Nursing Perspectives on Health Literacy Challenges and Strategies:
A Systematic Review

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Abstract: The challenges of health literacy have been observed to be inconsistent. However, many variables have been found to be correlated with health literacy across the globe. This systematic review thoroughly investigated the relationships between health literacy interpretation and the challenges faced during the delivery of key components of interventions in health literacy education. It was done using the 15 studies with 7,383 subjects. The three main variables of the study were the following: 1) language literacy, which most strongly influences health literacy in clients'/patients' interpretations of instructions pertaining to their care (ES = 23); 2) influential factors in the clients'/patients' ability to understand medical terminologies (ES = 20); and (3) practitioners' estimate of patients'/clients' specific need for health literacy (ES = 15). The findings showed that language literacy was one of the major challenges in health literacy even though the reviewed studies did not consider how it creates interpretation discrepancies. However, in these trials, the implications were that health care practitioners encountered difficulties in estimating patients'/clients' needs for health literacy. The need was present in situations of low language literacy because its articulation was limited by language ability. Hence, health literacy interpretation and the challenges faced during the delivery of the key components of the interventions in health literacy education were positively related. This study showed the importance of prioritization of identified areas of concern as part of the recommendation. This was done in order to reduce the incidence or prevalence of health literacy in the Kingdom of Saudi Arabia. Thus, the stakeholders will be able to identify their priorities in managing the problems encountered by the health care team and the entire health care delivery system. Furthermore, this study included the insights of the Ministry of Health in creating programs based on the identified concepts. It also presented recommendations for addressing the growing difficulties in health literacy not only in Saudi Arabia but also across the Gulf Countries.

Key words: Health Literacy · Education Intervention · Awareness · Challenges · Nursing management

INTRODUCTION

According to the Institute of Medicine (2004), "Health Literacy is the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions." [1]. Studies have proven that over half the world's patient/client population is unable to interpret basic healthcare information [2,3]. Importantly, this dysfunction signals a real health care dilemma because it increases the risk of medical errors [2]. It also leads to faulty or wrong diagnoses of diseases that are based on the information and data provided by the patient during the patient-physician interaction [3]. Many interventions have been adopted in the attempt to enhance health literacy worldwide. They include simplifying instructions by adding illustrations and avoiding jargon that cannot be understood by the patients [4]. Other interventions include the employment of teaching methods that encourage patient participation and the use of enhanced questioning techniques while taking patient histories [4-6].

Although the evaluation of these strategies has shown marked improvement in individual behavior among certain social groups, health literary continues to be a global concern for many reasons. Immense changes have

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been made in the processes that involve the delivery of healthcare services to individuals [5]. Changes in technology seem to be very difficult for the ordinary elderly patient because they cannot understand the medical instructions properly [6]. Moreover, the elderly are unable to comply with and efficiently follow these new changes in the medical technology. Consequently, the United States of America Department of Health and Human Services and Healthy People 2020 initiative included health literacy as a new concern. Health literary must be addressed in the coming decade because of its increased occurrence in the medical community. For the effective prevention of medical errors caused by inadequate medical health literacy, it is imperative to develop distinct objectives that assist policy executors in designing their interventions [7].

It is mandatory that individuals are knowledgeable about using healthcare services. This knowledge is also required so that individuals can take suitable and appropriate decisions about their health care. Compared to the traditional interpretation of literacy, health literacy allows individuals to develop their thinking, investigation, analysis and reading capabilities. It also helps them to decode certain information, charts, symbols that can be viewed in the medical reports. They can also weigh the benefits and risks associated with their medical and health-related decisions. The phenomena of health literacy can be applied to the environment, materials and implications that are associated with the avoidance of diseases and health support [8, 9].

The Healthy People 2020 initiative is based on the idea that individuals should possess a basic understanding of health care services. Only then would individuals be designated as health literate and thus be able to make healthcare decisions that suit them. Health care professionals must possess the knowledge about patient-physician contact, labeling medical instructions, information regarding health publications and patient history. Moreover, health care professionals should be knowledgeable about public health training, informed consent, assessments of medical professionals and speech pathology [9].

