Poster Session I: Monday 12:30pm

Poster #1

The association of health literacy to health status and health insurance varies by race/ethnicity. Sentell, Tetine. University of Hawaii, Honolulu, HI. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Health literacy is a key factor for understanding racial/ethnic health disparities, yet the importance of health literacy to health status and access may vary by race/ethnicity as different racial/ethnic groups face varied cultural and structural barriers to health and health care.

Methods

Data were used from the 51,048 adults who completed the 2007 California Health Interview Survey. Those who self-reported finding written information at the doctor's office "somewhat" or "very difficult" to understand were considered to have low health literacy. Poor health status was defined as self-reporting "poor" or "fair" health. Having health insurance was defined as self-reporting any health insurance in the past 12 months. Control variables were education, English proficiency, age, sex, poverty, and living in a rural area. Unadjusted and adjusted logistic regression models were run with the full sample, and with racial/ethnic groups individually to consider variation.

Results

The sample was diverse: 49% White, 21% Hispanic, 13% Asian, 11% Other Race, and 6% African American. Nineteen percent of the sample reported poor health, and 21% reported no health insurance. Whites were the least likely of racial/ethnic groups to report poor health, and the most likely to have health insurance. Overall, 15% of the sample reported low health literacy; 24% of Latinos, 21% of Other Race, 15% of Asians, 14% of African Americans, and 9% of Whites reported low health literacy ($Chi2(4)= 1573$; $P<.001$).

In the full sample, low health literacy was significantly associated with poor health status (OR: 1.31; 95% CI: 1.17-1.47) and negatively associated with health insurance (OR: 0.84; 95% CI: 0.75- 0.971) in both unadjusted and adjusted models (OR and 95% CIs presented above). However, when racial/ethnic groups were considered individually, health literacy was significantly associated with health status in all unadjusted models except for African Americans, but only maintained significance among Whites (OR: 1.56; 95% CI: 1.32-1.84) and Other Races (OR: 1.58; 95% CI: 1.16-2.15) in adjusted models. For health insurance, health literacy was again significant in all unadjusted models except for African Americans, but only maintained significance for Latinos (OR: 0.74; 95% CI: 0.58- 0.93) in adjusted models.

Conclusions/Implications

While health literacy is a key variable predicting health status and access, the relationship of health literacy to the factors varies significantly by race/ethnicity. As we strive to understand and reduce health disparities, and focus on improving health literacy and/or reducing literacy-related health system demands as a practical means to do so, it is critical to remember that the associations and consequences of health literacy may vary by both race/ethnicity and by health outcomes. Further research using validated health literacy measures should explore this important variation in more detail.

Poster #2

Health Literacy and Disease Self-management Among African Americans with Diabetes Mellitus. McCleary-Jones, Voncella. University of Oklahoma Health Sciences Center, Oklahoma City, OK. *Presented via poster on Monday at 12:30pm.*

Background

For persons with diabetes (DM), low literacy skills make it difficult to read and understand information required to manage their disease (Doak, Doak, & Root, 1996), and may impair an individual's functioning in the health care environment, affect patient-physician communication, and lead to substandard medical care (AHRQ, 2004). African Americans (AAs), Hispanics, and Native Americans experience approximately a 50% to 100% higher burden of illness and mortality due to DM than white Americans (Smedley et al.,2003). DM self care is recognized as an essential component of effective glycemic control and self-management is key to achieving optimal health outcomes (Lorig et al., 1999; Meers et al.1996, & The Diabetes Control and Complications Trial Research Group, 1993). DM education relies heavily on written materials, yet the educational materials are often written at too high of a level for low-literate patients to understand (Williams, Baker, Parker, & Nurss, 1998). Studies have shown improved chronic disease self-management with enhanced self-efficacy (Farrell, Wicks, & Martin, 2004). Measures to enhance self-efficacy, stress management, goal setting, and decision making have been found to improve metabolic control (Nath, 2007) and self-efficacy alone has been found to explain individual adherence to a home DM care regimen in AA women (Skelly, Marshall, Haughey, Davis, & Dunford, 1995). Further research is needed to clarify the association between health literacy (HL), self-efficacy, and self-management among minorities with DM. Study hypotheses: 1) HL and diabetes knowledge are associated with diabetes self-management among AAs with DM; and 2) There are associations between HL, diabetes knowledge, self-efficacy, and diabetes self-management among AAs with DM.

Methods

Fifty English-speaking, adult AA participants with DM were recruited from a community health center and a church located in the Midwestern U.S. Cross-sectional data collected utilizing the Rapid Estimate of Adult Literacy in Medicine, Diabetes Knowledge Test, Diabetes Self-efficacy Scale, and Summary of Diabetes Self-care Activities Questionnaire. Relationships among variables were examined based on the study's theoretical framework, and employed both descriptive and inferential statistics for data analysis.

Results

Bivariate associations were identified for HL with diabetes knowledge level; diabetes knowledge level with dietary self-care activities; and self-efficacy with dietary, exercise, and foot care self-care activities. Diabetes knowledge level and self-efficacy were independent predictors for dietary self-care activities, while self-efficacy was the sole independent predictor for foot self-care. Means for HL and DM self-care activities were influenced by demographic factors examined.

Conclusions

Association between HL and diabetes knowledge, and relationship of diabetes knowledge and self-efficacy reveal that these may be important factors influencing an individual's participation in DM self-management activities. Strategies to enhance the individual's knowledge of DM and self-efficacy are important aspects that should be considered and addressed in all activities utilized to facilitate successful DM self-management. Future testing of interventions designed to

increase self-efficacy and knowledge should be done to explore causal links between these factors and participation in diabetes self-care activities. Further research should focus on identifying culturally sensitive strategies that will enhance HL and self-efficacy among AAs with DM, and will promote improved health outcomes in this population.

Poster #3

Limited functional health literacy is associated with undiagnosed airways disease (asthma and COPD) among older adults. Adams, Robert J.[1]; Appleton, Sarah L.[1]; Visvanathan, Renuka[1]; Sowden, Judith[1]; Hill, Catherine L.[1]; Wilson, David H.[1] ; [1]University of Adelaide, Adelaide, South Australia. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Undiagnosed airways disease (i.e. asthma and COPD) has been estimated to account for up to 20-30% of all cases of airways disease in the population, and imposes a large health burden on the community, particularly among older adults and those from socially disadvantaged backgrounds (Adams et al, Thorax 2003). Limited functional health literacy (FHL) has been reported in 78% of older adults (Adams et al, MJA 2009). We hypothesized that limited FHL would be a significant predictor of undiagnosed and unmanaged airways disease among adults aged >55 years.

Methods

Subjects were recruited for a study to determine if a therapeutic trial of inhaled asthma medication (fluticasone / salmeterol) could be used to make a diagnosis of asthma in older adults without a prior diagnosis of asthma or COPD. Subjects were recruited from the general population of Adelaide, South Australia by random-digit dialing of telephone numbers and adults aged >55 years could be eligible if they reported respiratory symptoms but had no diagnosis of any chronic respiratory disease nor any treatment for respiratory conditions. Exclusion criteria included an abnormal chest x-ray or a confirmed diagnosis of heart failure. Pre and post-bronchodilator spirometry was performed according to American Thoracic Society criteria. All subjects gave written, informed consent and the study was approved by the Institutional Review Board.

For this analysis asthma was classified by an acute bronchodilator response of an increase in FEV_1 of 12% and >200ml following bronchodilator. COPD was determined by a post-bronchodilator FEV_1/FVC ratio of <0.7. All subjects completed the Newest Vital Sign (NVS) as a measure of FHL. Socio-economic status was assessed by Socio-Economic Indicators For Australia (SEIFA) codes for area of residence. Mood disturbance was measured with the Geriatric Depression Scale.

Results

Of 171 subjects who completed the study, 39 (23%) had undiagnosed airways disease. Of the 171, 67% (n=115) had an NVS score ≥4 (almost always indicating adequate health literacy), but among those with undiagnosed airways disease 47% had an NVS score ≥4 compared with 72% without undiagnosed airways disease. There were no significant differences in the proportions with NVS score ≥4 between genders, age groups, SEIFA quartiles, smoking status, BMI categories or those with and without diabetes, hypertension or depression.

In multiple regression analyses, undiagnosed airways disease was over 4 times more common in those with a high likelihood of limited FHL (NVS 0-1) (OR 4.6, 95% CI 1.4, 15.0) and in those at-risk for limited FHL (NVS 2-3) (OR 2.3, 95% CI 0.95, 5.8), but was not related to frequency of primary care visits. Limited FHL was not associated in adjusted analyses with lower SES as measured by SEIFA, or with hypertension or depression. Diabetes was associated with NVS 0-1 (OR 2.7, 95% CI 0.8, 9.2).

Conclusions/Implications

Undiagnosed asthma and COPD is common despite frequent attendances with primary care physicians and was significantly associated with limited FHL. Work is needed to increase physician awareness that people with limited FHL and asthma/COPD may not present with symptoms and active screening is needed for case identification.

Poster #4

Effects of motivational interviewing for low literacy elderly with hypertension in the community. Kang, Soojin[1]; Lee, Taewha[1]; Kim, Hyehyun[1]; Lee, Hyesun[1]. [1]Yonsei University, Seoul, Korea. *Presented via poster on Monday at 12:30pm.*

Background

Low-income elderly have limited literacy and low self-efficacy which affects their disease management problem of chronic diseases. Motivational interviewing is a patient-centered approach to facilitate adherence with treatment recommendation. This study was to evaluate the effects of motivational interviewing on lifestyle changes, self-efficacy and medication adherence among low health-literate elderly with hypertension.

Methods

We have developed a hypertension education program using picture-based materials and a motivational interviewing guideline including scripted dialog and open-end questions about hypertension management. In a randomized controlled trial, a total of 161 eligible persons (73.3% women) who were over 60 years old (mean age 72.4) and diagnosed as hypertension were recruited from the visiting nurse program in a public health center in Seoul, Korea. For 5 weeks, the intervention group received motivational interviewing counseling and individualized education, which is delivered by 3 trained nurses at participants' homes, and follow-up calls for 7 weeks. The usual care group received a standard home care service for 12 weeks. Repeated Measured ANOVA was used to test changes in outcome variables at baseline, 5 weeks, and 12 weeks.

Results

A total of 81.4% of the participants remained and completed the study: 131 persons survived (65 intervention vs. 66 usual care). There were no significant differences in lifestyle, self-efficacy, and medication adherence between the intervention and usual care groups at baseline. After 12 weeks, the motivational interviewing group showed significant changes in lifestyle ($p<.001$), self-efficacy ($p<.001$), and medication adherence ($p<.001$) compared to usual care group.

Conclusions

Motivational interviewing skill of health care providers was proved as one of useful strategies to improve health outcomes of elderly with limited health literacy.

Poster #5

Relationship between Perceived Racial Composition and Health Literacy among Community Health Center Patients. Kaphingst, Kimberly A.[1]; Goodman, Melody S.[2]; Pyke, Owen[2]; Stafford, Jewel[2]; Lachance, Christina R.[3]. [1]Washington University School of Medicine, St. Louis, MO. [2]Stony Brook University, School of Medicine, Stony Brook, NY. [3]National Human Genome Research Institute, Bethesda, MD. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

The development of effective large-scale interventions to mitigate the impact of health literacy on patient outcomes has proved to be challenging. Policy and intervention approaches based on an understanding of the upstream social determinants of health literacy could have promise, and, therefore, there is a strong need for investigation of these determinants. However, prior research on factors associated with health literacy has focused largely on individual-level sociodemographic variables, and only limited research has examined community-level or neighborhood-level factors. To begin to address this research gap, this study examined the associations between self-reported perceived racial composition of prior educational and neighborhood contexts and health literacy.

Methods

We conducted a cross-sectional survey of 1061 English- and Spanish-speaking community health center patients 18 years of age or older. Respondents' self-reports of the perceived racial composition of their high school and neighborhood growing up were assessed using a five-part item adapted from the Behavioral Risk Factor Surveillance System. Health literacy was assessed using the Newest Vital Sign (NVS). We first examined descriptive statistics for all variables, and conducted bivariate analyses to examine the associations between health literacy and the perceived racial composition and sociodemographic variables. We then built a multivariable linear regression model to examine significant predictors of health literacy.

Results

About one-quarter (26%) self identified as being non-Hispanic White, 31% as non-Hispanic Black, and 35% as Hispanic. Although 83% had at least a high school diploma or GED, only 34% had adequate health literacy as measured by the NVS. In the multivariable linear regression model, perceived racial composition of high school and neighborhood growing up were independent predictors of health literacy, controlling for participants' race/ethnicity, educational attainment, age, country of birth, and language of survey administration. In the model, individuals who perceived that their high school had been mostly White had an average NVS score of 0.33 points higher than those who did not ($p=0.014$), while those who reported that their neighborhood growing up was mostly White had an average NVS score of 0.30 points higher than those who did not ($p=0.037$). In addition, we found a significant association between race/ethnicity and health literacy within each educational strata. Among all strata, non-Hispanic Black patients had significantly lower health literacy than did non-Hispanic White patients, with an average NVS score of more than one point lower among Blacks. Hispanic patients had significantly lower health literacy than non-Hispanic White patients in the high school degree/GED strata (0.79 points lower on NVS; $p=0.003$) and the some college or more strata (0.85 points lower on NVS; $p=0.001$).

Conclusions/Implications

The findings revealed substantial disparities in health literacy across community health center patients. In addition, perceived racial composition of neighborhood and school contexts were

shown to be significant predictors of health literacy. Transdisciplinary, multi-level interventions focusing on the health care and educational systems are needed to address the health literacy needs of patients and improve the health of this population.

Poster #6

An Analysis of National Rural Health Literacy and Sources of Health Information.

Bergsma, Lynda J.[1] Arizona Rural Health Office, Mel & Enid Zuckerman College of Public Health, University of Arizona, Tucson, AZ. *Presented via poster on Monday at 12:30pm.*

Background

Health disparities, most often associated with urban ethnic and racial populations, persist in rural America as well. Geographic isolation, socio-economic status, health risk behaviors, and limited job opportunities contribute to health disparities in rural communities. Twenty percent (60 million) of the United States population lives in rural areas, where higher rates of chronic illness and poor overall health are found when compared to urban populations. Rural residents are older, poorer, and have fewer physicians to care for them. This unique combination of factors, which creates disparities in health care not found in urban areas, makes it essential that we understand and address the health literacy issues of this population group.

Although the 2003 National Assessment of Adult Literacy examined health literacy and information-seeking behavior in the context of numerous demographic characteristics, it did not report on rural versus urban residence. Thus the research question for this study was: How do the health literacy levels of U.S. urban and rural populations compare across demographic characteristics, including gender, race and ethnicity, language spoken before starting school, age, highest level of educational attainment, poverty threshold, self-assessment of overall health, type of health insurance coverage, sources of information about health issues, degree of rurality, and census region?

