understand. Social cognitive theory literature suggests action or behavior is contingent on feelings of self-efficacy that arise from repeatedly mastering a task. If students' health literacy knowledge is inadequate, it may undermine their ability to achieve this mastery status. Further, once students leave their preparation programs, it is unclear what mechanisms are available to close the health

literacy knowledge gap. Professional development courses is a possible medium through which health literacy can be promoted, but the extent to which health literacy content is routinely included in training is ambiguous.

It was not surprising many students performed fairly well on the questions that assessed recommendations for written health care material and health literacy screening approaches. The knowledge assessed in these items mirrors requirements in National Commission for Health Educator Credentialing (NCHEC) Competency 7.2. This competency requires health educators to be able to develop and tailor messages for different populations. Since classroom instruction is often guided by credentialing requirements, it is likely students had received instruction on developing health care materials and assessing literacy levels of populations.

The parallel between health literacy and some NCHEC competencies may be one explanation for the absence of a statistically significant relationship between students' health literacy knowledge and their report that health literacy was included in their curriculum. It was expected that students who were receiving health literacy instruction would perform better on the knowledge scale than students who got no instruction, but that was not the case. It is possible students interpreted health promotion content as health literacy inclusion in the curriculum when, really, the focus was not on health literacy. Health literacy includes a broader range of issues than the NCHEC competencies cover.

A finding that was somewhat unexpected was the negative correlation between prior academic degree and health literacy knowledge. Even though there are overlaps between health literacy and education, the extant literature indicates education is not a

good predictor of health literacy (USDHS, 2010). The specialized nature of health information can baffle even well-educated individuals, especially in the stressful context of ill-health (Kickbusch, 2001; Nielsen-Bohlman, Panzer, & Kindig, 2004). Hence, it was expected there would either be no relationship or a weak positive relationship between prior degrees and HL knowledge. The analysis, however, identified a statistically significant inverse relationship. Since no data was collected about the nature of prior degrees, it is not clear what factors might be driving this relationship or influencing the direction.

Apart from gaps in knowledge, students also reported limited opportunities to develop health literacy experience. The small number of participants who reported always or frequently engaging in different experiences indicates students may need more opportunities to gain practical experience. Health literacy is skills-based, and skills are honed through repeated practice (Ericsson, 1993). On the other hand, students' seeming lack of experience in a couple areas may be more a reflection of shifts in technology. In an era of internet and online content, many students may never use audio tapes and video tapes, which are somewhat obsolete, in health promotion activities. This is not to say they have no experience using technology to deliver aural and visual messages. Future refinement of the instrument should review these questions to ascertain their continued validity.

In general, the HL-KES is a reliable tool for measuring health education students' health literacy knowledge and skills at the functional level. In this study, the Cronbach's alpha was .77 and .81 for the knowledge and experience scale, respectively. These alpha values fall within the acceptable range of .65 to .90 (Tavakol & Dennick, 2011; Vaske,

Beaman, & Sponarski, 2017). The subscales, however, had low reliability coefficients, but this was not surprising. Cronbach's alpha is a function of test length and inter-item correlation and most of the subscales had just a few items. Reduction in the number of items no doubt attenuated the internal consistency.

The reliability measures in this sample of health education students are similar to reliability measures reported in other studies that used the same instrument. Knight (2011) evaluated the health literacy of registered nurses in Georgia. Her assessment of Part 2 of the instrument found good reliability (α =.81). She did not report the reliability for Part 1. Torres and Nichols (2014) used the instrument to measure the health literacy knowledge and skills of nursing students pursuing an associate degree. The researchers did not provide Cronbach alpha values for each part of the HL-KES, but reported the overall instrument had good reliability (α = 0.82). As a whole, therefore, the HL-KES appears to be a useful tool for assessing health literacy across different health profession populations. Individual domains, however, will need to be supplemented by equivalent items if the domains are extracted and used independent of the original scale.

