Continuing Education Contact Hour Opportunity

Measuring English Linguistic Proficiency and Functional Health Literacy Levels in Two Languages: Implications for Reaching Latino Immigrants

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Abstract

The purposes of the study were to determine the health literacy levels of Latinos in the Greater Cincinnati Area in both English and Spanish by utilizing two standardized quantitative measures of health literacy, and to undertake an assessment of the relationship between language, health literacy and acculturation in this community. Given a rapid increase in the Latino immigrant population in the Midwest, data on health literacy and acculturation were needed. A convenience sample of 214 Latinos was recruited in the Greater Cincinnati Area. Semi-structured interviews in English or Spanish included three validated scales: one for linguistic proficiency, and two for health literacy levels. Results showed that most participants chose to be surveyed in Spanish and that 2/3 were married or living together, well-educated and under the age of 40 years. Almost half had more than high school education and half reported annual income under $16,000. 60% had lived in the USA 10 years or less. Almost half were born in Mexico and about a quarter in Central America. Most participants had low acculturation to US culture and low health literacy and English reading ability. Lower acculturation was associated with lower health literacy. Recommendations for Health Education practice are presented.

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Background

A major role of health educators is the improvement of health, health care quality, and quality of life of individuals and society by addressing health disparities. Health education programs are based on theories which require sustained adoption of new attitudes, skills, and behaviors by the community or targeted subgroup for the purpose of improving health and quality of life. In an over-simplification, health educators are trained to assess, plan, implement, and evaluate health promotion and education programs through good communication. Communication with its four components (sender, receiver, channel, and message) binds those processes together. In the context of health education and promotion, completing the communication loop (which is knowing whether or not the message reached the intended receiver and whether or not the message was understood and/or used by the receiver), is an area that needs more research (Finnegan, 2002; du Pre, 2005). Understanding the sources of health information and the approximate functional health literacy of an intended audience for health education/health promotion messaging are key components for health communication.

Once those components are known, health educators are then able to develop health promotion programs which are successful in changing health behaviors, particularly for the racial/ ethnic minority and underserved communities that experienced higher rates of health disparities (Institute of Medicine 2002; Luquis, 2008). Language differences have been found to be a barrier to effective health communication and often lead to patient dissatisfaction, noncompliance, and fewer physician visits (Flores, 2006; Morales et al., 1999; Rojas-Guyler et al., 2008; Sarver & Baker, 2000).

Functional Health Literacy and Health Literacy Level Assessment

Baker and colleagues (1997) described Functional Health Literacy (FHL) as the ability of a patient to read, understand, and act on medical information to improve their health (Baker et al., 1997). A person's functional health literacy is affected by their ability to self-manage their chronic health condition (Baker et al., 2002; Gazmararian, Williams, Peel, & Baker, 2003; Sarkar et al., 2006). Nutbeam (2000) presents three categories of health literacy: a) Basic/functional literacy, "sufficient basic skills in reading and writing to be able to function effectively in everyday situations;" b) Communicative/ interactive literacy, "more advanced cognitive and literacy skills which, together with social skills, can be used to actively participate in everyday activities, to extract information and derive meaning from different forms of communication, and to apply new information to changing circumstances;" and

c) Critical literacy, "more advanced cognitive skills which, together with social skills, can be applied to critically analyze information, and to use this information to exert greater control over life events and situations" (Nutbeam, 2000, p. 263-264). Translating these categories into health education materials that are appropriate for the community member for whom they are designed is an important step. For this match to be successful, identifying which [reading] level is appropriate for the intended receiver is critical. However this information is not always readily available (Riffe, Turner, & Rojas-Guyler, 2008).

Health literacy has been defined as many as 17 different ways in the research literature (Sorensen, 2012) and is best recognized by the Institute of Medicine's definition, "Health literacy is the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions. But health literacy goes beyond the individual. It also depends upon the skills, preferences, and expectations of health information and care providers: our doctors; nurses; administrators; home health workers; the media; and many others" (U. S. Department of Health and Human Services (USDHHS), 2000). It is known to empower community members and enhance decision -making for health related choices (Speros, 2005).

The AHRQ Evidence Report (2004) by the Agency for Healthcare Research and Quality (AHRQ) reported a link between low literacy and poorer health, less use of preventive care, poorer control of chronic disease, lower quality care, medical errors, poor outcomes, and disparities (Agency for Healthcare Research and Quality (AHRQ), 2004). According to the 2003 National Assessment of Adult Health Literacy (NAAL) of US households and inmates (n = 19,000), the most recent national level health literacy assessment, the average health literacy score was the lowest for the Hispanic population (n~ 3,000). The NAAL was the first national assessment of English literacy which included items designed to measure health literacy directly through tasks completed by adults rather than relying on self-reports and other subjective evaluations (Kutner, M., 2006).

Latino Health Disparities

According to the 2011 National Healthcare Disparities Report, disparities in quality of care are common: Hispanics received worse care than non-Hispanic Whites for 39% of measures and Hispanics had worse access to care than non-Hispanic Whites for 63% of measures among others (Agency for Healthcare Research and Quality, 2012).

