Published in final edited form as:

J Immigr Minor Health. 2014 August ; 16(4): 652–660. doi:10.1007/s10903-013-9803-y.

Health Information Seeking Behaviors of Ethnically Diverse Adolescents

Anastasia E. Okoniewski, BSN, MSN, PMHNP, DNPc,

Columbia University School of Nursing, 617 West 168th Street, New York, NY 10032, (212) 342-6886

Young Ji Lee, MSN, BSN, PhD,

Columbia University School of Nursing, 617 West 168th Street, New York, NY 10032, (212) 342-6886

Martha Rodriguez, BS,

Columbia University School of Nursing, 617 West 168th Street, New York, NY 10032, (212) 342-6886

Rebecca Schnall, RN, PhD, and

Columbia University School of Nursing, 617 West 168th Street, New York, NY 10032, (212) 342-6886

Alexander F. H. Low

NewYork-Presbyterian Hospital, 627 West 165th Street, New York, NY 10032

Anastasia E. Okoniewski: aeo2126@columbia.edu; Young Ji Lee: yl2612@columbia.edu; Martha Rodriguez: mr2283@columbia.edu; Rebecca Schnall: rb897@columbia.edu; Alexander F. H. Low: all9050@nyp.org

Abstract

Research on health information has primarily focused on the needs of adults or parents of children with chronic illnesses or consumers. There is limited research on the health information needs of adolescents and in particular those from underserved communities. The primary objective of this qualitative study was to understand the health information needs of healthy, urban adolescents, and how they met those needs. Focus group methodology was used to gather information from a sample of ethnically diverse urban adolescents. Data was analyzed using Kriekelas' Information Seeking Behavior framework to, examine the participants' report of their immediate and deferred health information needs. Our sample of adolescents used several different sources to satisfy their health information needs depending on acuity and severity, which was congruent with Kriekelas' framework. Understanding how adolescents use technology to meet their health information needs, and in what order of preference, will be critical for the development of technology that adolescents find useful and has the potential to decrease health disparities.

Keywords

Information seeking; Adolescent; mobile technology; health seeking behaviors

Introduction

Information seeking has been studied since the 1950s, but earlier studies primarily focused on the information seeking behavior of researchers, scientists, and healthcare providers [1, 2]. There has been limited research on the health information needs of consumers, including adults with chronic or terminal illnesses [3–9], parents of children with chronic illnesses [10–18], and adolescents with chronic illnesses [19–22]. There are few studies that examine the health information needs of healthy adult consumers [23, 24] and one recent cross-sectional survey exploring the information needs of healthy adolescents [25].

Understanding information seeking in adolescents is particularly important because the number of adolescents in the U.S., has been growing since the 1990s, and is expected to continue growing through 2050. From 1990 to 2000, the adolescent population increased by 16.6%, from 34.9 million to 40.7 million. Furthermore, the adolescent population is more racially/ethnically diverse than the general population [26]. This is particularly significant since African Americans and Latinos suffer from growing health disparities, and thus are in need for health behavior interventions [27].

Moreover, adolescence is a stage of life when future health behaviors are established. To help adolescents establish appropriate health behaviors, it is critical to design interventions targeting their health information needs. One promising type of intervention is mobile health technology since adolescents are the largest consumers of mobile technology, social networking, and Internet use [28]. In contrast to adults, adolescents are still in the process of accruing information that informs healthcare decision-making. With limited past experiences, adolescents may rely more heavily on external sources of information, including the Internet, social media, friends, and family. Information technology has shown great promise and is uniquely positioned to improve gaps in health disparities [29]. In contrast to adults, adolescents are still in the process of accruing information that informs healthcare decision-making. Without internal resources, adolescents may rely more heavily on external sources of information, including the Internet, social media, friends, and family. In this study, we sought to understand the health information needs of adolescents and how they met those needs.

Methods

Study Design and Approach

A descriptive qualitative design with an interpretative perspective was used because this can best link participants' subjective interpretations with knowledge discovery. We convened focus groups as this would allow us to gather a large amount of information in a relatively short amount of time. In the focus groups, we permitted participants to use their own words to answer open-ended questions and to freely react to each other's responses (Kitzinger, 1995). This interaction between participants was expected to elicit the most information.

