

High school students' perspective on the features of consumer health information websites

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Abstract

The main aim of study was to identify the primary source of health information seeking among high school students and the characteristics of quality consumer health information from their perspective. A cross sectional descriptive survey was used to conduct the study utilizing a valid questionnaire. The first source of health information seeking for most of the high school student

(79%) was the Internet rather than books, journals or family members. Majority of boys (87%) go to the Internet for pathology and definition of diseases, but the girls (82%) usually search for life style, exercise, nutrition, mental health, maturity and then general health information such as physiology, anatomy, and calculations. All of the student recognize content accuracy, and believe that involvements of information specialists in management of websites may guarantee the quality criteria of website. It is concluded that development of a quality consumer health information website is essential to meet the health information needs of students and promotion of health literacy among high school students and adolescents in Iran.

Keywords

Health literacy; Health promotion; Health information systems; Health information management; Intermediate School students

Introduction

Internet has been widely spread as an easy to use communicating and source of information tool (Ritterband et al., 2008; Coberly et al., 2012; Horga, Sweeney, 2010). Students use Internet for different reasons. One of the most important information needs of this growing community is the desire for health related questions which sometimes is obtained through invalid and inappropriate channels or neglected without getting answers and leads in deviance. For instance, socio-cultural issues and barriers might prevent adolescents from asking questions about hormone levels, sexual, physical changes and related topics. Exposure to or tendencies for high-risk behaviors such as smoking, adaptogens, digital drug and i-Dozing in cyberspace cause a propensity for information needs that require reliable information sources. Documents indicate that drug misuse, high-risk sexual behaviors, malnutrition, visual and auditory problems, communicable and infectious diseases are challenges that adolescents face with them (Centers for Disease Control and Prevention [CDC] 2004; Borzekowski, Fobil & Asante, 2006). In this regard, lower level of health literacy is associated with high-risk behaviors such as smoking unsafe sex, violence and inappropriate social manners as well as general health (Grant et al. 2012);

A variety of factors play role in health literacy level of students including family, friends, teachers, policy makers, healthcare providers and mass media such as TV, magazines, websites, social networks (Kochaki 2011; Duane, 2002; Judith, 2005). Sectional passive trainings which are provided directly by schools' health educators (Ilika, 2002; Kaveh, 2000; Jolaei, 2004) or through TV programs, have temporal and short-term effect on target group and do not transform society's fundamental knowledge including students' community (Fox & Rainie, 2002) But, active information seeking and informed access to an information source which is available anywhere and anytime; for example, health information on the web, could improve both the

potential (learning and recognizing individual and social healthy behavior) and actual health information literacy of students. Therefore, it seems necessary to identify and evaluate information needs, interests and preferences of the students in applying web-based information formats and training models.

It could also be helpful in web designing to deliver reliable health information to high school students whom are a major part of youth community in the countries. Unfortunately, the evidence reveal that knowledge-based planning and policy making are not conducted in Iran but in other countries like the United States, National Health Education Standards has emphasized that anybody should be able to find, comprehend and use web-based health information and services (National Health Education Standards [NHES], 2015). In addition, it is notable to mention that health information websites like MedlinePlus as a trusted source which is developed by National Library of Medicine has had a great impression in delivering health information to the public.

Literature review signifies that students' health information has always been the center of attention in several studies. A study on the access to health information in the United States showed that a high percentage of 15-24 years age group employ Internet to obtain health information (Rideout, 2001). Additional documents indicated that the first source to gain access to health information for adolescents and young adults (aged 11-19 years) in the United States is the Internet (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005). Ghaddar et al. (2012) studied the relationship between using a reputable health information source like MedlinePlus with better health literacy level among 261 students in 14-20 years age group in Texas. In this research, health information on MedlinePlus website was added to the curriculum of the students. The results proved that health literacy score was increased in 95% of the students after employing health information on MedlinePlus (Ghaddar, Valerio, Garcia, Mlis, & Hansen, 2012).

