Language Access on the Frontlines: A Photovoice approach to Spanish in public space in Health Service Organizations along the U.S.-Mexico border. Martinez, Glen[1]. [1]University of Texas Pan American, Edinburg, Texas.

Background

Language access is an important determinant of unequal care and uneven health outcomes in Latino populations. Policy formation at the federal, organizational and state levels has been directed at improving language access for patients with limited English proficiency. The implementation of such policy, however, has not been uniform. Variation exists in language access measures by region, type of facility and access strategy. This paper examines the implementation of language access in the public space as prescribed in Standard 7 of the National Standards for Culturally and Linguistically Appropriate Services (CLAS) in a border region with high concentrations of LEP patients. The research questions to be addressed are: How is CLAS Standard 7 implemented in health service organizations? What patterns are evident in the distribution of Spanish and English signage and written materials in health service organizations? How do young bilinguals interpret the distribution of languages in public space.

Methods

A photovoice approach was used to gain access to community perceptions and interpretations of language access policies in the border region. A purposeful convenience sample of 20 young bilinguals was recruited. Participants were young adults between the ages of 18 and 22 who have acted as health information brokers in their families. An orientation meeting was conducted to familiarize participants with language access policies and with the methods of photovoice. Participants collected photographs that represented language access in clinics, hospitals, and doctor's offices in their communities and provided captions for each photo. Discussion groups were held to incite critical dialogue and reflection on the photos presented.

Results

The results showed that Spanish and English are unevenly distributed in public spaces within health service organizations. Photo evidence reveals that Spanish language signage and materials are focused primarily on "marketable" information, e.g., clinic hours of operation, payment options, services available. It also reveals that English language signage and materials include a broad array of information types including marketable information, disease prevention information, and health promotion information. Young bilinguals interpret this distribution as a persistent inequality that must be addressed in policy at federal, organizational, and state levels.

Conclusions

The results of this study point to an uneven implementation of federal language access policy in the border region. The photovoice approach to this issue provides a compelling means to reach policymakers in the state of Texas that are currently considering state level language access legislation.

Are we failing at measuring health literacy in individuals with diabetes? A systematic review and evaluation of available measures. Johnson, Jeffery[1]; Al Sayah, Fatima[1]; Williams Beverly[1]. [1]University of Alberta, Edmonton, Alberta, Canada

Background
The objectives of this systematic review were to identify instruments used to measure health literacy in individuals with diabetes, evaluate their use, measurement scope and properties, and propose the most useful, reliable, and applicable measure for use in research and practice settings.

Methods
A systematic literature review was conducted to identify the instruments, where nine electronic databases were searched and criteria for selection of studies and evaluation of instruments were specified. Nutbeam's domains of health literacy and a diabetes health literacy skill set were used to appraise the identified instruments and to evaluate their use in people with diabetes.

Results
49 studies were included, and one diabetes-specific (LAD) and five generic measures of health literacy were identified (REALM, TOFHLA and its shorter form s-TOFHLA, 16 brief screening questions and its briefer 3 question version, SILS, and 3-level health literacy scale). The identified instruments were categorized into direct and indirect measures. The most commonly used instruments measure selective domains of health literacy, focus mainly on reading and writing skills, and do not address other important components of health literacy such as verbal and written communication skills, navigating the health care system, and making appropriate health decisions. The structure, mode and length of administration, and measurement properties were found to affect the applicability of these instruments in clinical and research settings. The 16-brief screening questions are the most comprehensive, applicable and useful tool to screen for inadequate health literacy in this patient population.

Conclusions
This review provides guidance to practitioners and researchers for selecting the most suitable instrument for use in clinical settings and different research applications.

A Mixed Methods Study of Prescription Medication Self-Management Among Independent Community-Dwelling Older Adults Who Participate in a Health and Wellness Program in a Southern State.
Deupree, Joy[1]; Ivankova, Nataliya[1]; Geiger, Brian[1]. [1]University of Alabama at Birmingham, Birmingham, AL.

Background

During the next decade, an estimated 7,918 Americans will turn 60 years old every day. It is increasingly important to insure that older adults are health literate and are able to follow health care instructions. Misunderstandings place patients at risk for adverse drug events. Research indicates that nearly half of all American adults have limited literacy skills. The purpose of this two-phase mixed methods study was to explore how independent community-dwelling older adults who participate in a health and wellness program accurately self-manage prescription medications. Quantitative research questions explored the demographic characteristics, daily prescribed medications, and health literacy scores of participants who reside in a rural southern community. Qualitative research questions explored the role of health literacy in self-management of five or more daily prescriptions, and barriers and facilitators to accurate medication self-administration among older adults.

Methods

Fifty older adults, who are members of community senior citizens centers, completed a Demographic Questionnaire (DQ) and the Personal Medication Administration Record (PMAR). Fewer (15) completed the Test of Functional Health Literacy of Adults (TOFHLA) following administration directions. Quantitative data was analyzed using descriptive statistical methods. Using a maximal variation strategy and the information from the DQ, PMAR and TOFHLA, nine individuals were selected for follow-up qualitative multiple case study. Three distinct cases were composed of three individuals who scored within three health literacy levels measured by TOFHLA. Home interviews and observation of daily practices of medication self-administration were completed. Self-efficacy for personal medication self-management was measured using the Medication Adherence Self-Efficacy Scale. Researchers interviewed case managers and reviewed participants' case records. Analysis was conducted within each case and across cases.

Results

Most participants who completed all quantitative measures were female. Thirteen were at or between the ages of 70 to 74 with a mean age of 71.27 years. Eight were African Americans. Eight graduated from high school and eight were married. None were employed and all had health insurance. Nine of the 15 reported less than $15,000 of annual income. Four reported annual income between $15,000 and $25,000 and two did not reply. Qualitative analysis of cases revealed three themes: accuracy of prescription self-administration, issues related to medication adherence, and resources to assist with medication administration. Prominent sub-themes were community and social support, patient-provider communication, pharmacy support, confusion related to generics, medication side effects and self-efficacy. Themes and subthemes were confirmed during cross-case analysis.

Conclusions

Older adults who have community support to assist with daily prescription medication management may not fit a stereotypical presentation of someone with low health literacy.

Regardless of age, number of daily prescribed medications, levels of formal education or health literacy, participants were able to demonstrate error-free medication self-management. Comparison of data from multiple sources indicated no adverse drug events. This important finding is inconsistent with some previous research. Researchers surmised that community and social support is the likely explanation for successful self-management of multiple prescribed medications among participants.

Pediatric Oral Health in the Czech Republic; A Family Health Literacy Approach.

Herman, Ariella[1]. UCLA Anderson School of Management, Los Angeles, CA

Background
The project was designed to evaluate the adaptability of the model developed by the Health Care Institute (HCI) at UCLA to an international environment. For this purpose, a family-based pilot in the Czech Republic was implemented with the goal of bringing oral health prevention to parents and their school aged children.

Methods
Children (ages 7-9) and their parents from primary schools in Prague (N=151) and in Ostrava (N=149) participated. A comparison of results between the urban and rural settings was part of the initial design. At the outset, each child underwent an oral hygiene assessment including evaluation of plaque levels by use of disclosing tablet staining. Results were scored in a standardized way. Each parent filled out a knowledge and behavior survey. Following the initial assessment, separate training sessions were held for parents and for children (in their classrooms). Monthly reinforcement materials were distributed to the families after the training. At a return visit six months later, a reassessment of dental hygiene and plaque levels was performed on the children and parents were resurveyed.

Results
Alarming findings at baseline revealed 82% of children in Ostrava and 62% of children in Prague had never flossed. Parents in both cities reported visiting the ER for gum pain for their children. Following the intervention in both urban and rural settings, parents showed improvements in oral health knowledge and children in oral health outcomes. The strongest behavior changes were found in Ostrava: children who never flossed their teeth decreased from 82% to 47%; no significant behavior change was seen in Prague (62% pre to 61% post). Hygiene levels were scored on a scale of 1-3, with 1 representing good oral hygiene and 3 representing poor oral hygiene. The hygiene index in Prague improved from 2.12 to 1.76 and in Ostrava from 1.98 to 1.67. At the 6 month visit, both groups of children demonstrated a 50% reduction in plaque index levels.

Conclusions
The training intervention was effective in producing knowledge change, self reported behavior change for dental hygiene practices in the home, and reduction in objective findings of plaque in the children. The measured improvements in knowledge and behavior with this low cost intervention have the potential to lead to better oral health for children long term, which in turn, could lead to reduced overall oral health costs. A preliminary observation that the magnitude of the change in parental knowledge was relatively small compared to the more substantial improvement in oral health of the children led the authors to an intriguing speculation that including the children in the training seemed to amplify the effectiveness of the intervention. The fact that health outcomes improved independent of the level of improvement in parent's knowledge and behavior led to the conclusion that the training of the children, which is the common factor between the two cities' implementation, ultimately led to the change in health outcomes. This comprehensive family, low literacy approach can be an important factor in improving oral health outcomes.

Table1: Pre-Post Results for Parents(n= 300)

	PRE		POST	
Behavior	**Ostrava**	**Prague**	**Ostrava**	**Prague**
Children never floss their teeth	82%	62%	47%	61%
Children teeth never cleaned by a dentist or dental hygienist?	76%	67%	60%	47%
Main source of information dentist/clinic	84%	80%	62%	82%
Take child to ER when tooth or gum pain	22%	18%	19%	12%
	PRE		POST	
Knowledge (% right)	**Ostrava**	**Prague**	**Ostrava**	**Prague**
BEST method for preventing rotten teeth (cavities)?	56%	70%	86%	88%
How often do you need to replace your toothbrush?	60%	67%	81%	79%
BEST description of dental sealants	25%	42%	85%	94%
What would you do if your child knocks out a tooth?	16%	33%	62%	45%

Development of a Definition and Framework for Verbal Exchange Health Literacy.

Valerio, Melissa[1]; Harrington, Kathy[2]. [1]University of Michigan School of Public Health, Ann Arbor, MI; [2]University of Alabama at Birmingham, Birmingham, AL.

Background

The Institute of Medicine's report on health literacy describes reading, writing, speaking, listening and numeracy as necessary skills for use of health information in decision making.1, 2 To date, health literacy conceptual models, assessments and efforts to improve abilities among the population have been primarily focused on the appropriateness of written communications. Yet for an individual, much of the health information they seek and receive is gained from listening and speaking, an exchange with health care providers.1, 3 Other factors that influence patient ability to use health information, such as socioeconomic status, social support, and physical and emotional well-being related to the health care setting have been documented.4 Given our expanding understanding of health literacy, we define health literacy as an array of constructs, including verbal exchange health literacy (note "oral" refers to dentistry). Our aim was to develop a working definition and conceptual model of the verbal exchange health literacy construct.

Methods

We reviewed current definitions and models of health literacy, current methods of screening and assessment of health literacy, and examined the health literacy, general literacy and communication literature to identify and represent contributing factors, influences and relationship to verbal exchange health literacy. We developed a working definition of verbal exchange health literacy. After listing all potential influences, we collapsed like factors and grouped them using a card sort procedure. Each group was then reviewed and assigned an overall label. Considering other conceptual models of health literacy,4-9 we developed a visual representation depicting the relationships among factors contributing to the verbal exchange health literacy construct..
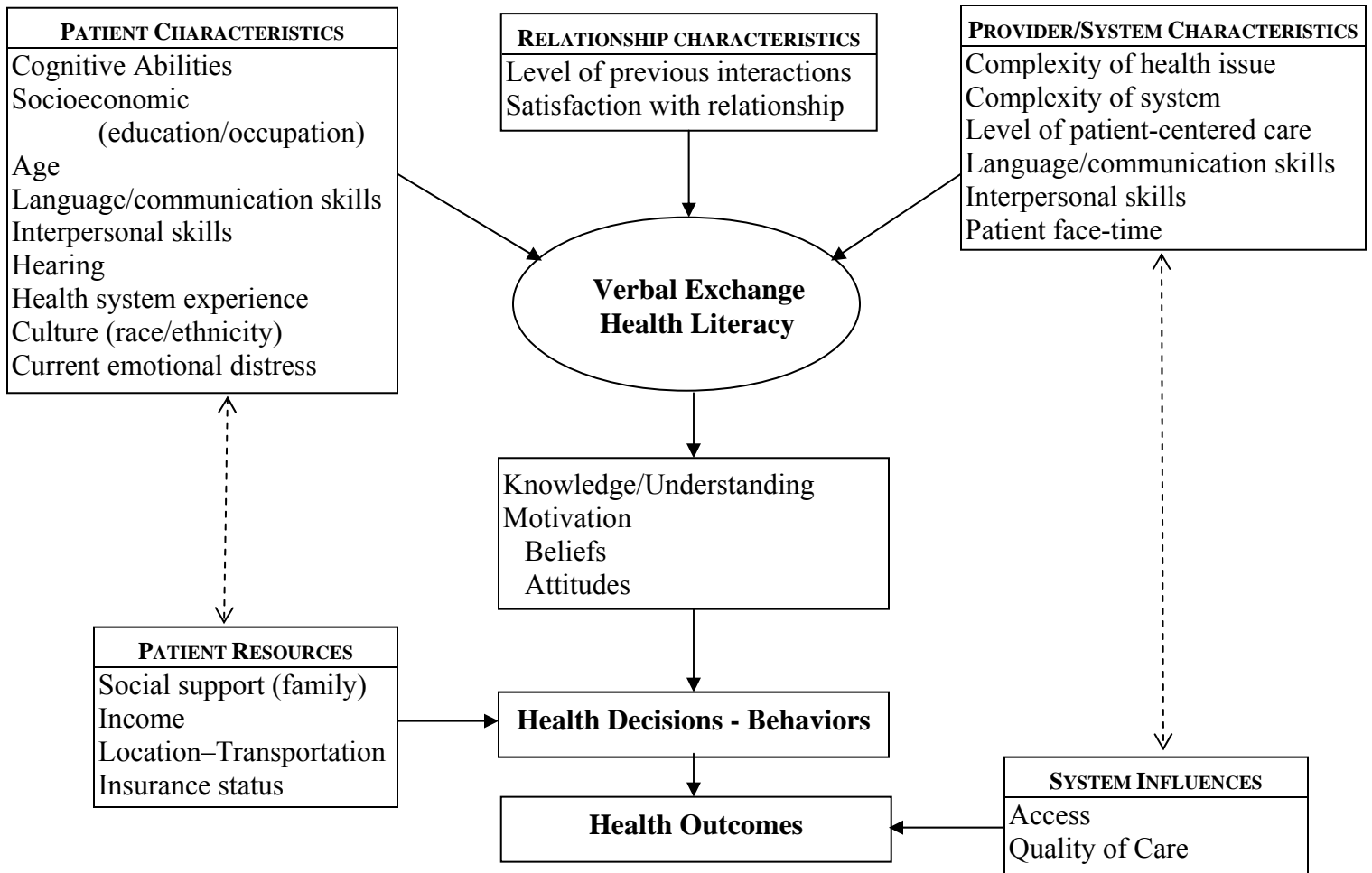
Results

Our working definition is: The ability to speak and listen that allows for the exchanging, understanding, and interpreting of health information for use in health-decision making, disease self- management and navigation of the healthcare system. Figure 1 depicts a framework for considering verbal exchange health literacy.

Conclusions

Improving health literacy is a national imperative. To improve it, we need to understand it, in its various forms and context. Development of a definition and framework of verbal exchange health literacy is a first step in the design of educational and training programs to improve and measure this important construct.

Figure 1. Influences on Verbal Exchange Health Literacy and its role in Health Outcomes

PATIENT CHARACTERISTICS
Cognitive Abilities
Socioeconomic
          (education/occupation)
Age
Language/communication skills
Interpersonal skills
Hearing
Health system experience
Culture (race/ethnicity)
Current emotional distress

RELATIONSHIP CHARACTERISTICS
Level of previous interactions
Satisfaction with relationship

PROVIDER/SYSTEM CHARACTERISTICS
Complexity of health issue
Complexity of system
Level of patient-centered care
Language/communication skills
Interpersonal skills
Patient face-time

**Verbal Exchange
Health Literacy**

Knowledge/Understanding
Motivation
   Beliefs
   Attitudes

PATIENT RESOURCES
Social support (family)
Income
Location–Transportation
Insurance status

Health Decisions - Behaviors

Health Outcomes

SYSTEM INFLUENCES
Access
Quality of Care

Older Adults' Health Literacy and Direct-to-Consumer Prescription Ads.   An, Soontae[1]; Muturi, Nancy[2]. [1]Ewha Womans University, Seoul, South Korea; [2]Kansas State University, Manhattan, Kansas.

Background
Given the increasing visibility of DTC ads targeting older adults, how effectively DTC ads convey useful medical information to them and particularly how those with limited health literacy perceive the informational content of DTC ads warrant a thorough assessment.
Methods

The sample consists of 170 older adults, recruited from retirement centers, nursing homes, and churches in a Midwestern college town. The average age was 78.4, ranging from 66 to 95. Among the sample, 69 percent were female and 31 percent were male. Health literacy (α=.76) was measured by seven items adopted from Chew, Bradley, and Boyko (2004). The educational value of DTC ads (α=.93) was evaluated by seven items adapted from Brodie (2001). Each interview took place in-person with a paper and pencil questionnaire.

Results
To see whether older adults' assessment on the information contents of DTC ads depend on the level of health literacy, a hierarchical regression was run after controlling for basic demographic, health, and media usage variables: age, income, education, gender, their overall healthiness, prescription medicine use, and media exposure. Among the variables, age and overall health were two significant factors; that is, those who were younger tended to evaluate the educational value of DTC ads more highly (β=-.15). Also, those in bad health tended to rate the information contents of DTC ads more positively (β=-.19). After controlling for the above factors, health literacy turned out to be the strongest factor predicting older adults' views on the information contents provided in DTC ads (β=.61). Those with high health literacy were more likely to assess the educational value of DTC ads positively as opposed to those with low health literacy.

Conclusions
The results found that older adults' assessment of the educational value of DTC ads depended on the level of health literacy. Aging consumers with low health literacy found the communication contents of DTC ads less effective in terms of addressing key medical information. In accordance with extant literature on health literacy, the level of health literacy was significantly associated with older adults' understanding of medical information presented in DTC ads. It should be noted that the same content was evaluated less favorably by one group, while the other group rated the content of DTC ads more favorably. The finding that the less favorable view was observed by those with low health literacy alerts us to the inadequate informational values of DTC ads for consumers who truly need such information to be more educated and empowered. This population segment has the highest need for health information but limited access to mass media and other health information sources. Their lower functional health literacy also limits their understanding of health information gathered from the media, including DTC advertising. The results of this study indicate that DTC ads do not appear to empower them, as proponents often claim.

Diabetes Self-Management in patients with low health literacy: ordering findings from literature in a framework. Fransen, Mirjam[1]; Von Wagner, Christian[2]; Essink-Bot, Marie-Louise[1]. [1]University of Amsterdam, Academic Medical Centre, Amsterdam, The Netherlands; [2]University College London, London, United Kingdom.

Background

Self-management has become increasingly important in the treatment of diabetes type 2 (DM2). Adequate self-management requires adequate health literacy (HL), including the competencies to gain access to health information, to understand and to use it in ways that promote and maintain good health. The aim of this study was to review empirical studies on HL and self-management in patients with DM2 and to order the findings in a conceptual framework that describes causal pathways between HL and self-management.