Methods

This study consisted of a secondary analysis of the 2003 National Assessment of Adult Literacy (NAAL) restricted-use dataset to examine responses from 18,097 U.S. adults, and compare health literacy levels and sources of health information measures for adults living in rural households to those of adults living in urban households. The following hypotheses guided the study: 1) Rural residents will have significantly lower health literacy levels than their urban counterparts and 2) Degree of rurality (i.e., large rural, small rural, and small/isolated) will be inversely related to health literacy levels To test these hypotheses, analyses consisted of performing weighted cross-tabulations for all variables reported in the 2006 NAAL report (*The Health Literacy of America's Adults*) for urban, large rural, small rural, and small/isolated populations groups for the country as a whole and by U.S. Census Regions.

Results

Twenty-one percent of the NAAL respondents were characterized as living in non-Metropolitan Statistical Areas (non-MSA), which is consistent with published Census Bureau data.

Across demographic variables, the data analysis generally supported hypothesis number one and partially supported hypothesis number two, with there being differences in health literacy levels between large rural and smaller rural populations groups but little difference among small rural and small/isolated rural populations.

Conclusions

The study findings provide input for the development of health communication policies and health-related information and program practices for rural adults.

Efforts to understand more about the multiple components of rural health literacy and health information-seeking behaviors should be high among the list of public policy priorities in order to enable rural Americans to: 1) Find, understand, and use the information they need to stay healthy, 2) Access needed services and support systems, and 3) Understand and respond to mass communications about health promotion, disease prevention, and disaster management and response information.

Poster #7

Health Literacy and Its Impact on Health Disparity among Under-served Korean American Immigrants. Lee, Hee Yun.University of Minnesota, Twin Cities, St. Paul, MN.
Presented via poster Monday at 12:30pm.

Background/Research Question

It has been reported widely that immigrants and refugees who recently arrived in the United States have low levels of health literacy. Research has found that people with low health literacy have difficulty in navigating the health care system, tend to underutilize health services, and report poorer health and mental health outcomes. Individuals with inadequate health literacy also report poorer physical and mental health functioning and have less knowledge and understanding of chronic diseases, physicians' instructions, and medication regimens. 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 the level of health literacy and factors associated with health literacy among Korean American immigrants—one of the under-served and disadvantaged Asian American immigrant groups—and to provide culturally competent intervention strategies to improve their levels of health literacy.

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. STATA 9.0 was used to perform univariate, bivariate, and multivariate analysis.

Results

Overall, about 32.0% of the respondents were classified as having inadequate health literacy, while 57.0% of the sample was identified as having marginal health literacy. Only 11% of the study sample was identified as having an adequate level of health literacy. Multiple regression analysis indicated that those who were male, married, highly educated, and had higher English proficiency reported higher levels of health literacy. Interestingly, those having a primary physician and higher self-reported health status also showed higher levels of health literacy.

Conclusions/Implications

The findings confirmed that Korean American immigrants have low levels of health literacy, which may contribute to health disparity. This study's findings provide important information for developing culturally competent health literacy enhancement interventions and policies among immigrants in order to improve health outcomes of vulnerable populations. The primary target population for intervention will be those who have difficulty in speaking English, have no primary physician, and indicate a low health status. Strategies for interventions that can help physicians and other health-care professionals working with those with limited health literacy will be discussed along with implications for health-care policies.

Poster #8

Older adults, health literacy, & Web-based multimedia health tutorials: a usability testing.

Xie, Bo[1]; Watkins, Ivan[1]; Huang, Man[1]. [1]University of Maryland, College Park, MD. *Presented via poster on Monday at 12:30pm.*

Background

With the development of technology, Web-based health tutorials have begun to move beyond pure text-based materials to increasingly incorporating multimedia features. Little is known about what multimedia features of Web-based health tutorials work and what do not work for the older population. While there are existing guidelines about designing senior-friendly Websites in general, there is a lack of guidelines about designing Web-based multimedia health tutorials for older adults. To begin to address these gaps in the literature, we conducted a comparative usability testing of Web-based multimedia health tutorials by older adults in February-March of 2010. This study had two primary research questions: 1) How senior-friendly are the three selected Web-based multimedia health tutorials? and 2) What are older adults' perceptions and use of multimedia features of Web-based health tutorials?

Methods

Three Web sites were selected for testing in this study: 1) the MedlinePlus Surgery Videos site (http://www.nlm.nih.gov/medlineplus/surgeryvideos.html) and 2) the MedlinePlus Interactive Tutorials site (http://www.nlm.nih.gov/medlineplus/tutorial.html) both maintained by the NIH, and 3) a Surgery Simulation (pseudo name) site by an U.S. non-profit organization. A total of ten older adults aged between 61-83 (M = 71.4, SD = 8.28) participated in this study. All participants were African Americans. Seven of them were women. Seven participants had at least some college education. Three of them had less than one year of experience with the Internet; three had between 1-3 years; the rest had more than 5 years of Internet experience. A list of six tasks was developed for each site, involving manipulation of the multimedia program on each site to find specific information or to present the information in a specific way. The testing followed standard usability testing procedures.

Results

The interviews, surveys, and observation yielded rich quantitative and qualitative data. These data reinforce each other and all suggest that the MedlinePlus Interactive Tutorial was the most popular and easiest to use, followed by Surgery Simulation. MedlinePlus Surgery Video was the least popular and most difficult to use. Interestingly, there appears to be a consensus among the participants that the Surgery Video site is for "medical students" while the Surgery Simulation site is for "pre-med students." Participants felt that only the Interactive Tutorial site was intended for "older adults" like themselves.

Three major themes were identified from the analysis of the qualitative data to help explain the relative popularity and usability of each site:

Theme 1: Interactivity needs to be the right type (not too simple, not too complicated) and right amount (not too little, not too much) for the right audience;
Theme 2: The need to segment the information and to show the "big picture"; and
Theme 3: Real versus cartoonish presentations of health educational messages.

Conclusions

The findings provide preliminary evidence for the generalizability of existing multimedia learning theories and principles, which were developed for the most part for younger learners in

formal educational settings, to the older population in an informal educational setting. Our findings also call for attention to the unique characteristics of health tutorials (particularly surgery-related).

Poster #9

***Nuestra Salud* Program: Enhancing Health Literacy of Immigrant Populations.** Lozada, Carolina Irene[1]; Pinete, Liliana[1]. [1]Northern New Jersey Maternal/Child Health Consortium, Paramus, NJ. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Health literacy has been recognized as an important public health issue over the past decade. Individuals with low health literacy skills might find it difficult to locate medical services and seek preventative care thus resulting into poor health outcomes. Low health literacy is associated with lack of communication between patients and health care providers which may lead to inefficiencies in proper patient treatment. Immigrants, especially those who are non-English speaking, are at higher risk for low health literacy.

Methods

The Robert Wood Johnson Foundation through its New Jersey Health Initiatives program has funded the Northern New Jersey Maternal/Child Health Consortium (NC) and the Hispanic Institute for Research and Development (HIRD) to develop the Nuestra Salud (NS) program in order to promote health literacy in New Jersey. NS program targets Hispanic immigrants enrolled in HIRD's English as a Second Language (ESL) classes. The program consists of providing 5 hours of health literacy lessons during a 40-hour ESL course. The program utilizes "Expecting the Best" (ETB) curriculum, a field-tested syllabus designed specifically to be incorporated into ESL courses. Instructors are asked to complete a Nuestra Salud program objectives timeline throughout the duration of the ESL course in order to track the time spent per health lesson and compliance with the ETB curriculum. A *mid-cycle evaluation* is administered to students each cycle. The mid-cycle evaluation helps assess the students' satisfaction with the instructor and the overall ESL course. *Student attendance* is recorded by each instructor. Students are required to complete a *pre and post evaluation questionnaire* that helps measure the increase in health knowledge gained during the ESL cycle. An *instructor evaluation* which rates each instructor's teaching techniques and overall qualities is conducted by the Nuestra Salud Project Coordinator. Each instructor is encouraged to complete *an instructor's feedback form* at the end of each cycle in order to get additional comments and/or concerns regarding the NS Program.

A *milestone scale* has been developed for the NS program to monitor the project's accomplishments over a three year period. A *logic model* has also been created to identify the resources, activities, and short & long term outcomes for the program. All the data collected is analyzed and reported at the end of each cycle.

Results

NS program goal is to train ESL instructors on "Expecting the Best" curriculum and have the instructors include the health literacy lessons into all the ESL courses. Also, the program aims to increase health knowledge of 885 ESL students through 5 ESL classes/cycle during 11 cycles over 3 year period. Additionally, 33 health workshops are offered throughout a 3 year period to provide basic knowledge and resources on various health related topics.

Conclusions/Implications

The Nuestra Salud program expects that "Expecting the Best" curriculum will continue to be integrated into the ESL courses in New Jersey and ESL students will improve health literacy.

Poster #10

Validation of Self-Reported Health Literacy Questions Among Spanish-speaking and Diverse Populations. Sakar, Urmimala[1]; Schillinger, Dean[1]; Lopez, Andrea[1]; Sudore, Rebecca[1].
[1]University of California, San Francisco, CA. *Presented via poster on Monday at 12:30pm.*

Background

Limited health literacy contributes to poor health outcomes and disparities. Measurement of health literacy in epidemiologic studies has been limited because the assessments are in-person and time-intensive. The objective of this study was to evaluate the performance of 3 self-reported health literacy questions in a diverse, chronically ill, low-income, English- and Spanish-speaking population.

Methods

This validation study was nested within a randomized trial of diabetes self-management support interventions within the San Francisco Department of Public Health (SFDPH). Patients were included in the validation cohort if they were over age 17 years, had ICD-9 codes consistent with type 2 diabetes, self-reported fluency in English or Spanish, made $\geq$1 primary care visit at one of four (SFDPH) clinics in the prior year, and had a hemoglobin A1c value (HbA1c) $\geq$8.0% at the time of recruitment. Bilingual research assistants administered the following 3 self-reported health literacy questions with 5-point Likert responses in English or Spanish: (1) How confident are you filling out medical forms by yourself; (2) How often do you have problems learning about your medical condition because of difficulty understanding written information?; and (3) How often do you have someone like a family member, friend, hospital or clinic worker or caregiver, help you read hospital materials?. We also created a summative scale (scores 3-15) with higher scores reflecting worse self-reported health literacy. As the reference (e.g. gold standard), we administered the validated short Test of Functional Health Literacy in Adults (s-TOFHLA) in English and Spanish (scores 0-16 represent inadequate, 17-22 marginal, and 23-36 adequate health literacy. We calculated the C-index and test characteristics compared to the s-TOFHLA and assessed variations in performance by language (Spanish/English), race/ethnicity, age, and education.

Results

Of 296 participants, 48% were Spanish-speaking and only 9% were White, non-Hispanic. As measured by the s-TOFHLA, 47% had inadequate health literacy and 12% had marginal literacy. For the self-reported questions, 57% reported being confident with forms "somewhat" or less, 45% of participants reported problems learning "sometimes" or more frequently, and 42% reported needing help reading "sometimes" or more frequently. The "confident with forms" question performed best for detecting inadequate health literacy (C-index= 0.82, (0.77-0.87)) and inadequate plus marginal health literacy (C index= 0.81, (0.76-0.86); $p<0.01$ for differences from other self-reported questions), and performed comparably to the summative scale. The 'confident' question and the scale also performed best across language, race/ethnicity, educational attainment, and age.

Conclusions

This study suggests that among diverse, English and Spanish-speaking populations, a single self-reported health literacy question about confidence with forms or a summative scale of 3 questions can discriminate between those with adequate health literacy and those with inadequate and/or inadequate plus marginal health literacy. The "confident with forms" question and the summative scale performed better than the other 2 individual items within all patient subgroups.

Either the single “confident with forms” health literacy question or a summative scale of 3 questions may be useful for estimating health literacy in epidemiologic and clinical research involving English and Spanish-speaking, chronically-ill, diverse populations.

Poster #11

Exploratory and Confirmatory Factor Analyses of the S-TOFHLA. Ownby, Raymond L.[1]; Waldrop-Valverde, Drenna[2]. [1]Nova Southeastern University, Fort Lauderdale, FL. [2]University of Miami, Miami, FL. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Factor analysis is a statistical analytic technique frequently used in test construction to investigate the constructs assessed by a measure. It provides information on general patterns of covariance in test data so that underlying traits or abilities (e.g., verbal compared to visuospatial skills) can be identified. The Short Test of Functional Health Literacy (S-TOFHLA) is a widely-used health literacy measure that includes items assessing healthcare-related numeracy skills as well as reading comprehension for healthcare related materials. No readily-identifiable study has reported on the factor structure on the S-TOFHLA. The purpose of this study was to evaluate the factor structure of the S-TOFHLA. As numeracy and reading comprehension skills are assessed by the instrument, we hypothesized that two distinct factors would emerge from the data, one comprising numeracy items and the other reading comprehension items.

Methods

As part of a larger study of health literacy and cognitive abilities, 153 African American and Hispanic HIV+ participants completed the S-TOFHLA. The factor structure of the measure was evaluated through exploratory analyses with various number of factors completed in SPSS and through evaluation of confirmatory models in MPlus. Number of factors to retain for rotation in exploratory analyses was determined through evaluation via the eigenvalue greater than one criterion and inspection of scree plots. Confirmatory models explicitly tested whether a single factor model or a two-factor model comprising numeracy and reading comprehension factors provided the best fit to the underlying data.

Results

Exploratory models suggested the presence of several factors the represented either general health literacy, reading comprehension of two levels of difficulty, and reading comprehension plus numeracy skills. A four-factor model that revealed a factor including high loadings on the numeracy items suggested that the items included substantial loadings on reading comprehension factors as well. Confirmatory models that assessed single vs. multiple factor models suggested that the inclusion of more than one factor did not significantly improve the fit of factor models to the data.

Conclusions/Implications

This study evaluated the abilities underlying the S-TOFHLA via exploratory and confirmatory factor analyses. We hypothesized that distinct factors represented by numeracy and reading comprehension items would provide the optimal ability structure for the measure. Although reading comprehension and healthcare-related numeracy have been thought to represent distinct abilities, these analyses suggest that numeracy as a distinct ability from healthcare-related reading skills is not strongly represented in the S-TOFHLA items. Even when a numeracy factor was extracted, the pattern of factor loadings suggested a substantial contribution of reading ability to being able to answer these questions. Results thus suggest that while numeracy may be an important factor in health literacy, the abilities required by the S-TOFHLA numeracy items also overlap considerably with reading comprehension skill. Evaluation of healthcare-related numeracy thus may be closely related to reading as well as numeracy abilities, at least among the African American and Hispanic patients in this sample.