Procedure

Data were gathered from November – December 2011. All study activities were approved by the Columbia University Medical Center IRB. We gathered written informed assent from

all study participants. The focus group sessions were recorded with two digital recorders to safeguard against mechanical failure. Each focus group session lasted approximately one hour. Data were generated using the basic focus group session format via audio. Audio tape recordings and field notes. Data collection continued until saturation of themes was reached. We hosted six focus group sessions involving three to eight participants. Each focus group session was moderated by the senior author (RS); a second member of the research team recorded field notes. The moderator verbally explained the purpose of the study. Participants were informed that their personal information and responses would be shared only with the study team and that the participants would not be identifiable in any publications or presentations arising from the study. We began the focus group session by distributing questionnaires to capture participants' demographic information and their frequency and experience with computer and mobile device use. In addition, we distributed the Medical Outcomes Study 36-Item Short-Form Health Survey (MOS SF-36) [30]. The MOS SF-36 is a validated multipurpose health survey [31]. It produces eight-scale profile of scores, as well as physical and mental health summary measures. Scores are measured from 0–100, with higher scores reflective of better health status [32]. Following completion of the questionnaires, ground rules were introduced to improve participants' understanding of the purpose of the focus groups and to ensure the flow of the session.

The six-question focus group guide included sections covering the opening, introductory, and transition periods (Krueger & Casey, 2000). Focus group questions included: 1) How do you seek health information (e.g., asking a person, search online)?; 2) What is your preferred source of information for particular types of subjects?; 3) Tell us a little about how you use mobile technology. What type of personal health information have you viewed using mobile health technology?; 4) Anything else that you would like to say that you didn't get a chance to say? We probed participants to elicit clarification to responses and to gather more information. The moderator summarized the key point at the end of each question, which served as member checks. We reimbursed focus group participants for their time (\$20) and gave them food and drinks appropriate for the time of day. The research team debriefed immediately following each session.

Data Analysis

We compiled demographic information using descriptive statistics. The audio tapes were transcribed verbatim into a Microsoft Word document. Audiotapes and transcripts of the focus group conversations were stored on a locked computer in one of the author's offices at the Columbia University School of Nursing and were destroyed upon completion of the study. We coded each transcript but only after we had read it at least twice and highlighted the relevant ideas. Codes were created based on a line-by-line analysis. The author summarized data thematically through an iterative process after each focus group session. The informants' words guided development of the codes. We used Krikelas's "Information Seeking Behavior" framework to guide the analysis of the focus group data (Figure 1). This formative model for the study of information-seeking behavior posits information seeking begins when someone perceives that the current state of possessed knowledge is less than the need to deal with an identified issue or problem and ends when the perception of need no longer exists [33]. The gap in knowledge motivating a user to seek further information is

considered a “need creating event” and comprises immediate and deferred needs. Krikelas defines *immediate* needs as directed toward satisfying a potential problem and categorizes satisfying this immediate need as information *seeking* behavior. Information *gathering*, related to *deferred* needs, is more casual and assists the user in constructing a cognitive map to facilitate coping with uncertainty in an area lacking knowledge. For this analysis, an immediate need is an event that causes a user to seek information directly related to his or her immediate health status, such as seeking treatment or identifying a potential diagnosis for symptoms. A deferred need may impact long-term health outcomes or involves health-seeking information for curiosity. Krikelas differentiates preference of information source as either internal or external. Internal sources of information are stored within the individual as memories of previous experience or education, or by direct observation of experiences now integrated into the user’s knowledge. External sources of information are those that exist outside the user and are intentionally accessed and include direct contact or recorded literature. Direct contact includes bidirectional or participatory contact with a medical professional, family member, teacher, or peer who provides information. Recorded literature is any form of unidirectional media information source, including television, printed literature, and websites or other online media. Krikelas also stresses that individuals may exhibit different information-seeking behaviors due to significant differences in the nature of the problems they are searching for information about. The model suggests that the steps for obtaining information were as follows: 1) perceiving a need; 2) searching for information; 3) finding the information, and 4) using the information, which results in either satisfaction or dissatisfaction [34]. For the purpose of this paper, we will be focusing on how users identify health needs, search for information, and evaluate information once obtained.

