

8-13-2013

A Systematic Review of Health Literacy Interventions and Policies and the Effect on the Health Outcomes of Limited English Proficient (LEP) Patients

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**A SYSTEMATIC REVIEW OF HEALTH LITERACY INTERVENTIONS AND POLICIES
AND THE EFFECT ON THE HEALTH OUTCOMES OF
LIMITED ENGLISH PROFICIENT (LEP) PATIENTS**

BY

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A CAPSTONE SUBMITTED TO THE GRADUATE FACULTY
OF THE SCHOOL OF PUBLIC HEALTH AT GEORGIA STATE UNIVERSITY
IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA

SPRING 2013

APPROVAL PAGE

A SYSTEMATIC REVIEW OF HEALTH LITERACY INTERVENTIONS AND POLICIES
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ABSTRACT

Melissa Duong

A Systematic Review of Health Literacy Interventions and Policies and the Effect on the Health Outcomes of Limited English Proficient (LEP) Patients

(Under the direction of Bruce Perry, MD MPH)

Limited English Proficient (LEP) patients are subject to low patient health outcomes due to limited health literacy. Cultural and linguistic barriers prohibit the obtainment and comprehension of health information and services. This systematic review will present the complications of healthcare experienced by LEP patients and will provide an analysis of interventions and policies that will be a gateway to better health outcomes for the LEP patient population.

INDEX WORDS: systematic review, health literacy, limited English proficiency, LEP, Asian, Hispanic, deaf, interventions, policies

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CHAPTER I

Introduction

With the upcoming reforms that the Patient Protection and Affordable Care Act (ACA) promises, there is increasing concern for the patient consumer's awareness and ability to understand and access the United States (U.S.) healthcare system. Policies are in place to ensure all Americans access to healthcare by mandating that everyone be enrolled in a health insurance plan, whether it is by an employer, government, or private insurance. Efforts have been made to simplify the process of "shopping" for insurance plans, such as the provision of private insurance exchanges offered by each state, where consumers may choose the healthcare plans that best suit their medical needs (ASPA, 2013).

Increased access to health services comes with the need for increased access to health information. The diverse U.S. patient population requires additional mechanisms, such as interventions and policies, which specifically address the varied needs of each vulnerable patient population. For example, limited English proficient (LEP) patients experience lower health literacy rates, due to language barriers and cultural beliefs. In turn, limited health literacy makes LEP patients more susceptible to lower health outcomes. This paper will present the complications of healthcare experienced by LEP patients and will provide an analysis of interventions and policies that will be a gateway to better health outcomes for the LEP patient population.

CHAPTER II

Background

Literacy

The National Center for Education Statistics (NCES) sponsors the U.S.'s most comprehensive assessment of adult literacy to date. As defined by NCES, literacy is the ability of “adults to use printed and written information to adequately function at home, in the workplace, and in the community” (“National Assessment of Adult Literacy (NAAL), n.d.”). In 2003, NCES conducted its second nationally representative survey, the National Assessment of Adult Literacy (NAAL), with a sample size of 19,000 adults, ages 16 and older. NAAL measured a person’s knowledge and skill in performing three types of literacy tasks: prose (use of continuous texts, such as editorials, instructional materials, etc.); document (use of noncontinuous texts, such as job applications, maps, etc.); and quantitative (balancing a checkbook, figuring out a tip, etc.).

From the first assessment in 1992 to 2003, literacy levels of the general American public have been stable in prose and document literacy, with a significant increase in quantitative literacy (“National Assessment of Adult Literacy (NAAL),” n.d.). The earlier assessment found that vulnerable populations, such as the elderly, immigrants, minorities, and low-income individuals, have “basic” or “below basic” reading levels (Schillinger et al., 2002). NAAL estimates that out of the 11 million “nonliterate” adults, 4 million could not take the test because of language barriers (“National Assessment of Adult Literacy (NAAL), n.d.”), indicating that language is a strong factor of literacy levels.

Health Literacy & Its Implications

The effect of health literacy on patients and their health outcomes is gaining awareness as a public health issue. In 2004, the Institute of Medicine (IOM) acknowledged the importance of health literacy in health promotion and protection in its report, Health Literacy: A Prescription to End Confusion. Thereby, the phrase *health literacy* was ultimately defined as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (“Health Literacy,” n.d.).

Inevitably, Americans do not equally possess the same or even comparable rates of health literacy. This ability is determined by one’s level of education, culture, and language, and just as importantly, the characteristics of one’s healthcare environment (Ratzan & Parker, 2000). More than one-third of American adults have limited health literacy levels. In a study of 103 patients admitted to the Internal Medicine Hospitalist Service in Vermont, where the population consists mostly of educated, native English speakers, 60% of inpatients, 33-51% of outpatients, and 15-50% of adults in emergency departments are reported to have limited health literacy (Morris, Grant, Repp, MacLean, & Littenberg, 2011), emphasizing the need for patients and family members to fully understand and comply with post-discharge instructions. The 2003 NAAL was the first national assessment to measure health literacy in the U.S. Only 28% of Whites had basic or below basic health literacy rates, as compared to 31% of Asians, 37% of Multiracial Persons, 48% of American Indians, 58% of Blacks, and 66% of Hispanics (Kutner, Greenberg, Jin & Paulsen, 2006).

Similar to the measurement for literacy rates, health literacy encompasses five different literacy components: reading, writing, numeracy, oral (speaking), and aural (listening) (Ratzan & Parker, 2000). A community-based study of 618 residents of Boston, MA and Providence, RI

showed that one's level of reading ability is not directly proportionate to one's oral and aural skills (Schonlau et al., 2011). Therefore, health information and communications should be disseminated and expressed in both written and verbal forms to reflect the variability in Americans' literacy skills.

