HEALTH INFORMATION SEEKING BEHAVIOR (HISB) AMONG THE UNIVERSITY STUDENTS

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Article Info	ABSTRACT
Article type: Research	Introduction: Understanding the information seeking behavior of individuals, especially students who are more likely to seek health information than other people, can be seen as an opportunity to provide resources to improve lifestyle or prevent possible health threatening behaviors among students. The main objective of this research is to determine the HISB among students of Tabriz University of Medical Sciences (TUOMS).
Article History: Received: 2019-06-16 Revised: - Accepted: 2019-07-08	Material and Methods: This descriptive cross-sectional study was carried out at TUOMS among students in 2017 through using simple random sampling method.
* Corresponding author: Hossain Aghayari PhD candidate of Health Information Management, Department of Health Information Technology, School of Management and Medical Informatics, Tabriz University of Medical Sciences, Tabriz, Iran. Email: aghayarih@tbzmed.ac.ir	Results: The results showed that most of the students had experience of searching information about prevention of illness (47.8%) and general health knowledge (45.1%). The common outcomes of accessing health information by students were their decision to visit the physician (68.2%) and relieving their concern about their condition or illness (60.2%).
	Conclusion: The results of this study indicate that most students are searching for information on diet, physical activity and physical health.
	Keywords: Health Information, Information Seeking Behavior, Health Information Seeking Behavior, Iran.

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INTRODUCTION

Nowadays health consumers do consume not only health services but also health information. They do search for health information for many reasons [1]. Importance of health information seeking behavior and effectiveness of services providing health information resources cannot be underestimated as there are the unpredictable growth of information and innovations related to the storage, organization, retrieval and access to information in health domain [2].

From Spink and Cole's view, finding information is a complex information and communication activity that requires access to various information resources in order to solve personal, social and

occupational problems. An overview of research in the field of information needs and information seeking behavior shows that the most of studies have focused been on specific user groups in recent years. Students are among these groups that understanding their information seeking behavior is of great important [3]. Having access to the relevant health information will reduce their anxiety in dealing with health issues and consequent stressful situations, increase their abilities to overcome risk factors, contribute to faster recovery, increase self-care capabilities and will lead to more active participation in decision making processes regarding their health.

However, the increasing amount of publications and the development of scientific fields have created serious problems in accessing relevant information.

The main problem is how one can identify the subject from a wide range of topics. Information seeking is a skill that can be used to access the most useful and relevant information from the bulk of available information.

Finding information is the purpose of information seeking behavior, which is traditionally the subject of studies in the field of information. Searching for information is the result of a secondary need that comes from a person's more basic need, created by the roles of his life or the environment to which he belongs. To begin the search for information, one must overcome personal, interpersonal or environmental barriers first. In addition, active information search is a behavior in which, individuals perform targeted searches -that come from one of their needs- to obtain information. A similar definition has been made in which information seeking is "a targeted achievement of information through information carriers" [4].

Several models that describe various types of information search activities have been presented. The issues most likely to be discussed include Dravin's Structural Thinking Theory (1992), Ellis Information Search Model (1989 and 1993), the Kuhlthaus Information Search Engine model (ISP) (1994), and Wilson's model of information behavior, the search model and revised information behavior model (Wilson & Walsh, 1996, Wilson, 1999). In addition, the McKenzie (2003) model of information search is also noteworthy [4].

One type of information that has always been popular for searching is health information that directly affects the quality of life. Health information includes a wide range of information that can be effective in making decisions about individual and social health. As accurate and valid information in the field of health is useful and constructive, receiving inaccurate or even incomplete information can exacerbate the health of the individual. High amount of health information that a person receives through the Internet and other media outlets, and the misconceptions about them, make the issue even more complicated. This is where the level of health literacy matters; which means how much each individual has been able to assess the credibility of the information and to understand the information content for proper use. Information overloading can lead to confusion among individuals interpreting them [5]. The health information seeking behavior (HISB) indicates how to search, find and use disease-related information, information about health-threatening factors and activities related to health promotion by an individual [5]. It also includes how to deal with health threats, participate in medical decision making, and change behavior as a result of finding information. HISB is typically a strategy focused on coping with the problem and resolving it

[6].