Poster #12

Improving Health Literacy for Rural Elderly. Young, David[1]; Weinert, Clarann[1]. [1]Montana State University, Bozeman, MT. *Presented via poster on Monday at 12:30pm.*

Background

Good health literacy skills are foundational to meaningful health care decision-making and self-care management. Reports indicate that 9 out of 10 adults have difficulty understanding and using everyday health information which is frequently linked to poor self-care management, low use of preventative services, unhealthy behaviors, higher rates of hospitalizations and poorer health outcomes. Elderly in small, rural, impoverished, geographically-isolated communities are further disadvantaged in improving their health literacy where health information, Internet access, health care and social services are limited. The goals of the Health Enhancement for Rural Elderly (HERE) project were: a) to improve the health literacy skills of rural elderly, and; b) to build the health literacy capacity of selected rural communities to enable elderly to make well-informed health-related decisions, better manage their own self-care, and enhance their overall health and well-being.

Methods

This project involved four rural Montana communities with populations under 2,000 where elderly accounted for 17.4 - 31.3% of the communities' populations. HERE was designed to be community-based and hubbed in local senior centers. To enhance the health literacy skills of older residents, the following interventions were used: a) *My Health Companion*©, b) hands-on instruction to increase skills for seeking and processing web-based health information on the internet, and c) five health information webinars. Building the health literacy infrastructure of the community involved engaging key stakeholders, e.g., county extension agents, senior center staff, public health nurses; and local librarians, as well as, equipping the senior centers with computers, printers, access to the Internet, LCD projectors, screens, speaker phones, reference books, guidelines /toolkits, and providing training for informal caregivers.

Results

This presentation will include a description and evaluation of each of the interventions. *My Health Companion*© provides a structure for tracking and maintaining health information and enhancing health literacy. Sixty eight individuals used *My Health Companion*© for one year, completed the initial questionnaire, and had the opportunity to provide feedback. The hands-on sessions to build Internet skills for seeking and processing web-based health information were attended by 41 individuals. The evaluation included a pre-survey with repeated measures at one and four weeks. There were 152 participants in the webinar series with an evaluation completed immediately following each session. A total of 18 persons received the 2 ½ day "Powerful Tools for Caregivers" national training program with a post evaluation. Participants were certified as caregiver trainers and returned to their home communities to conduct the program.

Conclusions

Through the HERE project interventions, it was clear that there is a critical need to develop, promote, and improve access to electronic health information at the community level for elderly in small rural communities. There is a wide range of levels of readiness in engaging rural elderly in various interventions to improve their health literacy. Community-based stakeholders are key to marketing, supporting, and implementing practices and interventions to improve health literacy of rural elderly. Local senior centers are a central point of contact for engaging seniors who are interested in improving their health literacy skills.

Poster #13

Sensitivities of Three Single-Item Literacy Screener (SILS) Questions in Geriatric Monolingual Spanish-Speaking Patients. Cordasco, Kristina M.[1]; Franco, Idalid[1]; Homeier, Diana C.[2]; Sarkisian, Catherine[3]. [1]The RAND Corporation, Santa Monica, CA. [2]Keck School of Medicine at USC, Los Angeles, CA. [3]University of California, Los Angeles, CA. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Several studies have assessed various single-item literacy screener (SILS) questions for their utility in identifying patients with limited health literacy skills. Three items performing well in English-speakers are: (1) "How often do you have problems learning about your medical condition because of difficulty understanding written information?" (always, often, sometimes, occasionally, never) (2) "How often do you have someone help you read hospital materials?" (always, often, sometimes, occasionally, never) and (3) "How confident are you filling out medical forms by yourself?" (extremely, quite a bit, somewhat, a little bit, not at all). We were unable to find any studies assessing the utility of theses questions in non-English speakers. We tested the sensitivity of each of these SILS questions in geriatric monolingual Spanish-speaking patients.

Methods

Between September 14th, 2009 and March 31st, 2010, a bi-lingual and bi-cultural research assistant (RA) approached Spanish-speaking patients who was diagnosed with diabetes for 1 year or more and arrived for an appointment in the Geriatrics Clinic at LAC+USC Medical Center. Patients were invited to be screened for a study of how "people with different reading levels take care of their diabetes." All patients who agreed to screening received a sports bottle as an incentive for participation. Patients were assessed for self-reported English-proficiency and physical, cognitive and visual impairment, using previously-tested instruments. All patients who self-reported speaking English less than "well," had no evidence of significant physical or cognitive impairment, and had a corrected visual acuity of at least 20/100, were asked, in random order, the three SILS questions, translated from English to Spanish, and then back-translated, by a certified translator. Then, each patient's health literacy was assessed using the Spanish Shortened Test of Function Health Literacy in Adults (sTOFHLA).

Results

During the study period, 152 potentially eligible patients arrived for at least one appointment, 147 (97%) of whom were invited to participate. The remaining 5 arrived when the RA was unavailable. Of the 147 invited, 141 (96%) agreed. One-hundred and three patients (73%) were found eligible, answered the three SILS questions, and completed the sTOFHLA. Of these, 89 (86%) had inadequate health literacy (IHL), as measured by the sTOFHLA. The table depicts the sensitivity of each SILS questions, at each possible cut-point, in our Spanish-speaking sample and compares these findings to the sensitivities of each cut-point documented in prior studies in English-speakers. The question, "How confident are you filling out medical forms by yourself?" has highest sensitivity at each possible cut-point. For either of the other two questions, even when using the choice "occasionally" or more often as the cut-point, 37 to 53% of patients with IHI may be misclassified as having higher literacy levels.

Table – Sensitivity of SILS Among Participants, At Each Possible Cutpoint, in Comparison to Data From Prior Studies in English Speakers

Cut-Point	Sensitivity-Spanish Speakers	Sensitivity-English Speakers
"Confident With Forms"		
< Extremely	1.00	1.00
≤ Quite a bit	0.93 (0.88-0.98)	0.80-0.93
≤ Somewhat	0.76 (0.68-0.85)	0.80-0.87
≤ A little bit	0.70 (0.61-0.79)	0.33-0.69
≤ Not at all	0.61 (0.51-0.70)	0.10-0.37
"Problems Learning"		
≥ Never	1.00	1.00
≥ Occasionally	0.63 (0.54-0.72)	0.62-0.79
≥ Sometimes	0.61 (0.51-0.70)	0.48-0.57
≥ Often	0.47 (0.38-0.57)	0.25-0.43
≥ Always	0.29 (0.20-0.38)	0.09-0.14
"Help Read"		
≥ Never	1.00	1.00
≥ Occasionally	0.47 (0.38-0.55)	0.58-0.93
≥ Sometimes	0.45 (0.35-0.54)	0.47-0.73
≥ Often	0.35 (0.26-0.44)	0.30-0.67
≥ Always	0.24 (0.15-0.32)	0.16-0.27

Conclusions/Implications

Among Spanish-speakers, the SILS question that asks about confidence with forms is the most sensitive among the three tested. The other two other questions are insensitive. Testing in a larger sample is needed to determine the utility (e.g., specificity and overall psychometric performance) of the confidence with forms question for distinguishing Spanish-speaking patients with IHI.

Poster #14

Single Item Literacy Screener or two-item screener to predict the TOFHLA. Brice, Jane H.[1]; Foster, Mark[1]; Principe, Stephanie[2]; Shofer, Frances S.[1]; DeWalt, Darren A.[1]. [1]University of North Carolina, Chapel Hill, NC. [2]Davidson College, Davidson, NC. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Quick and flexible strategies to measure health literacy are of interest to practitioners and researchers. Practitioners are interested to know approximate literacy skills in order to customize teaching, and researchers need short instruments that could be administered over the telephone. In this context, we compared a single-item screener to a two-item screener in predicting scores on the short Test of Functional Health Literacy in Adults (S-TOFHLA) among patients who receive dialysis.

Methods

We enrolled patients in seven dialysis centers in the piedmont region of North Carolina who were 18 years or older in a cross-sectional study during the summer of 2009. We excluded subjects who were not able to communicate effectively in either English or Spanish, were mentally impaired, or had poor vision. After verbal consent, enrolled subjects were screened utilizing the Single Item Literacy Screener (SILS) which asks about a person's need for assistance when reading written medical information, a two-item screener (TIS) comprised of questions about last grade completed and self-reported reading ability, and our criterion-standard, S-TOFHLA. Demographic information including age, race, and gender were collected as well. IRB approval was obtained prior to the initiation of the study.

Results

We enrolled 311 subjects. Most were English-speakers (292/311, 93.9%); the remainder were Spanish-speakers. Male subjects represented about half of our sample (167/311, 53.7%) and 57.0% were African-Americans, 30.7% White, and 7.8% Hispanic. 236 subjects (75.9%) completed all three health literacy tests. The mean S-TOFHLA score was 23, median 24, and inter-quartile range 15-34. 29.7% (70) of subjects demonstrated inadequate, 15.7% (37) marginal, and 54.6% (129) adequate health literacy. Both the SILS and the two-item screener were able to predict TOFHLA but SILS was better at predicting TOFHLA than TIS. Using linear modeling, SILS (R-square 0.21, $p<0.0001$)) was better able to predict TOFHLA than TIS (R-square 0.17, education $p=0.2657$, reading ability 0.0012, interaction term between education and reading ability 0.7288). The sensitivity of SILS (positive = score >2 on SILS) in predicting inadequate health literacy was 0.41 (95%CI: 0.32, 0.51) and the specificity was 0.93 (95%CI: 0.87, 0.96) with an area under the Receiver Operating Characteristics Curve (ROC) of 0.68 (95%CI: 0.62, 0.74). The stratum-specific LR for SILS to diagnose inadequate health literacy was as follows with 95% CI: SILS=1 LR 0.60 (0.48, 0.76), SILS = 2 0.74 (0.42, 1.30), SILS>2 5.89 (3.07, 11.31).

Conclusions/Implications

The SILS is better than TIS for predicting inadequate health literacy. A positive result on the SILS (>2) substantially increases the likelihood that a patient has low health literacy. However, a negative result (score 1-2) does not adequately exclude the possibility of low health literacy.

Poster #15

Short-form of the Health Literacy Skills Instrument (HLSI). McCormack, Lauren[1]; Bann, Carla[1]; Squires, Linda[1]; Berkman, Nancy[1]. [1]RTI International, Research Triangle Park, NC.
Presented via poster on Monday at 12:30pm.

Background/Research Question

In a landmark report, *Health Literacy: A Prescription to End Confusion,* the Institute of Medicine (IOM) recommended the development of new measures. The IOM called for the development, testing, and use of culturally appropriate measures of health literacy and to field them as part of large ongoing population surveys. Parker & Kindig (2006) echoed the call for new measures by stating that "*new measures of health literacy must be developed and evaluated*" (p. 891), and the authors concluded that "while progress [in the area of health literacy] is being made, the scope is not broad enough and the pace is not fast enough" (p. 891). Baker (2006) also supported the need for more comprehensive measures.

Methods

We developed a 25-item skills-based instrument to measure health literacy that is based on a more ecologically framed perspective of the construct. The instrument uses a computer-based data collection format. We pilot tested the instrument in 2009 with 889 individuals using KnowledgePanel®, created by Knowledge Networks, an online Non-Volunteer Web-based 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. We then conducted psychometric and other analyses of the pilot data to develop a 10-item short form of the instrument. We considered several factors when developing the short-form. Our goals were to: 1) include a range of difficulty levels; 2) represent various health content areas; and 3) reflect different types of skills and tasks – namely, print-based, quantitative, oral, and Internet-based information-seeking.

Results

The 10-item short form was highly correlated with the 25-item long form (r=0.91), suggesting that minimal information is lost with the use of the short form. Similar to the long form, the short form had a small to moderate correlation with s-TOFHLA (r=0.39 for short form vs. r=0.47 for long form). Although not necessarily applicable given the dichotomous coding of the items (i.e., correct vs. incorrect), the Cronbach's alpha for the short form was 0.70. The items showed good discrimination as reflected by high factor loadings (>0.40), item total correlations (>0.30), and IRT slopes (>1.00). Mean scores on the short form varied by race, ethnicity, education, health status, and self-reported skills (see Table 1).

Conclusions/Implications

This new health-literacy instrument and its short-form fill an existing gap in an important area of measurement, demonstrate robust psychometric properties, and are moderately correlated with an existing measure of literacy. They reflect a range of tasks and skills that adults are likely to face in their daily lives in the context of the U.S. health care system. Both versions measure the ability to obtain and use health information from print as well as non-print sources, which is more consistent with how people typically receive their health information today. The short-form of the instrument is responsive to the need for a scale that reflects the health literacy construct without requiring extensive items. It could be used in intervention research studies or for larger-scale surveillance.

Poster #16

Developing measures of health literacy for general health contexts. Begoray, Deborah L.[1]; Kwan, Brenda[2]. [1]University of Victoria, Victoria, BC. [2]University of British Columbia, Vancouver, BC. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Our study explored the measurement of health literacy by explicating it as a construct (an operational definition and qualitative data) and by comparing approaches to measurement (task-performance and self-report).We used as an operational definition of health literacy: *the degree to which people are able to access, understand, appraise and communicate information to engage with the demands of different health contexts to promote and maintain health across the life-course.*

Our research questions were:

1) How do adults interpret the health literacy skill terms--access, understand, appraise and communicate?
2) How do self reports of health literacy ability compare with task performance results?

Methods

229 interviews were conducted. Participants started by identifying a health topic for which they had sought information; participants described their experiences with accessing, understanding, appraising, and communicating information on the identified health topic. Self-report items and task-performance items were also administered. Self report items included nine questions on all four health literacy skills. Task performance questions were based on two reading passages from published pamphlets – one on a chronic disease self-management program and the other about fats and health. The questions were designed on 5 levels of difficulty, based on IALSS test building protocols, to measure 'understanding' of health related material. The REALM was also included as the comparison for criterion-related validity.

Results

Participants had varying interpretations of the terms access, understand, appraise and communicate, Participants indicated high belief in their own health literacy (4 or higher on a 5 point scale with standard deviations of less than 1). REALM scores ranged from 45 to 66 with an average of 65 and standard deviation of 2.5. Quantitative scores on the reading passages, mean of 7.7 out of 9 with a standard deviation of 1.1 to measure task-performance, were modestly correlated with scores on the REALM. The sum scale of self report items, however, did not correlate with task-performance items.

Conclusions/Implications

If we are to continue with our claims for the devastating results of low health literacy, including health disparities and inequities, we need to clarify what exactly we mean by health literacy skills. Measurement tools are particularly important to test hypotheses and evaluate programs on health literacy. These tools are, in turn, founded on frameworks of health literacy which are too often not completely explicated. The oft cited skills of health literacy are not currently clear in meaning. Our work suggests that different types of items may not be measuring the same construct. It does not suggest that self-report items are inherently less "valid" than task-performance items. In busy clinical settings, a few self-report items may be more practical than task-performance tests like the REALM. However, such self-report items would first need to be developed and tested, as for task-performance items. Health literacy is a construct which needs

further attention lest the research and interventions undertaken in its name run ahead of our conceptual understandings.