Ensuring Methodological Rigor

In order to maintain the trustworthiness of this study, the authors established four criteria: credibility, transferability, dependability, and confirmability. A variety of methods were used to produce credible findings (Guba, 1981). Engagement in the field extended over a period of nine months and contact with participants was maintained over time. Peer debriefing among research team members present occurred immediately after each session and also in a meeting between the first author (AO) and senior author (RS). We undertook “member checks” with the adolescent participants to validate interpretation of the data and ensure our confidence in that data. Thus, the team reflected and summarized the participants’ responses intermittently during the focus group and immediately after each focus group question by asking participants if they agreed with the moderator’s summary of the group session.

To ensure findings would be transferable, impacting the range and limitations of the study findings beyond the context of this sample [35], we interviewed adolescents with varied demographic backgrounds. To ensure our findings were dependable we created an audit trail so that another investigator can follow the decisions made by the authors. The audit trail included coded focus group transcripts and field notes (Creswell, 2007; Strauss & Corbin, 1988).

The authors were aware of the need for neutrality and the importance of capturing all participants' views to ensure confirmability. The focus group moderator frequently asked nonparticipants to contribute and reminded the group that every opinion was valid and respected. The moderator and the assistant made every effort to promote an atmosphere in which opposing opinions were expressed and all participants had an opportunity to contribute.

Results

Sample

Our participants included 32 adolescents age 14–18 years ($M = 16$, $SD = 1.16$) who were enrolled in a public high school in the Bronx, NY. We had 14 female, 17 male participants and one participant that declined to report gender. Participants self-identified themselves as Black (18.8%), Pacific Islander (12.5%), Multi-racial (31.3%), and Other (34.4%). Eighty-four percent of participants classified themselves as being Hispanic. The mean self-reported physical and mental health status scores for our participants were 76.32 ($SD = 30.87$) and 75.19 ($SD = 9.80$), respectively. These values are significantly above the established national means, which is 50 (standard deviation $\frac{1}{4}$ 10) as measured by the MOS SF-36, demonstrating a healthy participant cohort. A large majority (of 90.6%) of the participants started using a computer more than 2 years ago and 81.3% used a computer at least once a day. Similarly, 81.3% of participants used a mobile device at least once a day.

Findings

Participants' responses to questions were iteratively and systematically analyzed and summarized into themes associated with these constructs. The authors explored each theme in depth, discovering categories within each of the major themes. Focus group participants' statements are quoted verbatim because the individual speaking articulated a particular point well. Since participants were guaranteed confidentiality, an effort has been made to report what was said without divulging any identifying information. The findings are presented in sections according to the themes related to the Krikelas (1985) model. Participant responses were identified as either immediate or deferred needs, and preferred source of information was identified based on the specific need-creating event.

Information Need Themes

We identified eight themes of need creating events, with some themes overlapping as both immediate and deferred needs. Anatomy and physiology included definition and clarification of basic anatomy and workings of the human body. Basic medical care included triage and treatment of routine conditions and health maintenance. Emergency medical care included urgent treatments for first aid, bone/joint dislocations, or asthma attacks. Diet and exercise included questions regarding nutrition, activity, intake, and weight loss. Growth and development included questions about developmental norms. Reproductive health included statements related to sexually transmitted infections and gynecologic and reproductive questions. Definition and clarification included exploration and confirmation of diseases or diagnoses and medical terminology. Health promotion/prevention included information

seeking to prevent a disease from occurring or recurring. Participant needs were then identified as either immediate or deferred.

Immediate Needs

Four themes of immediate needs were identified as reasons for information seeking (Table 1). Participant statements related to emergency medical care included, “Anything severe I think you should go to the doctor” and “my little brother dislocated his elbow... so I just Googled it... and I just popped it back into place.” Participants seeking information regarding basic medical care searched for treatment suggestions, such as “how to get rid of a sore throat” and diagnosis/clarification, such as “symptoms of pink eye.” In addition, respondents used recorded literature and Internet searches for reproductive health information seeking. For example, one participant stated he would search for information about sexually transmitted infections, commenting, “...say like if you catch it and you don’t want to tell nobody and you want to get information.”