In terms of identifying and examining the information needs of adolescents and applying communication and information technology, Schnall and colleagues (2013) conducted a study in Colombia, although the sample size of their study was small but it revealed that adolescents were mostly interested in health information about diet and exercise. (Schnall et al, 2013) In general, studies represent that adolescents in developed countries like US, Canada and UK use Internet as a source of health information to obtain access to a wide range of health issues. (Rideout 2001; Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005; Borzekowski & Rickert, 2001; Skinner, Biscope, Poland, & Goldberg, 2003) In developing countries unlike developed countries, limited studies have been carried out about using Internet by adolescents to acquire health information. For instance, Borzekowski, Fobil and Asante (2006) evaluated the access and use of online tools pertaining to health information among students and non-students (aged 15-18 years) in Accra, the capital of Ghana, using questionnaire. They found that the half of the study population use Internet to get health information (Borzekowski, Fobil, & Asante, 2006). Ybarra and colleagues

who performed a survey among students aged 12 to 18 years in five schools in Mbarara in Uganda, demonstrated that one-third of the study population use Internet to search for health information. (Ybarra, Emenyonu, Nansera, Kiwanuka, & Bangsberg, 2008)

Literature review of Iran's studies showed that no research has been performed regarding assessing high school students' health information needs and accessing channels, especially using Internet to get answers to their health information needs. Previous studies have evaluated the level of health information literacy among elementary students and the impact of schools' health educators (Sobhaniyan & Mosallnejad, 2003; Kaveh, 2000, Jolaei, Mehrdad, Bohrani, & Kolband, 2004). Thus, answers to questions like: "what are the main information needs of Iranian adolescents? Do Iranian adolescents use Internet to get answers to their health questions? What type of health information should be provided if we consider Internet as a health information tool for adolescents?" were not found in the literature. Consequently, it provoked us to conduct the present study. The main object of this study is analyzing various types of health information needs of high school students and the degree of using web to obtain answers to health information needs in Iran. The results of this study could help targeted policy-making and planning regarding promoting the level of adolescents' health literacy through Internet as an easy and accessible source of general health information.

Materials and Methods

This is a quantitative cross-sectional study (2013-2014) and its population was high school students. Since the main object of this study is determining the types of health information that high school students expect to obtain through web, self-expressing questionnaire was identified as the best method.

Data collection

Data collection instrument was a health information surveying questionnaire that was designed applying literature review, information needs and the preferences of health information website end-users. It involves questions in three categories as follows: demographic, open and closed questions. In closed questions, items were designed according to the published information in the articles. Open question, (one question), was developed to evaluate the opinion of respondents about their sources regarding finding answers to the health questions. In order to determine questionnaire content validity, Content Validity Ratio (CVR) (Lawshe, 1975) and Content Validity Index (CVI) were employed and questionnaire content was presented to 10 experts. The experts were asked to rate questions in three categories: essential, useful but not essential and not necessary. According to CVR formula, the calculated number was greater (except one question) than Lawshe's table number (0.62). Therefore, it confirmed that questions are significantly essential and important. The question which did not achieve the required score was removed.

According to the results, CVI was calculated as follows: relevance 0.94, simplicity 0.9 and clarity 0.96. To assess instrument reliability and internal stability, pre-test, test-retest and Cronbach's (alpha) were applied. To achieve this purpose, 15 respondents filled out the questionnaire twice in a two-week period. The questionnaire reliability was calculated higher than 0.7 using Cronbach's (alpha) which proved its stability. Collected data were analyzed using SPSS v.20.

Data Collection Sampling

Research population was comprised of boys' and girls' high school students. Sampling was calculated 200 using factor analyses. The questionnaire was distributed and collected on the same day among high school students. Inclusion criteria were willingness to participate in the study, being student and Internet user. Filling out the questionnaire was considered as informed consent to participate in the study. At first, students were asked if they had ever used Internet to seek health information or not. If they answered "yes", they could fill out the questionnaire. An announcement was put on the bulletin board for voluntarily participation in the study.

Ethics

Respondents were asked to answer the questions with informed consent. They were assured that the provided information will only be used for research purposes. For privacy concerns, writing names of the participants and schools were optional.

Findings

A total number of 200 students (100 participants from boys' high schools and 100 participants from girls' high schools) filled out the questionnaire. Demographic information of the participants is shown in Table 1. The findings of the study revealed that among all the sources used by the individuals to get answers to health questions, Internet was the most used (79%) and seniors and informed people, books and magazines were the least used sources, respectively. Furthermore, female students had more intention than male students to use various sources of health information and males employed Internet more than females to obtain answers to health questions (Figure 1).