Poster #17

Does A Careful Reading of Aspirin Drug Facts Information Modify Preconceptions About Aspirin? Ryan, Michael P. University of Texas at San Antonio, San Antonio, TX. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

The information provided in the Drug Facts box on labels for over-the-counter products such as aspirin is meant to inform consumers about the safe and effective use of those products. Because individuals are likely to have preconceptions about OTC products, product label information should be considered effective only if it serves to update those preconceptions. An effective label should increase the perceived truth of correct preconceptions and decrease the perceived truth of incorrect preconceptions. As such, an individual's naïve beliefs about an OTC product must be considered in evaluating label effectiveness. To date, however, no effort has been made to test the effectiveness of product label information in confirming or correcting the prior knowledge that individuals have concerning the product.

Methods

90 undergraduates first provided information about their use of OTC analgesics. They then rated the truth value of 18 label-confirmable claims (e.g., Aspirin can be used to treat toothache pain) and 21 non-confirmable claims (e.g., each regular-strength aspirin tablet contains 20 mg. of caffeine) about the Drug Facts on an aspirin. They were next given an opportunity to read those Drug Facts in order to correct any misconceptions. In order to demonstrate attentiveness to that information, participants were asked to circle any typographical errors they found in that simulated text. After completing a short verbal ability test, participants rated the set of claims a second time.

Results

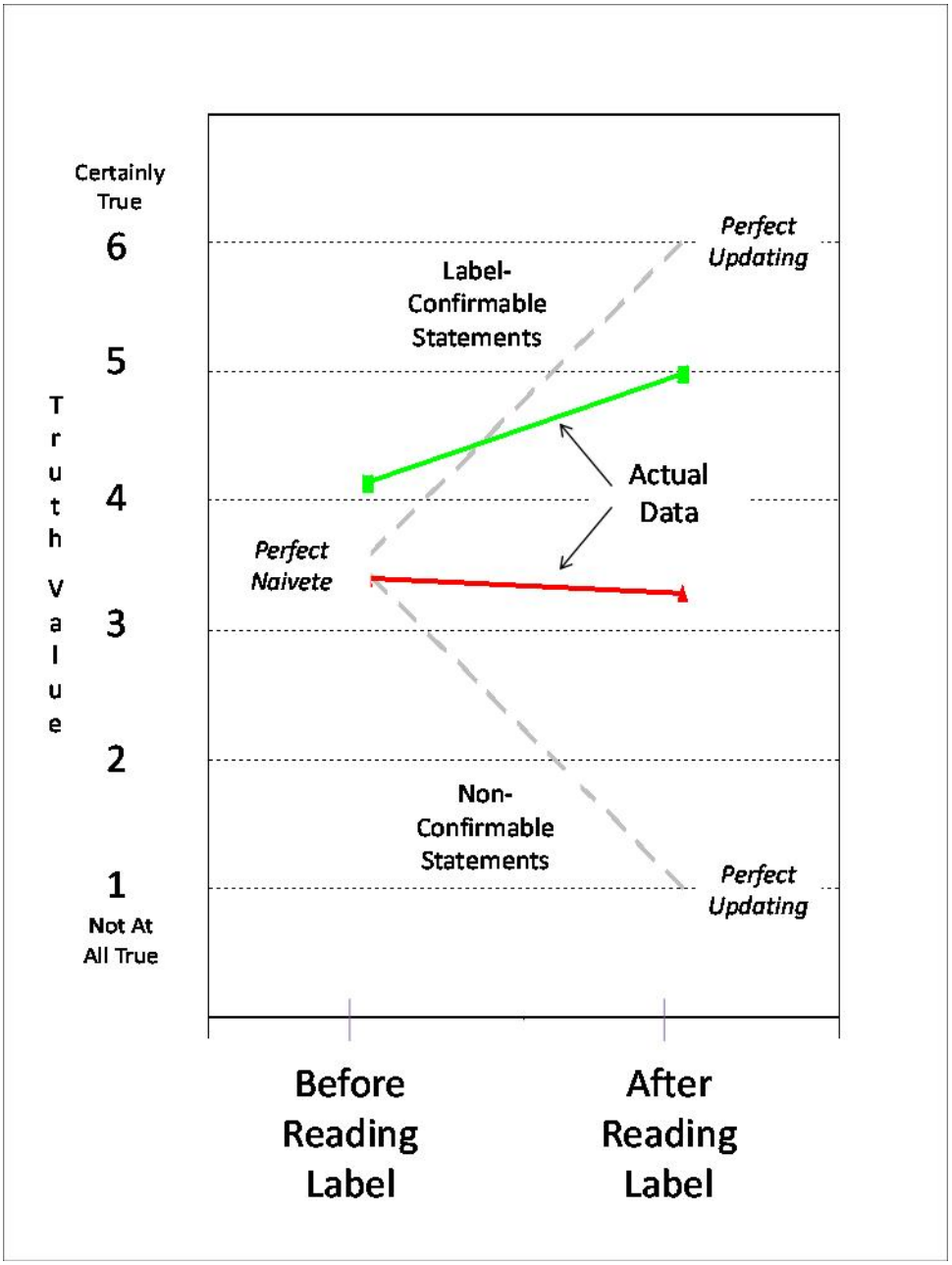
Label-confirmable ("True") claims were initially assigned higher truth ratings than non-confirmable ("False") claims. After reviewing the Drug Facts, participants significantly *increased* their truth ratings for label-confirmable claims. They also significantly *decreased* their truth ratings for non-confirmable claims. These results demonstrate an updating effect, but the effect size is much larger for confirmable than non-confirmable claims. The results did not vary as a function of verbal ability nor of attentiveness in reading the Drug Facts. They also did not vary as a function of participants' reported care in reading the Drug Facts for their preferred OTC analgesic nor of their anticipated efficacy in correcting aspirin misconceptions as a result of reading aspirin Drug Facts.

Conclusions/Implications

Findings indicate that individuals can distinguish between valid and invalid claims about aspirin Drug Facts. They also indicate that Drug Facts information is effective in modifying product preconceptions so as to increase their validity. This knowledge updating effect is much greater for true than for false claims about aspirin and cannot be attributed to differences in verbal ability or to differences in attentiveness in reading label information. One important implication of these findings is that even a careful reading of a product's Drug Facts may leave product misconceptions intact. The basis for this effect may reside in the difficulties individuals face in reminding themselves of preconceptions as they read product label information, in reconciling discrepancies when they find them, or in recalling corrected misconceptions at a later time. Given these updating challenges, efforts to improve product use information by using "plain

language" to create more readable product label information may not prove effective in dispelling product misconceptions.

Figure 1. Truth Values for Label-Confirmable and Non-Confirmable Aspirin Drug Facts Claims Before and After Reading a Simulated Product Label.



Poster #18

Beyond Reading Skills – Empirical Health Literacy Domains in Colorectal Cancer Screening Brochures from the National Cancer Institute (NCI) and Centers for Disease Control and Prevention (CDC). Kilbridge, Kerry L.[1]; Vanderpool, Robin C.[2]; Wolf, Andrew[3]; Williams, Rochelle A.[1]; Yang, Theresa[1]; Sepucha, Karen[1]. [1]Massachusetts General Hospital, Boston, MA. [2]University of Kentucky, Lexington, KY. [3]University of Virginia, Charlottesville, VA. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

CRC screening is an effective way to prevent deaths from cancer. Communicating the different screening options for CRC is central to educational efforts by the NCI and CDC. We performed a series of 152 qualitative interviews among socioeconomically diverse primary care patients from five underserved community health clinics in Virginia and Massachusetts. Our objective was to assess the comprehension of five empirical health literacy domains found in the NCI's pamphlet, "What You Need To Know About Cancer Of The Colon and Rectum" (WYNTK) and CDC's pamphlet, "Colorectal Cancer Screening Saves Lives" (SSL).

Methods

We reviewed WYKTK and SSL to identify the health literacy skills and knowledge ascribed to patients referencing these materials. In a series of face-to-face interviews of men and women eligible for CRC screening, we used qualitative and mixed methodologies to compare what patients know and understand about CRC screening, to the proficiencies assumed by the NCI and CDC pamphlets. We characterized differences in five empirical health literacy domains:

1) reading level (measured by Flesch-Kincaid for the pamphlets and the Rapid Estimate of Adult Literacy in Medicine [REALM] for the patients)
2) numeracy skills using a pictorial method that does not rely on literacy
3) anatomic knowledge
4) comprehension of common medical terms and
5) basic cancer biology concepts.

Results

Patients' median age was 54. There were 69% of patients with a high school education or less and 59% of patients self-identified as African American. Flesch-Kincaid grade level estimates suggest a reading level of 8.5 is required by WYNTK and 9.1 by SSL. We found that 58% of patients read at $\leq$ 7-8th grade level according to the REALM assessment and would be challenged by the reading skills required in these pamphlets. Both brochures assumed the ability to understand percents, but 38% of our study population could not calculate 30% of 10 and 30% of 100. Using an unlabelled anatomic diagram, 60% could locate the rectum, but only 30% could locate the colon and just 23% could show where colorectal cancer would affect a patient. Some misunderstanding of colon function or anatomy was manifest in even the most well-educated patients. Most patients had not heard of any other CRC screening tests except for colonoscopy. Although 30% of patients could correctly describe "how the doctor tested stool for blood", only 15% had heard of fecal occult blood testing. The concept of early stage versus late stage cancer was understood by 76% of patients, but the concept of cancer screening was poorly understood.

Conclusions/Implications

In addition to reading skills, there are other domains of health literacy attributed to the reader in NCI and CDC educational brochures on CRC screening. Our results suggest that much of the information in WYNTK and SSL would be inaccessible to our study population, although we did

not test the brochures directly. Few patients were familiar with CRC screening tests other than colonoscopy. Even among well-educated patients, anatomy and commonly used medical terms in CRC screening are frequently misunderstood.

Poster #19

The Communication Toolkit: Increasing health literacy around evidence-based health care.

Carman, Kristin L.[1]; Dardess, Pam K.[2]. [1]American Institutes for Research, Washington DC. [2]American Institutes for Research, Chapel Hill, NC. *Presented via poster on Monday at 12:30pm.*

Background

The use of evidence in health care decision-making is the foundation to a range of approaches to achieve high quality, safe, effective, and affordable care. Consumers are increasingly being asked to assume an active role and incorporate evidence into their decisions about treatments and providers. For consumers to be successful in these tasks, they must understand the basics of evidence-based health care, recognize the importance of being involved in their health care, and understand how to take action.

As part of a project funded by the California HealthCare Foundation (CHCF), the American Institutes for Research (AIR) conducted research with consumers, employers, and other key stakeholders to understand how to effectively communicate with consumers about key concepts in evidence-based health care. This research informed the development of a free online Communication Toolkit to help employers and other organizations communicate with consumers about topics such as health care quality, costs, and engagement as well as the use of evidence in health care decision-making. The Toolkit was implemented and evaluated with a collaborative of California healthcare purchasers who adapted and disseminated the materials to employees and members.

Methods

We conducted audience-based research to develop the Toolkit. Methods included an environmental scan, interviews, focus groups, and a survey. The Toolkit was implemented with a collaborative of 6 organizations that represent over 2 million insured lives. Evaluation methods included one-on-one interviews and group meetings with collaborative members, employee surveys, and consumer focus groups.

Results

There are key challenges to engaging consumers in evidence-based health care, including gaps in knowledge about safety and quality (e.g., consumers believe that more care is better care), reluctance to question physicians about care, skepticism about evidence and guidelines, and lack of appropriate information and support. Formative testing indicated that the Toolkit materials helped to address these challenges, and were liked and understood by consumers. Results from the Toolkit implementation and evaluation demonstrated that employers, health care purchasers, and insurers can effectively disseminate messages about evidence-based health care, but benefit from support in doing so. While organizations are eager to communicate about these issues they also are challenged by lack of knowledge and experience communicating about such topics, competing priorities, and difficulty breaking out of traditional communication patterns.

Conclusions

These lessons have implications for organizations seeking to communicate with consumers about evidence-based health care and decision-making. This research highlights the importance of building a foundation for consumers around the concepts of evidence-based healthcare before layering on decision-making tasks. It also demonstrates the importance of formative research in materials development and demonstrates that creating materials based on audience needs can

help bridge gaps in knowledge, attitudes and beliefs. Finally, it demonstrates that employers, purchasers, and insurers are important allies and intermediaries in the effort to provide consumers with health-related information that they can understand and use, but that they too would benefit from additional support. We are currently in the process of updating the Toolkit to incorporate lessons learned and to provide more targeted guidance to employers and other organizations in communicating about these topics.

Poster #20

Health Literacy Assessment of the STOFHLA: Paper versus Online Administration. Hart, Traci A.[1]; Chesser, Amy K.[1]; Wipperman, Jennifer[1]; Wilson, Rachel K.[1]; Kellerman, Rick D.[1].
[1]KU School of Medicine, Wichita, KS. *Presented via poster on Monday at 12:30pm.*

Background

Nearly half of all American adults have difficulty comprehending health information, making it nearly impossible for them to use information effectively. Low literacy affects more than 90 million adults in the U.S. Many with low literacy are least able to access health care and maintain their health. Studies utilizing the short TOFHLA (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. The S-TOFHLA has a correlation coefficient of .80 with the REALM. Persons with low health literacy had low health knowledge, increased incidence of chronic disease, lower use of preventive health services, increased hospital visits, longer stays, and utilize more resources. In actual costs, it is estimated that inadequate health literacy totals around $73 billion dollars in extra health care costs in 1998. However, while most research has focused on paper-based administration of health literacy tests, little is known about testing using a timed, computer-based survey. The purpose of this study was to evaluate if utilizing a computer-based S-TOFHLA test will allow researchers and health professionals to develop a successful analysis of health literacy levels within a variety of at-risk populations without the constraints of hiring a test-facilitator, costs of materials. If the online delivery proves valid and reliable, findings could allow researchers to assess large populations of people across a wide geographic range. Therefore, the study examined whether the delivery of the test through a web-based delivery system would be perceived favorably among participants.

Methods

A brief survey was administered to 100 adult patients at a Midwestern clinic. The survey was approved by two local Institutional Review Boards. Questions included demographics, technology use and the timed (7 minute) Short Test of Functional Health Literacy in Adults. Fifty participants (n=50) were administered the test via a computer-web-based system (surveymonkey) and 50 participants took the survey via paper-and-pencil methods. Administration of the STOFHLA was conducted using standard procedure and scoring (see Table 1).

Table 1: Interpretation of the TOFHLA raw scores*

TOFHLA	
Raw score	*Interpretation*
0-59	Inadequate functional health literacy: may be unable to read and interpret health texts
60-74	Marginal functional health literacy: has difficulty reading and interpreting health texts
75-100	Adequate functional health literacy: can read and interpret most health texts

*Adopted from Barber, M.N. Staples, M.Osborne, R.m. Clerehan, R. Elder, C. and Buchbinder, R. (2009) Up to a quarter of the Australian population may have suboptimal health literacy depending upon the measurement tool: results from a population-based survey. *Health Promotion International*, Vol. 24 No. 3.