Adolescents primarily relied on external information sources to address immediate health needs. In particular, they used recorded literature, including Google searches and health websites, to understand their current symptoms. One member asserted, “I would probably... Google the first thing that comes to my mind is to see whether it’s severe or not. And if it’s severe, I would just call the doctor, tell my mom and see what happens.” Another noted, “I normally go the web and there’s stuff I wouldn’t want my mom to know until I’m sure about it. So I look on the web first to see if I do have like a problem or something like that, then I’ll probably tell her.”

Although our participants frequently searched for information on the Internet, they reported that direct contact with either a family member or medical professional was more reliable than information on the Internet in addressing their immediate needs. As one participant shared, “Like certain things, when it comes to those things, [the Internet] doesn’t help because everybody’s [results] are different... So you’re not experiencing what that person is experiencing, what it says on Google, sometimes you just can’t really depend on it. So you might want to go to the doctor.” Often, participants did not feel comfortable assessing their symptoms and preferred to visit a medical professional. One commented, “I would go straight to the doctor. If there’s something wrong, I’m going straight to the doctor.” Multiple participants stated a preference for using a parent as a source of information needs. For instance, one participant shared, “I usually just ask my mom. That’s my best source of information right there.” Another described how he knew to use a specific over the counter remedy (Robitussin) to treat a cold, explaining, “...because my mom, she keeps one, every winter she buys one.” In addition to direct contact, our participants reported that they relied on memory to address their immediate information needs. One member commented, “I put peroxide on it. That’s what you’re supposed to put on your cuts.” When probed, the respondent cited her mother as the source of information.

Deferred Needs

Six themes of deferred information needs were identified (Table 2). Basic medical care was described in statements such as, “If Mom doesn’t know then I’ll ask the doctor.” Comments

related to the theme of diet and exercise included, “My doctor, she usually will talk to me about what I should eat and what’s good for me.” Speaking on the theme of growth and development, a participant shared, “I go to my science teacher and he said to start stretching.” Another recalled searching for information about health promotion/disease prevention, explaining, “...I wanted to see what the plant looked like so I would not touch it again.” Statements related to diagnosis and clarification included, “I looked it [cholesterol] up on Yahoo actually.” Meanwhile, for the reproductive health theme comments included, “I go to my guidance counselor because he talks a lot about that.”

Participants used recorded information, including television, as a source of information about diet and exercise. One explained, “I usually watch TV a lot, so some channels talk about your health... they talk about what should be on your plate.” Another participant identified a specific TV show as informative and easy to understand, stating, “Sometimes I watch Dr. Oz, I think it’s good because he explains a lot of things you need to do, like basic stuff.” Multiple participants identified Internet searches as primary sources for information. One participant used information obtained on the Internet as a means to prevention, recalling, “I had poison ivy one time when I was 10 years old... and I was looking it up on my phone...because I wanted to see what the plant looked like so I would not touch it again.” Frequently participants found Internet searches to be particularly useful for diagnosis and clarification. For example, one participant shared, “I’ve looked up something, I don’t know what it’s called, but you get it on the back, like when you give birth? Yeah, epidural. I looked that up for when I am older.” Several members identified their mobile phones as the mode for information gathering in these instances. Participants were also aware of public health campaigns on sexually transmitted infections and reproductive health issues.

Direct contact with a teacher, parent, or doctor was identified as a primary source of information related to diet and exercise, growth and development, and basic medical care. For instance, one participant explained, “My doctor, she usually will talk to me about what I should eat and what’s good for me.” Another commented, “I go to my science teacher and he said to start stretching.” Another participant simply stated, “If Mom doesn’t know then I’ll ask the doctor.” Many participants had little hesitation talking about reproductive health issues with parents, teachers, or medical providers. For example, one shared, “I go to my guidance counselor because he talks a lot about that.” Similar to information seeking for immediate needs, participants had fewer responses citing memory and direct observation as ways to address deferred health information needs. In regard to memory, one respondent stated, “I’ve heard of HPV, like I’ve heard things about it. So I was like, why not? I had no reason not to [get the vaccine].” Another participant described how he had to perform an orthopedic back adjustment daily, recalling, “My mom went and then she showed me.”