Health literacy further amplifies the health disparities that already plague the U.S. healthcare system and plays an important role in one's health status. By being able to read, understand, and act on health information, such as prescription drug labels, health education fliers, and physician instructions (Kim & Keefe, 2010; Schonlau, Martin, Haas, Derose, & Rudd, 2011), patients can reduce their risk of hospitalization, prescription medication errors, premature death (Mullins, Blatt, Gbarayor, Yang, & Baquet, 2005), and unnecessary diagnostic testing (Gany, Leng, Shapiro, Abramson, Motola, Shield, & Changrani, 2007).

Because of the unfamiliarity of Westernized culture and medical care, LEP patients often have difficulty navigating and accessing the U.S. healthcare system. Most LEP patients have low income, and thus, lack health insurance and the ability to pay for costly procedures (Burke et al., 2004). They are unknowledgeable of which services and healthcare options are available, and they experience great difficulty scheduling and getting to appointments due to language discordance and a lack of transportation (Burke et al., 2004; Uba, 1992). The inability to speak fluent English places some LEP patients in a cultural and social isolation.

LEP Asian patients may also underestimate the risks of associated conditions and diseases due to prior false misconceptions, and in turn, neglect taking appropriate preventive measures to maintain good health. For example, Asian women with no symptoms or family history of breast cancer disregard the need for annual mammograms, deeming it "unnecessary" (Wu & Ronis, 2009). In a pilot study surveying cancer knowledge among Asian Americans in

Philadelphia, PA, it was found that most Asians could not determine the risk factors of cancer (Phipps, Cohen, Sorn, & Braitman, 1999). The fallacy that nothing can be done about cancer also deters Asian patients from seeking care. Likewise, a similar study on cervical screening among Cambodian women in Seattle, WA showed that women who exhibited no symptoms, have no history of STDs, or who are abstinent or premenstrual think that they are not at risk for cervical cancer. This misunderstanding of risk, compounded by sentiments of embarrassment, pain, or fear of testing and other consequential procedures (such as a hysterectomy), reduces the likelihood of cervical cancer screening among Cambodian women (Schillinger et al., 2002).

Not only does limited health literacy affect one's alacrity to seek health services, it also affects the patient's willingness to actively obtain health information through recommended and trusted health-related resources. In a study of 180 asthmatic and diabetic teenagers in Columbus, OH, 92% of subjects were adequately health literate, and 62% planned to access the recommended health-related websites to learn more about their condition. Participants with higher levels of literacy, namely older White females, expressed greater intent to use the recommended and trusted sites (Chisolm, Hardin, McCoy, Johnson, McAlearney, & Gardner, 2011).

Health literacy also determines the extent to which patients can self-manage their prescriptions and medical conditions. Not understanding the provider will reduce the patient's adherence to medical regimen and therapy guidelines (Mullins et al., 2005). For some patients, the unfamiliarity of Western medication results in unfilled prescriptions or disrupted course of treatments. Some LEP Asian patients typically stop taking their medications once the symptoms have ceased (Uba, 1992).

Limited English Proficiency (LEP) & Its Implications

Among minority groups, those who cannot speak English fluently, especially those foreign-born or immigrants, experience an additional barrier to healthcare: language. The U.S. Census Bureau estimated that 21.4 million people had limited English proficiency (spoke English less than very well) (Gany et al., 2007). The President's Advisory Commission on Asian Americans and Pacific Islanders reported that in 2002, 40% of Asian families have no one over the age of 14 who can speak English very well (Wang, Miller, Hufstader, & Bian Ying, 2007). Past and current research have only been able to focus on the well-aculturated minority groups in the U.S. who speak English fluently, have higher education and income, and have better health insurance, while excluding the minorities who cannot speak English well enough to answer survey questions (Kim & Keefe, 2010). Not surprisingly, this unaccounted-for population suffers from serious health disparities and is more in dire need of adequate healthcare. Language barriers, compounded by limited health literacy levels, drastically affect the quality of healthcare among many minority groups, especially LEP patients.

Limited health literacy leads to lower health outcomes, due to the patients' inability to comprehend health risks and conditions, uninformed decision-making during office visits, and inadequate self-management and self-care of chronic conditions and medical regimen. Particularly among patients who are not English-proficient, limited health literacy also translates to limited access to healthcare and decreased precaution for preventive care. In a Los Angeles study for colorectal cancer screenings among Korean Americans ages 40-70, language barrier was the reason that a quarter of the study population did not get screenings, preceded by lack of health insurance (41%) and no knowledge of where to go to get screenings (30%) (Jo, Maxwell, Wong, & Bastani, 2008).

Beyond the implication of language barriers, much of the reason that LEP patients do not easily obtain, process, and understand basic health information and services can be attributed to cultural barriers. Strong beliefs instilled by one's culture, especially those that view Westernized medicine in a negative light, may drastically affect one's attitude toward seeking care. For example, most first generation Asian Americans, especially the elderly, view suffering and illness as a natural and inevitable part of life (Kim & Keefe, 2010), and attribute etiology of illnesses to supernatural causes, such as an imbalance of yin and yang, an obstruction of chi, or a curse or punishment by evil spirits (Uba, 1992). The cultural emphasis on stoicism perpetuates the belief that one's life is predetermined and medical care for physical pain or illness is futile (Uba, 1992), which decreases the likelihood that these patients will seek medical care promptly, if at all.