Data from the 2010 U.S. Census shows that Latinos are the largest and fastest growing minority group in the U.S. (2012). Latinos are persons of Latin American or Spanish ancestry who identify as Hispanic or Latino and are also the fastest growing minority population in the state of Ohio and in the Midwestern tri-state area (Office of Minority Health, DHHS, 2008; U.S. Bureau of the Census, 2000). Community health profile and health needs data from more established and larger Latino communities in other parts of the country (such as New York, Florida, California or Texas) do not reflect the heterogeneity of the local Latino community's current health education needs. Lack of this type of information hinders professional practice. A study that gathered socio-demographic data from Latino adults (n=535) in the Greater Cincinnati Area showed that most were recent immigrants, mainly from Mexico and Central America, and that nearly 79% of Latinos were not acculturated to the predominant U.S. culture of the region (Riffe, Turner, & Rojas-Guyler, 2008).

According to a report from the Commission on Hispanic/Latino Affairs of Ohio, Global-ready Ohio for the Twenty-first Century (GROh-21), the number of Latinos in Hamilton County alone (Cincinnati) increased by 83% from 1990 to 2000 (GROh-21, 2007). As the local Latin American community continues to grow at a rapid pace, health educators and other health and social service professionals often find themselves without sufficient information to serve the community. Currently, the literature on health information sources and health literacy levels for Latinos in the Midwest is sparse. Studies conducted on the east or west coasts and the southern border states of the United States are more plentiful. However, these are more established Latino communities with long history and presence in these areas and thus do not reflect the fast paced changes occurring in the Greater Cincinnati Area.

Acculturation

As noted by both Healthy People 2010 and 2020, populations that would most benefit from improved access to and use of health information resources are those who experience a disproportionate lack of access to health services or those at risk of health disparities (Burroughs, 2000; U.S. Department of Health and Human Services, 2010). By understanding that health education empowers an individual when used in the context of the individual's knowledge, health beliefs, perceived social norms, and environmental influences on lifestyle choices, researchers have found that health educators could tailor health promotion activities to the individual's health literacy level which can result in improved health outcomes (Kickbusch, 2001; Nutbeam, 2000). Studies have shown that patients' diagnosis, treatment, and quality of care all varied according to insurance coverage and type, providers' cultural competency, patient-provider communications, provider bias, provider discrimination, differential treatment based on population group, patient preferences, adherence to treatment plans, language barriers, diversity of the healthcare workforce, appropriateness of care, and effectiveness of care (Health Policy Institute of Ohio, 2004; Institute of Medicine, 2002; Kreuter & McClure, 2004).

The research literature documented 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 continue to play a role in health disparities (Edberg, 2012). Improvement of health status by addressing health disparities is a major role of public health education professionals. Knowing the ability of community members to understand and apply health information (health literacy) is known to be instrumental in developing successful health education/promotion programs. Culturally competent and appropriate health education and health services should include community specificity if they are to successfully reach minority and vulnerable communities.

There is an identified need to acquaint local Latino

newcomers with all aspects of the U.S. health care system and community services and "to identify and enhance services appropriate to their native cultures" (Riffe, Turner, & Rojas-Guyler, 2008, p.108). Specifically, the need exists for knowledge of local community health literacy levels due to the dearth of information. Only two studies have measured health literacy among Greater Cincinnati Latinos. In 2001 a study of the local community found that 8 of 10 participants had adequate FHL, however Latino participants had the lowest FHL scores of all study participants (Wells et al., 2001). In 2007, Britigan, Murnan & Rojas-Guyler found that in a small sample of Latinos (n=50) all but 8 chose to take the S-TOFHLA in Spanish; of these 42 Latinos, 82% (n=35) had adequate FHL (2009). Further, health literacy has been integrated into the academic literature of our profession in titles such as *Communicating across Cultures about Health and Disease* by Adeyanju (2008) and in *Cultural Competence in Health Education and Health Promotion* by Perez & Luquis (2008). Health educators are encouraged to remember that "It is crucial to provide educational materials that are targeted toward the appropriate reading and comprehension level for each cultural group" (Perez & Luquis, 2008, p.153).

Purpose

The purposes of this research study were to determine the health literacy levels of Latinos in the Greater Cincinnati Area in both English and Spanish by utilizing two standardized quantitative measures of health literacy, and to undertake an assessment of the relationship between language, health literacy and acculturation in this community. Since the Latino population in this area is primarily composed of first generation recent immigrants (Riffe et al., 2008), a measure of acculturation to Latino and U.S. culture was conducted to identify if acculturation levels were predictive of Health Literacy levels. Additionally, as the vast majority of medical and health services in the area are carried out and provided in English (Health Foundation, 2006), a better understanding of how English health literacy and acculturation relate in the community can be very beneficial. The results of this study may be used to facilitate the ability of health educators and other health professionals serving this community.

Methods

Procedures

Respondents were recruited through an intercept sampling method, which was flexible for the field work and included participants who the researcher could access through direct contact known as opportunistic sampling (Cohen & Crabtree, 2006) , also known as "grab sampling" (Cottrell & McKenzie, 2005) and emergent sampling (Patton, 2002). All study procedures were approved by the Institutional Review Board (IRB) at the University.

Participants

Participants were recruited from local venues such as health centers, community festivals, community centers or other recreational facilities, health fairs, churches, and markets (grocery stores). Potential participants were invited to take part in the study while attending these locations for services, entertainment, or other varied activities.