Limitations

The findings of this study are constrained by the limitations of the research. First, the sample is not representative of the population of health education students. It is a narrow sample drawn from three public universities in Texas and the sample was smaller than estimated. Hence, the findings cannot be generalized. Second, the cross-sectional design provides a single set of data at a single point in time. The results could vary if the constructs were measured at a different time. Finally, the instrument measured functional level skills only. Students' interactive and critical level knowledge and skills remain

unexplored. The study, therefore, provides only partial understanding of the health literacy knowledge and experience of advanced health education students.

Conclusion and Recommendations

In spite of the limitations, this study makes an important contribution to what is known about health education students' health literacy knowledge and experience. Prior to this study, the HL-KES had validation evidence from nursing populations only. This study provides support for the reliability of the instrument for health education students, as well. In addition, a search of the literature identified no other study that examined health literacy of health education students. This study, therefore, offers initial understanding about strengths and weaknesses in health education students' health literacy competence. The results of the study suggest there are a number of gaps in knowledge and students have limited opportunities to develop practical health literacy experience.

These results suggest professional programs may need to review and revise their curricula to identify and address health literacy deficiencies in course offerings. There is also need for more robust research to expand the literature on health education students' health literacy. Future studies could explore further the unexpected inverse relationship between prior academic degrees and health literacy knowledge. It would also be useful to investigate the mismatch between students' health literacy knowledge and their report that health literacy was included in their programs. Such investigation would help to clarify how health literacy is taught to health education students.

CHAPTER VI

CONCLUSION

Although health educators are at the forefront of preventative health care (Stanfield, Cross, & Hui, 2009), their ability to engage individuals and communities in health literacy capacity building may be challenged in part by their limited knowledge and understanding of health literacy. The results from the four studies in this dissertation highlight a discrepancy between health education specialists' and students' perceived preparation and competence and their actual preparation and competence.

The first study (Chapter II), a systematic review of the literature, shows health literacy pedagogy research, in general, lacks rigor and consistency. Qualitative studies failed to outline the analytic process and omitted trustworthiness details. Several quantitative studies did not identify a research design and failed to clearly delineate the research methods. They also used researcher-developed instruments with no validity support. These omissions and inconsistencies make it difficult to meta-analyze the studies or make cross-study comparisons. Further, health literacy preparation for health education specialists was missing from the literature. Of the 24 studies reviewed, only one included health educators, and they made up less than 10 percent of the sample.

The findings from this critical appraisal highlighted a significant research gap and underscored the need for closer examination of the education and training of health educators. The findings of the appraisal, therefore, provided the rationale and formed the backdrop against which the other three studies were conducted.

The second study (Chapter III) analyzed the objectives of health education syllabi to determine the extent to which health literacy was integrated into curricula of selected Texas public universities. The analysis covered 412 objectives found in 50 syllabi drawn from three universities. Data showed less than one percent of the objectives included health literacy content as learning outcome, and the inclusions were indirect. The phrase "health literacy" was not used in any objective. Health literacy was virtually absent from the curricula of the schools included in the study.

The absence of health literacy from the curricula mirrored the difficulty participants in the case study (Chapter IV) had defining and talking about health literacy. The case study was conducted to understand how two health education specialists' perceived their health literacy preparation and the role health literacy played in their practice. Participants perceived health literacy as important to their practice and reported health literacy was included in their professional preparation. However, their discussion of health literacy suggested health literacy was probably being used as a misnomer for needs assessment and message tailoring.

Similar to the health education specialists, most advanced health education students (juniors and seniors) who were surveyed also reported health literacy was emphasized in their preparation programs. Results from the objective measures of the fourth study (Chapter V), however, indicated weaknesses in some basic content areas such as populations in which low health literacy is most prevalent and popular tools used to screen for low health literacy.

While each of the four studies provides a partial understanding of the preparedness of health education specialists to apply health literacy principles to their practice, the triangulated data are very illuminating in two main ways. First, the merged results highlight a curious discrepancy between health literacy instructional content conveyed through learning objectives, participants' report of instructional content, and participants demonstrated health literacy knowledge. The scope of this research did not including a systematic investigation of this discrepancy, but based on the results from the objective measures, it is plausible there may be some misunderstanding among health educators about what constitutes health literacy. If such is the case, it is understandable; health literacy intersects with many other content areas such as communication, traditional literacy, and adult education (Berkman, Davis, & McCormack, 2010; USDHS, 2010). This kind of misunderstanding, though, would further underscore the need to clearly delineate how health literacy is positioned in health education/promotion.