A strong cultural distrust of Western medicine may prompt LEP Asians to first use traditional methods of care, such as herbal medicine, spiritual healers, or rituals, before seeking Westernized medical care. Due to the temporary physical markings and discoloration of the skin that may be caused by procedures, such as pinching, cupping, coining, or moxibustion, some Asians may delay seeking Westernized medical care for fear that the physician might misinterpret these markings as abuse (Uba, 1992). Thus, by the time they turn to Westernized medical care, their symptoms are much more severe, and their chances of successful treatment have decreased—consequences that they negatively attribute to Western healthcare (Uba, 1992), which only perpetuates their distrust of Westernized medical care.

The distrust of Western medicine is propagated by the unfamiliarity and lack of understanding of Westernized medical procedures. Asians frequently assume that all procedures and/or physician visits will result in an immediate treatment and diagnosis of their problems.

This flawed notion fuels the misconception that preventive or diagnostic measures, such as screenings and X-rays, are curative (Uba, 1992), and thus, greatly reduces the likelihood of follow-up care. In Denver, out of the 10% of Vietnamese refugees who sought Westernized medical care, only 27% returned for a follow-up visit (Uba, 1992). Furthermore, surgeries, invasive diagnostic techniques, and immunizations are seen as unnatural and pose dangers to one's spirit (Uba, 1992), and may sometimes be avoided although much needed.

Other cultural barriers to achieving proficient health literacy include cultural values that are placed on patient-physician interactions. Effective communication is the responsibility of both the healthcare professional and the patient. The IOM states that in order for patients to achieve the health goal of "active participation in encounters with healthcare professionals," they must be able to ask questions for clarification ("Health Literacy," n.d.). The ability to ask questions differs variably in different cultures. Patients need to feel comfortable with their healthcare providers in order to build rapport. Some cultures, particularly Asian cultures, "emphasize politeness, respect for authority, and avoidance of shame" (Uba, 1992). Because Asian patients regard physicians with a great deal of respect, there is a reluctance to ask questions or voice concerns about their treatment or prescribed medical regimen. This cultural value, coupled with the lack of bilingual healthcare providers, create frustration for LEP patients when they are unable to accurately communicate symptoms to providers and are unable to understand the explanations and reasoning behind diagnostic testing procedures, prescription medication, and the need for follow-up visits (Schonlau et al., 2011; Uba, 1992). The loss of control of one's illnesses and the inability to make personal healthcare decisions are ethical issues among many Asian and other LEP patients (Mullins et al., 2005).

The control of illnesses is often correlated with preventive measures and lifestyles. In regards to screening, Asian LEP patients are less likely to undergo invasive or vulnerable testing procedures, such as Pap smear testing or clinical breast exams, because of the awkwardness or discomfort of relying on a translator present in the room. However, they will participate in other screenings, such as mammograms, which tend to be more private and often do not need the presence of a translator (Jacobs, Karavolos, Rathouz, Ferris, & Powell, 2005). LEP patients often do not have a regular source of primary care and do not seek preventive care (Jacobs et al., 2005). Moreover, women who spoke a native language other than English were less likely than English-speaking or bilingual women to exercise regularly (Lim, 2010). Thus, language barriers greatly influence one's attitude towards preventive healthcare measures.

The Public Health Issue

The social ecological model establishes that there are many layers that influence the health of LEP patients, whether it is at the individual, community, or national level. Although it has been demonstrated that health disparities of LEP patients are multifaceted, the scope of this paper will focus on the various interventions and policies that are currently in place to promote better health outcomes and health literacy in LEP patients. By doing so, the author will ascertain the need for more attention to the sensitive health issues of the LEP patient population. Figure 1 shows the social ecological model of examples of interventions that help to mitigate health disparities within the LEP patient population.