Instrument

Based on a comprehensive review of the literature, orally-administered surveys were used to gather the data rather than traditional self-administer surveys in order to determine functional health literacy levels and to engage participation by people with low literacy skills. When needed, all instrument items were translated into Spanish and back translated into English. Demographics, bi-dimensional acculturation subscale on linguistic proficiency, a word recognition scale in English, and a numeracy scale and reading comprehension scale to measure functional health literacy were utilized to measure the observed variables. The survey instrument utilized three validated scales. One was a 12-item linguistic proficiency subscale (6 on English language ability and 6 on Spanish language ability) for a Bi-dimensional Acculturation Scale (BAS) (Marín and Gamba, 1996); a brief word recognition scale using nine English words, of which the first two are not scored, for an approximation of grade level in the English language (Rapid Estimate for Adult Literacy in Medicine -Short Form, REALM-SF) (Arozullah, et al., 2007), and the brief version of the Short Test of Functional Health Literacy in Adults (S-TOFHLA) which included a 4 point numeracy portion and a timed (7 minute) 36 item reading comprehension portion (Baker, et al., 1998).

Instrument Validity and Reliability Testing

Reliability and validity evaluations were performed on the survey instrument. The instrument was reviewed by an experienced bilingual and bicultural health education researcher. The scripted survey questions were distributed to a panel of experts (native Spanish speaking community members, health educators, and certified translators/interpreters) for their input on content, translation to Spanish and back-translation to English, in order to establish face and content validity. Face validity was determined by community volunteers (English and Spanish speakers) and the content validity was determined through subject matter expert panel review (English and Spanish speakers). Additionally, a convenience sample of Latino community members (n = 16) participated in a test-retest reliability analysis (r = 0.750). Additionally, results of reliability testing of the validated scales using the Cronbach's alpha *(α)* test for internal consistency showed high internal consistency for all scales: the Bidimensional Acculturation Scale for Hispanics (BAS/LP) (Marin & Gamba, 1966)--Linguistic Proficiency subscale among Mexican Americans (α=0.93 for Hispanic domain and α=0.97for non-Hispanic domain) and Central Americans (α=0..87 for Hispanic domain and α=0.95 for non-Hispanic domain); The Short version of the Test of Functional Health Literacy for Adults (S-TOFHLA) α=0.68 for the 4 Numeracy items and 0.97 for the 36 items in the 2 prose passages A & B); The correlation (Spearman) between the S-TOFHLA and the Rapid Estimate of Adult Literacy in Medicine (REALM) was 0.80; The TOFHLA showed good correlation with the REALM (correlation coefficients 0.84); the short version of the REALM (REALM-SF) instrument was highly correlated to the REALM development ($r = 0.95$, $P < 0.001$) and validation ($r = 0.94$, $P < 0.001$).

Recruitment

Following an analysis of the power of sample size necessary for adequate sample representation in the area, 214 surveys were conducted. Power analysis was conducted via utilization of an online calculator (Wimmer & Dominick, 2008) and resulted in a suggested sample size of 195 based on a US census Latino population of 41,000 in the selected geographical area with a confidence level of 95%, and a confidence interval = 7.

Following IRB approved procedures and documents, adults who self- identified as Latino/Hispanic were invited to participate in the semi-structured interview. Participation was voluntary and confidential. An introduction script was followed in English or Spanish and an Information Sheet was provided to each participant. The Information Sheet was available in both English and Spanish for participants to read or choose that it be read to them (Flesch-Kincaid readability grade level of 8.2 as measured by Microsoft Word). Verbal consent was obtained from participants, and due to the possible undocumented nature of the population, each survey was coded to match a tally sheet, thus avoiding personal identifiers. The tally sheet was designed to record the date and location of the data collection, participation counts, administrator information and gift card administration.

Bilingual survey administrators received training on IRB procedures, participant rights and all study procedures by the research team. Survey administrators included community members and graduate students. Potential participants were approached verbally and invited to receive information on a research study. Once the introduction was made and the participant showed interest the survey process began. The survey took approximately 20-25 minutes of the participants' time. An incentive gift card to a local grocer was provided to each participant (value = $5).

Data Analysis

SPSS v.21 was utilized for all data analyses. Descriptive and inferential analyses were conducted to assess frequency, percent and statistical relationships between the observed variables. Following an assessment of skewness and kurtosis, it was ascertained that demographical data distributions were not normal and therefore nonparametric tests were utilized for the statistical analyses of the data.

Results

A total of 301 people were invited to participate, of which 214 (71%) agreed to be a part of the study following the consent process. A total of 212 completed surveys were utilized for data analyses. Following descriptive analysis, 100% of the participants were Latino, most chose to take the survey in the Spanish language (n = 188, 88.7%), two- thirds were women (n = 141, 66.5%), and almost half were married (n = 99, 46.9%). Education levels showed that just under half obtained higher than a high school degree (n = 100, 47.8%), while the rest completed less than 12th grade. Participants represented 11 Latin American countries, most were from Mexico (n = 91, 42.9%) and nearly a third from Central America (n = 60, 28.3%). The mean number of years in residence in the USA was 12 with a majority having lived in the Unites States for ten years or less (n = 129, 62.9%). Lastly, the mean age was 37 years (range = 18-71) and the majority (62.2%) of the participants were under the age of 40 years. The mean annual household income reported was $21,198 (SD= $1,512) and approximately 94% of participants' households had an annual income less than $51,000. Table 1 on page 6 provides specific detail on demographic characteristics.