The second way in which the triangulated data are illuminating is that they show a near complete absence of health literacy from the formal education and training of health education specialists. This study did not examine internships and curricula, but the limited understanding demonstrated by participants in the case study and the survey suggests health literacy may be missing from these learning opportunities, as well.

When the findings are examined within the theoretical frame of social cognitive theory (SCT), they point to two possible outcomes. First, health educators may not feel efficacious to carry out health literacy activities, and therefore may avoid the task

altogether. Self-efficacy is important in goal pursuit and is bolstered through mastery experiences, vicarious experiences, persuasion and physiological states. The lack of direct instruction in health literacy, combined with a research and credentialing environment that backgrounds public health literacy, no doubt limits opportunities to develop mastery, receive praise, or observer others successfully use health literacy to achieve public health goals. This may interfere with health educators' positive belief in their ability to help individuals and communities develop health literacy skills and reduce these professionals' likelihood to act.

The second outcome is linked to participants' self-report of health literacy instruction even though there is little evidence of health literacy in the curricula and participants' knowledge of health literacy is incomplete. Feeling efficacious in the absence of actual ability to carry out a task can lead to unrealistic optimism and failure. In SCT, repeated failure or disappointments erode self-efficacy and reduce future likelihood of performing a target behavior. So, whichever outcome is the case, both present the potential for harm.

In general, based on the results of this study, it can be concluded that health education specialists are not adequately prepared to support health literacy capacity building in individuals and communities. This result has important implications for practice, professional preparation, credentialing, and research.

Implications for Practice

This study points to a possible gap between theory and practice. In theory, health literacy and health education share a common goal - empowerment. In Nutbeam's

model, which is widely accepted in the field, health literacy is a continuum of cognitive skills that equip individuals to advocate for themselves and their communities and take actions that change the environments that inhibit health (Nutbeam, 2000, 2008). This conceptualization of health literacy parallels the World Health Organization (WHO) assertion that "health education … is not only to increase knowledge about personal health behaviour but also to develop skills that demonstrate the political feasibility and organizational possibilities of various forms of action to address social, economic and environmental determinants of health" (WHO p. 60). Similarly, the Ottawa Charter for Health Promotion (1986) emphasized health promotion activities should be grounded in a socioecological approach that helps people gain autonomy over their health.

The centrality of empowerment in both health literacy and health education sets up a somewhat reciprocal relationship between the two. Health education activities produce health literacy and gains in individual and community health literacy lead to improved health outcomes ((Nutbeam, 2017). The results from this study suggest, however, health education specialists may not be very clear about this reciprocal relationship or how health literacy can be leveraged to achieve the ultimate goal of empowered, activated communities. While both health education students and practitioners reported health literacy was included in professional preparation, other indicators in the study highlight gaps in their knowledge.

These gaps in knowledge may undermine the effectiveness of health education specialist in challenging health disparities. Health literacy is at the heart of health equity (Commission on Social Determinants of Health, 2008). People who have strong health

literacy skills have greater ability to engage in personal and social actions that improve health (Nutbeam, 2017). On the other hand, individuals who have difficulty navigating the health system and advocating for themselves have poorer health outcomes, higher health care cost, and experience higher mortality from chronic diseases (Centers for disease control, 2016; Nielsen-Bohlman, *et al*., (2004). The link between health literacy and health equity makes it imperative for health educators to fully understand how health literacy complements and informs their practice and fits into the goal of health education.

Implications for Professional Preparation

Since health literacy skills are not acquired by chance (Ali, Ferguson, Mitha, & Hanlon, 2014), changes in practice must be preceded by changes in professional preparation. The findings from this study indicate health literacy is not being routinely taught in many health education classes. There is a need for professional preparation programs to undertake curricula review to determine adequacy of the health literacy training students receive.