Methods

We searched the database Medline for empirical studies on the association between health literacy and diabetes self-management and possible mediating variables, published between 1995 and 2010. Additional articles were identified by reviewing reference sections of retrieved articles. Findings were ordered on the basis of Von Wagner's framework that proposes that HL influences self-management via motivational determinants (knowledge and beliefs) and volitional determinants (implementation skills).

Results

We identified 10 relevant studies that included empirical data on the association between HL and self-management. Four of them found a significant association between HL and self-management activities. Five studies found that low HL was associated with inadequate diabetes knowledge. However, none of these studies actually demonstrated that inadequate knowledge in patients with low HL influences their diabetes self-management. The only volitional determinant that was investigated in the pathway between HL and self-management was self-efficacy. No evidence was found for the assumption that low self-efficacy in patients with low HL influences their diabetes self-management.

Conclusions

Until now only a few studies empirically investigated the relationship between health literacy and diabetes self-management. Evidence for motivational and volitional pathways between HL and self-management is weak. Future studies should investigate the causal role of socio-cognitive and psychological determinants in diabetes self-management of patients with low HL in order to enable the development of interventions to increase adequate and sustainable self-management in these patients.

Examining communication and self-efficacy as elements of an intervention focused on low-health literacy and diabetes management. O'Hara, Laura[1]; Shue, Carolyn[1]; Bunch, Jennifer[2]; [1]Ball State University, Muncie, IN; [2]Indiana University Health/Ball Memorial Hospital, Muncie, IN.

Background

Although patient self-efficacy and physician-patient communication are both related to self-management behaviors that can enhance health quality for patients with chronic conditions such as diabetes, little research has been devoted to the specific relationship between physician-patient communication and patient self-efficacy. Given that information cues from external sources such as health-care providers can impact one's self-efficacy, it is crucial to examine the interplay between physician-patient communication and patient self-efficacy. To this end, this study asks the following questions: 1) What are potential communication indicators in physicians that may encourage or discourage self-efficacy in patients who experience diabetes? 2) Is there a difference in the nature of the physician-patient interactions when patients self-report a sense of increased self-efficacy regarding the management of their diabetes versus those who do not report a sense of increased self-efficacy regarding the management of their diabetes?

Methods

Patients with diabetes were recruited for an assessment study of a patient-education video intervention that was created following low-health literacy design principles. This pilot study employs the Roter Interaction Analysis System (RIAS) to code physician-patient interactions, describe communication indicators of self-efficacy, and determine if differences exist between study groups.

Results

The results of this pilot analysis focus on four study groups: 1) a sample of 10 participants who did not view the videos and who did not report increased self-efficacy post-physician appointment, 2) a sample of 10 participants who viewed the videos and did not report increased self-efficacy, 3) nine participants who did not view the videos and did report increased self-efficacy, and 4) seven participants who viewed the videos and did report increased self-efficacy. Given the small sample size, statistically significant differences among the groups was difficult to obtain; however, the results demonstrate empirical evidence of communication behaviors grounded in interactions that demonstrate how physicians can promote and/or discourage patient self-efficacy when interacting with patients. For example, physician partnership statements combined with checks for patient understanding (e.g., "We gotta do what we gotta do, but you and I are thinking to ourselves, 'well, we'd prefer not to [take insulin] if we didn't have to,' right?") were prevalent in the groups reporting increased self-efficacy. During the physician-patient interactions in the groups in which patients did not report increased self-efficacy, physicians generally enacted few concern/worry statements, empathy statements, back-channel responses, and legitimizing statements, particularly when patients provided difficult lifestyle accounts. For example, in response to one patient's lengthy account of a job loss and resulting depression, the physician back-channeled "o.k." only once, asked one brief question about how she was doing, and did not acknowledge her answer, instead moving quickly to the examination portion of the visit.

Conclusions
The findings from this pilot study provide insight into how physician communication behaviors may help or hinder patients' self-efficacy regarding the management of their diabetes. Patients with higher levels of self-efficacy tend to manage their disease more effectively, which can lead to enhanced health quality. Given this, it behooves physicians to adapt their own communication to promote self-efficacy in their patients.

The effects of domain knowledge and concept map on processing and memory of hypertension-related text. Gao, Xuefei[1]; Bertel, Sven[2]; Chin, Jessie[1]; Madison, Anna[1]; Morrow, Daniel[1]; Stine-Morrow, Elizabeth[1]; McKreever, Stacey[1]; Conner-Garcia, Thembi[3]; Graumlich, James[3]; Murray, Michael[4]. [1]University of Illinois at Urbana-Champaign, Urbana-Champaign, IL; [2]Bauhaus-University Weimar, Weimar, Germany; [3]University of Illinois College of Medicine at Peoria, Peoria, IL; [4]Purdue University College of Pharmacy, Indianapolis, IN.

Background

Older adults have difficulty understanding the information they need for self-care due to inadequate health literacy (IOM, 2004), which may result from age-related declines in cognitive abilities (Levinthal et al., 2008). However, older adults may leverage internal (e.g., knowledge) and external resources (e.g., external aids) to offset declining cognitive abilities and support comprehension. A concept map (Nesbit & Adesope, 2006) is a type of external aid that while often used in institutional education has not been adequately studied for patient education. Previous studies demonstrated that the availability of a concept map 1) might differentially benefit those with lower abilities (Mayer, 2001), because the map explicitly signals conceptual relationships not readily available to them; and 2) differentially supports learning and retention of central rather than detail ideas in text (Nesbit & Adesope, 2006). We investigated the effects of concept map (i.e., presence vs. absence) and domain knowledge (high vs. low) on online processing and memory for passages about topics related to hypertension. We predicted that a concept map would be most beneficial for those with lower hypertension knowledge and that this effect would be exaggerated for key ideas in text.

Methods

Community dwelling older adults (n=31, Mage=66.0, SD=6.0; Meducation=17.0, SD=1.4), 45.2% of whom were diagnosed with hypertension, were recruited. Key concepts were identified from hypertension-related passages by independent raters with reliable consistency. Concept maps were hierarchically organized reflecting the inherent relationships among key concepts in each passage, and were simultaneously presented with the text. Hypertension knowledge was tested at the beginning of the session. Participants' eye-movements were tracked as they read the passages and the maps, followed by a memory test for central and detail ideas in text.

Results

Concept map improved low-knowledge individuals' performance for questions regarding the key concepts conveyed by the map, while concomitantly impaired their recall of the details conveyed by the text. In contrast, high-knowledge individuals recalled more details with the presence of a concept map; however, their memory for the key conceptual relationships remained unaffected, which tended to be at ceiling at the baseline. This pattern was supported by the online eye-movement measure that high-knowledge individuals were more likely to go back and reread the text after the first pass when a concept map was present.

Conclusions

Individuals with varying domain knowledge might differ in their internal representation of the text. Those with high knowledge may have developed a coherent construction of the text in the

form of a concept map, which scaffolded the integration of new information (i.e., details) into their knowledge base. Individuals with less domain knowledge, however, tended to have an impoverished internal representation and may have had to utilize the concept map to construct a text-based representation at the expense of resources available to processing of extra details (Wiley, 2005). Our results highlight the importance of integrating individuals' internal characteristics (e.g., domain knowledge) into external-aid designs such that future educational interventions with concept maps should pre-conceive "who" (i.e., low-knowledge vs. high-knowledge individuals) and "what" (i.e., core ideas vs. details) they target.

Implementation of routine health literacy assessment by clinical staff in adult primary care practices: the Health Literacy Screening (HEALS) Study. Willens, David[1]; Cawthon, Courtney[2]; Bruce, Corinne[2]; Roumie, Christianne[1]; Mion, Lorraine[2]; Wallston, Kenneth[2]; Rothman, Russell[2]; Osborn, Chandra[2]; Kripalani, Sunil[2]. [1]VA Tennessee Valley Health System, Vanderbilt University, Nashville, TN; [2]Vanderbilt University, Nashville, TN.

Background

The Joint Commission has recommended addressing patient communication needs across the continuum of care. In new models of chronic disease care, like the patient-centered medical home, patient health literacy must be addressed in order to improve quality. Our aim in the Health Literacy Screening (HEALS) Study was to incorporate health literacy screening into traditional primary care practices.

Methods

We implemented an electronic brief health literacy screen in Vanderbilt Medical Group primary care practices. Three brief health literacy screening items, as well as educational attainment, were incorporated into the education section of the patient intake assessment at three primary care clinics. These clinics collectively see approximately 30,000 unique patients each year. The intake assessment is completed by a clinic nurse or patient care technician (PCT) during every primary care visit and is stored in the electronic health record (EHR). The education section of the intake assessment is updated yearly for all patients.

Each clinic has a different culture, structure, and flow, necessitating tailored implementation. Training was conducted by an investigator or study coordinator at clinic staff meetings, and non-attenders were trained individually by the study coordinator. To increase the fidelity of administration, emphasis was placed on asking all questions verbatim and providing all five response options to patients. Clinic staff was able to problem-solve clinic-specific issues such as workflow or concerns about patient acceptance in collaboration with the study personnel.

Monitoring of documentation was completed by data extractions from the electronic health record (EHR) and Vanderbilt's Enterprise Data Warehouse (EDW). Administration techniques were reinforced via individual discussions with the clinic staff.

Results

The new intake assessment was implemented on November 22, 2010 in two clinics and on May 5, 2011 in the third and largest clinic. From November 22, 2010 to May 20, 2011 11,027 patients had the education section of the intake completed. These patients were insured (100%), mostly white (71.2%) and female (61.6%), with a mean age of 55.4 years. The population was well-educated, with an average of 15.0 years of education, and there were no differences in patient characteristics between clinics.

Overall, nurses and PCTs completed all three health literacy screening questions in 7,723 (70.0%) of all unique patient encounters. Using a cutoff of "somewhat" or sometimes" on each item, the prevalence of low health literacy on each of the three screening items was 13.8% (confidence with medical forms), 11.9% (need for assistance in reading medical materials), and 10.8% (problems learning about medical conditions).

Conclusions
Implementation of a simple electronic brief health literacy screen in primary care practices is feasible. Training must be individualized according to each clinic's culture and workflow, with buy-in generated through a series of group and individual dialogues with frontline staff. The prevalence of low health literacy in this medically insured and educated sample may be lower than in the general population. Demonstration of the feasibility of health literacy screening by clinical staff is an important step toward improving the quality of primary care.

eHealth literacy and patient engagement in an urban Federally Qualified Health Center: An exploratory study.

Dalrymple, Prudence[1]; Rogers, Michelle[1]; Lisl, Zach[1]; [1]Drexel University, Philadelphia, PA.

Background

Patient access to ehealth information is increasing, yet little is known about the ways in which it supports patient engagement, especially among populations with health disparities. We report on an exploratory study to provide tailored ehealth information via cell phones conducted at a trans-disciplinary, Federally Qualified Health Center serving a largely minority, low income and medically underserved population, over half of which lacks health insurance. Using Nutbeam's three-tiered health literacy framework, we investigated whether sending tailored text messages would encourage women in prenatal classes to seek additional health information on pregnancy-related websites. Through this intervention, we sought to explore ehealth usage patterns as the next step in an overall research program to understand the ways in which ehealth contributes to patient engagement. We also sought to understand whether the timing of ehealth delivery has an impact on patient receptivity.

Methods

Our previous research with this population indicated that cell phones are a preferred method for Internet access, especially among women under age 34.[1] Working with the health center's director, we introduced the CDC's program "text4baby" as a standard of prenatal care. Next, we created a library of text messages containing links to websites selected by medical librarians and tailored to the content covered during the prenatal group sessions. Patients received these text messages twice weekly. Prior to the intervention, we assessed health literacy using the Newest Vital Sign (NVS), and administered pre-tests to determine health information seeking behaviors. We also surveyed the patients monthly to determine use and satisfaction with the messages. We distributed a follow-up survey to determine long-term satisfaction and ehealth information usage patterns.

Results

More than half the patients taking the NVS scored at a level indicating adequate literacy and numeracy; all but two patients reported that they received all the messages and experienced no problems in accessing the Internet through their cell phones. Survey data revealed that patients who received messages looked at the websites and found the text messages informative and supportive. However, patients frequently changed their cell phone numbers, making it difficult to maintain consistent, reliable contact between the patient and health center.

Conclusions

This is the second phase of a program aimed at understanding how providing audience and time appropriate feedback contributes to patient engagement. Our results indicate that ehealth information is easily accessible, if not ubiquitous, even in health disparities populations. Previous assumptions about information access and health literacy in this population may need to be re-examined. In fact, the level of connectivity to the Internet through cell phone access—at least among the young-- approaches that of the mainstream population; however, participants' understanding of the concept of "health information seeking" may be different from that of other segments of the population. The opportunity now exists to raise questions about how this

information is acted upon and whether the interactive aspect of digital media promotes patient engagement, especially during "teachable moments" such as pregnancy.

[1]Zach L, Dalrymple P, Rogers M, Williver-Farr, H. **Patterns of Internet access and use: A case study of health information seeking by medically underserved patients at an urban health center**. *Health Information and Libraries Journal*. Under review.

Health Literacy and Transition Readiness in Adolescents with Sickle Cell Disease.

Chisolm, Deena[1]; O'Brien, Sarah[1]; Rhodes, Melissa[1]. [1]The Ohio State University, Columbus, OH.

Background

Advances in sickle cell disease screening and treatment over the past 30 years have improved the median survival age from mid-adolescence to mid-40's. This expanded life expectancy has created new challenges as most teenagers with sickle cell disease must now transition from pediatric to adult care and from parental disease management to self-management. Health Literacy is a significant predictor of disease management in adults with chronic illness. This study explores the relationship between parent health literacy, teen health literacy, and transition readiness in adolescents with sickle cell disease.

Methods

Teens, ages 12-18, and their parents were approached in the waiting room of an outpatient sickle cell clinic. In participating families, the teen and one parent completed health literacy screenings using the REALM or REALM-Teen, as appropriate, the STOFHLA, and the Newest Vital Sign. Teen transition readiness was assessed using the Transition Readiness Assessment Questionnaire (TRAQ), a 29-item questionnaire on which teens rate readiness to assume responsibility for health-related tasks in two domains: self-management and self-advocacy. Additionally, parents assessed transition readiness using the transition core indicator items from the National Survey of Children with Special Healthcare Needs. The core indicator was considered met if the parent reported that their clinician had discussed transitional issues regarding medical needs, providers, and insurance and if the clinician encouraged increased self-management "usually" or "always".

Results

In our ongoing study, we have enrolled 27 teens, 23 of whom had a participating parent. The remaining four were age 18 and did not have a parent present. Fifty-five percent of teen participants were male and the average age was 15.3 years. Thirty-seven percent of teens had a REALM reading level at or below 6th grade as did 8.7 percent of parents. There was no significant association between teen health literacy and either TRAQ domain. However, both self-advocacy and self-management trended toward negative correlation with parent health literacy (see table).

TRAQ	Parent REALM	Parent S-TOFHLA	Parent NVS
Self-Advocacy	r=-0.41 (p=0.05)	r=-0.34 (p=0.12)	r=-0.44 p=0.04
Self-Management	r=-0.25 (p=0.24)	r=-0.37 (p=0.07)	r=-0.50; p=0.01

Thirty-five percent of teens met all elements of the transition core indicator, slightly lower than the 41% found in the overall special needs population. Performance was highest for promotion of self-management (91%) and lowest for provider transition (61%). The transition core indicator was not significantly associated with parent or teen literacy but there was a trend toward a positive association with teen literacy. Half of teens with REALM literacy levels at 7th grade or

higher met the transition core compared to 18 percent of those at 6th grade or lower (p=0.11). This difference is not explained by age.

Conclusions
Results suggest that children of higher literacy parents have lower readiness for health autonomy and that lower literacy youths are receiving less transition guidance from clinicians than their higher literacy peers. Such poor chronic disease transition planning in health disparity populations like children with sickle cell disease may increase long term health inequities.

Health Literacy Among Amish and Non-Amish Adults Living In Ohio Appalachia. Katz, Mira[1]; Ferketich, Amy[1]; Paskett, Electra[1]. [1]The Ohio State University, Columbus, OH.

Background
The Amish, a unique cultural and underserved population, live mostly in rural Midwestern states. The largest Amish settlement in located in Ohio Appalachia. Characteristics of the Amish lifestyle include using English as a second language and the completion of Amish school only through the eighth grade. The objective of this study was to compare health literacy rates among Amish adults and non-Amish adults living in the same geographic rural area. This information may help to explain health-related practices and may be useful in planning cancer prevention and screening interventions.

Methods
A cross-sectional survey study included a random sample of Amish and non-Amish adults living in the Holmes County, Ohio Appalachia region. Amish (n=134) and Non-Amish (n=154) adults completed face-to-face interviews as part of a cancer-related lifestyle study. The interviews included the Rapid Estimate of Adult Literacy in Medicine (REALM); a 66 word recognition test. Words pronounced correctly were summed for each participant. Total REALM score (t-test) and the correct pronunciation of each word (chi-square test) were compared between groups. Significance was considered at $p<0.001$ because of multiple comparisons.

Results
Amish adults were slightly younger than non-Amish adults (mean age for males: Amish (52.4 years) vs. non-Amish (58.8 years), $p<0.05$; and mean age for females: Amish (52.9 years) vs. non-Amish (56.8 years), $p=0.07$). Among the Amish participants, only one male reported completing high school compared to 87.5% of non-Amish males and 87.8% of non-Amish females.

There was a difference ($p<0.001$) in mean REALM score among Amish and non-Amish males (53.3 vs. 61.2) and females (56.2 vs. 63.0). Twelve percent of the Amish participants read at or below the 6th grade level compared to only 2.6% of the non-Amish participants. Differences ($p<0.001$) between Amish and non-Amish participants in pronunciation of the following words included: herpes (40% vs. 97%); asthma (76% vs. 96%); incest (57% vs. 90%); fatigue (78% vs. 97%); arthritis (87% vs. 98%); syphilis (21% vs. 94%); nausea (75% vs. 95%); allergic (61% vs. 81%); menstrual (73% vs. 97%); alcoholism (75% vs. 94%); gonorrhea (29% vs. 94%); diagnosis (75% vs. 92%); potassium (80% vs. 97%); obesity (28% vs. 92%); and osteoporosis (34% vs. 84%).

Conclusions
Amish participants have limited health literacy based on the REALM test. The results suggest that most Amish adults may have difficulty with patient education materials that are not written below the 8th grade level. Innovative strategies that address low literacy levels and specific cultural characteristics are needed to improve health-related behaviors among the Amish.

Using a brief health literacy screening tool to identify at risk hospitalized patients. Press, Valerie[1]; Shapiro, Madeleine[1]; Thomas, Alishaa[1]; Mayo, Ainoa[1]; Meltzer, David[1]; Arora, Vineet[1]. [1]University of Chicago Medical Center, Chicago, IL

Background

Hospitalized patients with low levels of health literacy are at increased risk of medical errors and poor care transitions. Although a "universal precaution" approach for care of low-literacy inpatients is encouraged, to ensure adequate education for safe discharge home, identification of these high-risk patients may be necessary in resource-limited hospital settings. Chew et al have validated a brief, 3-item verbal screening questionnaire to detect low health literacy among outpatients, however this tool has not yet been deployed for hospitalized patients.