Acculturation

Scale scores were summed across each subscale (range= 1 - 4) for each subset of 6 questions. If the mean score fell between 1 and 2.4, the participant was considered to have low acculturation to that culture. If the average fell between 2.5 and 4, the participant was considered to have high acculturation to that culture. As seen in Table 2, the majority of participants (n = 200, 94.8%) had high adherence to the Hispanic domain (Cronbach alpha = .948) and 58.5% (n=121) had low adherence to the Non-Hispanic domain (Cronbach alpha = .970).

Medical Word Recognition and English Grade Level Reading Ability

The REALM-SF provided a brief, validated instrument for assessing participant literacy in English (in the form of reading grade level) for the various settings that this research study employed (Cronbach alpha = .951). The list of nine words (only seven are scored) that the participants read aloud were scored as to their correct pronunciation (dictionary standard) as follows: 1=correct pronunciation, 2=mispronounced, and 3= not attempted. The total score ranged from 0-7 points. The scoring was then assigned the corresponding grade level: a score of zero (0) was equal to less than or equal to third grade (<= 3rd); a score of 1-3 points was equivalent to fourth to sixth (4th -6th) grade; a score of four to six points (4-6) was equivalent to seventh to eighth (7th -8th) grade; and, a score of seven points (7) was equivalent to greater or equal to ninth (>=9th) grade. The results of the data analysis were that 18% (n = 37) of the participants had a reading level in English of third grade or less, 17.5% (n = 35) had a reading level in English of fourth to sixth grade, 39.3% (n = 79) had a reading level in English of seventh to eighth grade, and 24.9% (n = 50) had a reading level in English of greater or equal to ninth grade (See Table 3).

Functional Health Literacy

The short version of the Test of Functional Health literacy in Adults (S-TOFHLA) has a brief version that requires less time than the TOFHLA (12 minutes compared to 22 minutes) and still measures both numeracy and reading comprehension. The instrument is available in both English and Spanish languages which was critical for this research study population. The brief version was better suited for this research study due to the various conditions of the study and for the participants involved in the study. The numeracy portion consisted of four items (#1, 4, 5, & 8) and reading comprehension passages A and B (not C). The Cronbach's alpha for numeracy was 0.739 and the Cronbach's alpha for reading comprehension was 0.986. Each of the numeracy items had a weighted value of 7, for a

Table 1.

Demographic Characteristics of Participants

Gender	Mean	Range	N	%
Male			70	33.5
Female			141	66.5
Marital Status				
Married			99	46.9
Single			47	22.3
Living together, not wed			43	20.4
Separated, not divorced			10	4.7
Divorced			10	4.7
Widowed			2	0.9
Age	X = 37	18-71		
18-20			7	3.3
21-30			69	32.9
31-40			62	29.5
41-50			31	14.8
51-60			23	11.0
61-70			8	3.8
71+			10	4.8
Education level				
None or first grade			7	3.3
Second or third grade			7	3.3
Fourth or fifth grade			16	7.7
Sixth, seventh, eighth grade			30	14.4
Ninth or tenth grade			8	8.8
Eleventh or twelfth grade			41	19.6
More than high school			100	47.8
Country of Birth				
Mexico			91	43.1
Central America			60	28.3
South America			36	17.0
USA & Puerto Rico			24	11.3
Survey Language Preference				
Spanish			188	88.7
English			24	11.3
Number of People in Household	X = 3.66	1-9		
4 or fewer			139	70.0
5 -9			61	30.0
Household Income	X = $21,198	$0 - $106,800		
$0-15,999			72	50.5
$16,000-$24,999			40	28.1
$25,000-$50, 999			22	15.4
$51,000-75,000			5	3.5
$76,000+			3	2.1

Note: Missing Data Excluded

Table 2.

Frequency and Percent of Participants' Acculturation

Acculturation	N	%	Subtotal
English Language / Culture			
Low Non-Hispanic Acculturation	121	58.5	
High Non-Hispanic Acculturation	86	41.5	207
Spanish Language / Culture			
Low Hispanic Acculturation	11	5.2	
High Hispanic Acculturation	200	94.8	211

Note: Missing Data Excluded

Table 3.

REALM-SF Health Literacy Scores

Reading Grade Level	N	%
3rd Grade or less	46	22.0
4th -6th Grade	35	16.7
7th to 8th Grade	79	37.8
9th grade or more	49	23.4

Note: Missing Data Excluded

Table 4.