It would also be beneficial for programs to explore best practices for integrating health literacy into existing programs. The systematic literature review that front ends this dissertation showed clinical programs primarily used didactic and experiential instructional approaches in stand-alone or embedded health literacy courses. These programs, however, focused primarily on developing functional level skills. Since health education is also concerned with building critical health literacy, there may be need to

augment the clinical approaches with real world learning experiences such as service learning and action research.

Implications for Credentialing

The findings suggest credentialing requirements also need to be reviewed and revised to account for the different gradations of health literacy skills. The competencies outlined by the National Commission for Health Educator Credentialing (NCHEC) make no direct reference to health literacy even though agencies such as WHO and American Public Health Association (APHA) have identified health literacy as central to health education goal (APHA, 2010; Commission on Social Determinants of Health, 2008). Explicitly identifying health literacy as a requirement for credentialing will help to legitimize the role health literacy plays in health promotion and boost HL adoption in preparation programs.

Implications for Research

This work supports other studies that found contemporary research is dominated by the biomedical orientation to health literacy (Coleman, 2011, Nutbeam, 2000; Pleasant & Kuruvilla, 2008). In this orientation, health literacy is viewed as a patient deficit that needs to be circumvented in order to deliver health care. Subsequently, most interventions are based at the functional level and use work-around strategies in an attempt to get patients to understand basic health information and adhere to medication regimens (Dawkins-Moultin, McDonald & McKyer, 2016; Freedman *et al*. 2009; Pleasant & Kuruvilla, 2008).

This biomedical focus of health literacy research does not align well with the goal of health promotion / health education. Health literacy research needs to expand to include public health concerns. For example, research that develops mechanisms for critical literacy capacity building in individuals and communities will make it easier for health education specialists to adopt and integrate health literacy into their practice.

Research also needs to be carried out to identify competencies relevant to health education. The competencies developed by Coleman and colleagues (2013) fill a crucial void in the literature, but like the extant research, they have a biomedical orientation. Adding competencies that align with interactive and critical health literacy will be useful in guiding health educator preparation, credentialing, and practice.

Further, it is imperative the evidence-base that guides the field is constructed on sound science informed by well-designed studies that used instruments with strong validation support. Based on the findings of the systematic review, this is not the case in the current body of literature. There is need for research efforts that focus on developing standards and validated tools that capture the full range of health literacy skills relevant to health promotion.

A final worthwhile research activity would be to explore the factors that influence the gap between findings from the syllabi analysis and the knowledge scale and participants report of health literacy instruction. Could it be that health literacy is entering instruction in an informal way that is not captured in course objectives? Or, is "health literacy" being used to label content that really does not fall within the parameters of the field or are peripheral to the field? Whatever the case, these are issues

that need to be untangled if health literacy is to inform the way health education is practiced.

In conclusion, health education specialists are well positioned to promote disease prevention and combat health literacy (APHA, 2015), but they must be prepared for the task. The triangulated data in this study suggest current health literacy pedagogy research is low-tiered and there are gaps in the health literacy training of many health education specialists prepared in Texas. Health literacy has the potential to reduce health disparity and improve health outcomes, but health literacy activities will have to extend beyond functional level skills. Health literacy interventions that encompass the functional, interactive, and critical levels will build social capacity and achieve the empowerment goal of health education.

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APPENDIX A

MERSQI FOR QUANTITATIVE STUDIES. REPRINTED FROM (SULLIVAN, 2011)