Results
This research study will be conducted starting June 7, 2010. Results are pending due to data collection scheduling.

Conclusions
This research study will be conducted starting June 7, 2010. Conclusions are also pending

Poster #21

Communication Practices for Pediatric Immunization Information: Physician perceptions of parent health literacy skills. Chesser, Amy K.[1]; Paschal, Angelia[2]; Hart, Traci A.[1]; Jones, Jordan[1]; Wittler, Robert[1]; Ahlers-Schmidt, Carolyn R.[1]. [1]KUSM-W, Wichita, KS. [2]University of Kansas Medical Center, Kansas City, KS. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Medical professionals, including residents, have been shown to underestimate patient health literacy levels. Additionally, most physicians who measure patient health literacy simply ask for the highest grade or level of education the patient has completed. But, as research has shown, education level is not necessarily indicative of health literacy levels.

The advent of new technologies, including cell phone texting capabilities, could allow medical offices to remind patients of appointments and educated patients about current medical conditions in novel ways. This would include using short, easy-to-understand text messages, which may aid a low literate population.

The purpose of this study was to evaluate physician perceptions of patient health literacy rates as a part of a feasibility study for a text messaging intervention.

Methods

In order to assess communication practices for pediatric immunization information, a survey was conducted with family physicians and pediatricians in a single metropolitan statistical area. Contact information was obtained from the local medical society. Surveys were administered by e-mail to 149 physicians utilizing SurveyMonkey©. The survey was approved by two local Institutional Review Boards. Questions included current communication channels for disseminating information to parents or caregivers of children, methods for reminding parents or caregivers of appointments, technology used within the practices, perceived patient literacy level and ability to translate health information into action. Finally, respondents provided demographic information. Written comments from the open-ended questions were categorized using emergent coding procedures.

Results

Surveys were completed by 102 (68%) family medicine and pediatric physicians. Nearly all physicians currently communicate information about immunizations schedules to parents or caregivers of children (94; 92%). In addition, 89% (91) remind caregivers about the *next* immunization their child needs. When asked the method used for communicating immunization reminders, 89% of physician respondents remind parents or caregivers about child immunizations verbally during an office visit, followed by handout or appointment card at the office visit, etc.

Physician respondents (96;64%) believed the majority of their adult patients, or parents of child patients, have "*adequate"* health literacy. When asked if the majority of their patients' could complete health-related tasks (i.e. follow health care instructions, comprehend medical literature including prescriptions, etc.), physicians responded positively for all activities.

Conclusions/Implications

While physicians are interested in patient understanding, and currently communicate the importance of immunizations as well as provide reminders, better communication may be

required – especially if refined to 160 characters of a text message. Physicians participating in this study indicated their patients had adequate literacy, yet the comments indicate they are not sure of patient understanding of basic information. Additionally, although results indicate physicians consider readability when selecting handouts, they may not have accurate perception of patient literacy or dedicated time to do so well. Continued research is needed to decipher how physicians define health literacy, their patient's health literacy rates, and how it can affect patient interactions.

Poster #22

Building Wellness™: A Youth Health Literacy Pilot Program Targeting Underserved Youth and Families. Diamond, Catherine[1]; McGrail, Lauren[2]; Azrack, Adeline[3]. [1]"I Have A Dream" Foundation – New York Metro Area, New York, NY. [2] Eugene M. Lang Foundation, New York, NY. [3]UNICEF. *Presented via poster Monday at 12:30pm.*

Background

Health literacy, refers to the skills required to function well in a health care or public health setting, and is an important determinant of both individual and public health. There is a disconnect between health education in schools and health literacy levels of students in underserved areas. According to a survey of 77 students from underserved areas, 76% received nutrition education, but only 47% reported knowing how to cook a healthy meal and 50% were not familiar with the connection between diet and heart disease or Diabetes. Adults with low health literacy report less knowledge of medical conditions and treatment and less use of preventive services; this is likely true for youth as well.

The Eugene M. Lang Foundation developed a 6-year youth literacy curriculum, Building Wellness™, targeting low-income 3rd through 8th graders. The goal is to encourage and empower students to seek, question, process and integrate health information. Long term aims are to reduce morbidity in adolescents by reducing obesity, hospitalization due to asthma, alcohol and drug use, and accidental injury. Building Wellness is piloted at "I Have A Dream" Foundation (IHAD) after school programs where students are provided a comprehensive after school program with the guarantee of tuition to higher education upon high school graduation.

Methods

In order to determine the level of need and the goals of the program, we performed an internal survey and focus group of youth already enrolled in the IHAD program. The curriculum is structured with synopses, goals, objectives and lesson outlines. Curricula are written as scripts to include all information the instructor may need to ensure easy implementation regardless of level of health knowledge.

Building Wellness is a 6-year program, 15-weeks per year, with each year building on subsequent years. Participants receive a workbook, and lessons last about 1 hour. Health literacy, BMI and blood pressure will be evaluated before and after each 15 week module. We plan to collect data on health literacy and health outcomes in participants throughout high school, after completion of the program.

Results

Four sites have completed 5 years of the program. Health literacy appears to have improved based on better test scores and anecdotal reports from instructors showing positive behavior change and increased curiosity about their health and bodies. Participants retain information from each lesson and across curriculum despite a summer and a semester between Building Wellness years. Lessons have changed the culture of the sites in which Building Wellness is implemented. For example, students recognize and request healthier snacks, they are aware of hazards surrounding them, and they take action to keep themselves healthy by proper hand washing. Data are not yet available demonstrating any changes in BMI, BP, asthma episodes or accidents.

Conclusions

As the first long-term youth health literacy program created for under-resourced children, Building Wellness has shown feasibility of conveying these skills to low income children. IHAD is a national program and Building Wellness will be implemented in all future sites. This has the potential to reach thousands of youth and their families.

Poster #23

Adolescent eHealth Literacy: The Importance of Credible Sources for Online Health Information. Ghadder, Suad F.[1]; Garcia, Carolyn M.[2]; Valerio, Melissa A.[3]; Hansen, Lucy[4]. [1]University of Texas-Pan American, Edinburg, TX. [2]University of Minnesota, Minneapolis, MN. [3]University of Michigan, School of Public Health, Ann Arbor, MI. [4]South Texas ISD, Mercedes, TX. *Presented via poster on Monday at 12:30pm.*

Background

Given the important role health literacy contributes toward achieving better health outcomes, it is important to recognize that adolescents in 2010 are consumers of health information and the health care system. In doing so, we need a better understanding of the factors which contribute to differences in health literacy levels among adolescents and the potential role of health information technology in influencing health literacy and ultimately health disparities. The purposes of this research are to (1) explore the determinants of adolescent ehealth literacy, and (2) investigate whether exposure to a reliable and valid source of online health information, MedlinePlus®, is associated with higher levels of ehealth literacy.

Methods

An online survey was administered to a random sample of 280 students from four high schools in a magnet school district along the Texas-Mexico border. District selection was determined by the utilization of MedlinePlus® as a resource among some of the district's health teachers. The eHEALS, an 8-item scale, was administered online to measure knowledge, comfort, and perceived skills at finding, evaluating, and applying electronic health information to health problems. Self-reported socio-demographic characteristics and exposure to and use of MedlinePlus® were collected. Univariate tests to examine differences between students' ehealth literacy level and socio-demographic and online health information-seeking characteristics, and multivariate tests to determine the association between knowledge and use of MedlinePlus® and ehealth literacy were completed.

Results

Students were mostly Hispanic (84%) and economically disadvantaged (60%). Around 50% of students' parents were primarily Spanish speakers. Fifty-seven percent of students had heard of MedlinePlus®. There was evidence of a high level of adolescent involvement in family health matters. For example, 59% had sought health information related to a family member's health online, and 55% had provided interpretation services between a healthcare provider and a family member. Multivariate test results revealed that higher ehealth literacy scores were associated with higher self-efficacy, and higher reliance on the Internet as a health information source. Disparities in ehealth literacy were not related to factors such as ethnicity and socioeconomic status which are usually correlated with traditional health literacy measures. A significant positive association between exposure to MedlinePlus® and ehealth literacy scores ($p<.01$) was found.

Conclusions

Adolescents are using the Internet to seek health information related to their personal health and family members' health. In the process, they encounter many challenges to obtaining reliable and valid health information. Recently proposed frameworks for influencing health literacy identify the education system as a potential intervention point (Nutbeam, 2000; IOM, 2004). Results from this study support the need for incorporating a credible online health information resource into school health education curricula as well as the value of a skills-oriented approach to the

promotion of health literacy. It is promising that adolescents receiving this type of intervention report using and benefiting from their acquired ehealth literacy skills and knowledge. The importance of such interventions is particularly critical for vulnerable US-Mexico border communities where improving the ehealth literacy of adolescents can serve as an indirect mechanism to addressing health disparities for themselves and their families.

Poster #24

National Assembly on School-Based Health Care's Public Investigator Team: Young people's look at health literacy. Strozer, Jan[1]; Schulman, Sarah[2]; Woodburn Health Advocates Movement Public Investigator Team[3]. [1]National Assembly on School-Based Health Care, Washington DC. [2]In With For, Austin, TX. [3]Woodburn Health Advocates Movement, Woodburn, OR. *Presented via poster on Monday at 12:30pm.*

Background

Health information and health services are aimed at young people, but few are often actually designed with young people. NASBHC and a group of seven high-schoolers partnered on this pilot project to determine: What is health? What is "good" school-based health care? How best do adolescent receive health information?

Methods

Through a two-step competitive application process, NASBHC recruited a small group of high-schoolers as its first public investigator team. The team was charged with rethinking health literacy and generating new ideas to address the challenges of health literacy. NASBHC facilitated an initial online training session for the project and provided the public investigator team with a "probe pack" which contained the materials needed for their work. The public investigator team talked with peers, health providers, educators, family members, and others to observe what is going on with health and health information through interviews, journaling, and observation. Based on is work, the group will come together with two facilitators from NASBHC to brainstorm ideas for addressing health literacy in SBHCs. Although the final outcome of this project is dependent on what is gathered by the team, potential resources could include guidelines or trainings for a variety of audiences. The information gathered in this project was not meant to judge or evaluate information or services provided by a specific health center, but rather be the basis for broader ideas to help address adolescent health literacy.

Results

Youth worked to creatively gather health information which inspired both the young people and adults to look more broadly at health as a concept. Through processing of all the information gathered, the group designed three health maps and storyboarded ideas for approaching the issues identified in the health maps.

Conclusions

NASBHC's mission is to improve the health status of children and youth by advancing and advocating for school-based health care. Young people are a natural and essential partner in this work. The on-the-ground implications for the public investigator team can influence service delivery, health education, and health citizenship. The organizational-level impact can increase understanding of the abilities of young people, process of partnering with young people in a meaningful way (for both the young person and the organization), and the professional development needs of NASBHC staff.

Poster #25

Youth Health Promotion Challenge: Using a CBPR approach to address functional health literacy and type 2 diabetes prevention in African American and Latino adolescents.

Valerio, Melissa A.[1]; Parker, Edith A.[1]; Palmisano, Gloria[2]; Williams, Celia[3]; Rowe, Zachary[4]; Hill-Ashford, Yolanda[5]; Bolden, Kevin[6]; Trice, Richard[7]. [1]University of Michigan, Ann Arbor, MI. [2]CHASS, Detroit, MI. [3]Community in Schools, Detroit, MI. [4]Friends of Parkside, Detroit, MI. [5]Detroit Dept. of Health and Wellness Promotion, Detroit, MI. [6]Communities in Schools, Inc., Detroit, MI. [7]Alkebu-lan Village, Detroit, MI. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

African American and Latino youth are at high risk for type 2 diabetes. Preventive behaviors have been proven to delay/prevent onset of diabetes, however, many do not adopt these behaviors due to psychosocial factors and their level of functional health literacy. Inadequate functional health literacy reduces the ability of adolescents to understand their risk for diabetes. The Youth Health Promotion Challenge (YHPC) was developed and conducted to increase health literacy and promote diabetes prevention in this population.

Methods

Using a Community Based Participatory Research (CBPR) approach, the project's steering committee members were directly involved in the development, recruitment, retention, delivery and assessment of the YHPC. We used a pre/post randomized pilot study design to test the YHPC program. Measures assessed health literacy (REALM-Teen), behavioral (e.g., self-efficacy, diabetes knowledge) and clinical (e.g. non-fasting blood glucose, BMI and waist circumference) factors. Forty-six African Americans and Latinos aged 14-17 years with a family history of diabetes were enrolled. The 6-session YHPC addressed: family history and risk for diabetes, health disparities, prevention of diabetes (e.g. physical activity and nutrition), diabetes etiology, and communication with family/health providers.

Results

Surveys assessed pre/post changes between the intervention and comparison groups at baseline and post program. The study retention rate was 84% at post-interview. Forty-six percent of participants scored below grade level. Thirty-eight percent (n=16) of participants had a blood glucose reading >100 mg/dl and 61% of adolescents had a BMI-for-age and sex percentile of 85% or greater. At post-test, participants had higher mean scores in diabetes knowledge (4.52 vs. 4.00); self-efficacy (69.00 vs. 65.31); and health literacy (REALM Teen) (59.16 vs. 57.05).

Conclusions/Implications

A CBPR approach may be valuable in promotion of health literacy in at-risk community settings. We believe the CBPR approach used was a significant contributor to the design of a more appropriate intervention, and successful recruitment and retention of hard-to-reach adolescents in this pilot study. Health literacy in adolescent populations should be taken into account in health disparities research.

Poster #26

Voces Para Niños Saludables: The Voices of Latina Mothers on Improving Communication with Pediatric Primary Care Providers. DeCamp, Lisa Ross[1]; Kieffer, Edith[1]; Zickafoose, Joseph[1]; DeMonner, Sonya[2]; Valbuena, Felix[3]; Davis, Matthew M.[1]; Heisler, Michele[1]. [1]University of Michigan, Ann Arbor, MI. [2]Ann Arbor VA Hospital, Ann Arbor, MI. [3]Community Health & Social Services Center, Detriot, MI. *Presented via poster on Monday at 12:30pm.*

Background

Low health literacy of Latino parents is a significant factor underlying health disparities for Latino children. Promoting health literacy, through effective communication between families and pediatric health care providers, may reduce health disparities for Latino children. More information is needed about how to promote effective communication between pediatric care providers and families when language and cultural barriers exist.

