Findings Toward a Multidimensional Measure of Adolescent Health Literacy

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Abstract

Objective—To explore a multidimensional measure of health literacy that incorporates skills necessary to manage one's health environment.

Methods—We designed a questionnaire to assess variation in an expanded understanding of health literacy among publicly insured adolescents in California (N = 1208) regarding their health care experiences and insurance.

Results—Factor loading and item clustering patterns reflected in the exploratory principal components factor analysis suggest that the data are parsimoniously described by 6 domains.

Conclusion—This multidimensional measure becomes relevant in an era of health care reform in which many will for the first time have health insurance requiring them to navigate a system that uses a managed care model.

The concept of health literacy is expanding in scope from that of functional competencies to also include skills necessary to manage one's health and health care environment.[1–4] Nutbeam's seminal article reflects this perspective and argues that health literacy is not limited to one's ability to read and write, but also encompasses interactive and critical skills that resonate with a wellness and health promotion framework.[5] In 2010 Parker and Ratzan further developed an expanded definition by stating "health literacy occurs when the skills and ability of those requiring health information and services are aligned with the demand and complexity of information and services."[6] This definition not only captures health-

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literacy capacities of the individual but also underscores the importance and interplay of environmental demands and complexities. This has spurred research in the field to investigate expanded definitions of health literacy, leading to the need for more conceptually developed measures.[7,8]

Currently, there is a gap between conceptual and operational definitions of health literacy, specifically when framed within the context of health care systems that generally have adapted a managed care model in regard to patient access and use.[2,9,10] Parker and Ratzan's conceptual definition references aligning skills with the complexity of information and services; however, most measures assume that the ability to read and write is necessary (and to some extent sufficient) to understand and negotiate the health care system adequately, neglecting more interactive competencies and environmental factors such as informed decision making, ability to access routine, preventive and urgent health care, or knowledge of health insurance benefits.[11–14]

Traditional measures of health literacy, including the Rapid Estimate of Adult Literacy in Medicine (REALM)[15] and the Test of Functional Health Literacy in Adults (TOFHLA),[16] are screening tools developed for the clinical context. Practitioners in the health care setting use these measures to identify patients who have deficiencies in health-related word recognition (REALM) and reading comprehension (TOFHLA); thus, providers can tailor the medical encounter to ensure communication and instruction is matched to patient literacy levels. The REALM and TOFHLA are important screening tools in the clinical context, but are narrow in scope, rely on a risk-factor perspective, and neglect underlying health-promoting dimensions of the construct of health literacy, such as self-efficacy.

Building on the REALM and TOFHLA, other measures, such as the Newest Vital Sign (NVS),[17] attempt to measure a more interactive domain of health literacy by assessing the ability to apply health information to health-related decisions (namely, nutrition-related information). However, the NVS was also developed as a screening tool for health practitioners and relies heavily on the patient's computational skills. Although it may be an appropriate tool for assessing applied numeracy skills using health-related information, it may not be suitable for a wide range of health contexts due to content compatibility issues and does not assess broader skills and competencies of health literacy.[7] Such skills may include but are not limited to the ability to search for and evaluate health information, the ability to communicate one's health needs and preferences to a health provider, the ability to navigate a complex health care system, and the knowledge and awareness of one's rights and responsibilities as related to health care.

Recently a measure was developed that does assess additional health-literacy skills. Developed for the purposes of intervention research and large-scale surveillance, the Health Literacy Skills Instrument (HLSI)[18] uses real-world, health-related scenarios to assess health-literacy skills in prose, quantitative, oral, and Internet-based information-seeking domains. A strength of this measure is that it not only assesses a range of tasks and skills that health care consumers are likely to face in their daily lives but also examines the ability to obtain and use health information from both print and nonprint sources. However, the fact that the measure covers a wide range of tasks through very specific health-related questions

may not be appropriate in all populations or in all situations. For example, items in the measure related to identifying symptoms of lactose intolerance may assess a different set of knowledge and skills than navigating the shortest route from point A to point B using a hospital map or determining the amount of saturated fat allowed in a diet regimen. The HLSI assumes that these disparate scenarios measure an underlying, compatible construct when in fact they may measure different concepts. Moreover, despite its comprehensiveness in content, the instrument focuses heavily on measuring functional literacy skills.