Domain	MERSQI Item	Score	Maximum Score
Study design	Single group cross-sectional or single group posttest only	1	3
	Single group pretest and posttest	1.5	
	Nonrandomized, 2 groups	2	
	Randomized controlled trial	3	
Sampling	Institutions studied 1	0.5	3
	2	1	
	3	1.5	
	Response rate (%) Non applicable		
	< 50 or not reported	0.5	
	50-74	1	
	≥ 75	1.5	
Type of data	Assessment by participants	1	3
	Objective measurement	3	
Validity of evaluation instrument	Internal structure Non applicable		3
	Non reported	0	
	Reported	1	
	Content Non applicable		
	Non reported	0	
	Reported	1	
	Relationships to other variables		
	Non applicable		
	Non reported	0	
	Reported	1	
Data analysis	Appropriateness of analysis		3
	Inappropriate for study design or type of data	0	
	Appropriate for study design and type of data	1	
	Complexity of analysis		
	Descriptive analysis only	1	
	Beyond descriptive analysis	2	
Outcomes	Satisfaction, attitudes, perceptions, opinions, general facts	1	3
	Knowledge, skills	1.5	
	Behaviors	2	
	Patient/health care outcome	3	
Total possible score			**18**

APPENDIX B

CASP CHECKLIST. REPRINTED FROM (NATIONAL COLLABORATING CENTRE FOR METHODS AND TOOLS, 2011)

	Yes	No	Can't tell	Hint
1. Did the review address a clearly focused question?				An issue can be 'focused' In terms of the population studied, the intervention given, the outcome considered
2. Did the authors look for the right type of papers?				'The best sort of studies' would address the reviews question, have an appropriate study design (usually RCTs for papers evaluating interventions)
3. Do you think all the important, relevant studies were included?				Look for which bibliographic databases were used, follow up from reference lists, personal contact with experts, search for unpublished as well as published studies, search for non-English language studies
4. Did the review's authors do enough to assess the quality of the included studies?				The authors need to consider the rigor of the studies they have identified. Lack of rigor may affect the studies' results.
5. If the results of the review have been combined, was it reasonable to do so?				Consider whether the results were similar from study to study; the results of all the included studies are clearly displayed; the results of the different studies are similar; the reasons for any variations in results are discussed
6. What are the overall results of the review?				Consider if you are clear about the review's bottom line results; What these are (numerically if appropriate); How were the results expressed (NNT, odds ratio etc)
7. How precise are the results?				Look at the confidence intervals, if given
8. Can the results be applied to the local population?				Consider whether the patients covered by the review could be sufficiently different to your population to cause concern. Your local setting is likely to differ much from that of the review
9. Were all important outcomes considered?				Consider whether there is other information you would like to have seen
10. Are the benefits worth the harms and costs?				Are the benefits worth the harms and costs?

APPENDIX C

DEFINITIONS OF HEALTH LITERACY

Profession	HL Definition
Nursing	
Sand-Jecklin *et al*., 2010	"The Institute of Medicine (IOM) defines health literacy as the ability to obtain, understand, and act on healthcare information and instructions" (para. 3).
Bilotta, 2012 (Dissertation)	Health literacy is a group of skills such as literacy, numeracy, comprehension, and decision-making that is used by people when they are in a health context (p. 7)
McCleary-Jones, 2012	"the degree to which individuals have the capacity to obtain, process, and understand basic information and services needed to make appropriate decisions regarding their health" (p.214)
Medicine	
Kripalani *et al*., 2006	None provided
Harper *et al.,* 2007	None provided
Hess & Whelan, 2009	None provided
Price-Haywood *et al*., 2010	"the degree to which individuals have the capacity to *obtain*, process, and *understand* basic health information and services needed to make appropriate health decisions (p. S126).
Roberts *et al*., 2012	"Health literacy, [is] the ability to read, understand, and act on health information" (p. 200)
Green *et al*., 2014	"Health literacy is the ability to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (p. 76).

Profession	HL Definition
Price-Haywood *et al*., 2014	"Health literacy (HL) is defined as the "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (p. 1113).
Bloom-Feshbach *et al*., 2016	None provided
Coleman *et al.,* 2016	"Health literacy is the degree to which individuals have the capacity to obtain, communicate, process, and understand basic health information and services needed to make appropriate health decisions" (p. 49).
Pharmacy	
Sicat & Hill, 2005	"Health literacy is commonly defined as the ability to read, understand, and act on health care information. Functional health literacy refers to an individual's ability to perform basic reading and numeric tasks in the health care context such as reading and comprehending prescription bottles, appointment slips, insurance forms, and other essential health-related information needed as a patient" (p. 460)
Devraj *et al*., 2010	"Health literacy, a set of skills necessary to function adequately in the health care environment, has been defined as the 'capacity to obtain, process, and understand health information and services needed to make appropriate health decisions" (p. 7).
Chen *et al.,* 2013	"the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (p.531).
Wilcoxen & King, 2013	"the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions." (p. 85)
Ha & Lopez, 2014	"The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (p. 1).