Systematic reviews, involve a detailed and comprehensive plan and search strategy with the goal of reducing bias by identifying, appraising and synthesizing all relevant studies on a particular topic. Often, systematic reviews include a meta-analysis component which involves using statistical techniques to synthesize the data from several studies into a single quantitative

estimate or summary effect size [10]. While meta-analysis is a statistical process that allows the synthesis of quantitative research results with the ultimate goal of advancing knowledge and theory formulation. The meta-analysis provides the basis for policy development and patient safety and care [11]. In this systematic review, health literacy variables were identified, as well as specific challenges encountered by health care practitioners. Moreover, clients and patients were correlated with the independent variable of health literacy [12].

Previous researchs conducted on health literacy [5, 7, 8] found correlations of the many variables that contribute to health literacy challenges globally. However, the studies lacked comprehensive data that could be validated when empirical measurements were applied. Consequently, language literacy, clients'/patients' ability to understand medical terminologies and practitioners' estimation of patients/clients' specific needs for health literacy were determined [12]. These were found to be the most consistent dependent variables related to the independent variable of health literacy [13, 14]. Based on these previous findings, the researchers investigated the following three questions:

- How does language literacy influence health literacy in clients'/patients' interpretation of instructions pertaining to their care?
- What influences the ability of clients/patients to understand medical terminologies?
- How do practitioners estimate patients'/clients' specific needs for health literacy?

The aforementioned variables were examined through a meta-analysis and thorough investigation of the existing research (studies in the literature) on health literacy. Corresponding criteria and extraction procedures were conducted.

Related Literature and Studies: Each country places importance on the health literacy issue when it develops quality health care delivery. Strategies have been implemented to address the concerns of each client/community [15]. A wide range of interventions can be carried out through a series of research investigations in order to improve delivery of health services. This section presents the meta-analysis of the literature and the studies carried out on health literacy. The analysis is presented with the final themes that emerged from the review of the studies that passed the criteria.

Health literacy is defined as a patient's/client's capability to gather, comprehend, interpret and apply information about healthcare in making suitable health judgments. It also means following treatment instructions correctly. Previous studies showed that the numerous definitions of health literary depend on cultural relevance [13,15]. Moreover, in 21st century, health literacy has become a sensitive public health concern across the globe. Therefore, the relevant context of the issue must be placed within a frame of reference in terms of setting. The demands, individuals' accountability for the delivery of the process and the skills used to communicate health literacy to the recipient have to be known [15].

Language literacy is further defined in relation to health literacy as demonstrating competence in interpreting medication/diagnostic testing instructions and health promotion guidelines. This is done by utilizing the language that is practiced in the social group within the patient/client's environment. trials had been conducted to investigate the shared relationship of literacy, culture, language and the importance of addressing their connection in health literacy [2, 13, 15]. The results of these studies provided evidence that the strategies developed to improve health literacy in low-literate communities do not embrace the cultural diversity of distinct groups [2]. These groups encounter below average or low English proficiency (LEP) and are unresponsive to health care interventions because of the inability to communicate fluently in English. The researchers strongly recommended that an integrated health care vision must be offered by clinicians to patients and clients with limited English competence [13,15]. In addition, health care organizations and departments of education have a responsibility to improve the quality of health literacy. For the success of basic health outcomes, it is imperative that this vulnerable population become fluent in reading and writing English. Proficiency in English will facilitate them in communicating health information and making strong, suitable medical decisions for themselves [16, 17].