Pleasant et al published an insightful commentary that provides a framework for developing multidimensional measures of health literacy that take a social research and public health perspective.[7] A robust measure will capture the latent, multidimensional nature of the construct, allowing researchers to better survey and examine variations in health literacy among individuals and populations, and also permit testing impact and effectiveness of interventions and policies that are meant to improve health literacy.[7,19]

Drawing on this approach, the purpose of this paper is to present a multidimensional measure of health literacy that was developed and tested among publicly insured adolescents in California. Though often accompanied by their parents, adolescents are increasingly becoming self-reliant in terms of health care use and more importantly health information seeking.[20] Moreover, parental health literacy may not be associated with child and adolescent health-care use in all populations,[21] and particularly among first- and second-generation immigrant families, who often must use public health insurance.[22,23]

This effort is part of a larger study that examines the effectiveness of an intervention focused on improving health literacy among adolescents. The paper offers multiple domains of health literacy that capture skills and competencies relevant to managing one's health in the context of publicly insured health care, focusing on health-promoting dimensions such as confidence and self-efficacy. These concepts become more relevant in an era of health care reform in which, potentially, as many as 50 million adults will for the first time have a consistent source of health insurance and health care that they will have to know how to use and navigate.[24,25]

METHODS

Formative Research

We created a multidimensional health literacy measure through extensive formative research that was part of a larger, intervention-based study that included reviewing the health literacy literature, conducting 12 focus group discussions with adolescents aged 13–17, and interviewing 8 primary care providers who primarily served adolescent populations. Specifically, we used focus group discussions and key informant interviews to explore how teens access, navigate, and learn to manage their health care as well as their preventive health needs, focusing on salient interactions and experiences that would help define expanded dimensions of health literacy.

Formative research was conducted with a publicly insured adolescent population because examining the health needs and health care behaviors of a young, generally healthy

population with health insurance is paramount as the US health care system shifts towards incentivizing use of preventive care and more appropriate use of curative care. Moreover, due to the nature of the larger intervention study, we had access to publicly insured adolescents who were members of a large health plan in California. Finally, few studies examine health literacy in this population as most focus on higher users of care, such as adults. This limitation overlooks the fact that many adolescents are neophytes in the health care system and thus their health literacy may be low.

Focus group participants were recruited from community centers and clinics in California that provide services to youth aged 13–17 who are recipients of public health insurance, namely MediCal (Medicaid) and Healthy Families (State Children's Health Insurance Program). Key informant interviews were conducted by phone with primary care providers who were members of a large health plan in California and who met the eligibility criteria of serving a high number of publicly insured adolescents.

Based on findings from the formative research and qualitative analysis detailed elsewhere,[26] multiple health literacy domains emerged. They include patient-provider encounter, navigation of the health care system, rights and responsibilities, preventive care, and health information seeking.

Domain and Item Development

Using the domains that emerged from the formative research process, we designed a questionnaire to assess the effectiveness of an intervention focused on improving the health literacy of adolescents regarding their health insurance, health service use, and health providers. Materials were developed at a sixth-grade reading level in order to minimize any barriers related to functional literacy capacities. Embedded in the study survey instrument were measures that assess variation in an expanded understanding of health literacy. Some of the items were adapted and changed from prior health care and health promotion measures that have been shown to be valid and reliable, whereas other items were created to reflect a more expanded understanding of health literacy.