Our objective is to determine the prevalence of low health literacy among hospitalized urban low-income patients using the 3-item health literacy survey developed by Chew. We have also started a validation study to establish the concurrent validity of the 3-item health literacy screening questionnaire for inpatients through co-administration of a gold standard health literacy instrument.

Methods

Hospitalized adult general medicine patients were enrolled from an ongoing study of resource allocation and quality-of-care at the University of Chicago (interviews 70% of general medicine inpatients). Eligible patients (cognitively intact, English-speaking) were asked three "Chew" health literacy screening questions: (q1) "How often do you have problems learning about your medical condition because of difficulty understanding written information?"; (q2) "How often do you have someone help you read hospital materials?"; and (q3) "How confident are you filling out medical forms by yourself?" Patients answered on a five-point Likert scale, and were assigned "high" risk of having low health literacy if they answered: "always" or "often" (q1-2) or "extremely or "quite-a-bit (q3_. To validate these questions, we also administered the Rapid Estimation of Adult Literacy in Medicine-Revised (REALM-R) tool to a subset of patients.

Results

To date, 558 participants have been enrolled (January-May 2011). The mean age is 56; the majority are female (52%) and African-American (72%). Half (281) have ≤high-school degree and about a quarter have low SES (130). Over half (318) had been admitted previously in the past year. About one-third (195) screened 'high risk' by the Chew et al questions. To date, 9 (2%) participants also underwent the REALM-R health literacy tool, all but one were 'low risk' by the Chew questions. For those 8 who screened "low risk" via Chew, 6 (75%) had "adequate" health literacy according to the REALM-R tool. For the one patient who screened "high risk" by Chew, they also tested at a low health literacy level according to REALM-R. Data collection is ongoing for the validation study and formal kappa statistics will be conducted.

Conclusions

Consistent with prior literature, we demonstrate that in a low-income, primarily African-American, urban hospitalized population, one-third of patients had low health literacy using a brief 3-item questionnaire. Our early pilot results attempting to validate the Chew et al questions with the REALM-R find that the brief instrument may be useful in identifying high-risk patients.

However, more data are needed to truly confirm if this method may enhance our ability to efficiently and effectively improve quality of care and reduce health disparities by tailoring educational strategies for these high-risk hospitalized patients.

Improving Specific Community Health Outcomes by Increasing Overall Health Literacy Skills with Two Part Lesson Plans. Ramsey, Celina[1]. [1]Staten Island University Hospital, Staten Island, NY.

Background

Research shows that adults with limited English skills report poorer health statuses, and lower health literacy (HL) skill levels than native English speakers.

Objectives:
1. Improve overall HL for English language learners (ELL) through implementation of topic specific two-part HL curriculum
2. Improve specific HL in three areas reported to have the poorest community health outcomes
3. Increase HL via direct learning interactions in simple language between community members and providers

Methods

To improve the overall HL level of the immigrant population on Staten Island (SI), the healthy partnership program and HL curriculum developed by Staten Island University Hospital (SIUH) was implemented through partnerships from the Staten Island Health Literacy Collaborative (SIHLC).

English language learners (ESL) were enrolled in 10 week HL programs at three different agencies from 2009-2011. Participants had intermediate-advanced English language level Best Plus range from 341-638. Students were pre and post tested with the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Newest Vital Sign (NVS) to measure any increase to their overall HL skill set after participating in the program. Each student participated in three, two part HL lessons where topic specific health knowledge was measured using pre and post testing. Each health topic presented directly correlated to the community service plan, specifically to health status improvement goals set by the SIHLC. Part one of each lesson was implemented by the ESL teacher and part two was a unique hands on learning experience presented by an expert health professional. Part two of the lesson plan reinforced the class work, aimed to teach specific skill sets according to health topic, and gave participants an opportunity to communicate with a health care professional in simple language.

Results

Of total participants pre-tested, (n=66) 77.28% reported having low HL measured by the REALM, with reading levels ranging from < 3rd grade- 6th grade, 22.7% tested with higher HL levels, with reading levels > 7th grade (average 34.8 words pronounced correctly); NVS results: 45.4% measured having limited HL, 40.9% possible limited HL and 13.4 measured adequate HL levels (average score: 1.8).

Topic 1-Cancer Prevention and Detection: Participants (n=66) showed 24% improvement to health knowledge after pre (average: 3.8) and post (average: 6.2) subject matter testing. Range (1-10)

<u>Topic 2- Health System Navigation</u>: Participants (n=66) improved topic specific health knowledge by 27% after pre (average: 6.3) and post (average: 9) subject matter testing. Range (1-10)

<u>Topic 3- Diabetes and Nutrition</u>: Participants (n=66) improved topic specific health knowledge by 23% after pre (average: 5) and post (average: 7.3) subject matter testing. Range (1-10)

After the 10 week cycle, post testing showed a 21.28% decrease in those having low HL; and an increase of 21.16% for higher HL level measured by the REALM (average 42.6 words pronounced correctly.) NVS results measured an increase of 41.1% for those testing with possible-adequate health literacy (average score: 3.2).

Conclusions
Two part HL lesson plans with specific health topics presented by an ESL teacher in conjunction with a health professional can increase a person with limited English's overall health literacy level, therefore improving community health outcomes.

Table 1: Pre and Post testing of Adult English Language students over a 3 month cycle from 2009-2011 using the Rapid Estimate of Adult Literacy in Medicine (REALM) n=66

REALM	REALM Pretest	n	REALM Post-test	n
Low Health Literacy <3-6th grade	77.28%	51	45.45%	30
Possibly Low Health Literacy 7-8th grade	22.7%	15	33.33%	22
Higher Health Literacy High School	0%	0	6.06%	4
Median words pronounced correctly	34.8/66		42.6/66	

Table 2: Pre and Post testing of Adult English Language students over a 3 month cycle from 2009-2011 using the Newest Vital Sign (NVS) n=66

Newest Vital Sign (NVS)	NVS Pretest	n	NVS Post-test	n
Limited Health Literacy	45.4%	29.9	21.21%	14
Possibly Limited Health Literacy	40.9%	26.9	24.24%	16
Adequate Health Literacy	13.4%	8.8	54.54	36
Median score	1.8/6		3.2/6	

Table 3: Pre and Post testing of Adult English Language students over a 3 month cycle from 2009-2011 using three specific 2-part lesson plans for health topics relating to the poorest health outcomes in Staten Island

Health Literacy Classes n=66	Pretest Median Correct answers	Post-test Median Correct answers	Percentage Improved
Cancer Prevention and Detection	3.8/10	6.2/10	24%
Health System Navigation	6.3/10	9/10	27%
Diabetes and Nutrition	5/10	7.3/10	23%

Figure 1: Categorical improvement of health and literacy skills pre and post testing
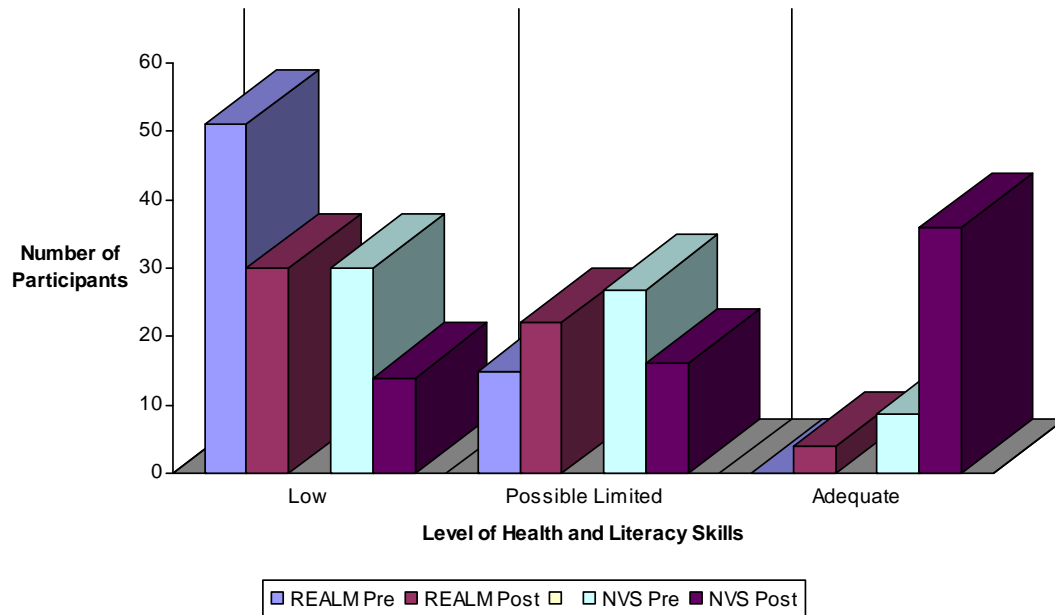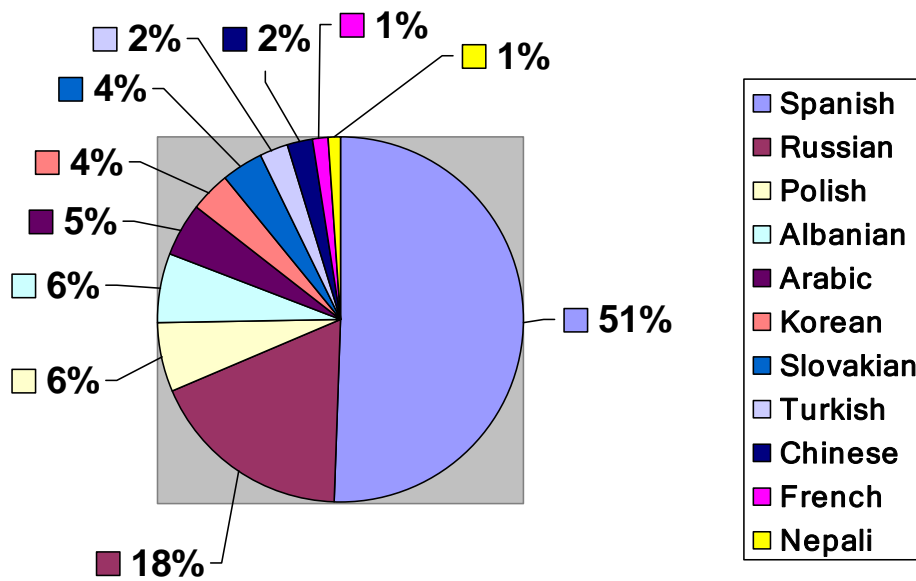

Figure 2: Illustrates a breakdown of the primary languages spoken by participants.

Design and Validation of a Chronic Kidney Disease (CKD) Self-Management Tool to Impact Care Quality. Devraj, Radhika[1]; Wallace, Lorraine[2]; [1]SIUE School of Pharmacy, Edwardsville, IL; [2]The Ohio State University Medical Center, Columbus, OH.

Background

Chronic kidney disease (CKD), a significant driver of health-related expenditures, results in various levels of damage ranging from decline in kidney function to kidney failure. In order to manage their CKD, patients must adopt and maintain several self-management behaviors such as dietary modifications, completing follow-up laboratory tests, and attending regular physician appointments. Limited knowledge of CKD self-management can ultimately lead to poor outcomes and higher health care costs in the long run. The myriad aspects of CKD self-management may prove challenging particularly for patients with low health literacy skills. As a fundamental starting point, healthcare providers can improve the quality of care they provide to patients if they are able to adequately assess their baseline knowledge of CKD. The purpose of this study was to design a valid and reliable low-literacy instrument to measure patients' CKD self-management behaviors. Such an instrument can be used by clinicians to tailor their communication to patients regarding CKD self-management and ultimately enhance the quality of care that is provided.

Methods

A preliminary CKD instrument was developed by the primary author following an extensive review of the literature and the National Kidney Foundation (NKF) patient education website. The initial draft included items related to the following domains: (1) general statements about managing kidney disease, (2) CKD symptoms, (3) self-evaluation regarding knowledge of CKD, and (4) current frequency with which they carry out various self-management activities. Next, a two-stage qualitative and quantitative review process using content experts (n=15) including practicing nephrologists, health literacy researchers, instrumentation experts, and practicing pharmacists is being used to establish content validity of the CKD instrument. Based on comments generated during the qualitative review, the CKD instrument has been revised and is currently undergoing quantitative review by content experts. Thereafter, approximately 15 patients will be recruited to participate in a field test to assess clarity of CKD instructions and individual items. The CKD instrument will be revised following completion of field testing. Lastly, an additional 25-30 patients will be recruited to participate in a pilot test of the final version of the CKD instrument to assess internal consistency and test-retest reliability.

Results

The quantitative review is currently underway. The study is expected to be completed by August 2011. The results describing the validity and reliability of the instrument will be presented at the HARC III meeting in October.

Conclusions

A valid, reliable, and understandable CKD self-management knowledge instrument tailored particularly to low literacy patients is being developed and validated. Health care providers who treat CKD patients can use this instrument to assess patient knowledge of self-management and tailor their communication accordingly, thereby improving care quality and enhancing adherence to recommended self-management behaviors.

Validation of the HLSI-SF in Pregnant Women. Hadden, Kristie[1]. [1]UAMS College of Public Health, Little Rock, AR.

Background

Interventions that aim to improve pregnancy outcomes by improving individual pregnant women's health literacy are increasing in maternal health promotion programs. In order for these interventions to be vigorously tested for efficacy and effectiveness, a comprehensive, valid, and reliable measure of health literacy is necessary. A new instrument, the Health Literacy Skills Instrument-Short Form (HLSI-SF) has been developed and psychometrically tested to be reliable and valid in a national sample. While initial testing of this instrument supports hypotheses that it is a valid and reliable in measuring a more comprehensive model of health literacy than instruments that have been used previously in research, this instrument has not been validated in a sample of pregnant women. The proposed research aims to validate the most current and comprehensive measure of health literacy in a sample of pregnant women.

Hypotheses
- Hypothesis 1: Pregnant women enrolled in prenatal care with higher education levels will have higher scores on the HLSI-SF than those with lower education levels.
- Hypothesis 2: Pregnant women enrolled in prenatal care who report less difficulty with skills related to health literacy will have higher HLSI-SF scores than those who report more difficulty.
- Hypothesis 3: Pregnant women's scores on the Test of Functional Health Literacy in Adults Short version (S-TOFHLA) and the HLSI-SF will be correlated; constructs measured by both instruments will be correlated at a level of statistical significance, constructs measured by only the HLSI-SF will be minimally correlated with the S-TOFHLA.

Methods

A one-group cross-sectional design will be employed for this research. Based on power analysis, a minimum of 100 pregnant women will be recruited from three clinics that serve low-income pregnant women: Two University of Arkansas for Medical Sciences Obstetric clinics and one private obstetric clinic in Pine Bluff, Arkansas. Participants will be over 18 years old and self-report that they speak and understand English; while there is a Spanish version of the S-TOFHLA, there is no Spanish version of the HLSI or HLSI-SF. Women in any stage of pregnancy will be invited to participate. Participants will be recruited at regularly scheduled OB visits.

Socio-demographic data, including age, race, education, income, and health insurance status will be collected, along with HLSI-SF scores, STOFHLA scores, and Perceptions of Difficulty with Health Literacy Skills ratings.

The analyses to assess the validity of the HLSI-SF, will consist of a series of analysis of variance (ANOVA) procedures to compare HLSI-SF scores by socio-demographic variables, participants' reported Perception of Difficulty with Health Literacy Task scale scores, and S-TOFLHA scores.

Results

Data are currently being collected. Projected completion of data collection is August, 2011.

Conclusions
If the HLSI-SF proves to be a valid measure of health literacy in a sample of pregnant women, researchers can conduct future studies on improving health literacy of pregnant women and include the HLSI-SF as a measure with confidence.

Examining Dimensions of Health 'Care' Literacy Among Adolescents. Massey, Philip[1]; Calimlim, Brian[1]; Quiter, Elaine[1]; Glik, Deborah[1]; Prelip, Michael[1]; Afifi, Abdelmonem[1]; Wongvipat Kalev, Nancy[2]; Nessim, Sharon[2]. [1]UCLA School of Public Health, Los Angeles, CA; [2]Health Net, Inc, Woodland Hills, CA.

Background

As healthcare reform places greater emphasis on preventive healthcare and wellness services, it is imperative to better define and measure skills and competencies needed to effectively navigate the healthcare system. Health 'care' literacy, broadly defined, is the skills and competencies needed to navigate through a complex healthcare system. Most studies have focused on adult populations, the assumption being that adults serve as gatekeepers and guides for adolescents to help navigate the system. However, adolescents are patients, too, and able to access the healthcare system on their own. By investigating dimensions of health 'care' literacy, we can move towards operationalizing the concept and developing a better understanding of how adolescents view and interact with the healthcare system.

Methods

To test an intervention for improving health 'care' literacy, adolescents aged 13-17 who have Medi-Cal or Healthy Families (SCHIP) health insurance through a large health insurance network in California were randomly selected to participate in our baseline survey (n=1,384). All items were self-reported and questionnaires were completed either by paper and pencil or online. Demographics and item response distributions were examined using frequency counts and summary statistics. Factor analysis identified two dimensions of adolescent health 'care' literacy: navigating the healthcare system and rights and responsibilities. The navigation dimension used two 5-point Likert scale items, measuring confidence in completing basic tasks in the healthcare system. The rights and responsibilities dimension was based on four 5-point Likert scale items. Dimension scores were calculated using Bartlett factor scores. Reliability of the scale responses was measured using Cronbach's Alpha. Hypothesis testing between groups was performed using chi-square-based methods and the two-sample t-test.

Results

Respondents had an average age of 14.8 years and a median education level of 10th grade. More than half (60.5%) were girls and 47.2% identified as Hispanic/Latino. When asked about routine medical care, nearly four out of five (78.1%) adolescents had a regular checkup or a non-emergency healthcare visit within the last 12 months. Boys and girls both agreed that it was their right to be able to talk to their doctor privately (87.0% and 88.9%, respectively), but more boys indicated confidence in talking to their doctor compared to girls (58.9% vs. 50.6%; p=.0029). The navigation scale had a Cronbach's alpha score of 0.73 and the rights and responsibility scale had a Cronbach's alpha score of 0.77. Results suggest lower rights and responsibility scores in boys (p=.0520) and lower navigation scores in Hispanic/Latino students (p=.0001) and non-12th graders (p=.0030).

Conclusions

Given that preventive health services are generally accessed during periods of wellness, the period of adolescence is an appropriate time to begin developing skills and competencies related to health 'care' literacy that will carry into adulthood. As healthcare reform shifts us to a

preventive- and managed care-focused system, it will be imperative to measure competencies in navigating and effectively utilizing the healthcare system, especially given its current complexities.

An Intervention to Improve Health Literacy Practices in Underserved Pediatric Settings.

Forbis, Shalini[1]; Brigham, Erin[1]; Stolfi, Adrienne[1]; Pascoe, John[1]; Spears, William[1]; Chumlea, W Cameron[1]. [1]Wright State University, Dayton, OH.