FIGURE 1: Social ecological model of interventions appropriate to LEP patients



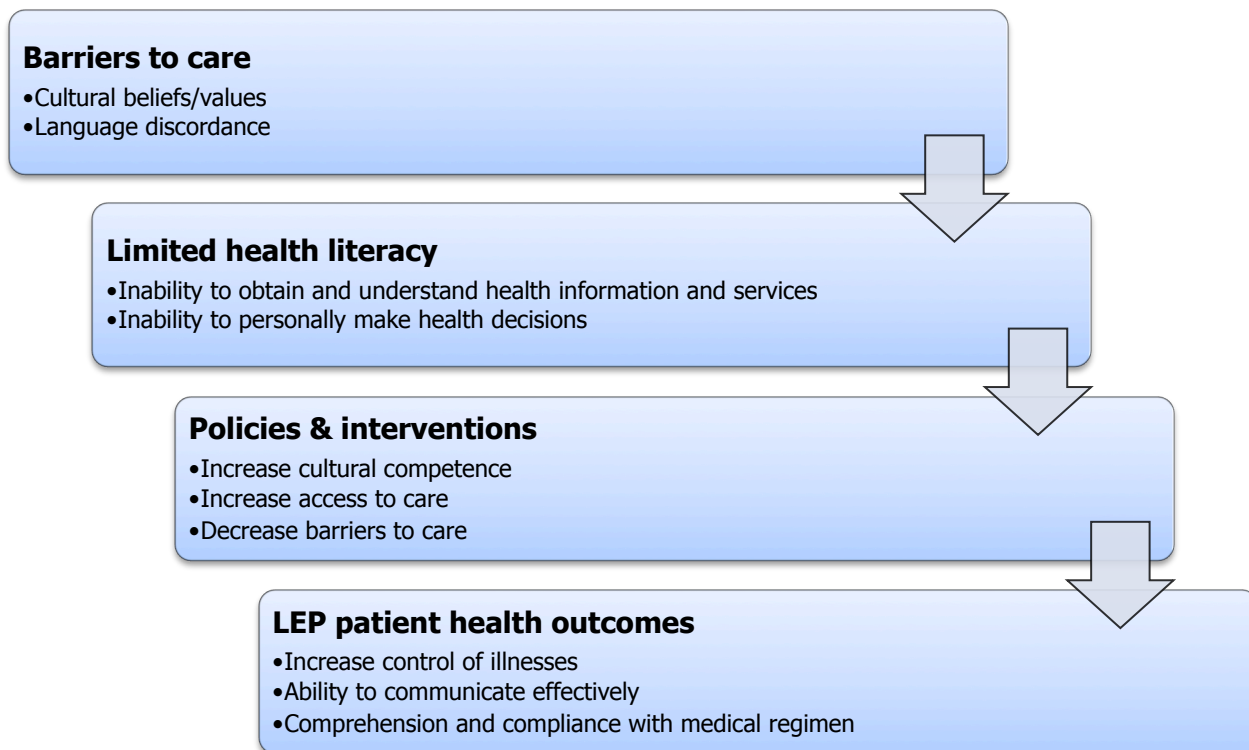
CHAPTER III

Methodology

Conceptual Framework

The methodology for this systematic review was developed after consultation with experts in health policy, health management, health disparities, and linguistic barriers to care. The databases included were deemed to contain the most relevant studies to the subject matter. The conceptual framework of this paper is to delineate the types of barriers to care that affect LEP patients, explain how limited health literacy contributes to the disparities of LEP patients, present interventions and policies that help mitigate these healthcare disparities, and demonstrate the subsequent effects on LEP patient health outcomes. Figure 2 shows a visual depiction of the conceptual framework used to guide this systematic review.

FIGURE 2: Conceptual framework for the review



Search Strategy

The search strategy for health literacy interventions targeted peer-reviewed, published literature found in four online databases, including the Academic Search Complete, Education Resources Information Center, Medline, and PubMed. Search strategies were developed for each database to include the phrases “health literacy” and “limited English,” being mindful that searches in the PubMed database required the use of medical subject headings (MeSH).

The search strategy for health literacy policies is similar to that of the strategy for interventions. For those papers that referenced policies, the original text of the policy was researched and analyzed.

Inclusion Criteria

To be included, the studies had to be undertaken in the U.S. and had to include interventions or policies that were targeted to promote health literacy and improve health outcomes in LEP patients. For example, some studies assessed rates of health literacy in LEP populations, but did not examine the effects of any particular intervention. Furthermore, articles that were descriptive studies, such as content analyses, or background papers were also excluded.

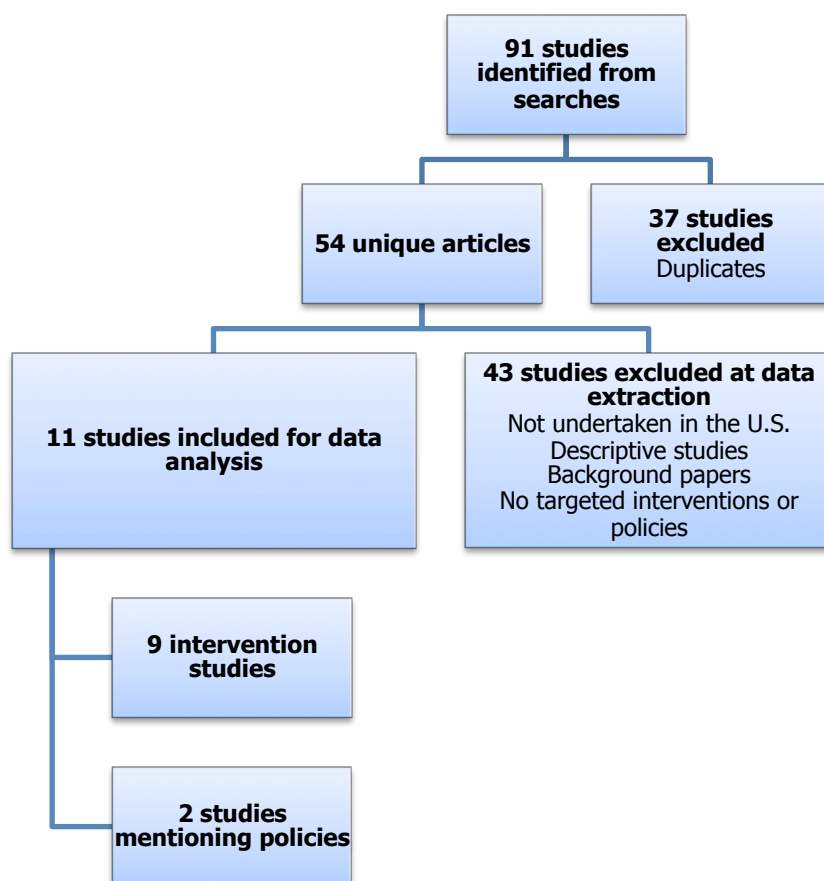
CHAPTER IV

Results

Because the search terms were very specific, only 91 studies were initially identified from the systematic search of the four databases. Of the original 91 articles, 37 were duplicates and were excluded, resulting in 54 unique studies. Upon review of the abstracts and full-text articles, 43 did not include targeted health literacy interventions or policies for LEP patients in the U.S., and were therefore eliminated. The remaining 11 studies were used for analysis.

Figure 3 shows the systematic search process with reasons for inclusion and exclusion of articles.

FIGURE 3: Flowchart of review



Interventions

Of the 11 articles that met the inclusion criteria, nine of the articles evaluated an intervention that targeted improving LEP patient health outcomes and health literacy levels. Table 1 shows a summary of the characteristics of the articles that met the inclusion criteria ($n=9$). In general, the nine articles included in the analysis had a very small sample size. Only two of the nine articles had a sample size that consisted of more than 200 people. Most of the articles focused on LEP Hispanic ($n=6$) and Asian patients ($n=5$), but only one article focused on interventions available for LEP deaf patients.