Additional dependent variables were clients'/patients' ability to understand medical terminologies and practitioners' estimation of patients'/clients' specific needs for health literacy. These were defined after the systematic review of the studies retrieved from the literature. In this systematic review, the clients'/patients' ability to understand medical terminologies is defined as their competence to read and interpret basic healthcare information [18]. Moreover, health care information entailed establishing the validity and reliability of the test, which comprised of 18 items on the ability of patients to interpret medical data. The number of correct answers was found to be 20% to 87% of the medical data interpretation test scores (on a scale from 0–100 scale) and the general distribution was median 61.1, mean 61.0, range 6-94. Reliability was average (test-retest correlation = 0.67, Cronbach's alpha = 0.71). Evidence of construct validity was demonstrated on many occasions. Higher scores were identified among the individuals with the highest education (69 v. 42, P = 0.004), the highest versus the lowest numeracy (71 v. 36, P<0.001) and the highest quantitative literacy (65 v. 28, P<0.001). The scores of the 15 physicians who completed this trial were considerably elevated compared to the participants who had various postgraduate degrees (mean score 89 v. 69, P<0.001) [18].

For the purpose of this systematic review, the estimation of patients'/clients' specific need for health literacy is considered because all health care professionals should be aware of a patient's capability to read or interpret instructions. The underlying assumption is that the standard approaches formerly used to estimate this health literacy feature may now be obsolete. This study emphasized that the materials used in medication instructions ought to be revised and aligned with the specific needs of individuals. Furthermore, the study's results revealed that documents in health care settings, such as consent forms and diagnostic testing preparation instructions, have not been fully researched for adequacy and relevance in the 21st century.

Table 1: Conceptual Definitions

Concept	Definition
Health literacy	Ability to gather, read, interpret and apply healthcare information in making suitable health decisions. In addition, it means correctly following treatment instructions [15]
Language literacy	Language literacy means demonstrating competence in interpreting medication/diagnostic testing instructions and health promotion guidelines utilizing the language expression practiced in a social group within the patients'/client's environment [2]
Clients'/patients' ability to understand medical terminologies	The competence to read and interpret basic healthcare information [18].
Practitioners' estimation of patients'/clients' specific need for health literacy	Health care practitioners' awareness of deficiencies in a patient's/client's ability to read or interpret instructions [16].

Significantly, no documentation exists regarding the implications for a patient's dignity when low literacy issues surface [16]. Table 1 presents the different terms used in the study and their conceptual definitions.

MATERIALS AND METHODS

The majority of the data used in older systematic reviews and meta-analyses were added to new data. However, in this systematic review, only studies published from 2000 to 2014 were considered. Studies earlier than 2000 were excluded because data become obsolete and irrelevant after a certain number of years. The purpose was to gather essential data pertaining to health literacy worldwide in order to establish relationships between health literacy interpretation and the challenges faced during the delivery of key components related to education interventions.

This study utilized a mixed methods quantitative and qualitative research design. The researchers conducted a systematic review by first identifying studies in the literature that were relevant to the main problem. Inclusion criteria for the studies reviewed were utilized. The data were managed by synthesizing the results of each study that was reviewed. This research method was used to extract 15 studies from the selected researches based on the criteria. A review of published data was combined with the statistical analyses. A pooled analysis was conducted on different studies by using their data (computed the q value). Thematic derivations from the selected literature were taken into consideration. Detailed discussions regarding the literature search and study selection were provided in the following sections.

Literature Search: Only studies published in English were included in this systematic review. Because of time and cost constraints in the extraction of the grey literature on health literacy, it was decided that only published studies would be used. It is important to note that this is a limitation of most meta-analyses conducted in the modern era [19]. A librarian assisted in guiding the selection of the studies that were the most appropriate studies for this investigative study. This ensured that the most reputable electronic databases were searched using different techniques. Consequently, an extensive database search on health literacy was conducted. The databases included PubMed (2000–2014), Google Scholar (2000–2014) and Medline (2000–2014). The search was facilitated by the Ovid Database, Cumulative Index for Nursing and Allied Health Literature (CINAHL) and the Institute for Scientific Information (ISI) software.