Profession	HL Definition
Trujillo, 2016	"Health literacy (HL) is the degree to which individuals can obtain, process, understand, and communicate health-related information needed to make health decisions" (p.1).
Dietetics	
Cotugna & Vickery, 2003	"ability to obtain/interpret/ understand health information and to use it to enhance health" (p. 879).
Health Care Management & Policy	
Riley *et al*., 2008	The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (p. 214)
Dental Hygiene	
Jackson *et al*., 2010	"the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (p. 6).
Multiple Disciplines	
Mackert *et al.,* 2011	"Health literacy is the ability of individuals to obtain, process, and act appropriately on health information" (e225)
Sullivan *et al*., 2011	None provided
Evans, 2014	None provided
Coleman & Fromer, 2015	"the degree to which an individual has the capacity to obtain, communicate, process, and understand health information and services in order to make appropriate health decisions" (p.388).

APPENDIX D

COGNITIVE PROCESS DIMENSION OF REVISED BLOOM'S TAXONOMY.

REPRINTED FROM (KRATHWOHL, 2002)

Cognitive Domain	Descriptor	Related Verbs		
1.0 Remember 1.1 Recognizing 1.2 Recalling	Retrieving relevant knowledge from long-term memory	know identify relate list	define recall memorize repeat	record name recognize acquire
2.0 Understand 2.1 Interpreting 2.2 Exemplifying 2.3 classifying 2.4 Summarizing 2.5 Inferring 2.6 Comparing 2.7 Explaining	Determining the meaning of instructional messages, including oral, written, and graphic communication	restate locate report recognize explain express	identify discuss describe review infer	illustrate interpret draw represent differentiate conclude
3.0 Apply 3.1 Executing 3.2 Implementing	Carrying out or using a procedure in a given situation	apply relate develop translate use operate	organize employ restructure interpret illustrate demonstrate	practice calculate show dramatize exhibit
4.0 Analyze 4.1 Differentiating 4.2 Organizing 4.3 Attributing	Breaking material into its constituent arts and detecting how the parts relate to one another and to an overall structure or purpose	Analyze compare probe inquire examine contrast categorize	differentiate contrast investigate detect survey classify deduce	experiment scrutinize discover inspect dissect discriminate separate
5.0 Evaluate 5.1 Checking 5.2 Critiquing	Making judgments based on criteria and standards	judge assess compare evaluate conclude measure deduce	argue decide choose rate select estimate	appraise value criticize infer validate consider
6.0 Create 6.1 Generating 6.2 Planning 6.3 Producing	Putting elements together to form a novel, coherent whole or make an original product	Compose produce design assemble create prepare predict modify tell	plan invent formulate collect set up generalize document combine relate	propose develop arrange construct organize originate derive write propose

APPPENDIX E

MODIFIED HEALTH LITERACY KNOWLEDGE AND EXPERIENCE SURVEY

(HL-KES)

Please, answer all three questions below to check your eligibility to participate.

Q1 Are you a junior or senior?
- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To Sorry, you are not eligible to participate in this survey. Thank you for your interest.

Q2 Is your major health education/promotion?
- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To Sorry, you are not eligible to participate in this survey. Thank you for your interest.

Q3 Do you plan to take the Certified Health Education Specialist (CHES) exam?
- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To Sorry, you are not eligible to participate in this survey. Thank you for your interest.

Modified Health Literacy Knowledge and Experience Survey

Part 1: Health Literacy Knowledge

Directions: Questions 1-29 are multiple-choice questions. Choose the best answer for each question.