TABLE 1: Summary of characteristics of articles meeting inclusion criteria

Characteristics of Studies	Articles ($n=9$)
<i>Sample Size</i>	
$n < 200$	7
$n > 200$	2
<i>Sample population</i>	
LEP Asians patients	5
LEP Hispanics patients	6
LEP deaf patients	1
<i>Type of Intervention</i>	
Individual	8
Group	1
<i>Setting of Intervention</i>	
Clinic	5
Community	2
Pharmacy	2
<i>Effective Interventions</i>	
Translation system/aid	3
Visual aid	3
Plain language	1
<i>Positive Effect on Health Literacy</i>	
Obtaining health info	2
Understanding health info	6
Obtaining health services	1
Understanding health services	3

Of the interventions mentioned, only one of the articles included a group intervention; all of the others ($n=8$) consisted of an individual-level intervention. More than half of the articles ($n=5$) consisted of a clinical intervention approach; the remaining articles mentioned community ($n=2$) and pharmaceutical ($n=2$) interventions. One-third of the articles ($n=3$) used a translation method, whether it was a new translation system or a translation aid, such as foreign language or American Sign Language (ASL) interpreters. Another three articles used some form of visual aid, including an interactive questionnaire survey. One article used plain language as a method of effective communication.

In regards to improving health literacy, the majority of the articles ($n=8$) focused on health information; two improved the patients' ability to obtain health information, and six improved the patients' understanding of the given health information. Four of the articles concerned health services, such as an improvement in the patients' access to health services ($n=1$) and comprehension of the importance of the recommended health services ($n=3$).

Tables 2 and 3 describe the articles in greater detail. Table 2 shows the study designs and sample populations of the articles. Table 3 shows a summary of the interventions evaluated in the articles, including the effects on patient health outcomes and health literacy.

TABLE 2: Designs and samples of articles meeting inclusion criteria

Author(s)	Design	Sample
Bailey SC, Sarkar U, Chen AH, Schillinger D, and Wolf M (2012)	Randomized control study to test efficacy of ConcordantRx instructions to improve comprehension of LEP patients	202 LEP adults (ages 18-85) from San Francisco ($n=100$) and Chicago ($n=102$) community-based organizations
Fitzpatrick AL, Steinman LE, Tu SP, Ly KA, Ton TGN, Yip MP, and Sin MK (2012)	Pilot study to assess the use of Photovoice to understand perceptions of cardiovascular health in Asian elders	23 LEP Asian [Chinese ($n=7$); Vietnamese ($n=9$); Korean ($n=7$)] elders (ages 50-88) in Seattle, WA

TABLE 2 (Continued)

Author(s)	Design	Sample
Leyva M, Sharif I, and Ozuah PO (2005)	Cross-sectional survey to test comprehension of written Rx medication instructions among Spanish-speaking, LEP, Latino parents	100 LEP Latino parents (ages 18+) whose children (ages 5 and younger) attended 2 urban pediatric clinics in the Bronx, NY
Nguyen GT, Chen B, and Chan M (2012)	Cross-sectional survey to assess effect of message frames of informational material on knowledge and attitudes of HPV, HPV vaccine, cervical cancer, and PAP testing	162 LEP Chinese American women (ages 18+) in urban areas of the northeastern United States
Saraiya B (2010)	Case study to use SPIKES framework and professional interpretation service to relay information about cancer prognosis	1 60-year-old LEP Indian woman who had previously been diagnosed with non-small cell lung cancer
Schillinger D, Machtiger EL, Wang F, Chen LL, Win K, Palacios J, Rodriguez M, and Bindman A (2005)	Cross-sectional survey to assess clinician-patient concordance of patients' warfarin regimen	220 patients (ages 17+) from an anticoagulation clinic in San Francisco General Hospital
Seliverstov, I (2011)	2 case studies following patients' care in outpatient Anticoagulation Management Service (AMS) clinic	1 86-year-old LEP depressed Russian patient who did not comply with INR-testing. 1 45-year-old LEP (deaf) Hispanic patient who needed 3 months of warfarin management at AMS clinic
Soller RW, Chan P, and Higa A (2012)	Pilot study to assess accuracy of Fluential's Speaking Multilingual Interactive Natural Dialog System (S-MINDS) speech translation system	21 LEP Spanish-speaking patients (ages 21-85) with diabetes in San Francisco, CA
Vargas PA, Robles E, Harris J, and Radford P (2010)	Pilot randomized control study to assess the efficacy of paper and electronic Asthma Screening Questionnaire (ASQ) methods	47 LEP parents (ages 22-64) whose children had asthma in Southern California

TABLE 3: Summary of interventions and the effects on patient health outcomes and health literacy

Author(s)	Type & Setting of Intervention	Control Group / Independent Variable	Intervention Group / Dependent Variable	Effect on Patient Health Outcomes	Effect on Health Literacy
Bailey SC, Sarkar U, Chen AH, Schillinger D, and Wolf M (2012)	Individual; Pharmacy	Received standard instructions printed on prescription (Rx) bottles, with typical terminology and "times per day" approach for taking medication	Received ConcordantRx instructions printed on Rx bottles, with instructions developed using health literacy best practices, such as distinct time periods for taking medication, simpler terms, and numeric characters	Intervention group was significantly more likely to take single Rx medication appropriately, dose more medications correctly in multi-drug regimen, and simplify medication use by consolidating pills.	Improved comprehension of health information (on Rx medication usage)
Fitzpatrick AL, Steinman LE, Tu SP, Ly KA, Ton TGN, Yip MP, and Sin MK (2012)	Group; Community	None	Received a disposable camera to take pictures (within 10 days) that depicted their perception of heart health and barriers to care and education; group discussion (in native language) was held afterwards	Photographs stimulated conversation and promoted awareness of healthy dieting, physical activity, and stress management.	Successful method of obtaining health information (on cardiovascular disease and stroke)