We adapted some items related to patient-provider encounters and health care experiences from the Young Adult Health Care Survey (YAHCS).[27] These items were originally developed to assess how well the health care system provides adolescents with recommended preventive care, with the ultimate goal of highlighting opportunities for improvement in performance. For this reason, the YAHCS has been marketed as a practice- or provider-specific tool with few surveillance studies. In 2001, however, a study did show that compared with teens who had "any other type of medical visit," teens who had a "wellness visit" in the last 12 months were less likely to report counseling and screening related to diet and exercise and were also less likely to report having a private and confidential visit, highlighting a need for further research.[28]

Items pertaining to health information seeking were adapted from the Health Information National Trends Survey (HINTS)[29] as well as from the eHealth Literacy Scale (eHEALS) measure.[30] Additional domain items were developed to cover gaps in existing measures,

including items related to confidence, self-efficacy, and rights and responsibilities. Following are the major dimensions that provided an initial framework for our measure.

Patient-provider encounter—In most health care systems today, which for the most part use a managed-care organizational model, the primary care physician (PCP) serves as the entry point for accessing the health care system. Therefore, assessing patient-provider encounters from a patient perspective may highlight features that facilitate or prevent a positive health care experience. Four items from the YAHCS were adapted and used to examine the most recent experience with a health care provider, focusing on communication and affective dimensions. This is relevant to an expanded definition of health literacy as it is becoming more and more apparent that one's health literacy is not determined solely by individual characteristics, but also by environmental characteristics such as one's encounter and experience with a health provider. For example, asking individuals to assess whether or not a provider spent enough time with or was respectful to them may capture broader underlying components of health literacy including empowerment. This is especially important when asserting one's health preferences to a provider as well as determining patient satisfaction that may ultimately influence the overall health care experience. Each of the items has a 5-point Likert scale with responses ranging from never to always.

Interacting with the health care system—As the US health care system shifts towards a managed care model, competencies needed to effectively navigate the health care system will become more important to maintain high-quality care. These competencies include not only the ability to make an appointment or fill prescriptions, but also factors related to confidentiality and referrals. Six items from the YAHCS were adapted and changed in order to capture confidence and self-efficacy related to interacting with the health care system. Each item has a 5-point Likert scale with responses ranging from not at all confident to very confident.

Rights and responsibilities—This dimension not only captures knowledge related to health insurance benefits but also examines attitudes and self-efficacy related to confidentiality in the health care setting and self-care practices. Seven items were newly created based on adaptations from the YAHCS, each with a 5-point Likert scale with responses ranging from strongly disagree to strongly agree.

Health information seeking—This dimension assesses the confidence and ability to look for health information from a variety of sources. These items were adapted from HINTS as well as the eHEALS measure.[29,30] HINTS data are limited to adult populations whereas we are working with an adolescent population; therefore, it is necessary to examine the relevance and reliability of these measures in our population. The eHEALS measure has been shown to be reliable among an adolescent population but was not associated with self-evaluations of health status.

Items adapted from HINTS were changed from measuring trust of an information source to measuring the confidence in getting information from a source. Confidence in getting information from a source better captures the ability to actively seek and obtain information from a source as opposed to passively receive information. Two items from the eHEALS

scale were used to measure competencies in seeking out and evaluating health information using the Internet. Two items were chosen from the 8-item eHEALS scale based on factor loading and the amount of variance captured within our sample. Additionally, this limited the response burden of an already lengthy measure. This domain includes 8 items each with 5-point Likert scales. Responses for confidence-related questions range from not at all confident to very confident, whereas agreement questions range in responses from strongly disagree to strongly agree.

Psychometric and Statistical Analysis

To describe the validity and reliability of the domains in the measure, adolescents aged 13–17 who are Medi-Cal and Healthy Families members of a large health insurance network in California participated in our survey (N = 1368). Due to health plan regulations and the fact that the larger study's goal was to measure the effectiveness of an intervention, a simple random sample of adolescent members could not be taken. Rather, a self-selected sample of all eligible study members was necessary to comply with health plan regulations as well as ensure a large enough sample to provide the necessary power for analysis. All items in the questionnaire were self-reported and were completed either by paper and pencil or online. Although an online option was offered, 99% of respondents completed the paper-and-pencil version; thus, both methods are presented together in the results section.