The key words applied in the search emerged from the constructs was found in the systematic review [20]. They included health literacy, health literacy education intervention, practitioners' health literacy awareness and health literacy challenges. The Boolean strategy operations AND and OR were applied in refining the searches to ensure that the key words were fully explored in the data base search. A total of 572 abstracts were retrieved. The number of articles found were as follows: Pub Med (326), Google Scholar (142) and Medline (114). It must be noted that these figures revealed primarily distinct citations that were presented in the databases during each search. Therefore, it must also be understood that restricting a literature search to computerized databases means losing access to more than 50% of the actual studies that might have been available [20].

Therefore, secondary search techniques, such as "footnote chasing," had to be applied. These were executed to facilitate the identification of additional articles, which may have been eligible, but could not be accessed by using the other techniques. The same key words were used in the initial computerized search to locate articles of interest and to select additional articles [20]. Fortunately, an additional article was retrieved from the database by using the refined search techniques.

Study Selection: The studies that were selected for inclusion in this systematic review were based on the following criteria:

- They were published during the period 2000–2014.
- They contained quantitative investigations of experimental data.
- The samples included health literacy practitioners and clients/patients.
- The sample size and individual subgroups were reported.
- They presented enough numerical data to calculate the sizes of relationships among the health literature and health literacy.
- They included other dependent variables of interest.
- They were published in English.

In addition, studies that did not differentiate between health literacy, language literacy and the challenges associated with each were not excluded from this systematic review. Every abstract used in this systematic review was derived from the initial computerized search and was screened for inclusion criteria (N = 900). Five hundred (500) abstracts were found to be not eligible. In other words, 55% of the abstracts were screened.

They were not included because the basic concepts targeted in the systematic review could not be measured statistically by the qualitative methodology. Four hundred reports were excluded in the computerized investigative intervention (n = 400) and footnote chasing (n = 1). Subsequently, full manuscript articles were acquired. Every article was evaluated and 350 (80%) articles were disqualified because they did not include correlations between health literacy and any of the predetermined concepts/variables.

Fifty (50) studies were then left for consideration. Two authors applied all the inclusion criteria necessary to conduct this systematic review. They were independent studies conducted by three competent researchers in the health literacy discipline.

Ultimately, an agreement of 96% was reached regarding the inclusion criteria. The differences were thoroughly discussed and compromises were made. In the final analysis, a further 37 studies were eliminated for the following reasons: (a) the sample consisted of school children and not literate adults; (b) the study did not accurately account for separate data on the subgroups in the model; (c) lack of sufficient information to calculate an effective size; and (d) two studies were unpublished. Finally, 15 studies passed the criteria and were included in the final extractions of "Health Literacy: Challenges and Strategies." Specifically, every report yielded a distinct/unique research study that was applicable to health literacy and associating variables.

Data Collection: Two types of data collection were conducted: data coding and data abstraction. The information retrieved from the studies was assembled on a form that identified the type of data required. A quality rating scale was designed to evaluate the integrity of the study. Specifically, the data coding form displayed the characteristics of the studies, such as design, measures and sample sizes and composition. The coded items included the authors' names, publication year, sex, education, mean years of experience, study settings. They also included methodology, length of trial, results, health literacy interventions and clients'/patients' health literacy competence. Another coder was recruited to facilitate this process. There was a 90% consensus on the results achieved by the coding.

Quality assessment is a main feature of systematic review research. It was applied to detect potential threats to internal and external validity in randomized control trials. The study definitions are usually descriptive. The scales developed to measure quality and evaluate the efficacy of randomized controlled trials, particularly inner validity. While quality analysis is important in systematic review research, there are still gaps in calculating the validity, which requires alternative contemporary measurements [21]. Further criteria for determining the appropriateness of articles with regard to the study design, results, sample and specific elements pertaining to health literacy were developed. Because all 15 studies selected for the systematic review consisted of eloquent correlation designs, the quality assessment indicators proved to be the most relevant to this methodology [22].

Data Analysis: The Comprehensive Systematic review [23] software package was used to conduct the data analysis. The correlations between health literacy, language literacy, clients'/patients' ability to understand medical terminologies, practitioners' estimation of patients'/clients' need for health literacy deemed as associated constructs were removed from the studies analyzed in this systematic review. The z and Q-statistics then were applied to each relationship detected [24].