Table 1. Demographic information of the participants in the study

	Group 1	Group 2
Age	15-16 (100%, n = 100)	17-18 (100%, n = 100)
Sex	Female (100 %, n = 100)	Male (100 %, n = 100)
Field of study	-	Math

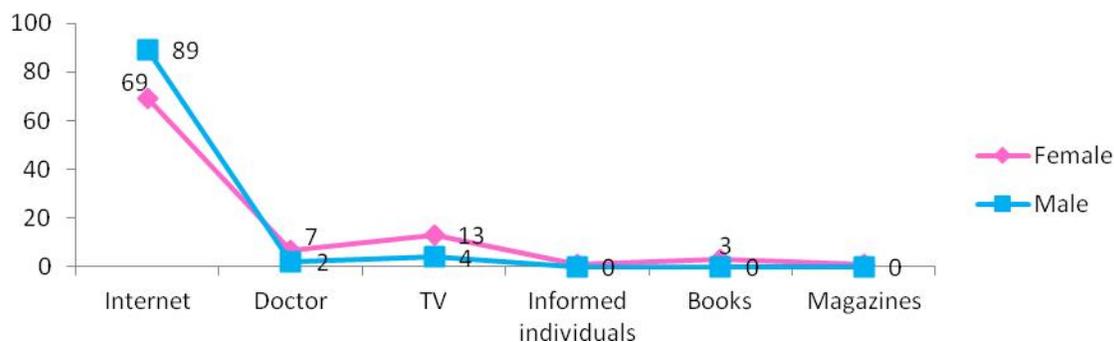


Figure 1. Resources used by students to get answers to health questions

High school students had more tendencies to search for information about diseases, causes and treatment in Internet and searching about techniques and diagnostic tests were in the lowest rank (Table 2). The results showed that male students searched information about diseases, causes, treatment and general medical information. Meanwhile, female students tended to search information about healthy lifestyle (Table 2).

Table 2. Type and content of health information searched by students on the Internet

Variables	Indicators	Frequency	Percent	Total Frequency	Total percent
Information about diseases, causes and treatment	Female	83	83	170	85
	Male	87	87		
Medication Information	Female	74	74	146	73
	Male	72	72		
Information about techniques and diagnostic tests, e.g. Blood sugar test, etc.	Female	71	71	130	65
	Male	59	59		
Information about healthy lifestyle, e.g. exercise, diet, mental health, etc.	Female	82	82	156	78
	Male	74	74		
General medical information (physiology, anatomy, calculating BMI, herbal medicine, Islamic medicine, etc	Female	69	69	141	70.5
	Male	72	72		

The preferred format of information included PDF, video, interactive games, cell phone compatible, educational animations and audio. Educational slides and Word format were the least favorite format.