Using and Evaluating Information

The participants described the process by which they used available resources to meet their health information needs. Based on the focus group data we determined that participants formulated internal decision trees to determine their preferred source of health information. Participants identified the Internet (recorded literature) and prior learning (internal memory) as primary sources for understanding their health concerns. If primary information sources

were inadequate they would seek out direct contact with either a medical provider or a parent. Figure 2 illustrates the different instances in which participants identified their initial, secondary, and, if necessary, tertiary sources of information.

Participants offered information on how they assessed the quality of online health information and the barriers to access. Some reported that they had methods for ensuring the veracity of data obtained from online resources, which included assessing if data was congruent with established internal memory. For example, a participant explained that information may be more trustworthy "...if it matches up with what's going on with you." The participants also depended on scholarship and Google ranking in determining the reliability of the information obtained. One participant was more likely to trust information "...if it sounds like they know what they're talking about." Another commented that, when performing an Internet search, accurate information "...would be the top answer on the list." Frequently, respondents cited *majority rules* as reliable means to validate online health information. For example, one explained, "I look at different websites and if they're all saying the same thing, then it's probably true." Participants also examined the origin of the website to assess data accuracy. One described this method stating, "I scroll to the bottom of the page to see where the information is coming from." Many also identified URL ending as a measure of trustworthiness, as explained by one participant, who stated, "The ones that are .gov or .edu are probably the most legit." Participants identified anonymity as a facilitator for using the Internet as an external source of information. One shared, "I normally go on the web, and there's stuff I wouldn't want my mom to know about until I'm sure about it... so I look for it on the web first to see if I do have like a problem or something, then I'll probably go tell her." Participants reported using personal computers and mobile technology to obtain health information. The personal computer was identified as a preferred source over a mobile device since it has a larger screen. A participant explained, "I use my computer... because when you're on the phone it only shows a small amount of the stuff." However, mobile technology was used when participants were not near a computer but had an information need, as with one respondent who noted, "Sometimes I don't have access to my computer, so I use my phone." If the information need was significant, respondents were willing to seek out secondary sources of information if the primary source was not satisfactory. For example, one commented, "If I can't find it on my phone I'd go to the library." Barriers to use of mobile technology included slow data plans, small screen size, and cost.

Discussion

Building on Krikelas's framework, our findings indicated that adolescents experience several different types of need creating events that cause them to seek health information. Adolescents have health information needs ranging from basic care of routine conditions to urgent medical interventions and prevention of future health conditions. They reported *immediate* needs of triage, diagnosis, and treatment and preferred using mobile technology and the Internet to identify symptoms or to assist in emergency care of others. However, they felt most comfortable using direct contact with a family member or medical professional when they experienced an immediate health concern of their own. The *deferred* needs of adolescents in our sample were congruent with Krikelas's model of information

gathering, as participants sought to satisfy their information needs or to accrue knowledge for later use. Our participants frequently used mobile technology to access the Internet as a primary source of information. If their information need was not satisfied then they would rely on direct contact with teachers, family, or medical professionals. This pattern is consistent with the Krikelas model, which supports the continuation of information seeking until the information need has been adequately satisfied.

Developmentally, adolescents are in a state of differentiation but lack the knowledge necessary to make informed healthcare decisions. Thus, adolescents have a limited ability to confidently make healthcare decisions without outside support and often rely on their parents or clinicians. Moreover, our participants could not always differentiate between veracious sites and those that were not. As a result, several relied on the *majority rules* method of validation and trusted that if information was repeated on multiple sites then it was true. Group decision-making theory posits *majority rules* thinking can be effective in eliciting and integrating beliefs and preferences of individuals, making it the most popular decision rule [36].

A better understanding of the information needs of adolescents is important for designing health information technology interventions. Since adolescents are frequent users of mobile technology, designing health interventions using this medium is appropriate. The anonymity and autonomy offered by the Internet and mobile technology provide a useful platform for healthcare interventions. Mobile technology is easily accessible by adolescents, thus improving self-care and decision-making. Future mobile healthcare interventions should include links to outside/additional resources, as participants were appropriately suspicious of information gathered from the Internet and sought out validation through URL endings and source references.