Short Test of Functional Health Literacy in Adults (S-TOFHLA) Results

Variable	Spanish (N = 187)		English (N = 24)	
	n	%	n	%
Inadequate FHL	41	21.9	1	4.2
Marginal FHL	23	12.3	1	4.2
Adequate FHL	123	65.8	22	91.7

Note: Missing Data Excluded

total of 28 possible points, and the comprehension items were assigned a value of 2, for a total of 72 possible points. The total score for this brief version of S-TOFHLA is 100. Literacy level scores are: a) Inadequate Functional Health Literacy (I-FHL), scores 0-53; b) Marginal Functional Health Literacy (M-FHL), scores 54-66; and c) Adequate Functional Health Literacy (A-FHL), scores 67-100. It is important to note that the results of each language version must be reported separately for the particular language involved. The results showed that the majority of the participants that took the S-TOFHLA in Spanish had adequate functional health literacy in Spanish (65.8%), 12.3% (n=23) had Marginal FHL, and 21.9% (n=41) had inadequate FHL. The majority of the participants that took the S-TOFHLA in English had adequate functional health literacy in English (91.7%) as well (See Table 4).

Measuring Health Literacy in Two Languages

Health literacy levels were measured in two languages utilizing two separate scales. A correlation analysis of health literacy scores in the two scales was conducted to identify the strength of the relationship. Chi-square analysis showed a statistically significant relationship between the frequencies for the REALM-SF grade level which measured word recognition in English and the frequencies for the functional health literacy level in Spanish which measured numeracy skills and reading comprehension ($X^2 = 91.166$, $df = 2$, $p < .05$). In other words, participants with inadequate health literacy were more likely to fall into a lower reading level than those with adequate health literacy. Additionally, a correlation of scores in both REALM-SF and S-TOFHLA confirmed that either test can be

used to measure health literacy for Latinos in this geographical area (Spearman Rho = .468, p = .001).

Health Literacy and Acculturation Levels

A series of Chi square comparisons were conducted to analyze if the distribution of health literacy levels in English, as measured by the REALM-SF grade level categories, differed from Acculturation levels, as measured by the BAS. The results show that participants with low acculturation levels to the US Culture were more likely to have lower reading grade levels in English ($X^2 = 20.019$, df = 3, $p<.05$). Results also showed that Latino adults with high acculturation to the Latino culture were more likely to have reading grade levels in English at the 7th grade level or above ($X^2 = 20.019$, df = 3, $p<.05$). Multiple regression analysis of Functional Health Literacy as predicted by acculturation levels, showed that both acculturation to Latino culture (Beta = 0.495, p = .039) and acculturation to US culture (Beta = 0.441, p = .001) were statistically significant predictors of health literacy levels among the participants. The overall model fit was $R^2 = .095$.

Health Literacy and Demographic Characteristics

There were significant differences between demographic characteristics and health literacy levels in English. Specifically, Latinos with lower English health literacy differed in their country of origin ($X^2 = 20.019$, df = 3, $p<.05$), being more likely to be from Mexico or Central America than from South America or the USA and Puerto Rico. Additionally, participants with adequate health literacy in Spanish were more likely to be from Mexico than from the Central or South American regions ($X^2 = 91.166$, df = 2, $p<.05$).

Length of residence in the USA (0-5 years, 6-10 years or 11+ years) was also compared with health literacy levels in both languages. Results showed that participants who had higher reading grade levels in English had lived in the United States longer (Kruskal-Wallis $X^2 = 39.558$, df = 2, $p<.05$), and that Latino adults with inadequate health literacy levels in Spanish having lived in the United States less years than those with adequate health literacy levels in Spanish ($X^2 =13.273$, df = 2, $p<.05$).

Other characteristics appear to have a significant impact on health literacy levels. For example, the higher the age of the participants (grouped into 7 categories by decade:18-21, 21-30, 31-40,41-50,51-60, 61-70, 71+), the higher the reading grade level in English (Kruskal Wallis $X^2 = 9.272$, df = 3, $p<.05$). For example, participants in the age range of 41 years or older had higher English reading grade levels than their younger counterparts. Also, Latinas were more likely to score higher on English health literacy than their male counterparts ($X^2 = 20.019$, df = 3, $p<.05$).

Discussion

The purposes of the study were to determine the health literacy levels of Latinos in the Greater Cincinnati Area in both English and Spanish by utilizing two standardized quantitative measures of health literacy, and to undertake an assessment of the relationship between language, health literacy and acculturation in this community. Overall, the results showed that indeed there are statistically significant relationships in these areas. The participants that took the test of functional health literacy in English had adequate levels of health literacy. This meshes with the findings that those with higher reading grade levels have lived in the United States longer than those with lower levels and are older (41+ years) and are bicultural. It may seem apparent that Hispanic/Latino people from other countries living in the United States a long time would be bicultural and that they would have higher reading grade levels in English. This study verifies that assumption. It also goes a step further and shows that being bicultural does impact ones functional health literacy level. The literature has already documented that a person's health literacy level is the most significant predictor of health status when compared to age, race, income, or education level. The finding that participants with low acculturation to the US culture were more likely to have lower reading grade levels in English mesh with the findings by Lara, Gamboa, Kahramanian, Morales, and Bautista (2005) in their review of the literature. They noted the paradox that more acculturated Latinos have worse behavioral and birth outcomes but have more frequent health care use than do less acculturated Latinos. They make the following recommendation, "At a minimum, public health practitioners should have information on the language and nativity of all their Latino clients. They also should have information on immigrants' length of residence in the United States and be able to differentiate between language of preference and that of use in evaluating acculturation among Latino clients. Government public health officials also should promote the inclusion of acculturation measures in all major government health surveys." Lara et al., 2005, p. 387)