Methods

In partnership with the Community Health and Social Services Center, located in the predominantly Latino Southwest Detroit, we studied the pediatric primary care experiences of community families. We completed 38 semi-structured Spanish-language interviews with limited English proficiency (LEP), low-income Latina mothers who identified a primary care provider (PCP) for their children and who had at least one child $\leq$ 3 years old. Through purposeful sampling we generated a sample that included first-time and experienced mothers, a variety of community clinics used, and different levels of health status of the children. Interview transcripts were coded through a consensual and iterative process to identify themes related to the quality of communication between families and the PCP.

Results

Nearly all study participants were of Mexican-origin. Most had low measured acculturation and less than a high school education. Satisfaction with communication between mothers and the PCP varied widely across participants. Participants who were satisfied with communication with their PCP described communication that included clear and thorough explanations, drawings or preprinted pictorial representations, eliciting and answering of parent questions, and warm, interpersonal interactions. Participants satisfied with the communication with their PCP tended to have more experience using pediatric primary care as they had older children. Additionally, they often described having poor communication with a previous PCP, which motivated a switch to their current PCP. Participants who were dissatisfied with the communication with their PCP focused on interpersonal interaction and eliciting and answering of parent questions as essential ways to promote better communication. Among all participants, many reported medical jargon as a barrier to effective communication regardless of whether a language concordant provider or interpreter was used. Interpreters were consistently reported as a barrier to effective communication. Participants worried that information was not being translated correctly and that provider instructions were truncated by interpreters. Many reported that the use of an interpreter prevented them from asking questions due to a sense of increased time pressure during the visit or a lack of confidence that they would receive sufficient answers to their questions.

Conclusions

Low-income Latina mothers in our study had expectations of effective communication with pediatric primary care providers consistent with a health literacy universal precautions approach, yet many experienced poor communication during health care interactions. Both family and

provider characteristics impacted communication; therefore, interventions to improve communication should target both sides of the family-provider relationship. Parent-level interventions among LEP Latinos to increase knowledge and capacity to effectively communicate with health care providers are needed. Provider-level interventions that build trust between parents and interpreters and reduce actual or perceived time pressures when interpreters are used may enhance communication between providers and LEP Latino families.

Poster #27

Inconsistencies in Labeled Dosing Directions and Dosage Delivery Devices of Pediatric Nonprescription Liquid Medications. Yin, H. Shonna[1]; Wolf, Michael S.[2]; Sanders, Lee M.[3]; Dreyer, Bernard P.[1]; Parker, Ruth M.[4]. [1]NYU School of Medicine, New York, NY. [2]Northwestern University, Chicago, IL. [3]University of Miami School of Medicine, Miami, FL. [4]Emory University School of Medicine, Atlanta, GA. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Over half of US children are given 1 or more medications in a given week, the majority of which are nonprescription medications. Parents' ability to understand how to accurately dose these medications is a critical issue at the intersection of pediatric patient safety and health literacy. Liquid medications are particularly difficult to dose. Variability in labeled dosing directions and dosage delivery devices of pediatric oral liquid nonprescription medications may contribute to parent confusion. While a recent FDA guidance released in November 2009 cited safety concerns related to the number of liquid drug products packaged with delivery devices which contain markings inconsistent with labeled dosing directions, there is no existing data which systematically describes the type and level of existing inconsistencies. In this study, we therefore sought to systematically document the within- and between- product variability of labeled dosing directions and dosage delivery devices for pediatric oral liquid nonprescription medications.

Methods

Design: Descriptive study.

Setting/Study Sample: 200 oral liquid nonprescription medications (over a 52 week period through October 30, 2009; representing 99% of market share; US store sales) categorized as analgesic, cough/cold, allergy, or gastrointestinal products, which included dosing information for a child <12 years of age.

Main Outcome Measures: Presence and type of dosage delivery device, inconsistency between labeled dosing directions and dosage delivery device (within product variability), inconsistency across products (between product variability), consumer guidance on appropriate use (e.g. inclusion of definitions of abbreviations used).

Results

74.0% (148/200) of products included a dosage delivery device. Of these products, 146 (98.6%) contained one or more inconsistencies between the dosing directions and device, with respect to presence of superfluous markings (81.1% (120/148)), missing necessary markings (21.6% (32/148)), inconsistency in text used for units of measurement (89.1% (122/137)), or inconsistency in numeric text with respect to format of decimals less than 1 and/or fractions used (52.7% (29/55)). Rate of inconsistency across products was high; among products which used abbreviations for unit of measurement, nonstandard abbreviations were used by over half. 98.8% of products which used an abbreviation for a unit of measurement did not provide a definition.

Conclusions/Implications

Dosing directions and dosage delivery devices for pediatric nonprescription liquid medications are highly variable and inconsistent, and may result in high rates of undue confusion and unsafe use among parents administering these medications to their children. While this is particularly

concerning for the 1 in 4 US parents with limited literacy skills, parents across all literacy levels are at risk. A plan for more standardized and systematic labeling is needed.

Note: Additional analyses involving this sample of nonprescription medications is currently underway, to examine features of the labeled directions from a health literacy perspective, including examining the use of pictograms, the formatting and location of dosing information, as well as font size, use of color, and highlighting of information.

Poster #28

Development of a Mental Health Literacy Intervention for Caregivers and Case Managers of Children with Severe Emotional Disturbances (SED). Davis, Christine S.[1]; Armstrong, Mary[2]; Smith, Richard B.[3]; Massey, Oliver T.[1]. [1]University of North Carolina, Charlotte, NC. [2]Louis de la Parte Florida Mental Health Institute, University of South Florida, Tampa, FL. [3]University of South Florida, St. Petersburg, FL. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Our body of research focuses on mental health literacy among case managers and caregivers of children with severe emotional disturbances (SED). This research focuses on health literacy among case managers and caregivers of children with mental illness, because - unlike other health consumer groups - this population has some of the greatest challenges to health literacy: their child's health situation is chronic and requires ongoing management; their health responsibility is for the care of a person other than themselves; their health-related and health seeking behaviors are strongly influenced by intrapersonal and societal issues such as stigma and shame; they have particular challenges in navigating the children's mental healthcare system with myriad providers and mandates; their child and family frequently have multiple diagnoses, challenges, and conditions; and their child's diagnosis and treatment is often primarily communication-based (thus, both provider and caregiver need to be literate and it is in their interaction that literacy is primarily constructed).

Methods

In our research, *funded by FL-AHCA*, we used observations, surveys, and focus group research to understand the elements necessary to include in an intervention designed to improve mental health literacy among caregivers and providers.

Results

Caregivers of children with mental health care needs tend to seek out information interpersonally, and while the quality of communication between caregivers and providers is important in the health literacy process, caregivers often do not know how to effectively communicate and negotiate with providers in ways that get them the information or services they need and that empower them to meet their own needs in the future. In addition, case managers and other providers are not effective in teaching caregivers how to do things for themselves or how to communicate effectively with their providers. This research found that caregivers did not think much about mental health or mental illness until their child had problems, and they obtained information on an 'as needed' basis, when their child exhibited problems to the extent that they knew they needed to seek help. Information on where to turn for help at such a time would have been helpful. Most of their inquiries for information were initially for crisis intervention and were interpersonal inquiries directed at formal systems such as police or mental health and the school system.. The research yielded a detailed list of information to be included in interventions targeted to providers and caregivers to enhance mental health literacy levels. Our research suggests that an intervention to improve mental health literacy should focus on needed communication skills and yielded a list of problems and issues to address for both caregivers and providers, such as: how to talk to their children's teachers in ways that are helpful; and how to help form a therapeutic relationship that facilitates communication, disclosure, and information.

Conclusions/Implications

Our research is unique because we focus on the interpersonal communication process involved in

literacy, and we propose an intervention that works within and extends the existing caregiver-provider practice.

Poster #29

Online Health Information & Teens with Chronic Disease: Health Literacy and other Predictors of Use. Chisolm, Deena J.[1]; Johnson, Lauren D.[2]. [1]The Ohio State University, Columbus, OH. [2]Nationwide Children's Hospital, Columbus, OH. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Online health resources can help teens with chronic illnesses transition from parental care to self-management of their conditions by providing health information, disease management tools, provider support, and peer support. To maximize the benefits of these resources, we must learn more about patient factors that affect their use.

Methods

180 patients, aged 13-18 years, treated for asthma or diabetes in specialty care clinics completed assessments of general literacy, health literacy, Internet use, and attitudes toward technology. A resource sheet listing selected publicly available websites in four categories (general health information, teen health information, disease-specific health information, and disease management support) was reviewed with each participant. Participants were then asked whether they intended to use any of the recommended sites in the next three months. We used ordinal logistic regression to model the relationship between intent to use websites, health literacy, and technology acceptance factors. Actual use in the 3-months following the baseline visit was assessed with a semi-structured telephone follow-up interview which assessed barriers and promoters of use.

Results

At the baseline visit, 79% of teens reported intent to use websites from the provided resource page at least occasionally within the next three months. Health literacy (OR=4.84; 95% CI 1.67-14.02), perceived usefulness (OR=1.91; 95% CI 1.33-2.72), and perceived ease of use (OR=1.85; 95% CI 1.26-2.70) were associated with stronger intent. Demographic variables were not significant predictors of intent to use. 124 of the 180 (68.9%) recruited study participants completed the 90 day follow-up interview. 62% reported visiting at least one of the recommended sites. Baseline intent to use was significantly associated with reported use within the ensuing 90 days. General health information sites (40%) and teen health information sites (39%) were most used. Disease-specific information sites were accessed by 32% of respondents. 16% accessed disease management support sites. Of the teens who visited at least one site, 14% stated that they would not visit any site again within the next 6 months. 61% percent said they would re-visit one or more of the sites once a month or less and 24% said they would visit a site more that once a month. Intention to continue use was highest for teen health sites, with 88% of those who had used a teen health site saying that they would use the site again at least once in the next 6 months. Follow-up interviews identified barriers to use of the recommended sites including lack of or limited computer/internet access, lack of interest in health information, lack of time, and lack of perceived health need. Themes associated with willingness to continue use were usefulness, ease of use, peer interaction, frequent updates, health need, and general positive opinion of the sites.

Conclusions/Implications

Most teens are willing to try recommended online health resources. Providers intending to integrate such tools into practice should clearly communicate the intended value of the sites and

should design features that focus on the teenage user, provide frequent content updates, and integrate social networking and interactive features to maximize committed use.

Poster #30

"Reality check": Applying domains of health literacy to local television health news. Willis, Erin[1]; Lee, YoungAh[1]; Lee, Sun-A[1]; Lee, Hyunmin[1]; Cameron, Glen[1]. [1]University of Missouri, Columbia, MO. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

The definition of health literacy has evolved from focusing on an individual's abilities to find and use health information (Simonds, 1974) to incorporating the process and outcome of such efforts, often leading to personal and social benefits (Nutbeam, 2000; Speros, 2005; Sullivan, 2000). In fact, recent definitions include multi-dimensional domains which provide flexibility given than an individual's understanding of health literacy evolves over time (Zarcadoolas, Pleasant, & Greer, 2005). However, such definitions of health literacy have not been applied to health communication, specifically local television health news. It is not known how these conceptual definitions translate to the actual reporting of health news. Thus, the purpose of this study was to survey the field of local television health news in regards to four domains of health literacy – *functional* literacy, *science* literacy, *civic* literacy, and *cultural* literacy (Zarcadoolas, Pleasant, & Greer, 2005) – in relation to story prominence (RQ1), story topic (RQ2), and story scope (RQ3).

Methods

A content analysis of local television health news was conducted. Local television health news was collected from two mid-Missouri television stations (NBC and ABC affiliates) at 6 p.m. and 10 p.m. from January to March 2009. A total of 245 newscasts, 30-minutes in length, were recorded, but only health news stories were included in the final sample (n=416). The unit of analysis of this study was each health news story clip. Each health news story was coded for the following variables: domains of health literacy, story prominence; story topic; and, news scope.

Results

This study identified different uses of the domains of health literacy within local health news. In regards to story prominence (defined as headline, middle, and closing news segments) (RQ1), *civic* literacy was used most often across news segments, while *science* literacy appeared dominantly both in the middle and closing segments of the news. In regards to story topic (defined as healthcare, treatment modality, policy change, statistics/trends, prevention, and philanthropy) (RQ2), *science* and *civic* literacy were most often used across categories, with the single exception of philanthropy. *Cultural* literacy was most prominently seen here. Differentiating between domains of health literacy used in story scope (defined as local, state, or national health news) (RQ3) showed an interesting pattern: fundamental literacy most often appeared in local news; civic literacy appeared in state news while science literacy was used in national news.

Conclusions/Implications

This study teased out the domains of health literacy and applied the conceptual definition to local health news. Such empirical evidence allows for further discussion of the definition of health literacy, but also offers a "reality check" of local television health news design. Understanding how different structures of health literacy are actually produced and used within the local television health news, this study suggests much need for understanding how, in reality, the information of health messages is presented to improve health literacy of local communities. More importantly, this systematic study examines the quality of local television health news

from theoretical perspectives of health literacy and emphasizes the necessity of improving the quality of local television news.

Poster #31

How Pediatric Providers perceive Parents' Health Literacy and its Impact on Treatment Recommendations and Instructions: A Qualitative Study. Harrington, Kathleen F. University of Alabama, Birmingham, AL. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Low health literacy is associated with poorer health outcomes including pediatric asthma, poorer communication with the healthcare provider, and diminishes shared decision making which is important for disease self-management. Provider perceptions have been found to affect the patient interaction in several ways: type and number of questions asked, prescribed treatment, information given and time spent. In a national survey of Pediatricians, the majority (69%) rated themselves as poor to good in identifying low literacy parents. As part of an ongoing study examining the impact of parent's health literacy on pediatric asthma outcomes, healthcare providers are asked to assess the parent's health literacy and ability to carry out treatment recommendations and how these perceptions effect treatment recommendations and the giving of instructions. We sought to explore providers' considerations when making these judgments.

Methods

Healthcare providers participating in the parent study were interviewed by the study Principal Investigator with a series of open-ended questions found in Table 1. Interviews were taped and notes recorded. Also, providers self-rated their ability to assess parent health literacy using a 5-point scale from 1-Poor to 5-Excellent and explained why they chose that rating. Themes were identified from the responses to each question, using standard qualitative methods.

Results

Six Providers were interviewed: 2 Nurse Practitioners and 1 Pediatrician specializing in Asthma care, and 3 general Pediatricians from health department clinics. All were female with 5 to 22 years of practice experience. Table 1 displays the primary and secondary response themes for each question. All providers rated themselves as 3-Good for identifying patient literacy, all citing that they thought they did pretty well, but without a metric to confirm their perception didn't feel they should rate higher.

Conclusions/Implications

Healthcare providers rely primarily on verbal cues from parents in assessing health literacy and on past history of adherence to rate parent ability to carry out treatments. Both of these assessments influence treatments given to some extent and greatly influence how instructions are given. Universal precautions for health literacy may allow more standard delivery of medical care to pediatric asthma patients.

Table 1.