To investigate the emergence of health literacy domains, items were analyzed using exploratory principal components factor analysis with varimax rotation. The analysis was performed multiple times, varying the number of factors fitted in order to investigate the optimal number of factors to fit. The following were considered in determining the optimal number of factors: (1) total proportion of the variance accounted for, (2) factor eigenvalues, (3) scree plot, (4) factor loading patterns, (5) item clustering patterns, and (6) face validity. Classical test theory approaches were used to evaluate the psychometric properties of the multidimensional measure.[31]

Of the 1368 participants, a total of 77 (5.6%) reported having no health care in the past 12 months. These participants were removed from the analysis because questions capturing the "Patient-provider encounter" domain reference the participant's experience in the past 12 months. Of the remaining 1291 participants, data were missing in 83 (6.4%) participants. Analysis was performed on the 1208 participants with complete data while the effects of missing data were assessed by multiple imputation using chained equations.[32]

Psychometric properties were measured by correlation patterns of items within a factor. An item's consistency was measured by the average interitem correlation: the average pairwise correlation of an item with all other items. An item's discriminability was measured by the item-total correlation: the item's correlation with the sum of all other items. Item reliability was evaluated by measuring the difference between the factor's reliability and the factor's reliability with the item removed. Reliability was measured by Cronbach alpha.[33] Items presenting substantial consistency or discriminability differences, an increase in reliability when removed, or diminished factor loading values across all factors were identified as poorly performing items and candidates for exclusion. All statistical analysis was performed using R statistical software version 2.10.1.[34]

RESULTS

Characteristics of our study sample are described in Table 1. Survey participants average 14.8 years of age, and females represent over 60% of the sample. Respondents self-identifying as Hispanic/Latino represent the largest race/ethnicity group (33.7%), reflecting California's large Latino population relative to most other states in the United States as well as enrollment patterns in government-sponsored health insurance programs in California. Respondents self-identifying as white represent the next largest race/ethnicity group (22.1%), followed by multi-ethnic, where about 1 out of 5 respondents self-identify as multi-ethnic, indicating a rather heterogeneous sample. Health status and health behavior variables indicate that, in general, the sample has very good to excellent health, participates in at least 3 days of physical activity per week, and has not experienced any health or emotional problems in the last month.

As Table 2 describes, factor loading and item clustering patterns reflected in the factor analysis suggest that the data are parsimoniously described by 6 factors (49.8% of the variance is accounted for, and all factor eigenvalues are greater than 1). Items intended to capture the "Patient-provider encounter," "Interacting with the health care system," and "Rights and responsibilities" domains had factor loading patterns suggesting an underlying construct consistent with these domains. Items intended to capture the "Health information-seeking" domain had factor loading patterns suggesting that these items are best described by 3 separate factors: Confidence in information from a personal source, Confidence in information from a media source, and health information-seeking competencies. Thus, the originally hypothesized 4-domain health literacy construct now contains 6 domains based on factor loadings. However, this resulted in only 2 items describing the "Health information-seeking competencies" domain. Although 2-item factors are generally described as being weak and unreliable,[35] the factor loading pattern suggests that these 2 items are measuring a construct that is unique from the other 5 factors. This is further reinforced by the items' weak correlation with all other items. These patterns suggest that these items form a unique factor, but more items may be needed to reliably define this factor.

Additionally, 2 items (one from interacting with the health care system and the other from confidence in information source) did not load highly on a single specific factor and were removed from the analysis. This does not mean that the items are not important to the underlying construct of health literacy that we propose, but rather they may be contained across multiple dimensions.

Psychometric measurements identified that all but one domain had a Cronbach alpha greater than .7. The domain "Confidence in health information from personal source" performed relatively low with a Cronbach alpha of .64. This may be a result of the variation in personal sources, which includes teachers, parents, and friends. Adolescents are likely to view and treat these personal sources differently based upon the health subject matter. This finding suggests that future research should further examine nuances in accessing health information from these personal sources. Overall the reliability across all items was greater than .80 (Cr-Alpha = .83).