Identifying health literacy levels, language preference and ensuring appropriate readability and numeracy levels of health education materials or communications are valuable steps in reaching recent Latino immigrants. Community members may benefit from clear, concise and easy to understand messages in their preferred language. Particularly people who have lower health literacy benefit if the health messages include selected characteristics as described in a document by the Centers for Disease Control and Prevention (CDC) entitled *Simply Put.* A selection of these characteristics follows: a) give the most important information first, b) limit the number of messages, c) present what they need to do, d) include what they will get out of it, e) keep it short, friendly and encouraging in tone, f) limit jargon, and g) use symbols sparingly (CDC, p. 5-8). Additionally, when working with Latino communities the health educators should consider the roles of culture, traditions and health beliefs; particularly when reaching Latinos with low acculturation levels to the predominant US culture.

Translation to Health Education Practice

Based on the fact that these identified variables are significantly related, it is important to the profession that health educators continue to explore health literacy and investigate how its social determinants impact our messages for our intended audiences. The questions the researcher would propose that health educators ask about the intended population segments would be: What demographic characteristics are known? What is the reading level of medical terminology, and/or the level of understanding/comprehension of health information for the members of the intended segment of the population? How

acculturated to the U.S. culture was this particular segment? What barriers existed for this segment that prevented the most well-planned, well-intentioned health message from reaching them? Only by knowing the answers to these questions for our intended audiences of health information will health education professionals know how best to communicate and help eliminate health disparities.

Health literacy is a multifaceted issue that requires a multi-sectorial approach for our society. Jani, Ortiz, and Aranda (2009) stated, "Applied to research, it is suggested that failure to account for culture and social position in methodology can lead to generalizations that are distorted at best and stereotypical and ultimately harmful in the worst-case scenario. Thus, it is part of the social justice mission of social work to make available culturally appropriate services for Latinos and research that accurately reflects their voices."

Research in all disciplines, including public health, needs to be held to this basic ethical standard. One way to approach this is to focus on the health literacy of health care consumers in order to inform health care providers' methodology of communication. However, it goes beyond the consumer level and must include the organizational level to make the impact that is needed for a system-wide change to occur. That paradigm shift has been happening over the last five years through the work of the *National Action Plan to Improve Health Literacy*, the Agency for Healthcare Research and Quality Health Literacy Universal Precautions Toolkit, and the Institute of Medicine's *Attributes of a Health Literate Organization*. According to Howard K. Koh, M.D., M.P.H., Assistant Secretary for Health, the plan "envisions a restructuring of the ways we create and disseminate all types of health information in this country. The plan also calls us to ensure that all children graduate with health literacy skills that will help them live healthier throughout their lifespan." (USHHS, 2010, p.iv).

Rima E. Rudd, Senior Lecturer on Society, Human Development and Health, Harvard School of Public Health, presented an overview and key highlights of the 2006 Surgeon General's Workshop on Improving Health Literacy, "Literacy is an issue of social justice and that to improve health literacy; we must look at social inequities" (Rudd, 2008). Rudd cautions, in reality, patients' health literacy skills have not been adequately measured. However, despite the imperfections of the measurements "those very weak tests offer some profound findings that there are differentials in health outcomes between people who can use materials with ease and those who cannot" (Rudd, 2009). Dr. Rudd also noted that the health literacy field needs to move beyond doctor/patient interactions and look at prevention. "The healthcare arena needs to consider that perhaps it is not making it easy for individuals with low literacy to take advantage of what society has to offer in this area" (Rudd, 2009). This has ethical ramifications, especially in the area of complex informed consent documents and medication instruction (or lack thereof).

As more is learned about making a concerted effort to be inclusive of racial and ethnic minorities in public health study designs, more awareness of the challenges of ethical engagement of minority populations is gained. Public health specialists understand that people of *all* types constitute the "public" in public health. Yet, being inclusive means being willing to create studies that are tailored to a specific segment of the public "audience" because not doing so is by itself exclusive. Tailoring a study for a particular ethnic minority segment of the audience does not mean that the study will not be generalizable per se. It does mean that care is taken in planning the study to ensure that methods "go the extra mile" to use certified translators (for translating & back-translating written materials), and professional, certified medical interpreters -- not ad hoc interpreters. This does not guarantee that the results of a study with an ethnic minority audience that follows culturally appropriate methods will always be statistically significant, but it will ensure that the participants will be engaging with a research study that acknowledges peoples differences and shows respect for them. This builds trust and allows future studies to benefit from the fact that trust was established with an ethnic community.

References

Agency for Healthcare Research and Quality (AHRQ). (2004). *Literacy and health outcomes, structured abstract.* Publication No.04-E007-2. Rockville, MD.: Retrieved from http://www.ahrq.gov/clinic/tp/littp.htm

Arozullah.,A.M.,Yarnold, P.R., Bennett, C.L., Soltysik, R.C.,Wolf, M. S., Ferreira, R.M.,et al., (2007). Development of a Short-Form, Rapid Estimate of Adult Literacy in Medicine. *Medical Care*, *45,* 1026-1033.