1 Low health literacy levels are most prevalent among which of the following age groups?
- ❍ 16 to 24 years of age
- ❍ 25 to 34 years of age
- ❍ 35 to 44 years of age
- ❍ 45 to 54 years of age
- ❍ 55 years of age and older

2 Low health literacy levels are common among which of the following ethnic groups?
- ❍ African Americans
- ❍ Hispanic Americans
- ❍ White Americans
- ❍ All ethnic groups

3 The research on health literacy indicates that:
- ❍ The last grade completed is an accurate reflection of an individual's reading ability.
- ❍ Most individuals read three to five grade levels lower than the last year of school completed.
- ❍ If an individual has completed high school they will be functionally literate.
- ❍ if an individual has completed elementary school they will be functionally literate.

4 What is the likelihood that a health educator working in a public health clinic, primarily serving low- income minority patients, will encounter a patient with low health literacy skills?
- ❍ almost never
- ❍ occasionally
- ❍ Often
- ❍ very often

5 The best predictor of health status is:
- ❍ socioeconomic status
- ❍ literacy
- ❍ gender
- ❍ educational level

6 Individuals with low health literacy skills:
- ❍ rate their health status higher than those with adequate literacy skills
- ❍ experience fewer hospitalizations than those with adequate health literacy skills
- ❍ are often prescribed less complicated medication regimens than those with adequate health literacy skills
- ❍ are often diagnosed late and have fewer treatment options than those with adequate health literacy skills

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

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

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

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

11 When working with individuals who have low health literacy skills, the health educator should keep in mind that these individuals:

- may not admit that they have difficulty reading
- will readily share that they need assistance with written information
- will frequently ask questions about information they do not understand
- should not be expected to manage their healthcare since they cannot read

12 Which of the following questions would provide the health educator with the best estimate of reading skills of an individual?

- What is the last grade you completed in school?
- Do you have difficulty reading?
- Would you read the label on this medication bottle for me?
- Do you need eye glasses to read?

13 Which statement best describes the Test of Functional Health Literacy? This instrument is:

- used to assess the reading comprehension and numerical skills of an individual
- only available in English and therefore has limited use with immigrants
- an effective tool for assessing the reading level of individuals
- recommended for determining the reading level of written healthcare materials

14 What is the strongest advantage to conducting health literacy screenings? Health literacy screenings:

- provide health educators with a good estimate of the educational level of individuals
- will help health educators to be more effective when providing healthcare teaching
- can be used to diagnose learning difficulties that serve as barriers to healthcare teaching
- assist healthcare agencies to comply with educational standards established by the Joint Commission on Accreditation of Health Organizations

15 Which of the following statements, made by the health educator, would be the best approach to starting a health literacy screening with a patient?

- It is necessary for me to assess your reading level; this will take a few minutes and it is very important.
- I need to conduct a test to see if you can read, please read these words for me.
- I want to make sure that I explain things in a way that is easy for you to understand; will you help me by reading some words for me.
- I need to administer a reading test to you. If you cooperate this will not take long.

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

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

18 Which of the following is true with regards to written healthcare information?
- Most healthcare information is written at an appropriate reading level.
- Illustrations can improve an individual's understanding of written information.
- Individuals are usually provided with information that they think is important to know about their healthcare status.
- Overall, individuals comprehend written information better than verbal instructions.

19 The recommended reading level for written healthcare information is:
- 5th grade
- 8th grade
- 10th grade
- 12th grade

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

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

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

23 When listing side effects for a treatment, the health educator should limit the list to:
- ❍ 2-3 items
- ❍ 5-6 items
- ❍ 10- 12 items
- ❍ 15-20 items

24 Written healthcare information provided to an individual related to a specific disease should include:
- ❍ only three or four main ideas about the disease
- ❍ all treatment options available to manage the disease
- ❍ a detailed explanation of the pathophysiology of the disease
- ❍ statistics on the incidence of the disease

25 Which of the following would be the most effective wording for a heading in a brochure on hypertension?
- ❍ HYPERTENSION: THE SILENT KILLER
- ❍ Symptoms of high blood pressure
- ❍ How do I know that I have high blood pressure?
- ❍ What factors contribute to hypertension?