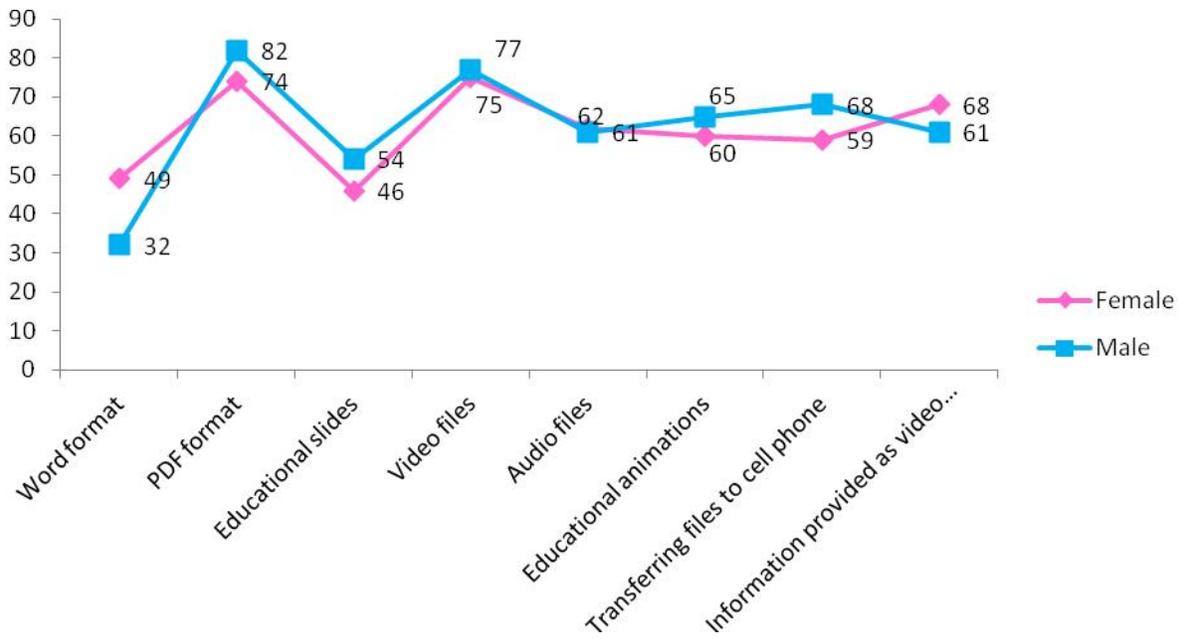


Figure 2. Preferred format of information from high school students' viewpoint

students' viewpoint about trusting criteria about the contents of health information websites indicated that content accuracy, authenticity (reference to valid sources), website administrating and its content control by doctors or highly informed experts with a frequency of 165 (82.9%) had the highest importance (Table 3). More than 70% of the respondents believed that criteria like authors' profile, information about the creator or the organization running the website and frequent update of the website play a major role in trusting to the website (Table 3). Moreover, regarding accessing to health information website, majority of the students (75.5%) prefer it as an independent website, not a subset (Table 4).

Table 3. Students' viewpoint about the reliability and trustworthy criteria towards the content of health information website

Variables	Indicators	Frequency	Percent	Total frequency	Total percent
Content accuracy and authenticity (reference to valid sources)	Female	78	78.8	165	82.9
	Male	87	87		
Frequent update of the website	Female	67	67.7	140	70.4
	Male	73	73		
Available information about the creator or the organization running the website (provider of the website)	Female	71	71.7	144	72.4
	Male	73	73		

Website administrating and its content control by doctors or highly informed experts	Female	85	85.9	165	82.9
	Male	80	80		
Authors' profile	Female	74	74.7	146	73.4
	Male	72	72		
Privacy and confidentiality of website users' personal information	Female	63	63.6	121	60.8
	Male	58	58		
Recommended by doctor	Female	60	60.6	110	55.3
	Male	50	50		

Table 4. Students' viewpoint in terms of accessing to health information website

Variables	Indicators	Frequency	Percent	Total frequency	Total percent
	Male	77	77		
Linked by University of Medical Sciences website	Female	26	26	49	24.5
	Male	23	23		

Evaluating the significance of the variables showed that there was only significant relationship between sex variable and using Internet, Doc/Docs (MS-Word) format, ability to print search results and link to valid websites. There was no significant relationship between other variables. (Table 5)

Table 5. Frequency distribution and significance level of variables

Variables	Female	Male	Mean	Significance level (p-value)
Using Internet	0.69	0.89	0.79	0.001
Doc/Docs format	0.49	0.32	40.5	0.014
Printability of results	0.50	0.66	0.58	0.022
Link to accurate websites	0.63	0.77	0.70	0.031

Discussion

The main focus of study was to identify whether the primary source of health information seeking among high school students is internet and what are the characteristics of quality consumer health information from their perspective.

The results of current study indicated that the most important information source for high school students in Iran is the Internet and the majority of the students (aged 15-18 years) use Internet to get answers for their health questions. Information sources such as informed individuals, books

and magazines are rarely used. The study found statistically significant differences between use of Internet and other channels for answering health related information needs among high school students ($P=1$). Among the previous studies also a similar pattern were observed. Rideout (2001) found that 75% of the adolescents (aged 15-24 years) in the United States use Internet to access to health information. (Rideout, 2001) Gray and colleagues (2005) proved that the first source of health information for adolescents and young adults (aged 11-19 years) in the United States is Internet. (Gray, Klein, Noyce, Sesselberg, & Cantrill, 2005) In a study by Borzekowski and colleagues (2006), which was conducted in Accra, the capital of Ghana, 53% of the adolescents (aged 15-18 years) used Internet to obtain health information. (Borzekowski, Fobil & Asante, 2006) But another study carried out by Ybarra and colleagues (2008), among students (aged 12-18 years) in Uganda and showed that only 38% of the study population use Internet to search health information. (Ybarra, Emenyonu, Nansera, Kiwanuka, & Bangsberg, 2008). It seems that the variations in the results of the mentioned studies are associated with lower knowledge level and access to the Internet in developing countries. Unlike the previous studies (Ghaddar, Valerio, Garcia, Mlis, & Hansen, 2012), the results of current study found that females have more tendency than boys to use diverse information sources and use other sources than the Internet to get answers to health issues. Meanwhile, the majority of males use Internet just to look up answers to health problems.