Adeyanju, M. (2008). *Communication and Cultural Competence*. In M. A. Pérez, & R. R. Luquis (Eds.), Cultural competence in health education and health promotion (1st ed.)(p.147-162). San Francisco, CA : Jossey-Bass.

Baker, D. W., Parker, R. M., Williams, M. V., Clark, W. S., & Nurss, J. (1997). The relationship of patient reading ability to self-reported health and use of health services. *American Journal of Public Health*, *87,* 1027-1030.

Baker, D. W., Gazmararian, J. A., Williams, M. V., Scott, T., Parker, R. M., Green, D., et al. (2002). Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. *American Journal of Public Health, 92,* 1278-1283.

Brice, J.H., Travers, D., Cowden, C.S., Young, M.D., Sanhueza, A., & Dunston, Y.(2008). Health literacy among Spanish-speaking patients in the Emergency Department. *Journal of the National Medical Association*, *100*, 1326-1332.

Britigan, D. H., Murnan, J., & Rojas-Guyler, L. (2009). A qualitative study examining Latino functional health literacy levels and sources of health information. *Journal of Community Health*, *34*, 222-230.

Britigan, D. H. (2009). *Health Information Sources and Health Literacy Levels of Latinos in a Midwestern Tri-state Area*. This open access ETD is published by University of Cincinnati and OhioLINK. Document number: ucin1258660537 Permalink: (https://etd.ohiolink.edu/ap:10:0::NO:10:P10_ACCESSION_NUM:ucin1258660537)

Burroughs, C. M. (2000). *Measuring the difference: Guide to planning and evaluating health information outreach.* Seattle, WA: National Network of Libraries of Medicine, Pacific Northwest Region.

Cohen D, Crabtree B. (2006). *Qualitative research guidelines project.* Retrieved from http://www.qualres.org/HomeSemi-3629.html

Cottrell, R. R., & McKenzie, J. F. (2005). *Health promotion and education research methods: Using the five chapter thesis/dissertation model.* Sudbury, MA: Jones and Bartlett Publishers, Inc.

du Pre, A. (2005). *Communicating about health: Current issues and perspectives* (2nd ed.). New York, NY: McGraw Hill.

Downey, L.A., Zun, L.S. (2008). Assessing adult health literacy in urban healthcare settings. *Journal of the National Medical Association, 100,* 1304-1308.

Edberg, M. (2012). *Essentials of health, culture, and diversity.* Jones & Bartlett Learning, Burlington, MA.

Finnegan, J. R., & Viswanath, K. (2002). Communication theory and health behavior change. In K. Glanz, B. K. Rimer & F. m. Lewis (Eds.), *Health behavior and health education* (3rd ed., p. 361-388). San Francisco, CA: Jossey-Bass

Flores, G. (2006). Language barriers to health care in the United States. *New England Journal of Medicine*, *355,* 229-231.

Gazmararian, J. A., Williams, M. V., Peel, J., & Baker, D. W. (2003). Health literacy and knowledge of chronic disease. *Patient Education and Counseling, 51,* 267-275.

Global-ready Ohio for the twenty-first century (GROh~21) (2007). *Ohio commission on Hispanic/Latino affairs.* Retrieved October 2009, from http://www.laprensatoledo.com/Stories/2007/022307/GROh_21_Final.pdf

Health Foundation of Greater Cincinnati. (2006). *2005 greater Cincinnati Hispanic/Latino health survey*. Cincinnati, OH: Author.

Health Literacy: A position Statement of the American Association of Health Education (AAHE). (Fall 2008). *HExtra*, *33*, 6-7.

Health Policy Institute of Ohio. (2004). *Understanding health disparities*. Columbus, OH: Author.

Institute of Medicine. (2002). In Smedley B. D., Stith A. Y. and Nelson A. R. (Eds.), *Unequal treatment: Confronting racial and ethnic disparities in health care*. Washington, D.C.: National Academy Press.

Institute of Medicine. (2004). In Nielsen-Bohlman, L. , Panzer, A. , Kindig, D., (Eds.) *Health literacy: A prescription to end confusion.* Committee on Health Literacy. Washington, D.C.: National Academies Press.

Jani, J.S., Ortiz, L., & Aranda, M.P. (2009). Latino Outcome Studies in Social Work: A Review of the Literature. *Research on Social Work Practice, 19*, 179-194. Downloaded on March 18, 2009, http://rswp.sagepub.com

Kickbusch, I. S. (2001). Health literacy: Addressing the health and education divide. *Health Promotion International, 16,* 289-297.

Kreuter, M. R., & McClure, S. M. (2004). *The role of culture in health communication.* Annual Reviews of Public Health, *25*, 439-455.

Kutner, M., Greenberg, E., Jin, Y., & Paulsen, C. (2006). *The health literacy of America's adults: Results from the 2003 national assessment of adult literacy*, No. NCES 2006–483. Washington, DC: National Center for Education Statistics.

Lara, M., Gamboa, C., Kahramanian, M.I., Morales, L.S., Bautista, D.E. Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. *Annual Review of Public Health.* 2005;*26:*367-397.

Luquis, R. R. & Pérez, M. A. (2008). *Cultural competence and health education: Challenges and opportunities for the twenty-first century.* In M. A. Pérez, & R. R. Luquis (Eds.), Cultural competence in health education and health promotion (1st ed.). San Francisco, CA : Jossey-Bass,.