Background

There are specific interventions recommended by national organizations to improve the health literacy environment of primary care practices. This study assessed the effectiveness of a health literacy intervention, based on the American Medical Association Health Literacy Educational modules, on health care provider knowledge and behaviors and on pediatric patient preventive care outcomes (immunizations and well child care).

Methods

Four underserved, urban practices were recruited to participate in the study; three of the practices were intervention sites and one served as the control site. At each site, all clerical staff (CS), medical assistants (MA)/nurses, and physicians (MD) were invited to participate. Staff at the three intervention sites received four health literacy related training sessions, appropriate patient education materials, supplies including medication syringes (to assist with medication education) and inhaler spacers (to demonstrate appropriate technique to caregivers). The four training sessions covered health literacy, creating a shame-free environment, verbal and written communication, and integration of the learned information into the clinical environment. All sessions incorporated didactics with role playing and small group interactions. Assessments conducted pre- and up to one year post-intervention included pediatric chart review of well child care visits and immunization rates, a staff health literacy survey (developed by American Academy of Pediatrics), and 4 audiotaped pediatric encounters. Pre- and post- chart review and survey data comparisons were analyzed with chi-square or McNemar tests.

Results

There were 28 participants at the intervention (INT) sites and 20 at the control site (CON). There were 46% MD, 39% MA/nurse, 14% CS at intervention sites and 60% MD, 25% MA/nurse, 15% CS at the control site. There were very few differences in health literacy survey results from pre- to post-intervention. At intervention sites, providers' awareness of the proportion of adults with limited literacy increased from a mean (SD) of 25% (18) to 42% (20), but remained unchanged at the control site 16% (13) to 12% (15) with interaction p=0.002. There were no differences for INT (p=0.581) or CON (p=0.625) from pre- to post-intervention in providing easy to read handouts (although INT were provided with handouts), staff offering to help with forms (INT p=0.289, CON p=0.344), having staff reinforce key information (INT p=0.581, CON p=0.453), and demonstrating medication administration (INT p=0.375, CON p=0.625) (sites provided with syringes and trained). A higher proportion of the INT group rated their ability to identify appropriately written educational materials high post- vs pre-intervention (p=0.07). There were no differences in well child visits from pre- to post- for any sites. The only difference in immunization status was that rates of IPV vaccination coverage at 6 and 9 months improved for INT, which may be due to a vaccine supply shortage during the pre-intervention period.

Conclusions

This health literacy intervention was mildly effective in improving provider knowledge and did not have an effect on preventive outcomes. Research is needed into effective ways of changing provider communication behaviors related to health literacy.

Health Literacy Related Verbal Communication Practices in Underserved Pediatric Settings.

Forbis, Shalini[1]; Bingham, Erin[1]; Stolfi, Adrienne[1]; Chumlea, W Cameron[1]. [1]Wright State University, Dayton, OH.

Background

Health literacy experts recommend the utilization of specific verbal communication techniques (i.e. plain language, teach back) as well as avoidance of certain communication practices (i.e. medical terminology) to overcome health literacy issues that may impact patient care. This study determined use of positive and negative health literacy related verbal communication techniques in underserved pediatric settings.

Methods

Health care providers at four underserved practices that serve children were recruited to participate as part of a larger intervention study. Providers included clerical staff (CS), medical assistants (MA)/nurses and physicians (MD). Participants completed a health literacy survey on knowledge, attitudes and self-reported behaviors. Four pediatric encounters were audiotaped for each participating provider. Audiotapes were transcribed and coded by two independent researchers using Atlas Ti. Transcripts were analyzed for six specific positive and six specific negative communication techniques (see Table). The number of times each technique occurred during an encounter was counted and then expressed as the number of occurrences per 10 minute period (10-min) to account for differences in encounter lengths. Comparisons between provider groups for total number of positive and total number of negative techniques were made with one-way analysis of variance; comparisons within provider groups were made with paired t-tests.

Results

There were 64 participants: 31 MD, 21 MA/nurse, 12 CS. CS used a mean (SD) of 0.98 (0.87) positive techniques per 10-min compared to 2.68 (2.02) for MA/nurse and 3.01 (1.36) for MD ($p<0.01$). There were no differences between the groups in the number of negative techniques used: CS 2.25 (1.91), MA/nurse 2.71 (3.00), MD 2.91 (2.20), $p=0.728$. Within provider groups, the number of positive versus negative techniques was not different for MD ($p=0.807$) or MA/nurse ($p=0.946$). However CS used significantly more negative techniques than positive techniques ($p=0.041$). Regarding specific techniques (see Table), 89% of respondents indicated that they most times/always use everyday language instead of medical terminology. However use of medical terminology and concept terms were the most frequent negative communication techniques found on the audiotapes. 48% of respondents reported that they assess for understanding (i.e. teach back) sometimes/most times/always, but there were only 0.01 occurrences/10-min in this sample. There were 0.01 occurrences of reviewing written materials per 10-min although 20% reported reviewing written materials most times/always. 92% never/rarely/sometimes address "Ask Me 3" – no instances were recorded in audiotapes. The most common positive communication techniques utilized were use of plain language and explaining medical terminology (use of medical term followed immediately by plain language term).

Conclusions

In this study, physicians and nurses utilize positive and negative communication techniques with equal frequency. However providers in this sample have poor self- awareness of their frequency

of using specific negative techniques. Development and dissemination of evidence-based interventions that increase the use of underutilized positive communication techniques while reducing utilization of those negative communication techniques that are seen more frequently in clinical practice is critical to improve verbal communication in pediatric encounters.

Table 1: Mean (SD) Positive and Negative Communication Techniques – Occurrences per 10 Minute Interval

Positive Communication Techniques		**Negative Communication Techniques**	
Total	2.52 (1.70)		2.72 (2.42)
Analogies	0.01 (0.04)	Ask "Do you understand"	0.01 (0.04)
Assess Understanding	0.01 (0.04)	Medical Abbreviation	0.05 (0.17)
Explained Medical Term	0.64 (0.61)	Category Term	0.09 (0.32)
Instructions Given	0.35 (0.46)	Concept Term	0.94 (1.01)
Plain Language	1.50 (1.32)	Value Term	0.48 (0.82)
Review Written Material	0.01 (0.08)	Medical Term	1.15 (1.29)

Examination of health literacy and health-related outcomes in an older cohort-study population. Valerio, Melissa[1]; Andreski, Patricia[1]; Ghaddar, Suad[2]; [1]University of Michigan, Ann Arbor, MI; [2]University of Texas Pan-American, Edinburg, TX.

Background

Limited health literacy results in substantial costs to individuals, society, and the healthcare system. A third of US adults have limited health literacy; many of these same individuals suffer from disproportionate rates of chronic illness and struggle to use health information for self-care management tasks. It is estimated that a high percentage of older adults have inadequate health literacy making them vulnerable to adverse health events and outcomes. Additionally, this population has been found to have two to three chronic diseases. In this study we examined the association between inadequate health literacy and health outcomes in a national sample of older adults.

Methods

Participants of the Panel Study for Income Dynamics (PSID) aged 65 and older (N=1353) were included in this analysis. The Demographic Assessment of Health Literacy (DAHL) was used to estimate the health literacy of the population. Health-related outcomes examined included overall health status, type 2 diabetes, hypertension, mental distress, activities of daily living (ADL) and instrumental activities of daily living (IADL) difficulties. Univariate and multivariate analysis were completed. Multiple regression analysis controlling for marital status and wealth were computed to examine the relationship between inadequate health literacy and health outcomes.

Results

In this study, 28% of the population were between the age of 65-69, 22% were 70-74, 22% were 75-79, 15% were 80-84 and 13% were 85 years of age or older. Both males (42%) and females were represented (58%) in the population; 8% were African American, 84% Caucasian, and 5% were Hispanic; 22% had less than a high school diploma, 37% had a high school diploma and 41% had some college or greater. Fifteen percent of the population had inadequate health literacy as measured by the DAHL. Those with inadequate health literacy were significantly more likely to have poor or fair overall health (OR=2.04; CI: 1.97-2.19), diabetes (OR=1.09; CI: 1.02-1.16); mental distress (OR=1.38; CI: 1.15-1.64), and needed more assistance with ADL (OR=2.45; CI: 2.30-2.59) and had difficulties with IADL (OR=2.32; CI: 2.18-2.47).

Conclusions

Inadequate health literacy as measured by the DAHL was associated with poorer health outcomes in a nationally representative sample. Public health strategies for older adults must account for health literacy regardless of educational attainment and race/ethnicity. Health interventions aimed at improving health literacy in older populations may translate into better quality of life and health outcomes.

Interactive Health Literacy and Older Adults' Reports of Communication With Providers.
Rubin, Donald[1]; Freimuth, Vicki[1]; Parmer, John[1]; Kaley, Terry[1]. [1]University of Georgia, Athens, GA.

Background
Older and low-SES adults as a group tend to score low in health literacy, and to exhibit limited participation in clinical encounters. Those factors are among several that result in poor comprehension and poor health self-management in this group. Communication in clinical encounters is enacted primarily through spoken discourse. Yet most measures of health literacy measure patients' capacity to decode written information. Such measures do not index patient/consumer participativeness. In contrast, the Measure of Interactive Health Literacy (MIHL) is designed to highlight patients'/consumers' capacity to exchange health information in oral communication. In previous analyses, MIHL predicted outcomes like general health status and satisfaction with health care better than did the reading-based S-TOFHLA. The present study extends that work by examining the association between interactive health literacy and patients' spontaneous accounts of specific encounters with physicians and other providers.

Methods
Older adults (n=104; Mage=74.58; s.d.=9.3) who qualified for Meals on Wheels services were administered the S-TOFHLA. About one week later they were administered the MIHL via telephone. The MIHL procedure presents a health message that deliberately includes information gaps, long silences, and explicit requests for questions. MIHL indices include relative frequencies of information seeking utterances (ISUs), turn-taking, and respondent talk time. Some months later, participants were interviewed by telephone immediately following a medical appointment. They were prompted to recount their clinical encounter in an open-ended narrative. The narratives were coded for evidence of patient agency, patient informational interactivity, and provider responsiveness (including expressions of affect).

Results
The reading-based TOFHLA failed to correlate with any of the measures arising from patients' accounts. On the other hand, the relative frequency of ISUs derived from the MIHL correlated moderately with patient interactivity with their providers (r=.21) and with accounts of provider responsiveness (r=.26). Patients' statements of their own agency in these encounters were associated with provider responsiveness (r=.32) and with patient informational interactivity (r=.32). In patient accounts, provider responsiveness was strongly associated with patient interactivity (r=.66). Age was negatively associated with patient agency (r=-.28).

Conclusions
The present study extends the evidence for primarily oral interactive health literacy as a key factor in health information exchange and utilization. Measured interactive health literacy, but not document-based health literacy, was associated with older adults' spontaneous accounts of their participation in a recent health encounter. Moreover, that participativeness was rather strongly associated with provider responsiveness. This pattern of results suggests that older adults who are prepared to ask questions and engage in other forms of proactive information exchange ultimately see their providers as positively responding to their communication behaviors. Training in interactive health literacy may therefore prove to boost the quality of

provider communication for low SES older adults. Regrettably, age was negatively related to patients' own sense of agency in their health care encounters. These results must be understood as explaining older adults' own constructions of their encounters, and not as representing actually observed behaviors.

Health Literacy and 30-day Post-discharge Hospital Reutilization. Mitchell, Suzanne[1]; Sadikova, Ekaterina[1]; Martin, Jessica[1]; Sarvepalli, Shashank[1]; Jack, Brian[1]; Paasche-Orlow, Michael[1]. [1]Boston University School of Medicine, Boston, MA.

Background

Low health literacy is associated with higher mortality, higher rates of hospitalization and poor self-management skills for chronic disease. However, few studies have examined the relationship between health literacy and 30-day hospital reutilization rates. Multiple state and national policies initiatives have emerged to reduce 30-day hospital reutilization. This study aims to examine the association between health literacy and 30-day hospital utilization in an urban, academic safety-net population.

Methods

We conducted a secondary analysis of 747 adult, English-speaking hospitalized patients from the control arms of the Project RED and Project REDLIT datasets. The primary independent variable was health literacy level as measured by the Rapid Estimate of Adult Literacy in Medicine (REALM) tool. The primary outcome measure was post-discharge hospital utilization defined as total emergency department (ED) plus hospital readmissions within 30 days of index hospitalization discharge. Poisson regression analyses were conducted to control for confounding.

Results

Of the 747 subjects included in the analysis, 147 (20%) were categorized with a health literacy level of grade 6 or below, (221) (49%) at grade 7 to 8, and 379 (31%) at grade 9 or higher. In unadjusted analyses, patients with low health literacy had significantly higher rates of 30-day hospital reutilization compared to patients with health literacy at grade 9 or higher, IRR=1.51 [CI, 1.14, 2.00]. After controlling for age, gender, race, marital status, income, length of hospital stay, frequent utilizer status, homelessness, depression, and having PCP, compared with high health literacy patients (REALM = grade 9 or higher), a significantly higher rate of post-discharge hospital utilization was observed for patients with low health literacy, IRR [CI], 1.45 [1.05-2.02], p=0.03.

Conclusions

Low health literacy is a modifiable risk factor that is significantly associated with a higher rate of 30-day hospital reutilization. Interventions designed to reduce early, unplanned, post-discharged hospital reutilization should consider health literacy as a potential intervention target.

Factors related to understanding a 3D diabetes education video: What matters? Liu,
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University Indianapolis, Indianapolis, IN.

Background
The prevalence of diabetes is high among older adults and minorities. Learning the disease
process is a critical component of diabetes education but can be difficult for people who do not
have background knowledge in pathology or biology. One significant advantage of using a video
in patient education is that the video can illustrate the disease process via dynamic visual
presentation, which may enhance learning. However, studies do not always demonstrate that
using videos as a patient educating tool is superior to traditional standard education which
includes the use of print materials and face-to-face instructions. The disappointment may lie in
not knowing factors that are associated with understanding video information. The purpose of
this study was to determine these factors.

Methods
Participants were recruited through posting flyers in the community and on-site recruitment at a
county hospital. Inclusion criteria were age > 60 years, English speaking, and no history of
diabetes. Participants with major neurological disorders were excluded. Eligible participants
were invited to a university lab. Prior knowledge of diabetes was assessed before watching a 5-
minute, three-dimensional (3D) video. The video was created by the 2nd author, and was shown
on a 15-inch 3D monitor with adjusted volume to each participant. The video explains the
pathological mechanism of diabetes via illustrations, animations, and narration. Perceptions of
the video, motor free visual perception, verbal knowledge, health literacy, working memory,
comprehension of the video information were evaluated in sequence afterwards.

Results
Twenty-one participants completed the study (13 Whites, 5 African Americans, 2 Asian Indians,
and 1 Brazilian American). Based on 10-point rating scales, they thought the video was slightly
too fast (Mena = 7.48) but helpful (Mean = 9.38), exciting (Mean = 8.19), valuable (Mean =
8.29), and easy to follow (Mean = 8.19). The Table summarizes descriptive results, correlation
matrices, and also multiple regression analysis results. The multiple regression model is
significant, adjusted $R2 = .86$, $F (6, 14) = 20.91$, $p < .001$. Significant predictors of video
comprehension scores are race, prior knowledge of diabetes, and verbal knowledge. Higher
comprehension scores are associated with being White, and having higher prior knowledge of
diabetes and verbal knowledge.

Conclusions
A surprise finding of our study is that verbal knowledge is a strong factor associated with the
ability to understand the 3D diabetes process video. Video is multimedia that requires viewers to
integrate illustration or animation with narration to reach of the goal learning. Information can be
conveyed via the auditory-verbal channel and visual-pictorial channel in a video. This finding
suggests that participants rely on the auditory-verbal channel, rather the visual-pictorial channel,
to process the video information. Diabetes health educators need to pay attention to the audio
presentation while developing an educational video. Additionally, the factor of race indicates that
using a video may not totally eradicate the health disparity in knowledge of diabetes process.

Table 1. Results of Descriptive Analysis, Correlation Matrices, and Multiple Regression Analysis.

Variable	Mean (SD)	2	3	4	5	6	7	8	B	$SE\ B$	β
Video comprehension scores	15.86 (2.99)	.66**	.35	.47*	.53*	.83**	.56**	.48*			
1. Race	-	-	-	-	-	-	-	-	-2.36	.71	-.39**
2. Age	66.48 (5.04)	-							.02	.07	.03
3. Years of education	15.48 (2.79)	.33	-								-[a]
4. Prior knowledge of Diabetes[b]	15.24 (4.30)	.29	.07	-					.23	.07	.33**
5. MVPT[c]	108.19 (22.27)	.19	.17	.44*	-				-.03	.02	-.19
6. Verbal knowledge[d]	31.14 (6.45)	.53*	.41	.24	.67**	-			.29	.07	.62**
7. Health literacy[e]	33.24 (4.54)	.38	.48*	.22	.41	.63**	-				-[e]
8. Working memory[f]	14.48 (4.34)	.35	.20	.35	.57**	.53*	.62**	-	.01	.08	.01

Note. a. The variable, years of education, was not estimated in the regression model due to low correlations with other variables. b. A 24-item diabetes knowledge questionnaire (Gracia et al., 2001 in *Diabetes Care*). c. MVPT-Motor Free Visual Perception Test (Western Psychological Services). d. A 40-item vocabulary test (Shipley, 1940 in *Journal of Psychology*). e. Short Test of Functional Health Literacy in Adults (Peppercorn Books and Press). The variable, health literacy, was not estimated in the regression model due to non-normality distribution. f. Sum scores of Digit Forward and Digit Backward Tests (Wechsler Adult Intelligence Scale). *$p < .05$. **$p < .01$.

Health literacy inclusion in undergraduate nursing education: An integrative review.

French, Kim[1]. [1]Austin Peay State University, Clarksville, Tennessee.

Background
A major nursing responsibility is to educate patients with diverse literacy levels using understandable health communication. Inadequate or poorly communicated health information adversely impacts patient-provider interactions and health outcomes. Effective health literacy practices should be taught and learned throughout a nurse's undergraduate educational experiences. How are undergraduate nursing students prepared through current nursing education curricula, course content and clinical experiences to recognize, identify and intervene for patients with varied literacy levels?

Methods
The purpose of this study was to evaluate support for and inclusion of health literacy evidence based practices in undergraduate nursing education using Whittemore and Knafl's integrative review methodology. Search strategies included general, health related and educational computerized database searches, ancestry reference review and use of expert recommendations. The keywords "literacy", "health", "nurs*", "education" and "student" were used for the primary search. Seventy six abstracts of peer-reviewed articles in English from 1989 to 2011 were located. After excluding "information literacy" and "online learning", three descriptive quantitative, one quasi-experimental and one qualitative phenomenological observational study were identified as relevant. Health literacy definitions, health literacy inclusion, population characteristics, research design, student and patient outcomes and implications were extracted for comparison.

Results
Four subthemes emerged from the data analysis: curricular access, course content application, student engagement in learning and patient involvement in self care. Access and application of health information appear to be minimally represented in baccalaureate nursing curriculum and course content. Health literacy content was evaluated through specialized projects or in senior level Community Health courses at the baccalaureate level. These findings suggest that health literacy practices may not be fully synthesized throughout all levels of nursing curricula or teaching content. Functional health literacy information was used to characterize current health literacy course content. Students were engaged in functional health literacy interventions to increase patient health knowledge with improved patient self care as the goal. None of the studies linked direct measurements of improvements in patient outcomes to student health literacy knowledge or practices.