Item consistency and discriminability measures suggest that the items within each factor are measuring the same underlying construct. All items exhibited a moderate to high degree of consistency (average interitem correlations ranging from .33 to .66) and discriminability (item-total correlations ranging from .39 to .74). Though still exhibiting an acceptable degree of correlation, item consistency and discriminability were lower in the "Confidence in health information from personal source" domain relative to the other domains. In conjunction with its relatively lower Cronbach alpha, this finding suggests that further research is needed to comprehensively describe and measure complexities within this domain. Analysis using imputed data reflected patterns and behavior similar to those observed within participants with complete data; thus, the removal of subjects with missing data did not seem to bias the results.

DISCUSSION

Our study builds upon work calling for an expanded definition and measure of health literacy. Specifically, we have derived a measure that mainly adheres to the interactive dimensions of health literacy, although it clearly entails some functional capacities such as understanding of preventive care and some critical aspects such as evaluation of health information seeking.

Reaching beyond reading capacities and word-recognition skills, health literacy must be contextualized in a health care system where individuals must be knowledgeable, confident health care consumers who understand the intricacies of complex health care and health insurance systems. Such complexities can include but are not limited to choosing a primary care provider or understanding one's health insurance benefits. Among our study population of publicly insured adolescents, competencies also included knowing one's rights and responsibilities and being confident in using various sources for health information. These competencies need to be incorporated into future studies.

As Pleasant et al describe in their commentary, health literacy should be considered a latent construct with multiple dimensions.[7] Furthermore, no single measure, and especially no single item, will capture the full, complex nature of health literacy. Thus, findings from this study substantiate the need for multiple domains that incorporate multiple items to measure an expanded understanding of health literacy.

Investigating multiple dimensions of health literacy also contributes to the research examining mechanisms through which health literacy impacts health behaviors and health outcomes. Paasche-Orlow and Wolf propose a causal framework that supports the movement towards understanding and measuring health literacy through multiple dimensions.[36] Their framework includes the mechanisms of health care interaction, provider-patient interaction, and self-care; valid and reliable multidimensional measures will allow researchers to test these proposed pathways. Thus far, one study has tested the self-care path among adult patients with hypertension and found that health literacy (as measured by the TOFHLA) indirectly influenced health status by way of knowledge, self-efficacy, and physical activity.[37] Further research is needed to test more expanded measures of health literacy and ultimately the effect on health outcomes.

A strength of our multidimensional measure is the compatibility between the content of the items and the context of their use. The items in this measure assess knowledge, attitudes, and behaviors in a wellness, preventive, and curative health care context, strengthening the validity of the measure. The items in our measure also push the field towards considering underlying theories that support notions of health competencies, namely health literacy concepts linked to knowledge, attitudes, and self-efficacy.

Furthermore, this measure takes an asset approach to health literacy by focusing on competencies related to health promotion. This is in contrast to a risk-factor approach that defines health literacy as the presence or absence of sufficient health vocabulary and reading comprehension, as measured by the REALM and TOFHLA. The risk-factor approach is based on health literacy's origins in the clinical setting: based on a patient's health literacy skills, measured by their reading and numeracy abilities, the medical encounter can be tailored by physicians and other health personnel to maximize patient comprehension.

On the other hand, the asset perspective of health literacy has its roots in health promotion and views health literacy as a capacity or set of competencies that can be developed and exercised in order to shape one's health environment, both in and out of the clinical setting. The health promotion approach moves us towards a social and public health research perspective that will allow for the measurement of the construct within a population and will allow us to measure it over time. Although the dimensions presented in this paper focus primarily on accessing and navigating health care, there are health promotion activities that could be further examined and applied to a broader public. Moreover, the dimensions discussed in this paper provide a preliminary step towards measuring a more robust understanding of health literacy.