TABLE 3: (Continued)

Author(s)	Type & Setting of Intervention	Control Group / Independent Variable	Intervention Group / Dependent Variable	Effect on Patient Health Outcomes	Effect on Health Literacy
Leyva M, Sharif I, and Ozuah PO (2005)	Individual; Pharmacy	None	Subjects were asked to correctly administer medication after reading English Rx label on Rx bottle, and asked to answer questions regarding information from Spanish drug information sheet (DIS)	22% correctly dosed medication after reading English Rx label; 29% correctly answered all questions pertaining to the Spanish DIS.	LEP results in limited comprehension of health information (on Rx medication dosage and drug information)
Nguyen GT, Chen B, and Chan M (2012)	Individual; Community	Informational material did not mention sexually transmitted nature of HPV	Informational material stated that "Almost all cases of HPV are transmitted through sex with an infected partner."	No statistical significance between the framing messages on HPV vaccination acceptability.	No effect on obtaining health services (vaccination)
Saraiya B (2010)	Individual; Clinic	None	Used SPIKES framework and professional telephone translators to convey news about worsening of cancer and discuss next steps in treatment	Improved; moving forward with procedures to test tumor for mutations that may lead to resistance.	Improved comprehension of health information (cancer) and health services (mutation analysis)

TABLE 3: (Continued)

Author(s)	Type & Setting of Intervention	Control Group / Independent Variable	Intervention Group / Dependent Variable	Effect on Patient Health Outcomes	Effect on Health Literacy
Schillinger D, Machtinger EL, Wang F, Chen LL, Win K, Palacios J, Rodriguez M, and Bindman A (2005)	Individual; Clinic	Verbal description of weekly warfarin regimen	Visual aid (digitized color menu of warfarin pills) to describe warfarin regimen	Cantonese speakers were over 4 times more likely than English speakers to become concordant when they reported regimen using visual aid.	Improved comprehension of health information (warfarin regimen). Patients with inadequate health literacy were 1.77 times more likely than those with adequate health literacy to be concordant when using visual aid.

TABLE 3: (Continued)

Author(s)	Type & Setting of Intervention	Control Group / Independent Variable	Intervention Group / Dependent Variable	Effect on Patient Health Outcomes	Effect on Health Literacy
Seliverstov, I (2011)	Individual; Clinic	None	Reassigned patient to Russian nurse. Enrolled patient in adult day care, where she met many other Russians. Adult day care also provided transportation to laboratory for INR-testing. Prescribed patient antidepressants. Used American Sign Language (ASL) interpreter to communicate warfarin regimen. Coordinated home visits with ASL interpreter and home care nurse. Implement use of Sorenson Video Relay Service for other deaf patients.	Improved compliance with INR-testing. Managed depression. Improved; had appropriate communication of warfarin regimen.	Improved access and comprehension of health services (INR-testing). Improved comprehension of health information and health services (warfarin regimen management).

TABLE 3: (Continued)

Author(s)	Type & Setting of Intervention	Control Group / Independent Variable	Intervention Group / Dependent Variable	Effect on Patient Health Outcomes	Effect on Health Literacy
Soller RW, Chan P, and Higa A (2012)	Individual; Clinic	Dragon, Jibbiga, Google	S-MINDS	Improved patient-physician dialogue. S-MINDS was 97-100% accurate on all translations. Patients' satisfaction was high (4.7-4.9 out of 5.0). S-MINDS outperformed 3 other translation systems when translating fast speech, speech disfluencies, and multiple noise conditions.	Improved method of obtaining health information, and improved comprehension of health information (diabetes).
Vargas PA, Robles E, Harris J, and Radford P (2010)	Individual; Clinic	Nurse-guided structured interview	Paper-and-pencil ASQ; Electronic ASQ	Parents using the electronic ASQ gave 68% more concordant answers with the nurse interview, compared to the 54% concordance rate of the parents who had paper ASQ.	Improved comprehension of health information (accurate portrayal of child's asthma symptoms).

Policies

Of the 11 articles that met the inclusion criteria, two described policies that related to LEP patients and health literacy. A total of four federal policies were extracted and researched for original text. Of these four, all implied an improvement in comprehension of health information, and one implied an improvement in access to health services, although none had any direct text that would signify a deliberate improvement in health literacy levels. Regarding the effects of the policies on the LEP patient population, one policy had no mention of LEP patients, one implied improved access to language-appropriate services and written health information materials (although this policy is not implemented federally), and two have no regulation on language-appropriateness. A summary of the policies can be found in Table 4.