Conclusions
Inconsistencies in the application of health literacy knowledge and practice in nursing education may limit the effectiveness of future nurses as communicators, patient educators and advocates. Increased inclusion of health literacy quantity and quality throughout nursing education should occur to bolster nursing student knowledge and evidence based practice. The impact of student interventions on patient outcomes and health care quality should be evaluated to determine areas for improving health literacy inclusion in current and future nursing educational practices.

The University of Kentucky Health Literacy Colloquium Series: Creating Solutions to Health Disparities Throughout Our State. O'Hair, Dan[1]; Dupuis, Jennifer[1]. [1]University of Kentucky, Lexington, KY.

Background

The University of Kentucky's College of Communications and Information Studies is known as a world-class research program that focuses on health communication and risk communication. Our research scientists have established that developing effective messages is one of the most important strategies for improving the health quality of our citizens. Without effective communication, advances in medical science have less potential to make a difference in people's lives. We can improve health communication by improving health literacy.

Health disparities are a major issue in rural Kentucky, where high-school drop-out rates and poverty are high, and access to and knowledge of technology and healthy food options are limited. To gain a state-wide view of how to improve health literacy in Kentucky, and in rural Kentucky particularly, we conducted a series of ten colloquia over one academic year. Each colloquium featured four local experts in health, health literacy, rural health issues, policy making, or research, plus a moderator. In these frank and open discussions, we identified people, issues, assets, and opportunities that lead to programs to improve health literacy.

Methods

For each colloquium, we identified four experts and invited them to comprise the panel. We strove for variety in discipline and geographic area, in order to foster creative discussion and learn about unique programs and activities throughout Kentucky.

Each hour-long colloquium was recorded in video format and made available on our College's website (http://cis.uky.edu/Colloquium). We have transcribed the content of all ten programs, and we are embarking on a content analysis of this content to create a problem and asset map of health literacy throughout the state of Kentucky that will identify problem areas (geographic or demographic areas where health quality is low and/or resources are lacking) as well as resources and programs that are already in place that can be replicated or used as a benchmark for programs in underserved areas of the state. This phase will be completed by the end of summer 2011.

Results

We have spoken to and recorded the discussions of 40 experts in 10 hours of content. We have identified research that already exists about the health quality of Kentucky residents that will be the starting point for our problem/asset map (Kentucky Institute of Medicine. The Health of Kentucky: A County Assessment. Lexington, KY, 2007. http://www.kyiom.org/healthky2007a.pdf).

Some trends that were consistently discussed in most or all of the colloquia include:

• community-based, grass roots efforts are the most effective in rural areas,
• identifying and recruiting community leaders to share messages is preferred to bringing in outside experts to teach the community,

• demonstrating the correlation between health literacy and economic strength of the community helps invest business and community leaders in improving health literacy and quality community-wide, rather than considering it an individual issue.

Conclusions
We have the research and background to begin implementing health literacy improvement initiatives state-wide. Our problem/asset map will allow us to identify crucial areas for improvement and resources that already exist which can assist our future projects.

A Promising ESL & Health Literacy Curriculum for Hispanic Adults. Soto Mas, Francisco[1]; Mein, Erika[1]; Fuentes, Brenda Oriana[1]; Muro, Andrés[1]; Tinajero, Josie[1]. [1]University of Texas at El Paso, El Paso, TX.

Background
Many approaches have been proposed to educate the public in three basic components of health literacy: prose, document, and numerical skills. These include traditional health education interventions planned by health care providers, implemented at health care facilities, and generally based in health behavior theory. Also presented on the literature is the limited success at the population level of health literacy interventions.

An approach that is in need of further exploration is the integration of education and health. There also exists evidence of the benefits of incorporating health into adult education, including English as a Second Language (ESL) instruction. This is an approach which has the potential for benefiting the Hispanic population in the U.S. for three reasons: 1) the rapid growth of the Hispanic population; 2) the low health literacy levels of this population group; and 3) the high participation of Hispanics in ESL programs.

This project, funded by NHLBI, was aimed at developing, implementing and evaluating an ESL/health literacy curriculum for Hispanic immigrants. Cardiovascular disease prevention provided the health context. The content and format were informed by health behavior, literacy learning, intercultural rhetoric, and communication theory, including self-efficacy, communicative competence, use of authentic texts, multiple literacies, and principles of adult learning.

Research questions
Do students who receive the ESL & Health Literacy curriculum improve their English proficiency and health literacy post test scores?
How do students perceive the contribution made by the content and format of the curriculum to their learning experience?

Methods
Mixed methods. Quantitative: one group, pre-post test design. Outcomes included changes in health literacy and English proficiency. All participants completed the Test of Functional Health Literacy in Adults (TOFHLA) and the Combined English Language Skills Assessment (CELSA) test. Qualitative: semi-structured group discussions. Participants were selected from the community; they attended a 6-week program. Inclusion criteria included; 1) adult; 2) able to write and read in Spanish; 3) low/intermediate English proficiency level. Analyses included: paired-samples t-test to compare pre and post test scores. Group discussions were transcribed, coded using pre-determined themes consistent with theoretical framework, and analyzed using qualitative methods.

Results
A total of 95 students participated, 77 completed both pre and post tests (81% retention rate). There was a statistically significant difference between pre and post test in TOFHLA ($t(76) = 10.611$, $p<0.001$; effect size=.31) and CELSA ($t(76) = 4.654$, $p<0.001$; effect size=.88) scores

(two-tailed). See Table 1 for descriptive statistics. In general participants were highly satisfied with the format and content of the curriculum, and they perceived that it contributed to improving their language and health knowledge.

Conclusions

There exists a need for interventions that benefit from the positive connection between education and health. Such interventions represent an opportunity for improving both the education and health status of Hispanics and decreasing health disparities. This paper discusses the need for interdisciplinary approaches to health literacy and for incorporating education theory into health literacy interventions; the key component of a theory-based ESL/Health Literacy curriculum; and the impact of the curriculum among Hispanic adult learners.

Table 1. Descriptive statistics (n=77)

Time	Mean	SD	Std. Error Correlation	
TOFHLA				
Pre	59.94	17.04$\pm$	1.943	
Post	72.79	12.38$\pm$	1.412	0.78*
CELSA				
Pre	99.23	5.83$\pm$	0.665	
Post	101.01	6.03$\pm$	0.687	0.84*

P<0.001

Health Literacy along the U.S.-Mexico Border: Proposing Alternatives to the Fotonovela Genre. Thatcher, Barry[1]. [1]New Mexico State University, Las Cruces, NM.

Background
Fotonovela is a Spanish word meaning drama pamphlet. Using a strongly visual comic-book format, the fotonovela teaches health concepts through a dramatic plot, interpersonal relations, and a richly grounded context, following the Latin American TV genre of telenovelas. The fotonovela is well established in Latin America and U.S.-Mexico border areas because it meets the cultural and literacy expectations of the population.

The instructional design of the fotonovela, however, might have problems. Using comic book approaches might make the mistake of treating the semi-literate adult population like children, not adults. Second, the drama-like approaches in fotonovelas are effective at demonstrating a problem, but often very weak at solving it, often inspiring an "exceptions to rules" mentality (Thatcher, 2000). Third, the relations-based approach is effective at modeling responsibilities and tasks, but when these exact relations are not in place, users are often resistant to perform work based on different models. Fourth, when high-context approaches are used, transferring the instructions from one context to another is difficult (see Thatcher, 2001; Thatcher, 2006). Despite the widespread use of fotonovelas, however, we do not know how serious these limitations are, nor have researchers developed viable alternative approaches.

Methods
This research will use an embedded case study (Yin, 2008) to compare two approaches to health literacy for residents of Fort Hancock, a small community or colonia in West Texas. Colonias are low income, unincorporated rural subdivisions characterized by substandard housing, and inadequate plumbing and sewage systems; almost all colonia residents are recent Mexican immigrants. Currently, the research team is funded by the State of Texas to develop sewer sanitation training for Fort Hancock.

The research team will prepare two pamphlets (in Spanish) on assessing the safety of cesspools, one using the typical comic-book approach of the fotonovela. The second version will use photographs of the colonia and a modified instructional design: It first will ground the topic like a fotonovela, but it will force learners to compare the relevant details of three different scenarios, subsequently building theories from these comparisons. Next, the second version will help the residents move the scenario theories into applicable cause and effect analysis, looking at what causes are linked to which effects. Finally, the 2nd pamphlets will move into program solving and analysis for the specific homeowners. The second design should meet the needs of the residents but also counteract the problems of the fotonovelas.

Results
Two health promoters from Fort Hancock will visit 120 households, sit down and take the residents through the two pamphlets, asking them which types of approaches they prefer and why. We will carefully document their preferences. The results will then be analyzed and reported using case study and qualitative analysis. These results will be added to the growing body of health literacy research for the Latino and Mexican communities.

Conclusions
Since the use of fotonovelas is so widespread in these communities whose health is almost always disproportionately low, the development of improved, more effective health literacy approaches is a must.

Navigating Treatment Programs: Health Literacy Issues For Drug Court Clients. Gill, Marie[1]; Engle, Veronica[1]; Speck, Patricia[1]; Cunningham, Patricia[1]. [1]The University of Tennessee Health Science Center, Memphis, TN.

Background

Drug Courts (DC) provide year-long supervised community-based drug addiction treatment programs as an alternative to incarceration for non-violent drug-related crimes. DC programs, however, have been studied by the criminal justice system for program evaluation and client behavior improvement rather than as a mental health intervention that requires optimal health literacy (HL) to navigate the complex DC treatment program, and to learn new self-care behaviors to remain sober. DC clients are predominantly unemployed low-literacy minority males with <12 years education, placing them at-risk for low HL and for health disparities. A Logic Model (LM) was developed to explain the factors and pathways affecting client participation in and successful completion of DC programs. This presentation describes: a) a LM for a mid-south DC treatment program, and b) recommendations for DC HL interventions and research.

Methods

A LM documented and evaluated key elements of a DC program's situation, inputs, outputs, and outcomes; assumptions about DC organizational culture; how DC programs work; and external factors influencing stated objectives. The DC judge, program coordinator, and counselors were interviewed to identify priority needs, barriers, and challenges. Additional information to develop the LM was obtained through a review of literature, participant observation of DC activities, follow-up interviews, and review of DC files and procedure manuals.

Results

DC client attendance of all treatment activities and court dates was the priority program need. Complex program design was a barrier to attaining this need. The DC treatment program has four phases that require 7 to 9 mandatory activities per phase, ranging from as needed to 3 times per week, changing in frequency during each phase. Program challenges were clients must schedule their own appointments, and the primary program navigational tool was a client handbook written at a 12th grade reading level for visual learners. The hypothesis is that DC clients are unable to navigate the DC treatment program because of the lack of usable information about client responsibilities, complex program requirements and activities, and poorly coordinated services. LM inputs included DC program navigational tools, DC structure, and DC partners. LM outputs included multiple treatment activities and treatment providers. Assumptions included a revised handbook would help clients keep timely DC treatment appointments and court dates. Desired LM health literacy outcomes included DC clients keeping appointments and court dates; revised DC navigational tools, including the client handbook, using suggestions from DC graduates; and evaluation of navigational tools, client attendance at DC treatment activities, and client progression through the DC program.

Conclusions

Successful participation in DC treatment programs requires that clients independently initiate and keep appointments for complex, year-long, and ever-changing treatment schedules. DC clients may lack basic skills to make and keep appointments. HL is an essential component for

clients to successfully complete the DC treatment program. Recommendations for DC HL interventions include evaluating clients' reading level, improving navigational tools, and interviewing clients about what they found helpful to keep appointments and additional resources needed to remain sober and finish the treatment program.

Feasibility of routine health literacy assessment for hospitalized adults: the Health Literacy Screening (HEALS) Study. Cawthon, Courtney[1]; Bruce, Corinne[1]; Willens, David[1,2]; Roumie, Christianne[1,2]; Mion, Lorraine[1]; Wallston, Kenneth[1]; Rothman, Russell[1]; Woods, Marcella[1]; Osborn, Chandra[1]; Kripalani, Sunil[1]. [1]Vanderbilt University, Nashville, TN; [2]VA Tennessee Valley Health System, Nashville, TN.

Background

The Institute of Medicine report on health literacy called for incorporation of health literacy assessment into healthcare information systems, as well as large-scale epidemiologic studies of the effects of health literacy on clinical outcomes. To our knowledge, no institution has incorporated health literacy screening into routine clinical practice. The Health Literacy Screening (HEALS) Study aimed to determine the feasibility of incorporating three brief health literacy screening items into the inpatient nursing assessment at a large academic hospital.

Methods

Vanderbilt University Hospital (VUH) receives more than 40,000 adult admissions per year. In collaboration with nursing leadership, we revised the "Learning Readiness" section of the nursing admission documentation to incorporate three health literacy screening items, a structured assessment of patients' educational attainment, language preference, and request for an interpreter. The three items assessed confidence with forms, need for assistance in reading hospital materials, and problems learning about medical conditions, respectively. The learning readiness documentation is required for all adult inpatients and observation patients and is completed by a staff of approximately 5000 nurses. It is stored in the electronic health record, as well as the institution's Enterprise Data Warehouse (EDW).

Before deployment of the revised learning readiness documentation, we developed educational resources on health literacy for staff nurses. This included webpages detailing the documentation change, tips on clear health communication, links to outside resources, an email address for questions or concerns, and a training video featuring a message from the chief nursing officer and a demonstration of how to best administer the screening items. Monitoring of documentation was completed initially by data extractions from the EDW and later through a customized dashboard that interfaced directly with the EDW.

Results

The documentation change was activated on October 19, 2010. Nursing leadership groups sent emails to nursing staff to provide details of the change, with links to the educational resources. Between 10/24/2010 and 3/19/2011, 13,127 (91.3%) adults hospitalized at VUH had the nursing admission documentation completed. Among those patients, 11,918 (90.8%) had responses recorded for all three health literacy items. Completion rates across the hospital climbed from 83% in the first week, to 94% by week 7, and leveled at 91% by week 11. Across hospital units, completion rates ranged from between 70% and 100%.

Using a cutoff of "somewhat" or "sometimes" on each item, the prevalence of low health literacy on each of the three screening items was 27.8% (confidence with forms), 32.3% (need for assistance in reading hospital materials), and 27.3% (problems learning about medical

conditions). Across hospital units, the proportion of patients with low health literacy ranged from between 9% and 44%.

Conclusions

With support from clinical leadership and electronic documentation tools, health literacy screening for hospitalized patients is feasible. Further investigation is underway to determine the accuracy and fidelity of administration by clinical personnel, to assess test-retest reliability, and to determine association of these measures with clinical outcomes.

The availability of translated public health materials for limited English proficiency populations in Washington State. Turner, Anne[1]; Capurro, Daniel[1]; Krichoff, Katrin[1]. [1]University of Washington, Seattle, WA.

Background

A key effort toward addressing health disparities is effective communication of health promotion messages to diverse populations. However, for the over 46 million people living in the United States with limited English proficiency (LEP) [i.e. individual speaks a primary language other than English and has limited ability to read, speak, write or understand English], obtaining accurate and up-to-date health information can be very challenging. For this growing segment of the US population, language barriers can contribute significantly to diminished health literacy and consequently increased health disparities. Studies indicate that LEP populations have poorer access to health education, less preventative health screening and report poorer health status than English speaking minority groups. Providing quality translations of English health information materials into other languages is a promising avenue for improving health literacy for these groups. Unfortunately, for many health agencies the time and costs associated with creating quality translations remains a barrier to providing translated health information for a linguistically diverse population.

To better understand the need for translated materials and the extent to which local health agencies (LHAs) are currently meeting the health information needs of LEP populations, we investigated the availability of translated health promotion materials on LHA websites in Washington State (WA).

Methods

We systematically investigated health promotion materials available on all LHA websites (n= 34) representing the 39 counties in WA. Online health promotion materials were classified by topic, format and source. We adopted the European Multilingual Thesaurus on Health Promotion for our classification system and added new terms to reflect the topic classification practices of the investigated LHAs. We then determined the availability of translations and the frequency of specific languages represented.

Results

A total of 2,004 health promotion documents were identified on 34 LHA websites. Health promotion materials were available in English on a variety of topics, from infectious disease to emergency preparedness.

The priority languages for translation – based on language spoken at home in WA – are Spanish, Vietnamese, Chinese, Russian, Somali and Ukrainian. Only 9.6% of the health promotion materials available on LHA websites were translated into languages other than English (see Table 1). Of the 192 translated documents, all were available in Spanish; Vietnamese (70) and Chinese (60) were the next highest frequency.

Translated materials available on LHA websites were from counties with the largest non-English speaking populations. There was little evidence of sharing of translated materials between LHAs.

Language	Number	% of Total
Spanish	192	9.6
Vietnamese	70	3.5
Chinese	60	3
Somali	52	2.6
Russian	42	2.1
Korean	37	1.8
Laotian	12	0.6
Other	78	3.9

Table 1: Frequencies at which public health promotion documents (Total = 2004) were translated into different languages. Note that these percentages add to more than the overall 9.6% translation rate since some documents were translated into multiple languages.

Conclusions

LHA websites provide a wealth of English language health promotion materials. However, there is a tremendous need for translated health promotion materials for LEP populations. Our study confirms that there is a paucity of translated health promotion materials available on WA LHA websites. Affordable methods for generating translated health materials are needed to fill this gap.

Through our recently funded TransPHorm project we are investigating the feasibility of machine translation technology to improve access to translated health materials for LEP populations.

What is the Association Between Health Literacy and Self-reported Use of Health Care Services? Hahn, Elizabeth[1]; Yost, Kathleen[2]; Jacobs, Elizabeth[3]. [1]Northwestern University Feinberg School of Medicine, Chicago, IL; [2]Mayo Clinic, Rochester, MN; [3]University of Wisconsin-Madison.

Background

An updated review of health literacy interventions and outcomes found low to moderate evidence of an association between health literacy and use of health care services (Berkman et al., 2011). Future research priorities include examining health literacy in the context of mediation and moderation.

Methods

"Health Literacy Assessment Using Talking Touchscreen Technology" (Health LiTT) is a new item response theory (IRT)-based measure of health literacy (NHLBI R01-HL081485). English-speaking primary care patients (n=608) participated in a study conducted at safety net health care centers. Health LiTT scores were generated using IRT calibrations; higher scores indicate better health literacy. Research assistants conducted face-to-face interviews to gather information on use of health care services, including cancer screening, and emergency room (ER) and hospital visits. Questions were based on BRFSS and were specific to the patient's age and gender. We dichotomized behavior for each screening test as adherent or not (e.g., mammogram within past 2 years) and created an age- and gender-specific measure of overall screening adherence (number of adherent tests/recommended number). We conducted linear and ordinal logistic regression analyses to evaluate the potential mediating effect of health literacy on the relationship between patient characteristics and use of health care services.