Due to limitations in the sampling procedure used in this study, future research in the field will need to test the generalizability and applicability of the measure in other populations outside of low-income, publicly insured adolescents. However, results from this study are still relevant and useful in that this is an exploratory study that generated domains and conducted preliminary tests on expanded measures of health literacy.

Another limitation is that all the potential domains of a broader health-literacy construct may not be articulated in this study. For example, Martin and colleagues discuss patient self-advocacy as a relevant domain of health literacy, specifically in the context of applying speaking and listening skills to overcome barriers in health care.[38] Moreover, other relevant health-literacy skills and competencies that have been described elsewhere may have been overlooked or omitted during the formative research process or may not have been relevant in our adolescent population.[2] Furthermore, domains may manifest differently among other populations, again hindering the generalizability of our findings. The findings from this paper are a stepping-stone toward defining and developing relevant domains for an expanded operational definition of health literacy.

Lastly, the domains presented measure health literacy subjectively; that is, respondents self-report and self-rate their Confidence, skills, and abilities in managing their health and health

care experience. For this reason, it may be difficult to compare true or absolute differences in domain or measure scores across individuals or even sub-populations.

Implications

Although developed for an adolescent population, this approach to measuring health literacy may be applied to other populations who are generally healthy and who may not interact with the health care system on a regular basis, as well as those who may be more regular users of health care. Moreover, this is relevant in an era of health care reform, in which as many as 50 million adults may soon have a consistent source of health care through public insurance for the first time. Further research would be necessary to test the measure's validity and reliability in other generally healthy populations or populations with chronic conditions. Additionally, exploratory analysis examining how the expanded domains vary according to demographics and health status will help validate the measure in adolescent as well as other populations.

Finally, in addition to tailoring educational materials to the patient's or individual's literacy skills, interventions that approach health literacy as an asset can focus on building capacities within individuals to better understand and use health information, thus gaining better control over their health. Functional literacy skills will be necessary to accomplish this, but not sufficient to develop broader health-literacy competencies. Confidence, self-efficacy, and communication skills are necessary components to these strategies; that is, instead of solely focusing on comprehension abilities, helping individuals build abilities needed to articulate their health circumstances to physicians, community members, and other decision makers is critical in developing capacities in health literacy.

Human Subjects Statement

The UCLA Institutional Review Board approved all procedures prior to the start this study.

Acknowledgments

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Table 1

Demographics of Publicly Insured Adolescent Sample With No Missing Health Literacy Domain Data, California (N = 1208)

	N (%) or Mean (SD)	
Age (13–17 years)	14.8	(1.3)
Gender		
Female	754	(62.4)
Male	454	(37.6)
Race / Ethnicity		
White	267	(22.1)
Black or African American	159	(13.2)
Hispanic / Latino	407	(33.7)
Asian	95	(7.9)
Other	23	(1.9)
Multi-Ethnic	246	(20.4)
Overall Health Status		
Excellent	212	(17.6)
Very good	367	(30.4)
Good	393	(32.6)
Fair	192	(15.9)
Poor	41	(3.4)
Weekly Physical Activity		
0 days	103	(8.6)
1–3 days	220	(18.3)
3–6 days	635	(52.7)
All 7 days	246	(20.4)
Experience any Health or Emotional Problems in the Last Month?		
0 days	640	(53.4)
1–3 days	356	(29.7)
4–6 days	117	(9.8)
7–14 days	53	(4.4)
15–28 days	32	(2.7)

Table 2

Health Literacy Domains and Corresponding Items Based on Exploratory Principal Components Factor Analysis With Psychometric Properties Among Publicly Insured Adolescents, California (N = 1208)