Recently, studies have started to examine how children and adolescents with chronic diseases seek health information, but this is the first study assessing the health information needs of healthy adolescents and how they seek to resolve those needs. Limitations of this study include the a sample being drawn from one geographic area. Data may not be generalizable to other populations since our sample was ethnically diverse from an urban environment. An additional limitation to the findings is that our data consisted of self-reported sources, limited by what our participants reported. A final limitation of using focus group design is that there is a possibility of group think [37], especially in adolescents, where participants may express an opinion in line with the rest of the group even if it is at odds with their actual opinion.

Conclusion

While adolescents are the largest users of information technology, there remains a dearth of research on their information needs and patterns of use. With multiple potential sources of information, it is critical for healthcare providers, researchers, and innovators to understand how adolescents use technology to meet their health information needs, and in what order of preference. Understanding this process will be critical for the development of mobile health technology that adolescents find useful. Mobile technology has the opportunity to improve

health and decrease disparities in urban youth through innovation and understanding of adolescents' health information needs.

Acknowledgments

This study was funded by HEAL NY Phase 6 - Primary Care Infrastructure "A Medical Home Where Kids Live: Their School" Contract Number C024094 (Subcontract PI: R Schnall)

References

1. Covell DG, Uman GC, Manning PR. Information needs in office practice: are they being met? *Ann Intern Med.* 1985; 103(4):596–9. [PubMed: 4037559]
2. Jerome RN, et al. Information needs of clinical teams: analysis of questions received by the Clinical Informatics Consult Service. *Bull Med Libr Assoc.* 2001; 89(2):177–84. [PubMed: 11337949]
3. Liang H, Xue Y, Chase SK. Online health information seeking by people with physical disabilities due to neurological conditions. *International Journal of Medical Informatics.* 2011; 80(11):745–53. [PubMed: 21917511]
4. Longo DR, et al. Health information seeking, receipt, and use in diabetes self-management. *Annals of Family Medicine.* 2010; 8(4):334–40. [PubMed: 20644188]
5. McMillan SJ, Macias W. Strengthening the safety net for online seniors: factors influencing differences in health information seeking among older internet users. *J Health Commun.* 2008; 13(8):778–92. [PubMed: 19051113]
6. Promislow S, et al. How well does the Internet answer patients' questions about inflammatory bowel disease? *Can J Gastroenterol.* 2010; 24(11):671–7. [PubMed: 21157582]
7. Radina ME, et al. Breast cancer patients' use of health information in decision making and coping. *Cancer Nursing.* 2011; 34(5):E1–12. [PubMed: 21116176]
8. Samal L, et al. Internet health information seeking behavior and antiretroviral adherence in persons living with HIV/AIDS. *AIDS Patient Care & Stds.* 2011; 25(7):445–9. [PubMed: 21682586]
9. Ussher JM, Perz J, Gilbert E. Information needs associated with changes to sexual well-being after breast cancer. *J Adv Nurs.* 2012
10. Jee RA, et al. Evaluation and comparison of parental needs, stressors, and coping strategies in a pediatric intensive care unit. *Pediatr Crit Care Med.* 2011
11. Kagihara LE, et al. Parents' perspectives on a dental home for children with special health care needs. *Spec Care Dentist.* 2011; 31(5):170–7. [PubMed: 21950531]
12. Khoo K, et al. Health information seeking by parents in the Internet age. *Journal of Paediatrics & Child Health.* 2008; 44(7–8):419–23. [PubMed: 18564080]
13. Kilicarslan-Toruner E, Akgun-Citak E. Information-seeking behaviours and decision-making process of parents of children with cancer. *Eur J Oncol Nurs.* 2012
14. Knapp C, et al. Internet use and eHealth literacy of low-income parents whose children have special health care needs. *J Med Internet Res.* 2011; 13(3):e75. [PubMed: 21960017]
15. Korus M, et al. Exploring the information needs of adolescents and their parents throughout the kidney transplant continuum. *Prog Transplant.* 2011; 21(1):53–60. [PubMed: 21485943]
16. Sciberras E, et al. Information needs of parents of children with attention-deficit/hyperactivity disorder. *Clin Pediatr (Phila).* 2010; 49(2):150–7. [PubMed: 20080521]
17. Vaughn LM, et al. Understanding the social networks of parents of children with sickle cell disease. *J Health Care Poor Underserved.* 2011; 22(3):1014–29. [PubMed: 21841293]
18. Wahl H, et al. Health information needs of families attending the paediatric emergency department. *Arch Dis Child.* 2011; 96(4):335–9. [PubMed: 21220262]
19. Flicker S, et al. HIV-positive youth's perspectives on the Internet and e-health. *Journal of Medical Internet Research.* 2004; 6(3):e32. [PubMed: 15471758]
20. Keegan TH, et al. Unmet adolescent and young adult cancer survivors information and service needs: a population-based cancer registry study. *J Cancer Surviv.* 2012