Next, Fisher's r-to-z transformation was used to determine the normalized distributions and stabilization of variances. A 95% confidence interval (CI) was constructed after a mean z-value, which was calculated using sample sizes. Subsequently, a homogeneity test, or Q-statistic, was conducted to determine whether the dispersion effect ranges surrounding the mean were greater than the anticipated sampling error. The Q-statistic was distributed as a Chi-square with k1 degrees of freedom [24].

RESULTS

The sample characteristics utilized data on 7,383 participants in the 15 studies selected for this systematic review. The mean age was reported in six studies as (n¼ 2,020) 42 years in a range from 21-82 years. The education status of patients/clients was reported in five studies (33%).

Table 2 shows the application of the criteria to the studies on health literacy. These criteria showed that in 100% of the studies, the research questions were explained and the participants in the sample were explained. The place where the study conducted was described in 82% of the studies. Description of data collection method was clear in 76% of the studies. The response rate was revealed in 90% of the studies. The operational definition of the outcome variable was clearly

Table 2: Percent Agreement of Quality Rating Scale

Items	Percentage (%)
Research question(s) clearly explained	100
Participants in sample explained	100
Place where study was conducted mentioned	82
Description of data collection method clear	76
Response rate was revealed	90
Operational definition of the outcome variable was clearly articulated	92
Sample reliability for health literacy instrument was provided	78
Overall study quality rating	86

Table 3: Study Characteristics

References	Sample size	Quality Rating Index	Health literacy q value
Yu X.Q., J.S. Li, S.Y. Li, Y. Xie, M.H. Wang, H.L. Zhang, H.F. Wang and Z.W. Wang, 2013. Functional and psychosocial effects of pulmonary Daoyin on patients with COPD in China: study protocol of a multicenter randomized controlled trial. J Integr. Med.; 11(2): 140-146. DOI: 10.3736/jintegrmed2013015. [25]	232	7	.3
Wu, J. R., G. M. Holmes, D. A. DeWalt, A. Macabasco-O'Connell, K. Bibbins-Domingo, B. Ruo, D. W. Baker, D. Schillinger, M. Weinberger, K.A. Broucksou, B. Erman, C.D. Jones, C.W. Cene, M. Pignone, 2013. Low Literacy Is Associated with Increased Risk of Hospitalization and Death among Individuals with Heart Failure. J. Gen. Intern. Med., 28(9): 1174-80. doi: 10.1007/s11606-013-2394-4. [26]	595	8	.7
Baker, D.W., J.A. Gazmararian, M.V. Williams, T. Scott, R.M. Parker, D. Green, J. Ren and J. Peel, 2002. Functional Health Literacy and the Risk of Hospital Admission among Medicare Managed Care Enrollees. Am. J. Public Health, 92(8): 1278-1283. [27]	3260	8	.4
De Walt, D., R.M. Malone, M.E. Bryant, M.C.Kosnar, K.E. Corr, R.L.Rothman, C.A. Sueta and M.P. Pignone, 2006. A Heart Failure Self-Management Program For Patients of All Literacy Levels: A Randomized, Controlled Trial. BMC Health Serv. Res., 6: 30: 2-10. [28]	123	9	.7
De Walt, D.A., D. Schillinger, B. Ruo, K. Bibbins-Domingo, D.W. Baker, G.M. Holmes, M. Weinberger, A. MacAbasco-O'Connell, K. Broucksou, V. Hawk, K. L. Grady, B. Erman, C. A. Sueta, P. P. Chang, C. W. Cene, J. R. Wu, C. D. Jones and M. Pignone, 2012. A Multisite Randomized Trial of a Single- versus Multi- Session Literacy Sensitive Self-Care Intervention for Patients with Heart Failure. Circulation, 125 (23): 2854–2862. Doi:10.1161/CIRCULATIONAHA.111.081745. [29]	605	7	.7
Kaiser, K., D. Jonas, Z. Warner, K. Scanlon, B.B. Shilliday and D.A. Dewalt, 2011. A Randomized Controlled Trial of a Literacy-Sensitive Self-Management Intervention for Chronic Obstructive Pulmonary Disease Patients. J. Gen. Intern. Med., 27 (2): 190–195. DOI: 10.1007/s11606-011-1867-6. [30]	99	9	.2
Paasche-Orlow, M.K., K.A. Riekert, A. Bilderback, A. Chanmugam, P. Hill, C.S. Rand, F.L. Brancati and J.A. Krishnan, 2005. Tailored Education May Reduce Health Literacy Disparities in Asthma Self-Management. Am. J. Respir. Crit. Care Med., 172 (8): 980-986. Doi: 10.1164/rccm.200409-1291oc. [31].	73	9	.45
Ng B.H.P, H.W.H. Tsang, A.Y.M. Jones, C.T. So and T.Y.W. Mok, 2011. Functional and Psychosocial Effects of Health Qigong in Patients with COPD: A Randomized Controlled Trial. The Journal of Alternative and Complementary Medicine. 17(3): 243-251. doi:10.1089/acm.2010.0215. [32].	80	7	.32
Rothman, R., A.D. DeWalt, R. Malone, B. Bryant, A. Shintani, B. Crigler, M. Weinberger and M. Pignone, 2004. The Influence of Patient Literacy on the Effectiveness of a Primary-Care Based Diabetes Disease Management Program. JAMA, 292:1711-1716. [33]	217	7	.6
Schillinger, D., J.Piette, K. Grumbach, F. Wang, C. Wilson, C. Daher, K. Leong-Grotz, C. Castro and A. Bindman, 2003. Closing the Loop: Physician Communication with Diabetic Patients Who Have Low Health Literacy. Arch. Intern. Med., 163: 83-90. [34]	112	7	.34
Schillinger, D., A. Bindman, F.Wang, A. Stewart and J.Piette, 2004. Functional Health Literacy and the Quality of Physician-Patient Communication among Diabetes Patients. Patient Education and Counseling, 52: 315–323. [35].	408	7	.34