Results

Participants were 51% female, 67% non-Hispanic Black, 17% less than high school education and 49% without health insurance. Mean adherence to recommended screening was 58%; 57% had > 1 visit to the ER and 32% had >1 hospital stay. In bivariate analyses, gender, age, insurance, comorbidities and Health LiTT scores were each significantly (p<0.05) associated with adherence; race/ethnicity was not (p>0.40); education was borderline (p≈0.10). In multivariable models, covariates remained significantly associated with adherence; addition of Health LiTT to the model did not mediate estimated associations. Interestingly, the direction of the association between Health LiTT or education and screening tests was unexpected, e.g., better adherence was associated with lower Health LiTT and lower education. Health LiTT was significantly (p<0.001) and positively associated with number of ER and hospital visits before and after adjustment for other covariates, and there was no evidence of mediation by Health LiTT.

Conclusions

Among a diverse group of underserved primary care patients, self-reported adherence to cancer screening tests was fairly high. Health literacy did not appear to be a mediator of the associations between sociodemographic/clinical characteristics and use of health care services. A future prospective study could evaluate health literacy as a potential mediator or moderator more definitively. Interestingly, both health literacy and education were negatively associated with adherence. It may be that self-report by interview resulted in social desirability bias among

patients with lower health literacy or education. Although technical terms like "mammogram" and "sigmoidoscopy" were defined by interviewers, it is also possible that patients with lower health literacy/education were more likely to misunderstand a screening question and incorrectly answer in the affirmative. The expected positive associations between health literacy and ER or hospital visits suggest that these types of questions may have been perceived as clearer and more understandable to patients or were less susceptible to social desirability bias.

Improving Interactive Health Literacy through Social Networking: Making a Case for Twitter and Facebook. Willis, Erin[1]; Young, Rachel[1]; Stemmle, Jon[2]; Rodgers, Shelly[2]. [1]University of Memphis, Memphis, TN; [2]University of Missouri, Columbia, MO.

Background

The popularity of the Internet and the proliferation of new media applications provide opportunities for health information to be easily and inexpensively disseminated to consumers (Kamel, et al., 2007). Social networking sites, like Facebook and Twitter, provide an opportunity for health organizations to engage in conversations with consumers and provide easy-to-use interactive features such as sharing photos and videos, or commenting on posts/Tweets. Interactivity is "the condition of communication in which simultaneous and continuous exchanges occur, and these exchanges carry a social, binding force" (Rafaeli & Sudweeks, 1997, p. 4). Social networking sites use interactivity to enhance consumers' understanding of health information, which is fundamental to health literacy (Nutbeam, 2000). Interactivity may also increase word-of-mouth among interpersonal networks (Kalichman, et al., 2002), and can improve consumers' self-management behaviors (Guendelman, et al., 2002). To determine how organizations are utilizing the interactive capabilities of social media sites, this research examined types of health organizations using Facebook and Twitter to engage in conversations with consumers (RQ1), textual and multimedia features of each site being used to reach niche publics (RQ2), topics related to health literacy addressed in social networking site postings (RQ3).

Methods

To explore how health-related organizations utilize Facebook and Twitter in promoting interactivity and health literacy, this study used content analysis. Health organizations that dealt with health literacy were identified through an Internet search and searches on Twitter and Facebook using the key term "health literacy." This study used a census sample, and the sampling time frame was September 2009 to February 2010 – one month before, during and two months after Health Literacy Month. The final sample included all comments (on Facebook) and tweets (on Twitter) from the date on which the organization joined the social networking site to the time of the study. The overall average Holsti's (1969) coefficient for the inter-coder reliability was .91.

Results

In regards to RQ1, the study revealed that 43 organizations meeting the search criteria used Facebook and 301 organizations used Twitter to disseminate public health messages: 78% were community, advocacy, or non-profit organizations; 37.6% were businesses, corporations, or pharmaceutical companies; 14.6% were colleges and universities; 6.7% were government centers or agencies (e.g., CDC, NIH); and 4.6% were health care institutions. A range of textual and multimedia features were utilized on Facebook (RQ2), including photos ($M = 42$, $SD = 36.02$), videos ($M = 2$, $SD = 4.55$), and hyperlinks ($M = 25$, $SD = 38.84$). On Twitter, the majority of the tweets were original posts (79.6%) while 20.4% were retweets. Most of the organizations (93%) posted about health literacy (RQ3), facilitating consumers' health knowledge by offering help, and asking or answering questions.

Conclusions

Although social network sites provide venues for organizations to interact with consumers regarding health literacy, the majority of health-related organizations are not yet capitalizing on this opportunity. Many of the interactive features are used sporadically, such as commenting on Facebook or retweeting on Twitter. Future research should explore the aims of health literacy organizations in using social networks to better understand how these organizations can take advantage of two-way communication opportunities to promote health literacy.

Health Literacy Assessment of the STOFHLA: Paper versus Online Administration Continuation Study. Chesser, Amy[1]; Wipperman, Jennifer[1]; Keene-Woods, Nikki[1]; Wilson, Rachel[1]; Kellerman, Rick[1]. [1]KSUM-W, Wichita, KS.

Background

Nearly half of all American adults have difficulty comprehending health information, making it nearly impossible for them to use information effectively. Low health literacy is associated with multiple poor health outcomes, and clinical assessment may be associated with improved patient-physician communication. Persons with low health literacy have low health knowledge, increased incidence of chronic disease, lower use of preventive health services, increased hospital visits, longer stays, and utilize more resources. Studies utilizing the short version of the Test of Functional Health Literacy in Adults (S-TOFHLA) or the Rapid Estimation of Adult Literacy in Medicine (REALM) identified high percentages of marginal or inadequate health literacy, which have been linked to increased utilization of health care services.

In 2010, we conducted a pilot study to evaluate the feasibility of using a computer-based system and its potential to assess the health literacy of adults. Using a computer-based S-TOFHLA test allowed us to develop a method to test health literacy levels within a variety of at-risk populations without the constraints of hiring a test-facilitator or limited geographic range, and may be more easily integrated into clinical practice. Results demonstrated the feasibility of using computers to administer the S-TOFHLA.

The aim of this preliminary study was to extend previous findings by assessing if the administration of the S-TOFHLA through a computer-based system is comparable to the paper-based test in terms of the accuracy and time to complete the S-TOFHLA survey. The study investigated how utilizing a computer-based S-TOFHLA test may allow researchers to develop a successful analysis of health literacy levels within a variety of at-risk populations without the constraints of hiring a test-facilitator and limited geographic range. The study will examined whether the delivery of the test through a different channel was perceived favorably among participants. In addition, the study used input from adults to assess the ease-of-use for the online delivery of the S-TOFHLA.

Methods

The study design is a crossover randomized assessment of the health literacy of adults attending a Midwestern Family Medicine Residency Program (see Figure 1). The survey was approved by two local Institutional Review Boards. Participants completed both a health literacy measure using paper-based and computer-based formats to compare the reliability of results using these two assessment channels. Forty participants were asked to complete the S-TOFHLA through the paper-based test first, followed by the computer-based delivery 30-40 days later. Forty participants were asked to complete the S-TOFHLA via computer-based delivery first, followed by the paper-based test 30-40 days later (80 participants total). Questions included demographics, technology use and the timed (7 minute) STOFHLA. Administration of the STOFHLA was conducted using standard procedure and scoring. Power was calculated using the regression model with the response being the difference between the second visit score and the first visit score, and the predictors being the sequence order (whether the patient is taking computer first or paper first), setting the alpha=0.05 and two-sided test.
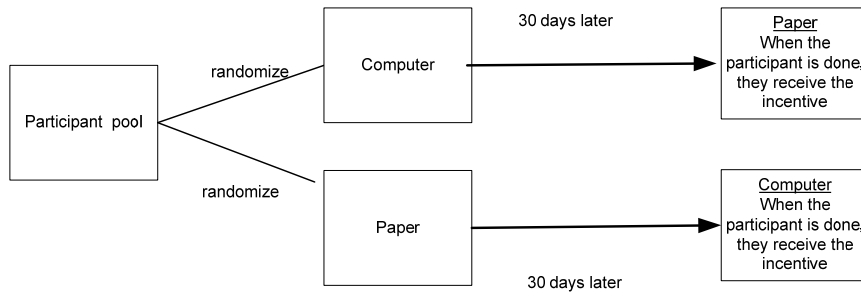
Figure 1. Randomization

Results
This research study will be conducted starting June 13, 2011. Results are pending due to data collection scheduling.

Conclusions
This research study will be conducted starting June 13, 2011. Conclusions are also pending.

The Role of Health Literacy for Physician-Patient Communication during an Office Visit.

Chesser, Amy[1]; Ebberwein, Chris[1]; Keene-Woods, Nikki[1]; Dong, Frank[1];   [1]KUSM-W, Wichita, KS.

Background

Low patient health literacy contributes to low patient understanding and dissatisfaction with the physician-patient encounter and health disparities. Health literacy has been defined as "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions". Bennet and colleagues found that poor health literacy is a contributing factor to racial/ethnic health disparities, Rudd and colleagues concluded that poor health literacy contributes to both low patient understanding and dissatisfaction with the physician-patient encounter.   Furthermore, in a review of literature, Ashton and colleagues named poorer communication between doctors and minority patients as a significant and remediable contributor to racial/ethnic differences in care. Improving physician-patient communication offers a possible remedy for both poor health literacy and health disparities. The purpose of this pilot study was to examine current communication practice among upper level family medicine residents and its relationship to patient health literacy and patient health disparities. Specifically, it aims to utilize direct observation to document family medicine resident efforts in assessing patient understanding of the information and recommendations provided during a scheduled clinic visit. Additionally, it assessed if the majority of patients' health literacy rates for the study population are adequate (when measured using the S-TOFHLA).

Methods

This was a prospective study. The study population (N=40) included patients attending a Midwestern Family Medicine Residency Program. The study was approved by two Institutional Review Boards. Physician communication was documented through observation of recorded medical visits, a brief patient interview, communication assessment tool (CAT), and the short form of the Test of Functional Health Literacy in Adults (S-TOFHLA). Participants received a $15 gift card as an incentive. Quantitative data was analyzed using Predictive Analytics Software (v. 18.0, Chicago, Illinois; formerly SPSS).   Descriptive statistical measurements were used to define and categorize responses; t-tests and analysis of variance (ANOVA) tests were run to compare mean health literacy scores to CAT scores and patient recall levels.

Results

This research study is currently in progress (n=21). Results are pending due to data collection scheduling.

Conclusions

This research study is currently in progress (n=21). Conclusions are also pending.

Intersections of Visual and Health Literacy: An Intercultural Analysis of a Patient Information Website. Lauten, Kathryn[1]; Buchenot, André[1]. [1]IUPUI, Indianapolis, IN.

Background

The Cancer Information Portal for the Indiana University Melvin and Bren Simon Cancer Canter (IUSCC) was launched in 2009 to provide an accessible online resource. Its development was grounded in user-centered interface design processes and in the comparative information model (Hibbard and Peters, 2003) to provide decision-making aids to Indiana's citizens including those with lower health literacy skills. Yet a recently published study of the portal reports that patients describe the website as "'polished' 'professional,' and 'logical,'" but also contends that design limitations hinder patient comprehension – particularly among patients from minority groups. Despite concerted efforts to use recommended health literacy and plain language practices, the researchers argue that the design is "unclear" to the point of limiting access for "citizens who have poor literacy skills, are socio-economically disadvantaged, non-English speaking, or are otherwise on the wrong side of health disparities and the digital divide" (Schilling and McDaniel 2010).

This paper presents results from a study to redesign the portal taking into account implications of visual rhetoric theory to health information sites, the diverse audience served by the portal, and linguistic theories that inform the rewriting of the text. These findings will be addressed through a literacy-focused analysis that pays special attention to intercultural issues and the applicability of the Indiana Center for Intercultural Communication PLAIN Health Model to health information design.

Methods

This project makes the information on the Cancer Information Portal more accessible by considering the cultural situation of visual elements that shape meaning on the website. Beyond the practical application of the Cancer Information Website, this project offers a way to build theory through directed use. The analysis and redesign built into this project addresses questions of how "displayed communication" (Kress 2003) might be manipulated to consider a diverse readership. It also poses new questions about the practicality of digital literacy in the high stakes context of health literacy. In short, this project contributes significantly to the discourse of digital and health literacy by exploring the communicative possibilities of online, visual texts.

While the original authors of the website used relevant recommendations for readability levels and simplified language as well as educational theory on information load, the topical structure and coherence analysis by a team of linguists has resulting in a rewritten site that more adequately relays the complexities of cancer and cancer treatment decisions in a manner understandable by those with limited health literacy, as advocated by Christina Zarcadoolas (2011).

Results

The resulting redesign of the website will be presented along with before and after examples in explanation of how the applied theories brought clarity, intercultural sensitivity, and accessible information to cancer survivors, including family members, friends and caregivers.

Conclusions
The methods used and explained here can be applied to paper and electronic communications to ensure that sophisticated and complete medical information is presented in a manner able to be processed and acted upon by the intended audience, including those with low health literacy.

Health literacy and ehealth literacy: Perspectives from health literacy professionals.

Schauster, Erin[1]; [2]Willis, Erin; Rodgers, Shelly[1]; [1]University of Missouri, Columbia, MO; [2]University of Memphis, Memphis, TN.

Background

The concept of health literacy has evolved from focusing on an individual's reading ability to incorporating the processes and influences of health education (Nutbeam, 2000), including education through the Internet, or eHealth literacy (Norman & Skinner, 2006). Leonardo da Vinci said that knowing is not enough; we must apply what we know (Suh, 2005). For the application of knowledge to be beneficial we must first know what health literacy means for both the patient and the health care professional. As a relatively new concept (Speros, 2005), health literacy has competing definitions from various fields (Greenberg, 2001; Ratzan, 2001; Zarcadoolas et al., 2005), which creates ambiguity for knowing what health literacy means in theory and in practice. In research, attention is given to the measurement and outcomes of literacy skills. The health literacy professional provides a unique perspective by working with patients, health care providers and the communication tools of health literacy. However, limited research examines the health literacy professional's perspective of health literacy (RQ1) or eHealth literacy (RQ2) and similarities between the two (RQ3). Clarifying the concepts of health literacy and eHealth literacy is essential so that knowledge is applied systematically and health communication tools are designed clearly and effectively as part of the health care process.

Methods

Telephone interviews with US professionals working in health literacy (N=122) were conducted. Participants in academic, clinical, educational, consulting, administrative and other related fields were sampled from online resources, academic conference rosters and personal referrals. Interviews were transcribed and qualitatively analyzed using open coding (Corbin & Strauss, 1990).

Findings

Participants suggested that a definition should capture the complexity of health literacy and consider an intended audience, "literacy" may have a stigma, and eHealth literacy is an online technology with implications for the patient. As a complex process, health literacy incorporates many factors including the patient, the health care provider, external factors such as a patient's living environment and the environment in which the patient and provider interact, which the definition does not fully capture. The definition of health literacy should consider the patient and be accessible to their abilities and knowledge level. However, there was disagreement on how to capture this. It was said that the use of "literacy" in the definition may be stigmatizing to patients since the word has negative connotation. Participants agreed that an audience should be specified since the definition should look different when directed toward a patient audience versus an academic audience. Participants also suggested that eHealth literacy is an online medium, or subcategory of health literacy, which has implications for patients regarding cost and access.

Conclusions

The current health care environment dictates that the patient must play an active role in managing their own health. The complexity of this environment and process is not fully captured in the definition. The involvement of patients and providers in an environment influenced by

multiple factors has implications for the process of health literacy, for conceptualizing the process, and for creating the communication tools used to facilitate the process. Conceptual agreement is needed for growth and application in the field.

The Knowledge Information Profile – Coumadin (KIP-C): a knowledge test suitable for patients with limited health literacy skills. Nordstrom, Cheryl[1]; Wilson, Feleta[1]; Templin, Thomas[1]; DiNardo, Ellen[2]. [1]Wayne State University, Detroit, MI; [2]Detroit Medical Center, Detroit, MI.

Background

Self-managing of Oral Anticoagulation Therapy (OAT), often using warfarin (brand name Coumadin) requires the patient to be actively involved with their health care professional to maintain the balance between clotting and bleeding. The majority of patients on OAT with Coumadin are older adults, a demographic group comprising one-third of the US low-literacy population, who must use basic comprehension and numeracy skills to manage anticoagulation therapy safely. Regularly assessing knowledge about Coumadin therapy could guide education tailored to a knowledge deficit.

Aside from the Knowledge Information Profile – Coumadin (KIP-C) being described here, there is no validated tool to measure patients' knowledge about Coumadin and anticoagulation management. The KIP-C reads at a 5th grade level, making it appropriate for the majority of patients.

The objectives were to 1) describe psychometric properties of an instrument that measures Coumadin knowledge, 2) examine literacy relationship with Coumadin knowledge, and 3) provide qualitative descriptions of patients' experience with Coumadin.

Methods

A convenience sample was recruited from patients receiving care at an outpatient, pharmacist-directed Coumadin Clinic affiliated with an urban teaching hospital. Patients who were 18 years of age or older, read and spoke English, and were cognitively able to participate were eligible and completed written informed consenting process. We collected demographics, health literacy assessment (REALM), and Coumadin knowledge test (KIP-C) at baseline. The KIP-C was retested two weeks later along with a brief interview about taking Coumadin.

Results

Our sample of 192 patients was predominantly African American (82%) and female (56%). Approximately 80% graduated high school or more, while 21% did not complete high school. Mean length of time taking Coumadin was 4.8 (sd 6.2) years and ranged from less than 1 to 37 years. Average score on the REALM was 52.9 (sd 17.9, range 0 to 66), which is equivalent to 7th to 8th grade reading ability. Scores on the KIP-C averaged 9.3 (sd 2.6) at baseline and 9.9 (sd 2.5) at the two-week follow-up. KIP-C scores at both examinations ranged from a low of 1 to 14, the maximum possible score.

KIP-C scores at baseline and follow-up were significantly correlated ($r = .68$, $p < .0001$), suggesting acceptable test-retest reliability. At baseline, the KIP-C was correlated with the REALM at .23 ($p = .002$) and with length of time taking Coumadin at .20 ($p = .005$); at follow-up the correlations were .28 ($p < .0001$) and .18 ($p = .01$). Thus knowledge about Coumadin was modestly related to literacy levels and to time using the medication. Ongoing additional analyses include multivariate regression and qualitative analyses of the interview transcripts.

Conclusions
The KIP-C offers an easy-to-read assessment of patient's knowledge about Coumadin. The final questionnaire has 14 items in a true/false format and takes less than 10 minutes to administer and discuss with the patient. Any misinformation can immediately be addressed by the provider and can also guide the focus of future Coumadin patient education. An informed patient can have more stable control over coagulation, ultimately reducing health care visits and costs.

Body Mapping Health Literacy with Incarcerated Women. Donelle, Lorie[1]; Hall, Jodie[1].
[1]University of Western Ontario, London, Ontario, Canada.

Background

Health literacy skills are compromised in people with lower income, lower education, higher age, and of visible minority heritage. Estimates within the prison population indicate that 70% of inmates read below an 8th grade skill. In practical terms these individuals are challenged to read and comprehend information that is not brief, simply laid out and within a familiar context. Yet, estimates of health literacy skill for female offenders do not exist. To date, there has been little investigation of general population Canadians' health literacy skill and even less so among the most vulnerable groups of Canadians.