21. Nwagwu WE. The Internet as a source of reproductive health information among adolescent girls in an urban city in Nigeria. *BMC Public Health*. 2007; 7:354. [PubMed: 18096032]
22. Rushing SC, Stephens D. Use of media technologies by Native American teens and young adults in the Pacific Northwest: exploring their utility for designing culturally appropriate technology-based health interventions. *Journal of Primary Prevention*. 2011; 32(3–4):135–45. [PubMed: 21805055]
23. Pena-Purcell N. Hispanics' use of Internet health information: an exploratory study. *Journal of the Medical Library Association*. 2008; 96(2):101–7. [PubMed: 18379664]
24. Cutilli CC. Seeking health information: what sources do your patients use? *Orthopaedic Nursing*. 2010; 29(3):214–9. [PubMed: 20505493]
25. Ettel G, et al. How do adolescents access health information? And do they ask their physicians? *The Permanente Journal*. 2012; 16(1):35–38. [PubMed: 22529757]
26. National Adolescent Health Information Center. Fact Sheet on Demographics: Adolescents. University of California, San Francisco; San Francisco, CA: 2003.
27. Committee on Future Directions for the National Healthcare Quality and Disparities Reports. Future Directions for the National Healthcare Quality and Disparities Reports. Institute of Medicine; Rockville, MD: 2010.
28. Lenhart, A., et al. Social Media and Young Adults. Pew Internet & American Life Project; 2010.
29. Militello LK, Kelly SA, Melnyk BM. Systematic Review of Text-Messaging Interventions to Promote Healthy Behaviors in Pediatric and Adolescent Populations: Implications for Clinical Practice and Research. *Worldviews on Evidence-Based Nursing*. 2012; 9(2):66–77. [PubMed: 22268959]
30. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992; 30(6):473–83. [PubMed: 1593914]
31. McHorney CA, et al. The MOS 36-item Short-Form Health Survey (SF-36): III. Tests of data quality, scaling assumptions, and reliability across diverse patient groups. *Med Care*. 1994; 32(1):40–66. [PubMed: 8277801]
32. Ware JE Jr. SF-36 health survey update. *Spine (Phila Pa 1976)*. 2000; 25(24):3130. [PubMed: 11124729]
33. Krikelas J. Information-Seeking Behavior: Patterns and Concepts. *Drexel Library Quarterly*. 1983; 19(2):5–20.
34. Weiler A. Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory. *The Journal of Academic Librarianship*. 2004; 31(1):46–53.
35. Malterud K. Qualitative research: standards, challenges, and guidelines. *The Lancet*. 2001; 358(9280):484–488.
36. Hastie R, Kameda T. The Robust Beauty of Majority Rules in Group Decisions. *Psychological Review*. 2005; 112(2):494–508. [PubMed: 15783295]
37. Turner ME, Pratkanis AR. Twenty-Five Years of Groupthink Theory and Research: Lessons from the Evaluation of a Theory. *Organizational Behavior and Human Decision Processes*. 1998; 73(2–3):105–115. [PubMed: 9705798]