Table 3: Continued

Daubenmier, J., E. Epel, P. Moran, J. Kristeller, M. Acree, P. Bacchetti, M. Kemeny, M. Dallman, R. Lustig, C. Grunfeld, D. Nixon, J. Milush, V. Goldman, M. Kiernan, S. Noworolski, B. Laraia and F. Hecht, 2014. A Randomized Controlled Trial of a Mindfulness-Based Intervention for Metabolic Health in Obese Adults. Journal of Alternative & Complementary Medicine, 20 (5): A15. [36].	194	7	.3
Zoellnera, J., 2014. Talking Health: A Pragmatic Randomized-Controlled Health Literacy Trial Targeting Sugar-Sweetened Beverage Consumption among Adults: Rationale, Design and Methods. Contemporary Clinical Trials, 37 (1): 43–57. [37].	340	7	.56
Seligman, H.K., F.Wang, J. Palacios, C. Wilson, C. Daher, J. Piette and D. Schillinger, 2005. Physician Notification of their Diabetes Patients' Limited Health Literacy. A randomized, controlled trial. J. Gen. Intern. Med., 20 (11): 1001–1007. DOI: 10.1111/j.1525-1497.2005.0189.x. [38].	245	7	.7
Xu, W. H., R.L. Rothman, R. Li, Y. Chen, Q. Xia, H. Fang, J. Gao, Y. Yan, P. Zhou, Y. Jiang, Y. Liu, F. Zhou, W. Wang, M. Chen, X. Y. Liu and X.N. Liu, 2014. Improved Self-Management Skills in Chinese Diabetes Patients through a Comprehensive Health Literacy Strategy: Study Protocol of a Cluster Randomized Controlled Trial. Trials, 15 (498): 1745-6215. doi: 10.1186/1745-6215-15-498. [39].	800	9	.5