Further, female offenders tend to have greater mental health concerns and communicable disease, lack access to health care resources, have higher mortality rates, and have higher incidence of chronic disease, all of which tend to persist upon release into the community. Consequently, the promotion of health literacy within this population has potential influence on the health of the broader community.

The purpose of this qualitative study was to gain insight into women offenders' health literacy skill and their perceived strengths and challenges in: (1) accessing health information, community services, social support; (2) their capacity to interpret health information and apply meaning of the information to their personal life context; and (3) their awareness of the broader social and political issues that shape their health circumstances and their ability to advocate for change. The research process was theoretically informed by Nutbeam's (2000) typology of functional, interactive and critical health literacy skills.

Methods

Participants were recruited from a provincial jail. Recruitment strategies were supported by the social work department and the correctional officer manager of the women's' unit. Researchers in the area of women's health, corrections and social justice recommend utilizing methods that provide a means by which the complexity of women's narratives can be captured. 'Body mapping', an emerging arts-based method of data collection, utilized life-size tracing of participants' bodies to gather and share health-related information in a group format. During focus group sessions researchers encouraged participants to use their body maps to document explanations of their health and health literacy issues. By using participants' own representations of their bodies as a starting point from which to explore health / health literacy issues, body mapping facilitated a less scripted interviewing style, allowing for exploration of issues that were difficult to access through verbal discussion alone.

Results

Ten women participated in 8 body mapping / focus group sessions within an incarcerated setting. Overarching themes included: (1) health information access: personal, providers; systems facilitators and barriers; (2) (Dis) empowerment; (3) Health - Inside / Outside.

Conclusions

This investigation provides valuable insights into women offenders' perceived strengths and deficits in health knowledge, access to information, services, social support, and perceived advocacy skill related to participant-identified health promotion issues.
Additionally, body mapping as a method holds potential for engaging with participants in a ways that respects and responds to diverse health literacy skill within marginalized populations.

Assessing Health Numeracy within the Context of HIV in a Predominantly African American Sample: Do Numbers Count? Gakumo, C. Ann[1]; Byrd, Elizabeth[2]; Byrd, James[2]; Vance, David[1]; Estrada, Carlos[1]. [1]University of Alabama at Birmingham, Birmingham, AL; [2]East Carolina University, Greeneville, NC;

Background

Although health numeracy was once explored as a component of health literacy, it has recently gained importance as a separate construct. In a recent review of studies that examined health literacy and health numeracy in relation to health outcomes (Agency for Healthcare Research and Quality, 2011), health numeracy was found to be more highly correlated with outcomes than health literacy alone. Health numeracy is especially relevant for HIV+ individuals because much of their health information is quantitative (i.e., complex medication schedules, CD4 cell count, and viral load). There is currently a dearth of information on instruments that measure health numeracy within the context of HIV. Furthermore, with regard to race, HIV+ African Americans in particular are more likely than other races/ethnicities to be more innumerate (Waldrop-Valverde et al., 2010), more likely to be nonadherent to HIV medications (Anastos et al., 2005; Osborn et al., 2007), and less likely to keep clinic appointments related to HIV treatment and care (Israelski et al., 2001; Mugavero et al., 2009). Our research question is as follows: What is the relationship of HIV-specific health numeracy to HIV-knowledge and health literacy in a predominantly African American HIV+ sample?

Methods

A sample of HIV+ outpatients (n = 117; 81.2% African American) was recruited from an HIV clinic in a Southeastern region of the U.S. HIV knowledge was measured by the Brief HIV-Knowledge Questionnaire (Carey & Schroder, 2002). Health literacy was measured by the Short Test of Functional Health Literacy in Adults (S-TOFHLA) (Baker et al., 1999) and the Rapid Estimate of Adult Literacy in Medicine (REALM) (Davis et al., 1993). Health numeracy was measured by the 3-item Schwartz et al. questionnaire (1997) with 3 additional HIV-specific health numeracy items added. The first HIV-specific health numeracy item asked: "If you have 250 mg pills of Viracept and you take 1250 mg in the morning and 1250 mg at night, how many of those pills should you take every day? _____ pills." The second HIV-specific health numeracy item asked: "If you have 200 mg pills of Sustiva and you take 600 mg at bedtime each night, and you have 15 pills left, would you have enough for one week (7 days)? Yes/No." The third HIV-specific health numeracy item asked: "If your normal T-cell count is 1,000, and your T-cell count is 350 today, would your T-cell count be: Low/Normal/High".

Results

HIV-specific health numeracy was positively associated with HIV knowledge ($p < .001$) and health literacy as measured by the REALM ($p < .001$) and the S-TOFHLA ($p = .02$).

Conclusions

Findings from the current study will be utilized to inform the development of a culturally-relevant HIV-specific health numeracy intervention to improve treatment adherence in HIV+ African Americans. Although previous work in health literacy and HIV has shown promise, interventions that do not take HIV-specific health numeracy and sociocultural factors into account have a limited scope of effectiveness.

Pilot Study of a Children's Book Intervention to Improve Family Communication with Providers. Kadivar, Hajar[1]; Arterburn, David[2]; Greene, Sarah[2]. [1]University of Washington, Seattle, WA; [2]Group Health, Seattle, WA.

Background
Active patient communication is fundamental to shared decision making and patient centered care. Patients who a) provide information, b) seek information, and c) verify information, have improved outcomes, including satisfaction and recall. Although the majority of patients, both adult and pediatric, are not proficient in the above components of communication, limited work has been done to promote these skills, especially within pediatric care. We have created an innovative and interactive children's book intervention that aims to empower and activate both pediatric patients, between 4-8yrs of age, and their caregivers to be more effective in communicating with their health care providers.

Methods
We are conducting a pilot study to assess the acceptability of the intervention, the utility of the measures, and the feasibility of performing a future randomized controlled trial within a general community-based pediatric clinic in a large integrated delivery system. The children's book intervention models desired communication behavior and is mailed to caregiver-child dyads one week prior to their well child appointment. Standardized instruments and interviews assess child anxiety, desired communication with providers, and recall; caregiver desired decision-making role, self-efficacy to communicate with providers, satisfaction, and recall; and provider satisfaction.

Results
Early results of this pilot reveal that caregiver-child dyads are receptive to the children's book intervention. We expect that caregivers will have increased self-efficacy to communicate with providers and increased desire for shared decision making regarding their child's care after the intervention. (Anticipated Results)

Conclusions
A book intervention that requires limited clinical resources can promote active family communication with healthcare providers. Further testing of this intervention is needed among a low socio-economic patient population and a randomized control trial is needed to assess the efficacy of such an intervention.

Developing health literacy in patients with a long-term condition through structured patient education programmes. Edwards, Michelle[1]; Davies, Myfanwy[1]; Wood, Fiona[1]; Edwards, Adrian[1]. [1]Cardiff University, Cardiff, Wales, UK.

Background

Health literacy is the ability to find, understand, appraise and communicate information to engage with the demands of different health contexts to promote health across the life-course. Developing health literacy is important for people living with a long-term condition to manage their health. The research question was: how do patients develop health literacy through patient education programmes and what factors act as barriers and facilitators. The aim of the study was to describe how health literacy may be developed through patient education and explore the processes involved and how they differ across programmes.

Methods

A longitudinal qualitative study using serial interviews with 18 participants to explore their experiences of learning to manage their health, and observation methods to explore the development of health literacy in three different patient education programmes (diabetes, cardiac rehabilitation and self-management). Data were analyzed using a framework approach.

Results

Lay and health professional tutors supported the development of health literacy through teaching about condition and self-management skills. Group dynamics, programme content, teaching methods, and class set-up were important to differences in the dimensions of health literacy that were developed across the programmes. Information on internet information sources was disseminated but only some participants were computer literate and some of them had difficulty seeking, evaluating and using internet information. Our health literacy pathway model shows how health literacy develops through a set of stages to activate patients. We have used the model in this paper to show how patient education programmes help move patients through these stages. We also identify pints in the model where patient education strategies acted as intervention points.

Conclusions

Patient education programmes can facilitate the development of health literacy. Some patients may benefit from training in specific skills that enable them to seek, evaluate and use internet-based health information. The findings have implications for the design and implementation of patient education programmes and the development of health literacy in patients managing a long-term condition.

Validation of a Short, 3-item Version of the Subjective Numeracy Scale (SNS-3). Wallston, Kenneth[1]; McNaughton, Candace[1]; Storrow, Alan[1]; Cavanaugh, Kerri[1]; Rothman, Russell[1].
[1]Vanderbilt University, Nashville, TN

Background
When Fagerlin et al. (2007) reported the 8-item Subjective Numeracy Scale (SNS-8), they suggested that it could be shortened to 5-items (SNS-5). Efficiency in scale design is important to reduce the burden on the subject and improve administration time. The aim of this study was to develop, validate, and cross-validate a 3-item version of the SNS-8.

Methods
For development and initial validation purposes, we used data from 208 patients who responded to the SNS-8 along with the WRAT math test, the REALM, and the S-TOFHLA while waiting to be seen in the emergency department (ED) of a university hospital. The main strategy for selecting items for the SNS-3 was to maximize its correlation with the WRAT math test and the SNS-8. For purposes of cross-validating the resultant SNS-3, we used two additional datasets of previously collected data from cross-sectional studies of health literacy--one consisting of 150 kidney disease patients, the other of 205 primary care outpatients—both containing the SNS-8 along with other measures of numeracy (WRAT and the Lipkus 10-item numeracy scale), health literacy (REALM and/or S-TOFHLA), and health status.

Results
After exploratory analyses, the 3 items selected for the SNS-3 were "How good are you at working with fractions," "How often is numerical information useful," and "How good are you at figuring out the cost of a shirt if it is 25% off?" In the initial sample of 208 ED patients, the SNS-3 correlated 0.88 with the SNS-8 after partialling out age, gender, race, education level and insurance status. Cronbach's alpha for the SNS-3 is 0.78, while alpha for the longer SNS is only 0.83. Both the SNS-8 and SNS-3 correlated 0.47 ($p < 0.001$) with the WRAT and 0.27 ($p < 0.01$) with the S-TOFHLA and the REALM. In the kidney disease sample, the SNS-3 correlated 0.57 with the Lipkus and 0.31 with the REALM, compared to 0.55 and 0.24, respectively, for the full SNS-8. In the primary care sample, the SNS-3 correlated 0.58 with the WRAT math test and 0.27 with the REALM, compared to 0.59 and 0.30 for the SNS-8. Furthermore, in the primary care sample, both the SNS-3 and the SNS-8 correlated significantly ($p < 0.05$) and comparably with self-reported health and patients' total number of chronic diseases.

Conclusions
The 3-item Subjective Numeracy Scale is internally consistent and correlates very highly with the original 8-item version. In three distinct patient samples, the validity coefficients for the shortened version of the SNS are comparable to those of the longer version, thus demonstrating that researchers can administer the shortened version without sacrificing validity in the measurement of subjective numeracy. The elimination of 5 items would allow researchers to include one or two other brief measures in their studies without increasing subject burden.

Variations in Health Literacy in a Community-Based Sample of African Americans.

Ferguson, Monica[1]; Weathers, Benita[1]; Bryant, Brenda[1]; Collier, Aliya[1]; Hughes-Halbert, Chanita[1]. [1]University of Pennsylvania, Philadelphia, PA.

Background
Health literacy is a fundamental component of access to and utilization of health care services. Studies have shown that there are significant racial differences in health literacy, with African Americans being less likely than whites to understand and use health information effectively. Racial group differences are important for identifying groups who are most likely to be vulnerable to adverse health outcomes, but since there is significant heterogeneity within racial and ethnic groups, it is also important to determine if there are within group differences in factors that play a role in health behaviors and outcomes. The purpose of this study was to characterize levels of health literacy in a community-based sample of African Americans and identify factors that are associated with literacy outcomes.

Methods
We recruited a community-based sample of African American men and women over the age of 50 who were residents of the Philadelphia metropolitan area for participation in the study. Data on study measures were collected by self-report during a baseline telephone interview. We used three screening questions devised by Chew to evaluate health literacy. Predictor variables included sociodemographic characteristics and health care variables. Descriptive statistics and bivariate analyses were performed to evaluate the relationship between health literacy and predictor variables.

Results
Table 1 shows the characteristics of the study sample (n=128). There were variable levels of health literacy. Twenty-seven percent of subjects reported problems understanding health information because of difficulty comprehending written information, 19% were not confident in their ability to fill out medical forms by themselves, and 24% needed assistance with reading materials about health information. Different factors were associated with health literacy. For instance, men (32%) were significantly more likely than women (17%) to report that they needed assistance reading health materials (Chi Square=3.83, p=0.05), whereas those with a high school education or less (34%) were more likely to have difficulty understanding health information compared to those with greater education levels (18%) (Chi Square=4.51, p=0.03).

Conclusions
Although previous reports have shown that African Americans have lower levels of health literacy compared to whites, our findings show that within this population, health literacy is more variable and may not be as limited. Specific efforts to address health literacy may need to be developed for men and individuals with fewer years of formal education.

The contextual framework and implications of an evidence based breast cancer education model targeting minority women early on. Doughty, Michele[1]. [1]A.T. Still University of Health Sciences, Kirksville, MO.

Background

The contextual framework for this research study targeted primarily the prevalence of breast cancer in African American women ages 20-39. In 2009, breast cancer in young women represented 25,100 cases total; in situ breast cancer represented 6,460 cases and invasive breast cancer represented 18,640 cases, of which 2820 mortalities occurred in women under age 45 across the various racial and ethnic groups (ACS, 2009). The 2000-2006 Surveillance Epidemiology and End Results Program (SEER) reported African American women experienced a higher incidence of early onset invasive breast cancer and in situ breast cancer in comparison to other racial/ethnic groups at earlier ages (NCI, 2009). The research question focused on whether evidence based breast cancer intervention could increase understanding of breast cancer.

Methods

The researcher over a course of 10 months designed, implemented, and evaluated an evidence based breast cancer prevention educational model. The methodology was implement in-class and through asynchronous learning centered environments designed to increase understanding of breast cancer and to influence the utilization of preventive services in African American women aged 20-39 in the Delaware Valley region. The educational methodology was conducted over a 4-week period at 2 yr and 4 yr post secondary schools and community based organizations.

Results

The results showed the intervention was statistical significant improving understanding of breast cancer in African American women in a classroom environment $p<0.039$ and in an on-line environment $p<0.05$. The study also compared ages 20-29 and 30-39 finding no statistically significance difference related to age about the use preventive services within the subgroups. The subgroups were both in high consensus about the use of preventive services, importance of preventive services, and the importance of tailoring preventive service for younger women. The subgroups were both in high disagreement related to the efficacy of preventive services tailoring outreach efforts to African American women, and the recommendation of the United States Preventive Task Force (USPSTF) related to mammogram services starting at age 50.

Conclusions

The evidence based course intervention demonstrated the perceptions of African American women aged 20-39 were in unanticipated high agreement with use of preventive services, importance of preventive services, and targeting preventive services to African American women at early ages both during and post the intervention. The study concludes the implementation of an evidence based culturally relevant breast cancer intervention improved understanding of breast cancer in this race/ethnicity. Additionally, there is a strong need to improve preventive services through the integration of evidence based educational interventions targeting women of African American ethnicity prior to age 40.

Low levels of health and general literacy are associated with less optimal psychosocial functioning. Kiviniemi, Marc[1]; Rintamaki, Lance[1]; Smith, Kaitlin[1]. [1]University at Buffalo, Buffalo, NY.

Background
Lower levels of health literacy have been associated with poorer clinical outcomes for a variety of health problems and with lower levels of medical self-care behaviors (e.g., medication adherence). Less research attention has been paid to the relation of health literacy and psychosocial constructs related to physical health. There are several psychosocial constructs which might plausibly be influenced by health literacy. For example, lower health literacy might cause greater stress levels given increasing difficulty of navigating medical encounters, and lower health literacy might inhibit engagement in positive coping strategies given lower coping skill levels. However, to our knowledge, the relation of health literacy to such psychosocial factors has not been systematically examined. In this study, we examined the relation between health literacy (both global and health-problem specific) and several important psychosocial functioning constructs. In addition, we examined the relation of general literacy levels to the psychosocial constructs.

Methods
119 clients of an HIV/AIDS health organization took part in the study; all participants were HIV+ and were receiving both HIV-related and general health care from the organization. In a structured interview with a researcher, participants completed measures of general literacy (SORT-R), global health literacy (REALM, S-TOFHLA), and HIV-specific literacy (BEKHA, HIV knowledge, modified functional health literacy measure for HIV). In addition, participants completed standardized questionnaire measures assessing quality of life, stress, positive/negative affect, locus of control, and coping styles.

Results
With the exception of quality of life, all of the psychosocial constructs examined were associated with one or more of the literacy assessments. Higher of general literacy was associated with lower stress, lower external locus of control, greater engagement in active/cognitive coping, and greater seeking of social support. Higher global health literacy was associated with lower stress, lower external locus of control, lower negative affect, and greater engagement in active/cognitive coping. Greater HIV-specific literacy was associated with lower external locus of control, greater seeking of social support, and greater realistic acceptance in coping.

Conclusions
In addition to clinical health outcomes, the results reported here indicate that general literacy, global health literacy, and HIV-specific health literacy are all related to multiple forms of psychosocial well-being. In particular, stress, locus of control, and coping are all related to one's literacy and health literacy status. Given the impact of each of these psychosocial constructs on both physical health and other aspects of well-being and optimal functioning, these findings suggest the importance of understanding how health literacy impacts psychosocial functioning. In addition, given that several of these psychosocial constructs are associated with physical health (e.g., stress and immune functioning, locus of control and engagement in preventive

health behavior), the findings suggest possible mechanisms through which health literacy might impact clinical health outcomes.

Keep it CLEAR: An Effective Health Literacy Curriculum for Medical Students. Roberts, Donna[1]; Reid, Jerri[1]; Conner, April[1]; Barrer, Sharon[1]; Miller, Karen[1]; Ziegler, Craig[1]. [1]University of Louisville School of Medicine, Louisville, KY.

Background
Contrary to recommendations from national medical organizations, medical school education often fails to train students to interact effectively with patients with limited health literacy. Faculty at an academic health center implemented a new curriculum in the required third year family medicine clerkship. The objectives were to increase students' knowledge of health literacy and to assure their comfort with specific communication skills by the end of the six-week clerkship.

Methods
Instructional strategies included lectures, small group practice with standardized patients (SPs), and a facilitated discussion board. Evaluation methods were pre and post-tests of knowledge, students' rating of their comfort using key communication skills, and final test scores with SPs. Senior students who participated in the curriculum were surveyed regarding their knowledge and use of the techniques taught during their third year clerkship.

Results
For the first year of the curriculum, there was a statistically significant increase in students' knowledge of health literacy. The majority of students considered the discussion board a useful tool for exploring health literacy. During the final testing with SPs, students achieved high scores for health literacy related communication skills. At the time of graduation the survey demonstrated students retained the core concepts taught in the curriculum and its impact on health care. Students shared experiences with the use of techniques to address the patient's limited health literacy in their patient encounters.