The results regarding the type of information needs and the content of health information searched by students in Internet revealed that majority of high school students search information about causes and treatment of diseases, and healthy lifestyle (exercise, nutrition, mental health, puberty, etc) and then general medical information (physiology, anatomy, calculating height and weight, etc), respectively. This is in consistence with some of findings of a recent study conducted by Okoniewski et al. (2014). They recognized eighth b categories (themes) of health information needs for 14-18 year students from different ethnics in US; and the main theme sought by adolescents was basic medical information and triage about treatments. Okoniewski, Rodrigue, Lee, Schnall, & Low, 2014) The study performed by Schnall and colleagues (2013) in Colombia revealed that adolescents (aged 13-18 years) were more interested in health information about diet and exercise (Schnall et al., 20013).

Borzekowski and Rickert (2001) indicated that the majority of adolescents (average age 15 years old) employ Internet to acquire information about sexual information (pregnancy prevention, pregnancy, etc), physical fitness, exercise and STD. (Borzekowski & Rickert, 2001) Oh and Kim (2014) compared two groups of American and Korean students (aged 18-24 years) and concluded that American students are likely to search information about medication, STD, alcohol and drugs. On the other hand, Korean students were more interested in physical fitness and diet. The results of this study showed that both groups of American and Korean students had more interests in physical fitness, nutrition/diet and information about mental health. (Oh & Kim,

2014) These distinctions could be the result of diversity of cultures and health care policy-making in different countries.

Sex of participants was not dominant and effective in the use of Internet but the content of health information needs affected by the gender. The findings indicated that female students have more tendencies to search about healthy lifestyle (exercise, nutrition, mental health, puberty, etc) and male students are more interested in information about diseases and treatments. Ekberg & colleagues (2013) were surveyed Sweden adolescents' health information needs in order to establish an appropriate online system for promotion of health literacy. Their research results also demonstrated that the first priority for the participants information about healthy life style, sport, exercise, diet and nutrition as same as girls priority health information need in current study. (Ekberg et al. 2013)

This study found that there is a statistically significant difference between students' preferences in format of information they may obtain from the Internet. Students were not interested in using Doc/Docs (Word) format but the HTML and the PDF. This might be due to easy use of PDF, since it is opened and viewed easily and the content is not modified but Word format is dependent on Microsoft software package. Furthermore, the newer formats of this software cannot be opened and viewed by old versions of Microsoft software.

More than two-thirds of students preferred interactive games (video games), the possibility of transferring files to cell phone, educational animations and audio files to get the information from health information website. The type of information format and the ability to print criteria were the favorite features of health information website which were statistically significant. This probably implies that paper consumption remains to be high among adolescents and although they prefer web and Internet to obtain information, but they consider printed version essential. This could also indicate that Iran's society has not left printing era behind. Moreover, it could demonstrate that most of the students do not own a personal computer and need the printed version of the accessed information.

The results of the study showed that high school students are well aware of the assessing criteria regarding information sources on the web. They know what content validity is and content provider's credibility affect information accuracy. The majority of the students considered accuracy of content and authenticity of information provider alongside website administration by physicians and/or information experts important for reliability of health information website. They believed that the profile of the administrator and content producer should be accessible. Ma and Latham (2013) also found that relevancy, authenticity, accuracy, and content validity are important criteria for bachelor students' of California University in evaluating health information website. (Ma & Latham, 2013)

In the bottom line high school students trust and rely on the Internet comparing to other sources of information to get access to health information. They prefer health information to be available as PDF, video format and the ability to transfer to cell phones. Meanwhile, there are no Persian health websites offering integrated, accurate and comprehensive information about diseases, treatments, drugs, lifestyle and information needed for puberty of adolescents.

Conclusion

Based on the findings of the current study, it is concluded that establishing an integrated and easy to understand and comfortable for access health information website is essential to meet the health information needs of adolescents and high school students in Iran. Based upon the high school students' experience and perspective, a recognized website for consumer health information must include features like interactivity, independence, and reliability. Also diversity in the formats of the offered information such as interactive games, simple PDF files and animation need to be considered in supplying the contents in the website. The information needs and preferences of girls and boys in regard with health information are different, therefore comprehensive consumer health information for high school students and adolescents must provide appropriate contents as well as high-tech features to meet the preferences of young generation of the society.

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