Legend: H=high quality (8 or 9) and M=moderate quality (5, 6, or 7); = low quality (below 5)
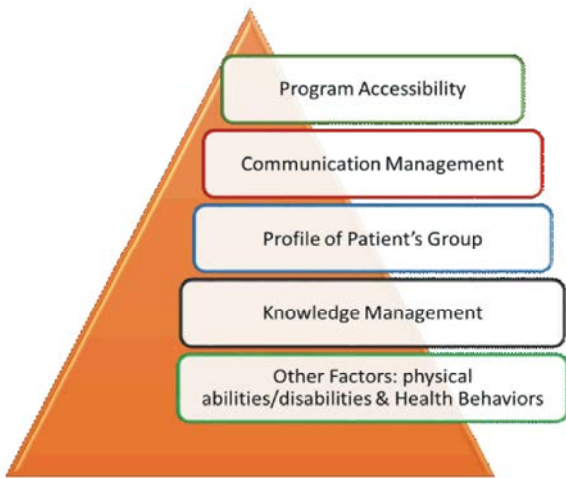

Fig. 1: Derived Themes from the 15 Studies on the Health Literacy

articulated in 92% of the studies. The sample reliability of the health literacy instrument was indicated in 78% of the studies. The overall quality rating derived from the criteria was included in 86% of the studies. The properties of the studies are shown in Table 3.

Table 3 presents the sample size, the quality rating index and the health literacy, individual q value of the 15 studies reviewed according to the set criteria. The table shows that the quality rating index ranged from 0.2 to 0.7 and the health literacy q value ranged from 7 to 9. Hence, the 15 selected studies had moderate to high quality ratings as reflected in the aforementioned results. The sample size was not significant to the quality ratings. Regardless of the sample size, the literature was interpreted as either of high quality or of low quality.

Publication Bias: Publication bias was calculated by applying a fail-safe N, which gives an estimate of the numbers of studies that possess an average effect size of zero. This was calculated to assess the average effect size needed for the studies to be eligible for the current systematic review at a significance level (p< 0.05) [40]. A safe principle in accounting for publication bias is the following: the fail-safe N goes beyond 5Kþ10 where K is the total number of studies [24]. The calculations found that N did not exceed 5Kþ10. Thus, it could be concluded that the publication bias was minimal.

The concepts that emerged in the first extraction are presented in Table 4. After classifying these concepts into the coded themes, namely: Self-Management Skill; Knowledge Management; Profile of Patient Group; Program Accessibility; Communication Management; and Other Factors, seven final themes had been concluded.

Figure 1 presents the themes derived from the 15 studies on the health literacy from a nursing perspective, which were reviewed and analyzed. The following were derived in hierarchical order: theme 1, program accessibility; theme 2, communication management; theme 3, profile of patient group; theme 4, knowledge management; theme 5, other factors, including physical abilities, disabilities and health behaviors.

The three main variables identified were the following: 1) language literacy influences health literacy in clients'/patients' interpretation of instructions pertaining to their care; 2) influential factors in the clients'/patients' ability to understand medical terminologies; and 3) practitioners' estimate of patients'/ clients' specific need for health literacy. The analysis of the themes revealed that theme 1 was categorized under