TABLE 4: Summary of policies on health literacy and LEP patients

Article	Policy (Effective Date)	Summary	Effect on Health Literacy	Effect on LEP Patients	Federal Adherence
Bailey SC, Agarwal N, Sleath B, Gumusoglu S, and Wolf MS (2011) Regenstein M, Andres E, Nelson D, David S, Lopert R, and Katz R (2012)	Title VI of the Civil Rights Act of 1964	Prohibits discrimination based on national origin	(Implied) Improve access to health services and improve comprehension of health information	(Implied) Provide access to LEP patients, including language-appropriate patient counseling and written health information	No
Bailey SC, Agarwal N, Sleath B, Gumusoglu S, and Wolf MS (2011)	PUBLIC LAW 111-274: Plain Writing Act of 2010	Executive orders for federal agencies to distribute communications and information in "plain writing"	(Implied) Improve comprehension of health information	No mention	Yes

TABLE 4: (Continued)

Article	Policy (Effective Date)	Summary	Effect on Health Literacy	Effect on LEP Patients	Federal Adherence
Regenstein M, Andres E, Nelson D, David S, Lopert R, and Katz R (2012)	U.S. Food and Drug Administration (FDA) - Medicine Guides (2010)	FDA requires manufacturers of certain drugs and biological products to issue Med Guides	(Implied) Improve comprehension of health information for increased safety	Requirement for non-technical wording; no regulation on language-appropriateness or translations	Yes
Regenstein M, Andres E, Nelson D, David S, Lopert R, and Katz R (2012)	FDA, Title 21, Volume 5, Chapter 1, Subchapter D, Part 310, Subpart E, Section 310.515 (2013)	FDA requires patient package insert for specific new drugs or devices	(Implied) Improve comprehension of health information for increased safety	Requirement for non-technical wording; no regulation on language-appropriateness or translations	Yes

CHAPTER V

Discussion

Interventions

- Use of translation system and translation aid

Out of the nine studies examined, the top two interventions consisted of using a translation system or visual aids. Since language is a barrier for most LEP patients, it would make sense that using the patients' native language would ease patient-physician communication. Three case studies used professional interpreters to communicate health complications to a Russian, Indian, and deaf patient (Saraiya, 2010; Seliverstov, 2011). When patients are ethnically matched to their physicians and other healthcare professionals, the language barrier decreases and services, such as those in the mental health field, are improved (Wang et al., 2007). Culturally similar patient/physician relationships may also result in a higher patient satisfaction, adherence to medical regime, and decreased costs, as opposed to using interpreter services (Mullins et al., 2005). New healthcare information technology are constantly emerging, and some have proved to be 97-100% accurate when translating conversations in a clinical setting (Soller, Chan, & Higa, 2012). The use of professional interpreters and translation systems allow for more fluid conversation between patients and healthcare professionals because patients have the opportunity to ask further questions about their prognosis, risks, and treatment options. Translation systems may also provide more patient privacy and confidentiality because there is little need to rely on family members for translation.

Interpreter services also have several drawbacks due to the ethnic diversity in the Asian population, and even that within subgroups of many ethnicities. It may be difficult to find interpreter services that accurately match the exact dialect spoken by the patient (Wang et al.,

2007). Thus, the problem then becomes the amount of staff and resources allotted to provide multiple dialects of one language and none of another. Additionally, in the study surveying cancer knowledge among Asian Americans in Philadelphia, PA, it was found that even with the use of translators, patients were still reluctant to ask questions about cancer and prevention (Phipps, Cohen, Sorn, & Braitman, 1999). In her assessment of cultural barriers experienced by Asian Americans, Uba also points out that untrained translators might overemphasize diagnoses or minimize symptoms, resulting in erroneous treatment and/or unnecessary frights to the patients (Uba, 1992). The inability to communicate with and ask questions of healthcare professionals results in the patients' decreased satisfaction of healthcare as a result of perceived decreased involvement in the decision-making process.

- Use of visual aids

The use of visual aids to help facilitate communication was another trend observed among the interventions examined. Patients better accurately describe their warfarin regimen when using visual cues, such as a digitized color menu of warfarin pills, than when they were asked to verbally describe their medical regimen (Schillinger et al., 2005). Visual aids may help patients gain better control of their health conditions by allowing for visual association between the pills and the proper prescribed methods. In another study of parents with asthmatic children in Southern California, parents were better to express their child's asthma symptoms when using the electronic Asthma Screening Questionnaire (ASQ) than a paper-and-pencil method (Vargas, Robles, Harris, & Radford, 2010). The interactive technology may be useful in helping patients accurately recall symptoms. A novel study, drawing from the ideology of Photovoice, asked elderly Asian patients to use a disposable camera to take pictures of things in their community related to heart health and barriers to care and education (Fitzpatrick et al., 2012). This approach

allowed patients to share in small groups (more comfortably in their native language) their perceptions of cardiovascular disease, and to learn from one another and trained professionals how to better care for their health. Visual aids, such as photos, colored menus, and interactive tools, are effective interventions to help healthcare professionals communicate health information to LEP patients.

- Use of plain language

Several states, including California, Illinois, and Virginia, have begun testing a new pharmaceutical plain language approach to prescription writing. Bailey et al. conducted an evaluation of the approach, using a randomized control trial to measure the efficacy of ConcordantRx instructions compared to standard pharmacy instructions. The standard instructions had usual terminology with capital letters, using a “‘times per day’ approach to explain when medicine should be taken (i.e. ‘TAKE TWO TABLETS TWICE DAILY’)” (Bailey, Sarkar, Chen, Schillinger, & Wolf, 2012). On the other hand, the ConcordantRx instructions were developed using “health literacy best practices.” Time of day for taking medication was split into four time periods (morning, noon, evening, bedtime), and used numerical characters instead of spelling out the quantity. These instructions were also translated into the patient’s native language, when necessary. The researchers found that the patients with ConcordantRx instructions were more likely to dose their medications correctly, even when there were multiple medications involved. This study provides evidence to support the standardization and revision of current instructions on prescription medication labels. If patients are better able to understand the prescription instructions, they will be less likely to make errors when taking their medications.

One intervention that did not seem to have much correlation with a change in patient behavior was the message framing approach in the study conducted by Nguyen, Chen, and Chan. Half of the participants received informational material that mentioned the sexual nature of HPV, and the other half of the informational material did not. Regardless of the message framing, acceptability and willingness to be vaccinated against HPV was very low among the study participants (Nguyen, Chen, & Chan, 2012). Further research may need to be conducted to determine the cultural barriers that perpetuate the resistance of HPV vaccination and Pap testing in Asian communities.