Figure 1.
Krikelas' Information Seeking Behavior Model

Figure 2.
Varied Decisions in Source Preference

Table 1

Summary of Immediate Need Utterances

Theme	Information Source	
	Direct Contact	Recorded Literature
Emergency Medical Care (ER)	<p>“Anything severe I think you should go to the doctor.”</p> <p>“I go to the doctor sometimes when I get a cold, it gets really bad and could turn to a fever fast.”</p> <p>“I wouldn’t use a medical app. You should go right to the doctor.”</p> <p>“I’d probably ask my parents to call the doctor or call the doctor myself.”</p> <p>“If it’s something major I don’t rely on the Internet.”</p> <p>“If it’s something serious I’d be notified by him right away.”</p>	<p>“I was playing basketball once and a guy sprained his arm and he said, ‘What are we going to do?’ and we got on the phone and he said, ‘Let’s go to YouTube.’”</p> <p>“My little brother dislocated his elbow...so I just Googled it... And I just popped it back into place.”</p>
Basic Medical Care (BMC)	<p>“I usually just ask my mom. That’s my best source of information right there.”</p> <p>“I ask my grandma... because she has all the remedies.”</p> <p>“She doesn’t always know the answers. If there’s something wrong, she’ll just take me to the doctor.”</p> <p>“I get some information from my dad.”</p> <p>“I don’t have anything that I have to search for. I just ask my mom to see if something’s wrong.”</p>	<p>“It depends on what I’m looking for. Say I have a problem with my knee, I’ll search how to help my knee or something.” whatever link comes up I’ll click it. Google is my best friend.”</p> <p>“If I were really sick I would be on it all the time, seeing how to make things better or things I could take”</p> <p>“I normally go the web and there’s stuff I wouldn’t want my mom to know until I’m sure about it. So I look on the web first to see if I do have like a problem or something like that, then I’ll probably tell her.”</p> <p>“When I got my belly pierced [I searched] how to know if your piercing is infected.”</p>
Reproductive Health (RH)	<p>“You’ve got to be honest.”</p> <p>“I would tell my mom first.”</p> <p>“I would go straight to the doctor. If there’s something wrong, I’m going straight to the doctor.”</p> <p>“And for good measure my mother told me.”</p> <p>“And the doctor, he handed me a book.”</p>	<p>“Say like if you catch it and you don’t want to tell nobody and you want to get information...”</p>
Diagnosis and Clarification		“Symptoms of pink eye”
Growth and Development (GD)		“They have like, Yahoo Answers. And I can see if anybody else is going through the same problems I am.”

Table 2

Summary of Deferred Need Utterances

Theme	Information Source	
	Direct Contact	Recorded Literature
Reproductive Health (RH)	<p>"If I want to, I'll talk to her [mom] about it."</p> <p>"I go to my guidance counselor because he talks a lot about that."</p>	<p>"I would read it, especially if it were about health. Because she should, especially our generation, due to the fact that we're getting sexually active and should know about HIV and AIDS and herpes. So if something pops up, I will read it."</p> <p>"Now they have train ads and the TV commercials about hepatitis. So there are already so many things that are reminding us to wrap it up, or do this or do that; so pretty much we have all that."</p>
Health Promotion and Prevention (PV)		<p>"I had poison ivy one time when I was 10 years old... and I was looking it up on my phone...because I wanted to see what the plant looked like so I would not touch it again."</p>
Diet and Exercise (DE)	<p>"I find health information by joining different sports teams. They have different ways of, like improving your health and your body."</p> <p>"My doctor, she usually will talk to me about what I should eat and what's good for me."</p>	<p>"I usually watch TV a lot, so some channels talk about your health... they talk about what should be on your plate."</p>
Basic Medical Care (BMC)	<p>"Whenever I learn something... I usually overhear people talking about it or my mom will tell me about it."</p> <p>"My mom takes me to the doctor every year and they tell her everything so I know."</p> <p>"If Mom doesn't know then I'll ask the doctor."</p> <p>"What it says on Google you can't always trust so you might want to go to the doctor."</p>	<p>"Sometimes I watch Dr. Oz, I think it's good because he explains a lot of things you need to do, like basic stuff."</p> <p>"But if I'm not too sure about anything, I kind of refer to the Internet."</p> <p>"If I can't find it on my phone I'd go to the library."</p>
Diagnosis and Clarification (DC)		<p>"I read stuff when I get bored."</p> <p>"If I needed more information I go on Google and read different documents."</p> <p>"I looked it [cholesterol] up on Yahoo actually."</p> <p>"Like if you want to know what are the symptoms of pregnancy, you can Google that and there will be websites that will tell you."</p> <p>"I've looked up something, I don't know what it's called, but you get it on the back, like when you give birth? Yeah, epidural. I looked that up for when I am older."</p>
Growth and Development (GD)	<p>"I go to my science teacher and he said to start stretching."</p>	