Table 4: Emerging Concepts from the First Extraction

CONCEPT EXTRACTION / FINAL THEME

Emerging Concepts	Coded Theme	FINAL THEME
-Literacy-sensitive self-management intervention.	SMS- Self Management Skill	Themes derived from the 15 articles:
-Literacy-sensitive self-management intervention.	SMS	1. Program Accessibility
-Self-management skills.	SMS	2. Communication Management
-Adequate health literacy to improve hospitalization and health knowledge.	KM-Knowledge Management	3. Profile of Patient's Group
		4. Knowledge Management
		5. Other factors
		5.1. Physical abilities and disabilities
		5.2. Health behaviors
-Program for single session intervention aside from multisession and determine the criteria for selection of participants.	PP-Profile of Patient Group	
-Group of patients literacy who will be included in the program	PP	
-Access to program to reduce health disparities.	PA- Program Accessibility	
-Good communication on literacy	CM- Communication Management	
-Responsible and active partners in health care	CM	
-Communication techniques that are effective for	SMS	
patients with low health literacy.	PP	
-Delivery of health-related services	PA	
-Sensitivity to the limited health literacy capabilities within this population.	PA	
-Patient's level of understanding of various information. Patient's ability	CM	
to use the information in making healthcare decisions based on the	PA	
information accessed is also an important part of health literacy.		
- Communication levels of patients.	CM	
-Physician's explanations of processes of care; empowerment; and	KM	
consideration of patient's desire and/or ability to adhere to treatment plans.	PP	
-Profile of the target population	CM	
-Communication problems in the health.	PA	
-Literacy problems in system-wide approach.	PA	
-Patients' ability to read and understand information that they need for	KM	
their health care or health education.		
-Ethnicity, background, location of patients. As cultural barriers,	PP	
language variations and differing educational opportunities.		
-Physical abilities and disabilities as factors in low literacy.	OF-Other Factors	
-Profile of the patients, (ethnographic profile) should be considered	PP	
-Web designers as an effort to reach out and ease the learning process and		
as a potential source to address barriers.	PA	
-Literacy program to reduce the risk of hospitalization and death.	PA	
- Health literacy behaviors of the patients.		
-Health behavior programs can be developed.	OF	

SMS = Self-Management Skill; KM = Knowledge Management; PP = Profile of Patient Group; PA = Program Accessibility; CM = Communication Management; OF= Other Factors

Table 5: The Five Final Themes and the Three Variables

Final Themes	Variable 1	Variable 2	Variable 3
Program Accessibility	/		/
Communication Management		/	/
Profile of Patient Group		/	/
Knowledge Management	/	/	
Other Factors: physical abilities and disabilities; health behaviors.		/	/

variables 1 and 3, theme number 2 was categorized under variables 2 and 3, theme 3 was categorized under variables 2 and 3, theme number 4 was categorized under variables 1 and 2 and theme 5 was categorized under variables 2 and 3. There was an equal categorization for each theme per each major variable found in the study (Table 5).

DISCUSSION

Three research questions guided this systematic review: (1) How does language literacy influence health literacy in clients/patients interpretation of instructions pertaining to their care? (2) What influences clients'/patients' ability to understand medical terminologies? (3) How do practitioners estimate patients/clients' specific need for health literacy?

The quality rating assigned to the 15 studies selected had an over-all average rating of 7.66, signifying a moderate to high quality index. The three variables that emerged through this meta-analysis were the following: 1) language literacy; 2) clients'/patients' ability to understand medical terminologies; and 3) practitioners' estimation of patients'/clients' need for health literacy. The relationships between and among the variables were investigated in terms of health literacy interpretation and the challenges faced during the delivery of key components in health literacy education interventions.

In this study, the examination of the 15 selected studies yielded seven themes. Language literacy was most strongly related to health literacy (ES¼.23), followed by clients'/patients' ability to understand medical terminologies (ES¼. 20) and practitioners' estimation of patients/clients' specific need for health literacy (ES¼. 15) [37, 41].

CONCLUSIONS

One of the greatest impediments to health literacy is the lack of profound knowledge about health language. Previous studies have not taken into account the discrepancies in the understanding of health language. This systematic review found that health care practitioners face difficulties and impediments when they estimate and evaluate the healthcare needs of patients/clients. The reason is that patients do not have the medical knowledge required to express their medical or health related issues. Moreover, the systematic review elucidated that the challenges and interpretation issues in health literacy that occur during the provision of healthcare services are positively related to the intervention in health education and health literacy.

The study's findings also illuminated areas of concern regarding health literacy. Based on the findings of the meta-analysis performed in this study, it is recommended that the Kingdom of Saudi Arabia should prioritize measures to reduce the incidence rate of health illiteracy. The stakeholders involved in this issue then could discuss their health problems. Furthermore, health care teams and the entire health care delivery system could prioritize and manage the issues that they face during the provision of health care services.

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