Policies

Although there may be states that have implemented their own policies to increase LEP patient health outcomes, and there have been strong recommendations from national agencies, such as the U.S. Food and Drug Administration (FDA) or the Office of Minority Health at the U.S. Department of Health and Human Services, this section will only discuss policies that have been passed as federal law.

In summary, none of the four policies extracted had any direct wording to signify an improvement in health literacy, although there were implied improvements to comprehension of health information ($n=4$) and access to health services ($n=1$). One notable finding is that the general interpretation of the Title VI of the Civil Rights Act of 1964 implies that entities that receive federal funding must provide language-appropriate services and healthcare information to LEP patients (Bailey, Agarwal, Sleath, Gumusoglu, & Wolf, 2011; Regenstein et al., 2012; “Title VI of the Civil Rights Act of 1964,” n.d.). However, this is the only policy out of the four that does not have complete federal adherence. If this policy were better regulated, or more

clearly stated to include implications for the LEP patient populations, LEP patients may notice remarkable improvements in health literacy levels and patient health outcomes.

While the FDA's two regulations on providing Medicine Guides (MG) and patient package insert (PPI) for certain drugs and biological products require non-technical wording for comprehension in the general U.S. public ("CFR - Code of Federal Regulations Title 21," n.d.; Regenstein et al., 2012; U.S. Food and Drug Administration, n.d.), these policies may not be enough to accommodate the LEP patient population. For example, there are no current regulations on language-appropriateness and no non-English versions available for MG or PPI.

Since 2010, President Obama has issued four executive orders stating that communications and information disseminated by federal agencies be written in "plain writing" and be "clear, concise and well-organized" so that the public can understand and use ("Plain Writing Act of 2010," n.d.). These executive orders make a very profound statement about the direction and commitment of the federal government to health literacy. The executive orders hold government agencies accountable to transparency and public review, which sets a great example and precedence for other agencies to take the same approach. However, there is no mention of how this policy can directly be related to the LEP patient populations.

Policymakers should familiarize themselves with the diversity of LEP patients and create policies, taking into consideration one's primary language, ethnicity, health literacy, insurance, and immigrant status (Kim & Keefe, 2010) to address the various needs between ethnicities and subgroups of the LEP patient population in the U.S.

Limitations

Because the systematic search strategy had specific keyword searches and specific guidelines for inclusions of articles, there is the possibility that other interventions and policies

that pertain to LEP patients may have been excluded. For example, there were many other interventions found in the systematic search that were not eligible for inclusion in this analysis because the studies did not evaluate the interventions or because the full text was no longer available online because it may have contained personally identifiable information. For example, Singleton, an expert in cultural and linguistic barriers to health literacy, developed eight picture story modules to prompt beginner and low-literacy public school students in Fairfax County, Virginia to think about and discuss difficult topics (Singleton, 2001). This, like the other visual aids, allows patients to better obtain and understand health information.

Other examples of successful interventions that were found in the literature review but did not meet the inclusion criteria for the analysis of this systematic search include community outreach efforts and language-appropriate media. Direct community efforts may educate immigrants about their rights and help them gain access to available health services (Wang et al., 2007), dispute misconceptions of health (Phipps et al., 1999), and specifically target and address the diverse ethnic needs of various Asian cultures (Wu & Ronis, 2009). One such example of a successful intervention study that may prompt further evaluation includes home visits, small group presentations, counseling, medical interpretation, and transportation to help Cambodian women in Seattle take a more active approach to health (Schillinger et al., 2002) and participate in annual screenings for cervical cancer. Although quite influential, outreach at the community level may be difficult because it calls for a change in behaviors of culturally sensitive issues (Mullins et al., 2005).

Similarly, language-appropriate educational material can help to reduce the stigma and reluctance of various health conditions and medical procedures (Wang et al., 2007) by portraying the health information in a way that is easily understood by the respective communities, age- and

sex-appropriate groups (Mullins et al., 2005). One colorectal cancer study showed that 42% of participants preferred community educational seminars, 30% preferred language-appropriate media (television), and 20% preferred language-appropriate health promotional print materials (Jo et al., 2008). Another study in California demonstrated an increase in Asians calling a language-appropriate hotline to access tobacco cessation information (Zhu, Wong, Stevens, Nakashima, & Gamst, 2010). Language-appropriate intervention methods have shown a positive correlation with improved patient outcomes in the Asian community, and should be further researched in the general LEP patient population.

Future Directions

There is still much work that needs to be done to understand the specific needs of the LEP patient population. This paper solely establishes the urgent need and call to action to address the health concerns of LEP patients. With more resources, the author plans to research and compile a comprehensive resource packet of interventions that may be appropriate to clinical, community, and pharmaceutical settings. Future studies may also include a comprehensive policy analysis of all existing state policies that are LEP-sensitive. This project may be used to inform federal policies to influence awareness of LEP issues in all states.

Conclusion

LEP patients are subject to low patient health outcomes due to limited health literacy. Cultural and linguistic barriers prohibit the obtainment and comprehension of health information and services. Culturally competent healthcare professionals and policymakers are needed to raise awareness and demystify LEP issues in the clinical and political settings. Interventions, such as translation services, visual aids, and use of plain language, help bridge the patient-physician communication gap. There is a need for more policies to state, in plain language, its

protection of LEP patients, and proposed methods for increasing access and comprehension of health information and services to LEP patients. Further ethnic-driven, culturally-sensitive research will better pinpoint the specific needs within each subpopulation of LEP patients.

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