Marín, G., & Gamba, R. J. (1996). A new measurement of acculturation for Hispanics: The bi-dimensional acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences, 18,* 297-316.

Morales, L. S., Cunningham, W. E., Brown, J. A., Liu, H., & Hays, R. D. (1999). Are Latinos less satisfied with communication by health care providers? J*ournal of General Internal Medicine*, *14,* 409-417.

Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*, *15,* 259-267.

Office of Minority Health, DHHS. (last modified 10/28/2008). *Hispanic/Latino profile*. Rockville, MD: Office of Minority Health, Department of Health and Human Services.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Riffe, H. A., Turner, S., & Rojas-Guyler, L. (2008). The diverse faces of Latinos in the Midwest: Planning for service delivery and building community. *Health & Social Work*, *33*, 101-110.

Rojas-Guyler, L., King, K. A., & Montieth, B. A. (2008). Health-seeking behaviors among Latinas: Practices and reported difficulties in obtaining health services. *American Journal of Health Education*, 39(1), 25-33.

Rudd, R. Opening keynote address, *Research in Health Literacy: Identifying the Gaps,* the Institute for Healthcare Advancement's (IHA) 8th Annual Health Literacy Conference, Thursday, May 7, 2009. http://www.iha4health.org/default.aspx?menuitemid=337&menugroup=_health+literacy+conference&&AspxAutoDetectCookieSupport=1

Rudd, R. Town Hall Meeting on Improving Health Literacy: *"A Vision for a Health-Literate Missouri."* May 16, 2008, St. Louis, Missouri http://www.health.gov/communication/literacy/TownHall/mo.htm

Sarkar, U., Fisher, L., & Schillinger, D. (2006). Is self-efficacy associated with diabetes self-management across race/ethnicity and health literacy? *Diabetes Care*, *29*, 823-829.

Sarver, J., & Baker, D. W. (2000). Effect of language barriers on follow-up appointments after an emergency department visit. JGIM: *Journal of General Internal Medicine*, *15*, 256-264.

Speros, C. (2005). Health literacy: Concept analysis. *Journal of Advanced Nursing*, *50*, 633-640.

U.S. Bureau of the Census. (2000). *American FactFinder, summary file 1 and summary file 3*. Retrieved October 2006, from http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program

U.S. Bureau of the Census. (2010a). *Ohio Census Statistics*. Retrieved March 2013, from http://census-statistics.findthedata.org/l/2079/Ohio

U.S. Bureau of the Census. (2010b). *Compare Census Statistics*, Retrieved March 2013, from http://census-statistics.findthedata.org/

U.S. Bureau of the Census. (2012). *State and County Quickfacts Ohio.* Retrieved March 2013, from http://quickfacts.census.gov

U.S. Bureau of the Census. (2013). *Compare Census Statistics Ohio.* Retrieved March 2013, from http://quickfacts.census.gov

U.S.Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). *National Action Plan to Improve Health Literacy.* Washington, DC: Author.

Wells, V. E., Chenier, T., Ludke, R. L., Downing, K., & Shaw, T. (2001). *An assessment of functional health among patients served in primary care providers to the poor practice setting*. Unpublished manuscript.

Wimmer, R.D., & Dominick, J.R., (2008). *Mass Media Research: An Introduction* (8th ed.) Retrieved October 2009, from http://rogerwimmer.com/mmr/wimmerdominick.htm

This article may provide one Continuing Education Contact Hour Opportunity for CHES (Approval Pending)

Instructions and self-study questions may be found on page 45

From the Editor,

I hope you find the articles in this issue engaging and useful for both health education practice and research. From research on contraceptive usage and college students (McDermott et al and Peterson et al) to strategies for sustaining coordinated school health teams (see Barnes and colleagues), Gammans are applying their research skills to relevant health issues facing us today. One set of health educators have described their experiences in determining level of health literacy in a given population (Rojas-Guyler et al). Common to all authors is the goal to improve the professional practice of health educators. At this time of year, as we reflect upon both personal and professional goals, I want to encourage all Gammans and ESG Chapters to continue to reach for excellence in the three pillars of ESG teaching, service and research. Whether a student, faculty sponsor or member-at-large, we encourage you to consider submitting a manuscript, become more involved nationally and nominate a deserving Gamman, Sponsor or Chapter for one of our many rewards. We have so many talented Gammans, please consider sharing your talents with all of us.

In the spirit of welcoming in the new year, I would like to share this quote from Neil Gaiman with you:

"I hope that in this year to come, you make mistakes.

Because if you are making mistakes, then you are making new things, trying new things, learning, living, pushing yourself, changing yourself, changing your world. You're doing things you've never done before, and more importantly, you're Doing Something.

So that's my wish for you, and all of us, and my wish for myself. Make New Mistakes. Make glorious, amazing mistakes. Make mistakes nobody's ever made before. Don't freeze, don't stop, don't worry that it isn't good enough, or it isn't perfect, whatever it is: art, or love, or work or family or life.

Whatever it is you're scared of doing, Do it.

Make your mistakes, next year and forever."

Welcome to 2014—may you achieve new goals and reach new heights—and above all, enjoy the journey!