Question	***Primary themes***	***Secondary themes***
What sorts of things do you consider when you answer "What is the **parent's health literacy** level?"	Parent articulation (history, treatment plan)	Adherence to treatment How well they can read
In general, does this perception influence what treatment recommendations you make? In what ways for those with low literacy?	Keep it simple	Start slower
In general, does this perception cause you to change how you give treatment instructions? In what ways for those with low literacy?	Repeat and repeat	Spend more time Color-code meds/action plans Teach-back methods
What sorts of things do you consider when you answer "What is the **parent's ability to carry out your treatment recommendations** for the child's asthma?"	Past compliance	How engaged they are in child's care
In general, does this perception influence what treatment recommendations you make? In what way for those with low literacy?	Keep it simple	Consider price of meds Try to engage child

Poster #32

Helping Children Become Health Literate: Children's results from EAT HEALTHY, STAY ACTIVE! Teutsch, Carol B.[1]; Herman, Ariella[1]. [1]University of California, Los Angeles, CA. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

The J&J Health Care Institute (HCI) has developed a tri-level low literacy multicultural intervention for obesity prevention in Head Start schools. We previously reported pilot design and results (poster HARC 2009) for parents and staff. Now we report the preschool intervention component and its impact on knowledge and BMI of 4-5 year old children who participated. Development of curricula in health literacy for early childhood is aligned with the new *National Action Plan to Improve Health Literacy* strategy from HHS.

Methods

Using the well tested HCI strategic model for implementing health promotion programs, a Head Start agency in Santa Clara implemented the full EAT HEALTHY STAY ACTIVE tri-level program. The staff integrated the innovative nutrition and activity curriculum into daily classroom activities. Lessons were synchronized with food groups and nutrition topics discussed at parent trainings. Teachers developed a customized, month long teaching plan in each classroom reflecting the unique personalities and needs of the children. The curriculum featured a range of activities exploring healthy living principles on a daily basis. In the classroom, children were introduced to MyPyramid; teachers used it to lead a variety of lessons on healthy foods and to discuss shapes, colors, counting, and other skills. During the next 3 months of the study, for reinforcement, teachers incorporated one to two lessons from the UCLA curriculum weekly; exercise sessions with music were also regularly included. Field trips to farmer's markets or grocery stores enlivened classroom lessons on healthy eating. One site created an in-school farmers' market, with farmer donated fruits and vegetables. Children, dressed in farm attire, used play money to make their own food purchases. They used vegetables they purchased to make a soup, aided by parent volunteers. Some children planted a garden with their teachers. Teachers used these activities to reinforce *Eat Healthy, Stay Active* principles, while creating learning opportunities in math, science, art, and other areas.

Results

At 6 months, knowledge results were ascertained with 5 survey questions (IRB approved) delivered verbally by classroom teachers individually (n= 85 "treated"). Control group (n=72) at the same Head Start site did not receive the curriculum. Height, weight were measured and BMI calculated for "treated" cohort twice during the year.

- Post intervention, more than 89% children correctly identified the food pyramid, five food groups, and various plates with each of the five food groups. Approximately 51% answered correctly in the control group.

- 93% of children knew the difference between foods they should eat more often, and less often. Only 54% knew the difference in the control group.

- Favorable changes in BMI were consistent with results from the national pilot. (Percentage of obese children decreased from 30.4% to 21.7%)

Conclusions/Implications

We believe that multi-level low literacy interventions such as ours, directed at preschool age children and their families in school settings, are crucial to a comprehensive national obesity prevention effort.

Poster #33

Low Health Literacy Is a Barrier to Inpatient Medication Reconciliation. Cawthon, Courtney[1]; Kripalani, Sunil[1]; Roumie, Christianne L.[1]; Munjal, Ankita[1]; Swain, Edith[2]; Businger, Alexandra[2]; Schnipper, Jeffrey L.[2]. [1]Vanderbilt University, Nashville, TN. [2]Brigham and Women's Hospital, Boston, MA. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

Patients with low health literacy display poor understanding of their medication regimen and may be unable to communicate health information adequately. Patients are an important source of information for medication reconciliation – "a process of identifying the most accurate list of all medications a patient is taking and using the list to provide correct medication for patients anywhere within the health care system." It is unknown to what extent low health literacy may pose a barrier to medication reconciliation, as physicians can access multiple other sources of information about patients' medications, including family members and prior records from the clinic, hospital, or pharmacy. We studied the effect of health literacy on the number of errors present in the physician's pre-admission medication list (PAML) at two large teaching hospitals.

Methods

Patients for this analysis were participants in the Pharmacist Intervention for Low Literacy in Cardiovascular Disease (PILL-CVD) study. During the enrollment interview, health literacy was measured using the short Test of Functional Health Literacy in Adults (s-TOFHLA), which categorizes patients as having inadequate, marginal, or adequate health literacy. Pre-admission medication lists were obtained by treating physicians according to convention at the two hospitals. Each hospital has a robust electronic health record that includes inpatient and outpatient visits, as well as software that facilitates the medication reconciliation process. Study pharmacists subsequently obtained a "gold standard" medication history according to best practices. They tabulated the number of errors as well as clinically relevant errors in the physicians' PAML. We used Poisson regression to analyze the association of patients' health literacy with PAML errors, adjusting for the number of pre-admission medications.

Results

Among 379 patients with available data, 21.4% had inadequate or marginal health literacy. The median number of pre-admission prescription medications was 8 (interquartile range [IQR] = 4 to 11). Almost half of patients (N=165, 43.5%) had 1 or more errors in the PAML. Among those with errors, the median number was 2 (IQR = 1 to 4). Clinically relevant errors in the PAML were present in 70 out of the 374 patients in whom this could be assessed (18.7%). Patients with such errors had a median of 2 (IQR = 1 to 3). In Poisson regression models that adjusted for the number of pre-admission prescription medications, PAMLs of patients with inadequate or marginal health literacy had significantly more overall errors (incidence rate ratio [IRR] = 1.29; 95% CI, 1.04 to 1.60), as well as clinically relevant errors (IRR = 1.36; 95% CI, 1.10 to 1.68).

Conclusions/Implications

Patients with inadequate or marginal health literacy were more likely to have errors in their pre-admission medication lists, despite the availability of robust electronic health records, medication reconciliation software, and other sources of medication information. Physicians should be aware that low health literacy poses a barrier to inpatient medication reconciliation.

Poster #34

Medication errors in young children: Analyzing calls to a Poison Center to develop health literacy interventions for parents. Schwartz, Lauren[1]; Mercurio-Zappala, Maria[1]; Howland, Mary Ann[2]; Hoffman, Robert S.[1]. [1]NYC DOHMH, New York, NY. [2]St. John's University, Queens, NY. *Presented via poster on Monday at 12:30pm.*

Background

Poison Centers (PCC) provide an integral service for the public health system through cost savings by reducing unnecessary emergency department visits related to poison exposures. Treatment advice is provided 24 hours a day, 7 days a week by registered pharmacists and nurses certified in poison information. In addition, community education programs are provided about poison prevention and medicine safety. Research has demonstrated that low health literacy is associated with misunderstanding medication instructions. The PCC receives 750 calls annually that involve medication errors in children under 6. We reviewed these cases to analyze the reasons for errors, types of medications, and care management.

Methods

A prospective study of calls to a PCC was conducted between January and May 2010. Study criteria included a medication error involving a child under age 6. A data abstraction form was completed for each case that collected patient age, gender, caller relation to patient, site of exposure, reason for medication error (dosing amount, administration route and schedule, units of measure, and formulation given) and the type of medication involved in the case. Patient management and treatment recommendations from the poison specialist were also noted.

Results

A total of 273 cases were reviewed. The mean age was 2.25 years old. The majority of cases involved boys (52%) and 82% of calls were initiated by the parent. Nearly all exposures occurred in the home (97%) and involved ingestions (92%). Primary reasons that medication errors happened were due to caregivers inadvertently giving the medicine twice—often by 2 different caregivers (25%), too much medicine was given (19%), there was confusion about the correct units of measure (18%), and the medication doses were given too closely together (11%). The most common types of medicine were analyzed. Prescription medicines accounted for 40%, nonprescription analgesics (36%), and nonprescription cough and cold (13%). Patient management recommendations were primarily observation at home (85%) and did not involve a visit to a health care facility.

Conclusions

These findings highlight the need for interventions that address health literacy and medication errors among parents/caregivers of young children. A medication checklist to reduce the incidence of double dosing medications by different caretakers will be created and evaluated in the community setting. Educational programs to improve parental knowledge regarding units of measure, dosing schedules, and dosing amounts will be developed. In the next phase of the study, qualitative interviews will be conducted with parents to further explore health literacy issues contributing to common medication errors.

Poster #35

Preferred sources of health information of Latino adults in a Midwestern tri-state area.

Britigan, Denise H.[1]; Rojas-Guyler, Liliana[1]; Murnan, Judy[1]; King, Keith A.[1]; Vaughn, Lisa A.[2]; [1]University of Cincinnati, Cincinnati, OH. [2]Cincinnati Children's Hospital Medical Center, Cincinnati, OH. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

As the local Latino community in the Midwest continues to grow at a rapid pace, health educators and other health professionals find themselves without sufficient information to serve the community. The research literature documents that racial/ethnic disparities in health exist and members of minority groups suffer disproportionately from chronic illnesses and experience higher rates of morbidity and mortality. Differences in healthcare access also play a role in health disparities. Improvement of health status by addressing health disparities is a major role of health promotion and education professionals. The research questions investigated were to see if the sample population's sources of health information varied with their respective health literacy levels (in English and/or Spanish), acculturation level, and/or other demographic variables such as country/region of familial origin, length of residence in the U.S., education level, age, or gender.

Methods

This study used validated subscales for measuring acculturation (Bi-dimensional Acculturation Scale) and health literacy in English (Rapid Estimate of Adult Literacy in Medicine) and in Spanish (Short- Test of Functional Health Literacy in Adults). Six focus groups and quantitative methods (n= 214 surveys) determined a working knowledge of the sources of health information resources and the functional health literacy levels of the population subgroup. Because the aforementioned variables did not meet the assumption of normality distribution, non-parametric statistical analyses were performed to determine if any statistically significant relationships existed.

Results

The results of the analyses showed statistical significance for all of the relationships studied, such that all of the 14 null hypotheses were rejected. Regarding the main source of health information for all of the surveyed participants, almost half chose a medical source as their main source for health information. Two-thirds of the participants that took the S-TOFHLA in Spanish had adequate functional health literacy *in Spanish,* almost a quarter had low functional health literacy *in Spanish*, and that the remaining few had marginal functional health literacy *in Spanish*. For those participants that took the S-TOFHLA in English, the majority had adequate functional health literacy *in English* and the remaining two participants each had marginal or low level functional health literacy respectively. A person's health literacy in English (i.e., their ability to read medical terms in English) varied with their health literacy in Spanish, their acculturation to the U.S. cultural domain, their acculturation to the Hispanic domain, their country / region of origin, their length of residence in the U.S., their age, or their gender.

Conclusions/Implications

Health literacy is a multifaceted issue that requires a multi-sectorial approach for our society. Three general approaches are recommended. First, evaluation and assessment of literacy, reading grade level and numeracy skills (for example, using numeracy props techniques) of the target audience for health education programs in the Latino community must be conducted. Second, the selection of the tools to measure these abilities must be practical and reliable to support their use

in the field. And third, we must meet health education program participants at the appropriate language and reading level needs of the individuals.

Poster #36

Pharmacists' attitudes and barriers towards health literacy and role in patient safety.

Devraj, Radhika[1]; Gupchup, Gireesh[1]. [1]Southern Illinois University-Edwardsville, Edwardsville, IL. *Presented via poster on Monday at 12:30pm.*

Background

Improper understanding of medication instructions can lead to medication errors and compromise patient safety. There is evidence that inadequate health literacy contributes to poor comprehension of medication information. As medication experts pharmacists are perfectly positioned to assist with patient understanding of medications, particularly for patients with low health literacy, thus contributing to improved patient safety. However, literature about pharmacists' attitudes and barriers associated with implementing health literacy tailored practices is lacking. The purpose of this study was to determine Illinois pharmacists' attitudes and barriers towards health literacy.

Methods

Six pharmacists representing chain, independent, and hospital practice participated in a focus group to generate potential items for a survey to assess health literacy attitudes and barriers. The survey was pilot tested among six practicing pharmacists, revised and pre-tested among a random sample of 200 Illinois pharmacists. After minor modifications, a cross sectional survey was administered to a random sample of 1500 pharmacists identified from a list provided by the Illinois Pharmacists Association. Sixteen attitude statements and 11 barrier statements on a four point Likert-type scale (1 = strongly agree to 4 = strongly disagree) constituted the attitudes and barriers subscales in the final survey instrument. Dillman's five step Total Design Method was followed for survey implementation.

Results

Of the 1500 surveys mailed, 701 returned surveys were usable (48.1%). Majority of the respondents were male (53.3%), between the ages of 31-60 years (69.3%), had a B.S. degree in pharmacy (64.4%), had spent more than 30 years in practice (36.8%), belonged to either independent or chain pharmacies (57.2%), and dispensed 300 or less prescriptions a day (50.5%). Principal components analysis with orthogonal rotation showed that attitudes statements comprised of five components. Health literacy and medication-related issues formed one component. On average pharmacists' strongly agreed or agreed that low health literacy is a problem because patients are not able to understand the value of preventive health measures [1.81(0.67)], patients with low health literacy have low medication compliance rates [1.9 (0.61)], and people who have low health literacy do not understand "why" they need to take medications [2.01 (0.65)]. Principal components analysis of barriers statements yielded three components of which process factors formed one component. On average pharmacists strongly agreed or agreed that lack of adequate time [1.66 (0.67)], use of mail order [1.74 (0.85)], and presence of convenience delivery mechanisms such as drive through or remote location drive through methods [1.86, (0.83)] were among barriers to implementing health literacy interventions. Canonical correlation of the barriers and attitudes factors showed that all three canonical dimensions were significant at the 0.05 level (Wilks lambda 0.74, p=0.00). Dimension 1 had a canonical correlation of 0.45 between the sets of variables, while for dimension 2 it was much lower at 0.19.

Conclusions

Significant correlations between attitudes and barriers suggest that training to address pharmacists' perceived barriers will also favorably impact attitudes. Such training may lead to pharmacists counseling patients on preventive health measures and lead to reduced medication errors due to better patient understanding.

Poster #37

Patient-Doctor Discussion of Online Health Information. Chung, Jae Eun. Kent State University, Kent, OH. *Presented via poster on Monday at 12:30pm.*

Background/Research Question

An increasing number of people are turning to the Internet for health information and advice. We have accumulated good knowledge about the characteristics of "e-patients" who go online for health information. Yet, questions remain as to who come to doctor's office ready to discuss materials they have found on the Internet and how doctors react to the online information. In spite of dangers of misinterpretation and concerns about low-quality, incorrect information (Fox et al., 2005; Stevenson, Kerr, Murray, & Nazareth, 2007), a relatively small proportion of "e-patients" ask questions to their doctors about what they have read online.