26 The best way to ensure that a breast cancer prevention brochure is culturally appropriate is to:
- ❍ review research on the community's culture.
- ❍ obtain input from healthcare professionals who have worked in the community.
- ❍ explore the types of materials currently available.
- ❍ include community members in the design of the brochure.

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

28 Which of the following approaches to health education provides minimal opportunity for the learner to actively engage in learning?

- ❍ Incorporating short answer questions periodically throughout written healthcare materials and providing space for the learner to write responses.
- ❍ Instructing the learner to watch a video after providing written healthcare instructions
- ❍ Planning a question answer session in small groups after completing a learning activity
- ❍ Providing pictures for the learner to circle in response to questions asked in a healthcare brochure

29 The most effective way for a health educator to determine how well an individual with low health literacy skills understands healthcare information is to:

- ❍ Utilize a pre-test before instruction and a post-test following instruction.
- ❍ Ask the question, "Do you understand the information I just gave you?"
- ❍ Have the individual teach back the information to the health educator.
- ❍ Verbally asking the individual a series of questions following instructions.

Health Literacy Knowledge and Experience Survey
Part 2: Health Literacy Experiences

Directions: Questions 30-38 ask you to describe how often you participated in learning activities related to health literacy. Choose the response that best describes your health literacy experiences while enrolled in the health education program.

30 How frequently is health literacy emphasized in your health education curriculum?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

31 How often do you use a health literacy screening tool to assess the health literacy skills of an individual?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

32 How often do you evaluate the reading level of written healthcare materials designed to be used for teaching?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

33 How often do you evaluate the cultural appropriateness of healthcare materials, including written handouts, videos, audiotapes, designed to be used for teaching?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

34 How often do you evaluate the use of illustrations in written healthcare materials designed to be used for teaching?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

35 How often do you use written materials to provide healthcare information to an individual or community group?

- ❍ Never
- ❍ sometimes
- ❍ Frequently
- ❍ Always

36 How often do you use audiotapes to provide healthcare information to an individual or community group?

- ❍ never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

37 How often do you use videotapes to provide healthcare information to an individual or community group?

- ❍ Never
- ❍ sometimes
- ❍ Frequently
- ❍ Always

Q38 How often do you use computer software to provide healthcare information to an individual or community group?

- ❍ Never
- ❍ Sometimes
- ❍ Frequently
- ❍ Always

Health Literacy Knowledge and Experience Survey
Part 3: Demographic Data

Directions: Questions 39-44 relate to demographic data. Choose the responses that characterize you best.

39 Gender

- ❍ Male
- ❍ Female

40 Race

- ❍ American Indian/Alaska Native
- ❍ Asian
- ❍ Black or African American
- ❍ Native Hawaiian or Other Pacific Islander
- ❍ White
- ❍ More Than One Race
- ❍ Unknown

Q41 Prior educational experience
- ❍ No prior degrees
- ❍ At least one undergraduate degree before entering my current health education program
- ❍ At least a master's degree before entering my current health education program.

43 My classification is:
- ❍ Junior (1)
- ❍ Senior (2)
- ❍ Neither junior nor senior (3)

44 How frequently do you interact with healthcare providers for your own personal healthcare needs or the healthcare needs of a significant other?
- ❍ Every few years
- ❍ At least once a year
- ❍ Three to four times a year
- ❍ more than four times a year

45 Please select your age range.
- ❍ 18-20 years old
- ❍ 21 - 23 years old
- ❍ 24 - 26 years old
- ❍ older than 26

Q66 What is the name of your school?

Q67 Please provide the email address to which you want the gift card to be sent.
Note: Gift cards will only be sent to your email address provided to you by your school.

Display This Question:
If Are you a junior or senior? No Is Selected
And Is your major health education/promotion? No Is Selected
And Do you plan to take the Certified Health Education Specialist (CHES) exam? No Is Selected
Q67 Sorry, you are not eligible to participate in this survey. Thank you for your interest.