Conclusions
Evaluation revealed that the curriculum was an effective method to increase students' knowledge of health literacy and to assure their comfort with specific communication skills by the end of the clerkship. Due to the positive outcomes, faculty are considering expanding the curriculum to more students, residents, and preceptors. The curriculum is replicable at other universities and was an effective and efficient way for medical students to learn about health literacy and to acquire valuable skills to improve their patient's understanding of health information. Knowledge of health literacy and related communication skills are essential to enhance the physician/patient partnership and support positive health outcomes.

Identification of Health Literacy Practices in the Communication of an Adult Education Group. Pope, Charlene[1]; Davis, Boyd[2]. [1]Medical University of South Carolina, Charleston, SC; [2]University of North Carolina at Charlotte, Charlotte, NC.

Background

Over 90 million adults in the US have low literacy, a contributor to increased incidence of chronic disease, decreased health knowledge, poorer chronic disease self-management, and health disparities. Functional health literacy is the ability to understand and act on spoken or written health information provided in ways that maintain health and well-being. Certain people are particularly at risk for low functional health literacy (FHL), particularly those over 65 years of age (estimated at over 50% less than adequate FHL), those with less than a high school education, racial/ethnic minorities, and those who have limited English proficiency (LEP). Low FHL is associated with a higher incidence of hypertension and cardiovascular complications. The AHRQ-supported Universal Precautions approach to health literacy assumes the promotion of common health literacy practices. Though a number of clinical trials of health literacy interventions are underway, few identify what constitutes specific health literacy practices that can be identified during interactive communication with adults with limited health literacy.

Methods

This pilot study examines the development of an intervention with photo novellas, which have been used in populations with LEP and low literacy for AIDS, STDs, nutrition, prenatal care, asthma, and chronic disease management, but with little systematic measurement of the changes in associated health literacy practices. Previously tested with certified nursing assistant students (CNAs) with low literacy, a collaborative activity is assigned to two groups of racially and ethnically diverse adults enrolled in a community-based GED program. In four recorded and transcribed sessions, participants work on photo novellas to create picture stories grounded in the group's experience with hypertension to produce user-friendly products for community health centers. Though the long term outcomes are to increase vocabulary and word density in description, expand content knowledge, and promote hypertension management skills as outcomes, this descriptive study represents the formative evaluation of the intervention. Discourse analysis will examine transcriptions for specific health literacy practices embedded in the group interactions that change health literacy status from session to session, as well as assessing knowledge of hypertension and its management.

Results

This intervention will represent the mechanisms of a process that targets health literacy within social networks and a means of using interactional sociolinguistics to identify specific health literacy practices that participants used to construct the photo novellas during interaction. Some practices mirror those first identified by Friere, Roter, and Rudd, and others suggest alternative strategies that are now evolving in a Web-based age with more various sources of information and textual forms. With a minimum of direction, participants can use Web sources, cell phones, cartooning, and community resources to build final products as well as speaking practices that mark particular forms of engagement, inquiry, and problem solving in the face of multiple literacies.

Conclusions

Though the testing of this intervention is still in progress, the process of intervention development offers insights about the construction of health literacy strategies that can be used to produce culturally sensitive materials for community wide distribution and to address specific health promotion and chronic disease prevention and self-management outcomes.

Adaptation of the Cancer Literacy Measure for women in Uruguay. Buki, Lydia[1]; Reich, Micaela[1]. [1]University of Illinois, Champaign, IL; [2]Universidad Católica del Uruguay, Montevideo, Uruguay.

Background

A number of studies support the notion that culture and knowledge affect health literacy. Indeed, cultural and conceptual knowledge are considered aspects of health literacy that contribute to health disparities. Recently, a health literacy measure focused on breast and cervical cancer was developed for use with Mexican women in the U.S. (CLM-BCC, Buki & Yee, 2008). This study reports on the adaptation of the scale for use with Uruguayan women. This information is important because women in Uruguay have the highest breast cancer incidence and mortality rates in all of Latin America.

Methods

To adapt the scale, 2 focus groups were conducted with a total of 15 women (7 women in one group, 8 in the other). Women without a personal history of breast or cervical cancer were recruited from community outlets with the help of community gatekeepers. Participants provided informed consent, filled out a sociodemographic questionnaire, and responded to questions following an interview guide. In the first focus group, information was obtained about women's attitudes, beliefs, knowledge, emotions, and behaviors concerning breast and cervical cancer screening. Subsequently, changes were made to the measure and it was piloted with participants in the second focus group. The interview guide for the first focus group included 10 questions. Sample questions include: "What are some factors that increase women's risk of breast cancer?" and "What do you think about getting a mammogram?" The interview guide for the second focus group included 8 questions. Sample questions include: "What was your experience completing the questionnaire?" and "Did you find that any of the questions were irrelevant to your experience? If so, which ones?"

Results

Participants' sociodemographic characteristics showed that this was a diverse group in terms of age, income, levels of formal education, and screening history. Among the major changes made to the scale were the following: (a) revising questions to reflect the structure of the local health system, (b) changing certain descriptive and emotionally charged words to reflect terminology used in Uruguay rather than Mexico (e.g., in mentioning "breast cancer," we changed the preferred Mexican term for "breast" ("seno") to the term "mama," which is most commonly used in Uruguay), and (c) adding choices to certain questions to reflect the existing knowledge in the population. Based on this information, we made a final version of the survey and are currently collecting data from 400 women nationally to conduct a large-scale psychometric validation of the scale.

Conclusions

This methodology was effective at yielding the necessary data to adapt a scale for a new population. It was clear from women's reactions that they would have felt uncomfortable filling out the measure with terms that are more unfamiliar to them, and with items that do not reflect their health system. By having a culturally-tailored measure to assess Uruguayan women's beliefs, attitudes, knowledge, and behaviors regarding breast and cervical cancer screening, we

can begin to more systematically explore theories of health behavior, understand health disparities, and we can tailor psychoeducational programs to increase women's cancer literacy.

Examining the Relationship between Health Literacy and Health Status. McCormack, Lauren[1]; Bann, Carla[1]; Berkman, Nancy[1]; Squiers, Linda[1]. [1]RTI International, RTP, NC.

Background

There are relatively few conceptual frameworks that identify which constructs contribute to an individual's health literacy and also explore the relationship between health literacy and health-related outcomes. We sought to examine the relationship between health literacy and health status using the Health Literacy Skills Instrument (HLSI). The HLSI is a new, computer-based measure of health literacy that demonstrates robust psychometric properties and is moderately correlated with an existing measure of health literacy (the S-TOFHLA). The HLSI reflects a range of tasks and skills that adults are likely to face in the U.S. health care system. We used the 25-item version of the instrument and data from the pilot fielding of the instrument for this analysis. The study sample (n = 888) is drawn from an online Non-Volunteer Access Panel. Potential panel members are chosen via a statistically valid sampling method and using known published sampling frames that cover 99% of the U.S. population.

Methods

We used structural equation modeling to test our conceptual model that demographics and resources have an impact on health literacy which in turn impacts health status. Health literacy was represented by a latent construct with each component of health literacy (print-prose, document, and quantitative, oral (listening only), and computer) as indicator variables to reduce potential measurement error. Health status was self-reported (Excellent/Very good/Good/Fair/Poor).

Results

The structural equation model fit well (CFI=0.95, TLI=0.94, RMSEA=0.04) (see Figure 1). Participants who have more education, internet access, own their homes, are employed, and are married had higher health literacy scores while those who are black or other race (vs. white) had lower health literacy scores. Those with greater health literacy had significantly better self-reported health status ($p < .001$). Age was directly related to health status with older participants rating their health more poorly. We also began to investigate the same model substituting health status for other self-reported outcomes and found good model fits and significant relationships between health literacy and these outcomes: exercise ($p < .001$); health information seeking ($p = .002$); and stress level ($p < .001$).

Conclusions

This study provides some evidence supporting a positive and significant relationship between an individual's health literacy level and their health status. The findings also suggest that health literacy may play a role in certain health related behaviors. Future research should examine other constructs that are theoretically relevant (e.g., social support, motivation) and may mediate the relationship between health literacy and health status. A strength of the study is the more representative sample and larger sample size used relative to many other studies of health literacy. However, the study has a number of limitations. First, it uses a cross-sectional design which does not allow us to infer that the associations were causal. There may also be unmeasured confounding due to variables not available on the dataset. All of the data are self-reported and potentially subject to respondent related biases.

Measuring associations between health literacy and usage patterns of a prostate cancer web-based treatment decision aid. Fleisher, Linda[1]; Kandadi, Venk[1]; Rusten, Cheryl[1]. [1]Fox Chase Cancer Center, Philadelphia, PA.

Background

There has been a big push to study the effects of computer/web-based decision aids on the treatment decision-making process of cancer patients. The current body of evidence suggests that a significant proportion of adults in the United States have, at most, a basic level of health literacy, with the elderly having significantly lower levels. Little is known about how different groups of patients with varying levels of literacy utilize these types of decision aids to guide their treatment decision-making processes. This cross-sectional pilot study aims to explore the associations between health literacy and how diverse men diagnosed with early-stage prostate cancer utilize a web-based decision aid.

Methods

A convenience sample of 56 men newly diagnosed with early-stage prostate cancer and seeking consultation at Fox Chase Cancer Center utilized a multimedia web-based treatment decision aid to guide their treatment decision-making process. The web tool was equipped with an analytical tracking capability to study how men used the tool and to quantify areas navigated. Prior to using the tool, participants provided demographic information and completed the Short Test of Functional Literacy in Adults (S-TOFHLA). This validated test uses 36 questions to gauge literacy levels. The tool is scored from 0 to 36 and three levels of literacy were calculated (inadequate, marginal and adequate). The decision aid used had several multimedia components consisting of a "Library" with factual text-based information, "Men's Stories" with video-based patient testimonials on different treatment options, and an "Office" with a combination of video and text-based information from physicians representing different treatment fields. We consolidated all navigated sessions into quantities of time (minutes spent) in video and text-based media. An analysis of the variance (ANOVA) test was used to measure the differences in mean time spent.

Results

The majority of the sample were white (87.5%) with African Americans representing 12.5% of the sample. Over half of the participants were above 60 years old (64.3%). Although not statistically significant, a trend was observed suggesting that those men scored " inadequate" in literacy spent the most time in the "Stories" (mean time=19 minutes) followed by the Library (mean time=9.5 minutes). Those with adequate literacy spent the most time in the Library (mean time=13.8 minutes), followed by the Stories (mean time=12.7 minutes). When comparing the mean time spent in text-based material among the three literacy levels, there was a marginal statistical difference ($p=0.06$) finding that men with the highest level of literacy spent more time in text-based content compared to men with marginal and inadequate literacy levels (mean=15.5, 6.3 and 9.8 minutes respectively).

Conclusions

Literacy characteristics may be associated with patterns of use. Larger studies are needed to corroborate these findings. Interventions intended for all users should accommodate different use patterns so that all users have access to the same information regardless of literacy level.

Alternatively, interventions should be appropriately tailored for specific groups of intended users.

A Head-to-Head Comparison of Basic and Health Literacy Measures. Rintamaki, Lance[1]; Kiviniemi, Marc[1]; Smith, Kaitlin[1]. [1]University at Buffalo, Buffalo, NY

Background

Health literacy has been the focus of considerable research in the past two decades, which has linked health literacy to a variety of clinical and behavioral outcomes. The ways in which researchers have operationalized health literacy has varied, however, ranging from measures of basic literacy, experience utilizing health information, and health-related understanding. Although similarities and relationships may exist between these constructs, differences between them could confound our understanding of health literacy and its link to health-related outcomes. The current study provides insight on how basic, global, disease-specific, and functional health literacy measures interrelate.

Methods

119 clients of an HIV/AIDS service organization (each of whom was HIV+ and receiving both HIV-related and general health care from the organization) participated in a structured interview with a researcher. Participants completed measures of basic literacy (SORT-R), global health literacy (REALM, S-TOFHLA), HIV-specific literacy (BEKHA, HIV knowledge), and functional health literacy (a modified functional health literacy measure for HIV). A simple correlation matrix was then established to examine relationships between these measures.

Results

A complex set of relationships emerged between the various literacy measures: (1) The basic literacy measure correlated with all but the functional health literacy measure; (2) The global literacy measures correlated with basic literacy, each other, and with the BEKHA HIV-specific literacy measure; (3) One of the HIV-specific literacy measures (BEKHA) correlated with each of the other measures, whereas the other did so intermittently; (4) Functional health literacy only correlated with one of the HIV-specific health literacy measures (BEKHA).

Conclusions

In short, the term health literacy is widely used among researchers, but the way in which the term is operationalized matters. Measures in the current study of basic, global, disease-specific, and functional health literacy expressed varying degrees of correlation, suggesting the constructs they represent are meaningfully different. Although methodological limitations should be considered when interpreting these findings, the current evidence suggests that efforts should be made by researchers to further delineate the precise meaning of work on health literacy, as well as further exploration of how different forms of literacy relate to clinical and behavioral health outcomes.

Development of a Multi-Lingual, Patient-Centered Prescription Container Label.
[1,2]Kripalani, Sunil; Riley, R. Brian[2]; Mohan, Arun[2,3]; Davidson, Elise[2]; Mashburn, Jennie[2]; Boyington, Dane[2,4]. [1]Vanderbilt University, Nashville, TN; [2]PictureRx LLC, Chattanooga, TN; [3]Emory University, Atlanta, GA; [4]ACT, Iowa City, IA.

Background

Prescription drug labels are difficult for many patients to understand, and they are usually provided in English, even if that is not the patient's preferred language. The State of California and U.S. Pharmacopeia have issued guidelines for the content and format of medication labels, which are being enacted as regulations. We describe the development of an evidence-based, multi-lingual, prescription container label which meets these guidelines and includes additional enhancements.

Methods

Based on research findings, principles for the design of patient education materials, and recommendations from the Institute of Medicine report on medication labels, we developed several prototypes of a prescription container label that can be printed in English only or in both English and Spanish. The labels included an image of the drug, icon to help show the medication's purpose, and daily instructions presented in a 4-time of day format (i.e., Universal Medication Schedule, UMS). Patients were also shown, for comparison, traditional medication labels as well as reformatted labels which adhered to the latest guidelines, but did not include illustrations. Through a series of focus groups and individual interviews, we presented the label designs to English-speaking consumers (N=21), Spanish-speaking consumers (N=29), and pharmacists (N=8). Participants were asked what features were clear or confusing, the relative importance of different fields, and how the label could be improved further. The designs went through several iterations, based on participant input, until convergence was reached on the layout.

Results

Patients and pharmacists expressed a preference for certain important information being grouped together and displayed more prominently, namely, the drug name, dose, indication, and instructions. Other content most relevant to pharmacists should be grouped separately. Patients also indicated a strong preference for inclusion of an icon which helps show the drug indication. Patients preferred labels that contained both the UMS and plain language text instructions, and specification of the dosage form in the UMS (e.g., "2 pills" rather than "2"). Patients preferred having pertinent warnings on the main label, rather than on auxiliary labels. Latino patients, as well as pharmacists, valued the incorporation of both Spanish and English instructions on the same label, so both parties could understand the content. Latinos requested the use of bold colors to highlight patient-relevant label content. The final label design incorporated these and other design elements.

Conclusions

We developed an evidence-based, multi-lingual, prescription container label which includes all content required by state pharmacy boards, adheres to the latest recommendations for label format, and incorporates additional improvements based on patient and pharmacist input. The effect of the label on patient understanding is being tested in a randomized trial.

Pathway to Health Literacy in Korean American Immigrants: The Mediating Role of English Proficiency. Lee, Hee Yun[1]; Choi, Jeon-Kyun[2]. [1]University of Minnesota, St. Paul, MN; [2]Winona State University, Winona, MN.

Background
Low health literacy impacts timely access to and use of existing health services. Individuals with low health literacy thus report poorer physical and mental health functioning. Poor health literacy also limits understanding of health information. Studies have found that individuals with inadequate health literacy demonstrate less knowledge and understanding of chronic diseases, physicians' instructions, and health-related Web information. Recent studies have shown that low levels of health literacy correspond with low levels of education and income, along with older age and ethnic minority status, a link that has been notable within the Asian American immigrant and refugee populations. Although health literacy has been considered to be a critical factor in terms of health disparity among immigrant and refugee populations, there is a dearth of empirical research focused on health literacy, particularly in the Asian American community. Consequently, a deeper understanding of Asian immigrants' health literacy and its impact on their own health disparity is necessary and timely. The purpose of this study is to investigate predictors of and pathways to health literacy among underserved Korean American immigrants.

Methods
Using a convenience and purposive sampling method, 407 Korean American immigrants residing in New York City were recruited for this study. Participants were asked to fill out a structured questionnaire consisting of questions that asked about their sociodemographic characteristics, health history, health accessibility, health literacy, as well as acculturation information. A quota sampling strategy was used to ensure equal representation of sex and age in the sample. Chew et al.'s 16-item health literacy screening scale was utilized to measure the group's health literacy. Social cognitive theory guided the study and Chew et al's 16-item health literacy screening scale was employed. Structural equation modeling was used to test a proposed conceptual model using Mplus 4.21.

Results
The findings revealed that education and English proficiency were the most influential predictors of health literacy among this study's participants. Education was associated with health literacy both directly and indirectly, the latter through language proficiency. Influential factors that predicted greater English proficiency included higher levels of education, younger age, and non-married status. Health insurance was not, however, identified as a significant mediating factor, although it was directly associated with health literacy.

Conclusions
The study's findings suggest that particular need for intervention is seen among immigrants who have minimal English abilities, little education, and no health insurance. Health-care professionals and social service providers who work with these vulnerable populations have a valuable opportunity to improve health outcomes. A patient-centered approach that focuses on each individual's particular language needs and cultural health beliefs can help reduce health disparity among immigrants with limited health literacy.

The Impact of Complex Health Insurance Plan Communications on Customer Call Center Costs. Kolterjohn, Melissa[1]; Rush, Steve[1]. [1]United Health Care, Minnetonka, MN.

Background

To quantify the potential financial impact that complex health insurance plan (i.e. Part D and Medicare Advantage) communications place on customer call centers.

Methods

A survey was conducted with a random sample of UnitedHealthcare® Medicare & Retirement Part D and Medicare Advantage members. Quotas were set to obtain a total of 2,000 Part D and 2,000 Medicare Advantage interviews. The survey assessed the members' reported call volume along with their perceptions of health plan communications. The findings from this study were partnered with internal membership numbers and average customer call center costs to provide financial figures.

Results

The study found that respondents who provided 'poor' ratings for questions regarding communications sent by their health insurance plan placed a statistically ($P<0.05$) significant higher number of calls per year to the customer call center compared to those with higher ratings. Part D members who provided 'poor' ratings contacted the customer call center 1.5 more times per year than those who provided higher ratings; for Medicare Advantage members the difference was 0.7 more calls per year.

Taking into account average call center costs per call and membership size, it was found that members who provide 'poor' ratings for health plan communications could place an additional financial burden of $4.3 million dollars per year on the customer call center.

Conclusions

Complex communications not only burden members, but also place large financial burdens on health plan insurers. Developing health plan communications where the complexity of the content match the skills and abilities of the members is crucial.