		Factor Loading[a]					
		1	2	3	4	5	6
Proprotion of Variance Accounted for (Overall = 49.8%)		10.0%	9.0%	12.6%	4.8%	8.6%	4.8%
Cronbach's Alpha (Overall = 0.834)		0.815	0.803	0.827	0.638	0.834	0.709
As you answer the following questions, think about your health care experience in the last 12 months:							
Q1	Did doctors or other health care providers listen to you?	0.699	0.213	0.090	0.028	0.049	0.050
Q2	Did doctors or other health care providers explain things so you could understand?	0.723	0.204	0.103	0.059	0.073	0.055
Q3	Did doctors or other health care providers show respect for you?	0.659	0.129	0.052	0.033	−0.022	0.018
Q4	Did doctors or other health care providers spend enough time with you?	0.700	0.224	0.095	0.067	0.037	0.047
As you answer the following questions, please tell us about how confident you feel about:							
Q5	Being able to speak privately with your doctor or other health care provider about your health issues?	0.339	0.593	0.100	0.106	0.001	0.027
Q6	Being able to make an appointment to see your doctor or other health care provider?	0.175	0.666	0.102	0.103	−0.002	0.109
Q7	Being able to fill a prescription at a pharmacy?	0.073	0.673	0.088	0.081	0.057	0.104
Q8	That your doctor or other health care provider will keep what you say to him or her confidential?	0.336	0.600	0.127	0.112	0.030	−0.004
Q9	That your doctor or other health care provider will send you to a specialist if you need one?	0.354	0.484	0.158	0.096	0.046	0.011
As a patient with health insurance, how much do you agree or disagree with the following statements:							
Q10	It is my responsibility to make sure I or my parent schedule a checkup every year with my doctor or other health care provider.	0.120	0.127	0.511	0.108	0.005	0.102
Q11	When I need other medical care it is my responsibility to make an appointment with my regular doctor or other health care provider or ask someone to make it for me.	0.120	0.139	0.557	0.037	0.048	0.049
Q12	It is my right to be able to talk to my regular doctor or other health care provider privately.	0.066	0.140	0.692	−0.020	0.019	0.021
Q13	It is my responsibility to only use the emergency room when it's really an emergency (for example, for an accident or serious illness).	0.077	−0.047	0.549	0.024	−0.031	0.047
Q14	It is my right that my doctor or other health care provider keeps information about my health confidential.	0.017	0.048	0.645	0.001	0.062	0.036
Q15	My doctor or other health care provider is supposed to discuss things with me that are bad for my health and what to do about them.	0.028	0.051	0.745	0.025	−0.003	−0.010
Q16	My doctor or other health care provider is supposed to send me to a specialist if I need to see one.	0.003	0.095	0.748	−0.021	0.053	0.010
How confident are you about using health information from the following sources:							
Q17	Family	0.119	0.197	0.062	0.486	0.049	0.043
Q18	Friends	0.003	0.061	−0.029	0.729	0.221	0.116

	Factor Loading[a]					
	1	**2**	**3**	**4**	**5**	**6**
Proprotion of Variance Accounted for (Overall = 49.8%)	**10.0%**	**9.0%**	**12.6%**	**4.8%**	**8.6%**	**4.8%**
Cronbach's Alpha (Overall = 0.834)	**0.815**	**0.803**	**0.827**	**0.638**	**0.834**	**0.709**
Q19 Teachers	0.066	0.135	0.087	0.482	0.379	−0.036
How confident are you about using health information from the following sources:						
Q20 Internet	−0.020	0.033	0.036	0.098	0.707	0.216
Q21 Magazines or Newspapers	0.063	0.041	0.054	0.089	0.861	0.073
Q22 Movies, Television or Radio	0.063	−0.010	0.003	0.214	0.759	0.048
How much do you agree or disagree with the following statements:						
Q23 I know how to use the Internet to answer my health questions.	0.080	0.038	0.131	0.050	0.129	0.774
Q24 I know what health resources are available on the Internet.	0.047	0.147	0.058	0.072	0.139	0.657

Note.

[a] Corresponding factors: (1) patient-provider encounter, (2) interaction with the health care system, (3) rights and responsibilities, (4) confidence in health information from personal source, (5) confidence in health information from media source, (6) health information-seeking competency using Internet