The goal of this study is three-fold:

1. to re-examine determinants of online health information seeking behaviors;
2. to learn the socio-demographic characteristics and health literacy skills of those who discuss online materials with their doctors; and
3. to identify factors that lead to more positive assessment of doctors' reaction to online materials.

Methods

Data from 2007 Health Information National Trends Survey (HINTS) were analyzed. Binary logistic regression models were run to estimate the odds of having searched the Internet for health information and advice (model 1); talking to a doctor, a nurse, or other health professionals about any kind of health information found from the Internet (model 2); and finding their health professionals very/somewhat interested in the information found online (model 3).

Results

Gender and education were observed to be the critical factors that affect the decision to bring online materials to doctors' office. College-educated male patients were most likely to talk to doctors about their online search efforts. Contrary to expectations, those who have troubles understanding or trusting online health information were not more likely to ask questions to doctors. Among those who managed to talk about what they have found online during their visit to doctors, only those in a good health condition and with little doubts about the quality of health information evaluated their doctors' reactions as positive.

Conclusions/Implications

The current study corroborates previous findings on online health information seeking patterns as well as offers new insights into how socio-demographic and health information-related variables affect patient-doctor discussion and subsequent evaluations. Although nearly two-thirds of doctors said that they would welcome patients coming with online information (Gerencher, 2007), only three out of ten patients reported having brought up information they found online during their consultation with doctors. The chance is even lower for the less educated patients, suggesting a need for guidance for the less educated on how to start a conversation on online materials. Efforts should be also made to facilitate patient-doctor discussion about online materials, especially among those who have troubles understanding and doubts in health advice online. With increasing number of patients going online for health information, the role of doctors in correcting any misinterpretation will become ever more important.

Poster #38

Maryland Adult Opinions of Dental Providers Communication Skills. Horowitz, Alice M.[1]; Wang, Min Qi[1]; Kleinman, Dushanka V.[1]. [1]University of Maryland, College Park, MD.

Presented via poster on Monday at 12:30pm.

Background/Research Question

As identified in HP 2010's chapter on Health Communication, communication skills of health care providers are important to provider-patient communication. Most patients claim they obtain oral health information from their dentists. Poor oral health in children has serious health consequences including needless pain, suffering and even death. Maryland found itself in the limelight of dental issues given the tragic death of a 12-year-old boy who died in 2007 due to untreated dental decay. This event is unfathomable in an industrialized country especially when we have known how to prevent this infectious disease for decades. If a caregiver does not know how to prevent this disease and does not have access to necessary implements such consequences happen. The purpose of this study was to determine knowledge, opinions and practices concerning the prevention and early detection of dental caries [tooth decay] of caregivers of young children and to determine their opinions of their dental provider's communication skills. This presentation will focus on selected questions from Agency for Healthcare Research and Quality's (AHRQ) Consumer Assessment of Healthcare Providers and Systems (CAHPS).

Methods

A survey instrument of 45 questions was developed and pretested. Selected CAHPS questions were used to determine Maryland adult opinions of health providers' communication skills. In March and April of 2010 a random digit dialing telephone survey was used to capture 803 completed surveys of 18-65 years of age who had a child in the home 0-6 years of age. Land phones were used in 75% of the calls; 25% were cell phones. Frequency distribution, chi square and logistic regression was used to analyze data.

Results

Respondents ranged between 21-65 years; 69% were females, 68% Caucasian and 21% were African American; levels of education included: High school and below = 18%; some college/trade school = 22%, 4 years of college = 30% and some graduate school = 29%. 16% of respondents used Medicaid for payment of their child's dental care. Overall respondents were reasonably satisfied with the communication practices of their dentists and staff. There was a trend that those with higher levels of education and females were more likely to respond favorably about the communication skills of their dentist and staff. When asked "During your last dental appointment for you or your child, how often did the dentist or staff explain things in a way you could understand?" respondents with Medicaid were less likely to indicate "Always" than those with private insurance, $p<0.05$. When asked "During your last dental appointment for you or your child, how often did the dentist or staff listen carefully to you?" respondents with Medicaid were less likely to indicate "Always" than those with private insurance, $p<0.05$.

Conclusions/Implications

Maryland adults who use Medicaid are less likely than those with private insurance to report positively about the communication skills of their dental providers and staff. Medicaid recipients are the individuals with the greatest dental disease and in need of preventive information and regimens. Upgrading communication, listening and cultural competency skills of dentists and their staff may address the discrepancy in perceptions among these subjects.

Poster #39

Use of communication techniques by dentists: Results of a national survey. Podschun, Gary D.[1]; Rozier, R. Gary[2]; Horowitz, Alice M.[3]. [1]American Dental Association, Chicago, IL. [2]University of North Carolina, Chapel Hill, NC. [3]University of Maryland, College Park, MD.
Presented via poster on Monday at 12:30pm.

Background

Communication between dental providers and patients is an important part of providing quality dental care. The purpose of this study was to determine: (1) communication techniques used routinely by dentists; and (2) variation in their use according to factors that can be targeted with change interventions.

Methods

An 86-item, self-completed questionnaire was distributed to a random sample of 6,300 dentists selected from the American Dental Association's master file of dentists who indicated either their primary or secondary occupations as full or part-time private practice. Respondents reported routine use ("most of the time" or "always" use during a typical week vs. "never", "rarely" or "occasionally") for 18 communication techniques, 7 of which are consider basic techniques, from 5 domains (use simple language, use Teach Back, use patient-friendly materials, provide assistance in understanding information, provide patient-friendly environment). Provider (age, race/ethnicity, sex, US born/trained) and practice (patient characteristics, dentist specialty, primary occupation, setting) characteristics were tested for their associations with the sum of the number of techniques using ANOVA and OLS regression models.

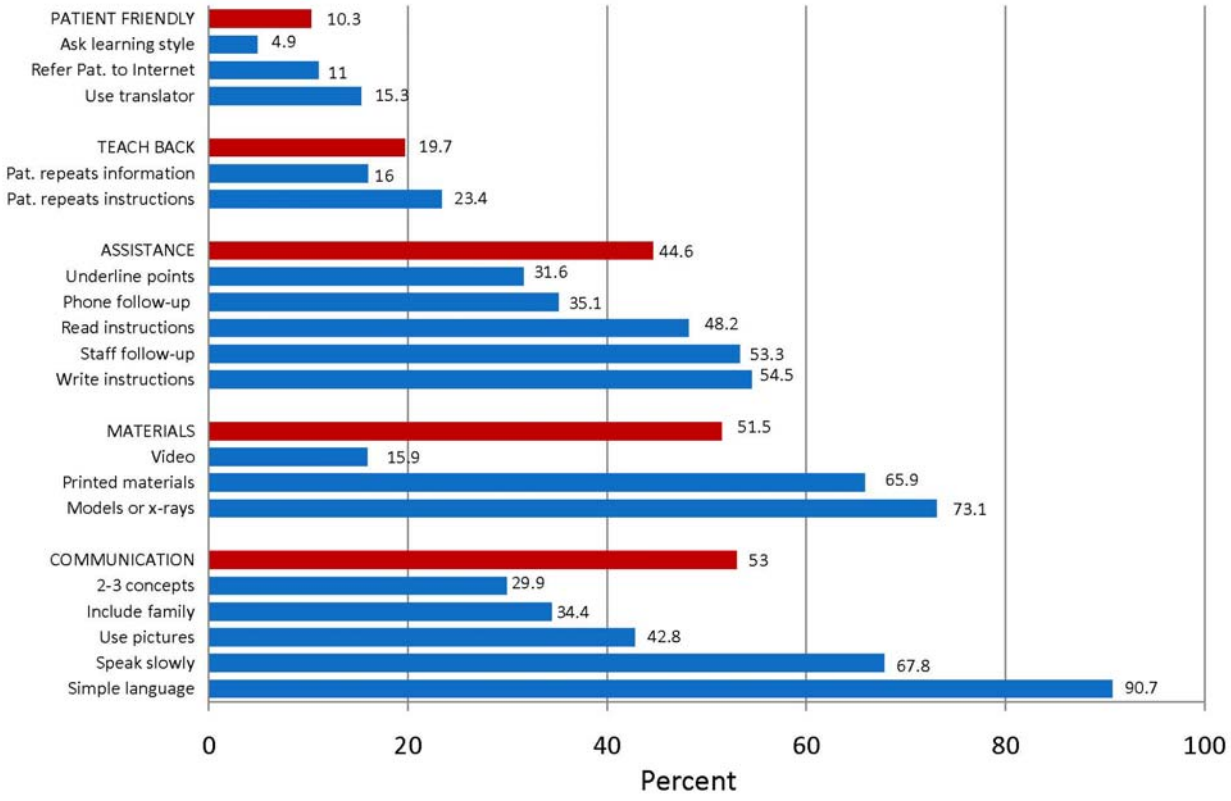
Results

Almost all dentists (99.2%) reported routine use of at least one of the 18 techniques during a typical week. They reported using an average of 7.11 (39.5%) of the 18 techniques and 3.07 (43.5%) of the 7 basic techniques. Four of the techniques were used by two-thirds or more of dentists (provide printed materials = 65.9%, speak slowly = 67.8%, use models or radiographs to help communicate = 73.1%, use simple language = 90.7%). Less than one-fourth of dentists used any of the 5 items in the Teach Back or patient-friendly-practice domains. Use was affected by dentist age, minority status, training outside the U.S. and specialty status. Health literacy variables (awareness, training, practice change) and lack of time also were associated with the number of techniques used by dentists.

Conclusions

Routine use of communication techniques is low among dentists, particularly some of those techniques thought to be most effective with low literacy patients, and might not match the literacy skills of a growing segment of dental patients. Results of the survey provide guidance for the design of learning opportunities in health communication for practicing dentists and their staff. Training will need to improve provider knowledge about outcomes and effectiveness of communication techniques and ensure self-efficacy in their use. A firm foundation for these efforts requires the development and dissemination of guidelines on provider communication.

Figure 1: Percent of Dentists Routinely Using Each Technique by Domain



Poster #40

Charging Community Newspapers with a Health Literacy Mission: Findings from a media intervention focused on rural communities in Missouri. Stemmle, Jon T.[1]; Casey, Chris[2]; Caburnay, Charlene[2]; Culbert, Arthur[3]. [1]University of Missouri School of Journalism, Columbia, MO. [2]Washington University, St. Louis, MO. [3]Health Literacy Missouri, St. Louis, MO.
Presented via poster on Monday at 12:30pm.

Background

Ranked 38th in overall health out of all U.S. states by America's Health Rankings, Missouri is a predominantly rural state with 2 million rural residents living outside the Kansas City and St. Louis metropolitan areas. A study by the RAND Corporation found high levels of low health literacy across the state. Rural areas had the highest rates of low health literacy, a troubling finding since over 95 percent of these rural communities are also burdened with geographical challenges such as low access to healthcare and reduced public health services. Furthermore, health disparities among rural populations are exacerbated by a lack of information. Unlike its urban counterparts, the majority of Missouri's rural communities still lack broadband Internet, a major daily newspaper and TV station. For these communities, the 200+ community newspapers are their source of local information. Charged with improving the health of all Missourians while raising national awareness of health literacy, Health Literacy Missouri (HLM), funded the Health Communication Research Center (HCRC) to reach these rural, underserved audiences through a media intervention. The intervention aims to raise and frame the issue of health literacy with rural populations by targeting community newspapers.

Methods

After an initial pilot, the current intervention centers on increasing the "pickup rate" of health literate stories in local, rural community papers. Story topics are identified and releases are tailored to local communities including: localized headlines, problem statements, calls to action, localized data, national/state quotes, original graphics and resource referrals. Releases are written on average at a 9th grade reading level. Releases are e-mailed to newspapers with localized subject lines and a clipping service evaluates all newspaper stories in Missouri for key words such as "health literacy," used in the text. A sample of each release is content analyzed along with every newspaper "hit."

Results

Our preliminary findings for the current intervention show that our first 10 releases, which were localized by community, generated nearly 100 hits. That's a 300 percent higher rate than the 10 releases sent out in the pilot. Based on criteria from the U.S. Department of Health and Human Services Office of Rural Health Policy, 86 percent of the "hits" were from rural counties, including nearly 50 percent with populations under 20,000 people.

Although our content analysis is still in process, we expect the data to show how various elements of the release were received and where our stories were most effective. Early findings show that most of the stories are printed without changes from the release, indicating that the intended reading level and positive framing and action steps are intact.

Conclusions

Based on the intervention, increasing health literacy and health literacy awareness can be achieved through media. In particular, media interventions may be the best way to reach

geographically and technologically isolated rural communities. By incorporating localization techniques to improve community newspaper pickup rates, local health departments and other agencies can model this intervention for a variety of health and emergency preparedness needs.

Poster #41

Impact of TV show cartoons and animated movies on the health attitudes and behaviors of young elementary school children-a literature review. Poopatana, Christina A. PHANYC, New York, NY. *Presented via poster on Monday at 12:30pm.*

Background

Children in general are influenced by what they see, which may affect their behavior and development. Cartoons influence young viewers to develop certain self constructions that are potentially destructive on most physical, mental, emotional and social levels, which contribute to existing public health problems and social injustices. They create stereotypes and double standards that display how people are supposed to look. Also, they lure children to eat in a certain way or ingest unhealthy foods because they see it on television. With aggressive competition among the multi-million dollar corporations and industries vying for success of their products, are current programs and research studies effective and sufficient in combating the negative socio-cultural imperialism that imposed on young children due to watching cartoons and animated movies? As public health professionals how can we use cartoons to teach children about health physically, mentally, emotionally and socially? As researchers, how can we accurately monitor the impact of cartoons and animated movies in order to achieve equal social justice and reduce health problems in young children?

Methods

Scenes were taken from animated commercials (Barbie, Lucky Charms and Frosted Flakes), television (Flintstones, Pokemon and Teletubbies) and movies (Aladdin, Pocahontas and Mulan) that display images that stereotype and create double standards. A literature review was done to deconstruct the socio-cultural imperialism that has been imposed on young children and what has been done thus far to deal with this overshadowed problem.

Results

Most research studies continue to emphasize the importance of media literacy. Rating systems in media were designed to assist parents in selecting programs that are suitable for their children. Various organizations acknowledge the necessity of media literacy by establishing programs that provide guides on teaching children without interfering on their development. On the political side, the New York City Department of Health & Mental Hygiene (NYDOHMH) developed programs to promote healthy eating and increased physical activity using vivid and real images.

Conclusions

Further studies need to be done to accurately monitor the impact of cartoons on increasing public health problems among young children. Collectively, public health professionals need to develop an effective plan to incorporate media literacy and positive empowerment in order achieve social justice and reduce health problems.