The World Health Organization has defined patient empowerment as "a process through which people gain more control over their health decisions." Empowerment of the patient has been seen as a practical and ethical necessity: a means to change health behaviors, to control health care costs, to improve the quality of care, to ensure continuity of care, to improve patient experience and to enable community decision making in a way that Patients can fully participate in their health care decisions. Having access to high-quality information is a prerequisite for population and patient's empowerment [7]. Since information seeking behavior is a psychological phenomenon, like other psychological phenomena, it is affected by underlying, individual and environmental characteristics. The underlying characteristics of each person influence their information seeking behavior and, consequently, the effectiveness of his health control [5]. In addition, the notion of information needs can be divided into "information demands (desires)" and "information needs". The difference between information needs and information demands has been widely discussed by information experts.

Information need is "the information that individuals ought to have to do their job effectively, solve a problem satisfactorily or pursue a hobby or interest happily". Information demand is a request for an item of information believed to be wanted. When a user starts to seek information he/she is likely to meet an information professional and interact with an information system, source or intermediary [8]. Usually, for designers of information systems, the question is: what are the information needs of users? And, what is their information seeking behavior? Informational systems cannot be designed in the right way without a clear understanding of what users need or want to know, how they search for information and how they evaluate information they find. Obviously, the key to success in the transmission of information is, to some degree, dependent on the identification of the information needs of users [9].

The results of studies clearly show that information seeking behavior, like any other behavior, is the result of complex interactions. "Internal" and "external" factors affect the behavior of information seeking in individuals, which can be categorized in the following main factors:

Individual factors: such as experience, knowledge, information literacy and computer skills, information needs, expectations, age, gender, intelligence, individual characteristics, personality, sentiment and motivation.

System related factors: such as the user interface

page, search capabilities, indexing and abstracting methods, the way information is highlighted (presented), information display, the existence of guides and other display variables.

Social and environmental factors: such as demographic factors, social groups, cultural and economic factors, rules and regulations governing the flow of information, occupation.

Information-related factors: such as document type, file type and size, information structure, how to access information source.

With proper knowledge of these factors and controlling them, we can often lead the information seeking behaviors of the searcher to specific paths [9].

One of the most effective efforts to find out the success of the searchers in data retrieval and identifying their problems is to get to know the process of individuals' behavior to retrieve information to arrive at an appropriate response. The process of user activity from the beginning of the search to the desired result in information channels includes several stages, which form information seeking patterns can be formed.

To date many studies have looked at the factors influencing health information seeking behavior. Some of these studies can be found in the researches by Okhovati et al. [1], Pálsdóttir [4], Medlock et al. [7], Yari and Ahmadi [10], Habibi et al. [11], Kahouei et al. [12], Zare-Farashbandi et al. [5], Mahmoudi and Taheri [13], Bakar [14], Zhang [15] and Harris et al. [16].

In the current research, students were surveyed as a community which usually search for information more than other people and they were encountered with questions about health information search resources, health information types, student skills, and health information barriers. Understanding the information seeking behavior of individuals, especially students who are more likely to seek health information than other people, can be seen as an opportunity to provide resources or health information to improve lifestyle or prevent possible health threatening behaviors among students. The main objective of this research is to determine the health information seeking behavior among students of Tabriz University of Medical Sciences. The specific objectives of this study were to determine self-assessment of students about their skill in acquiring and using health information sources, reasons for use of health information among students, information sources used to have access to health information among students, preferred device to search for health information and the type of health information that students are searching for. The behavior of students after having access to resources was also examined.

MATERIALS AND METHODS

This research is a descriptive, analytical and cross-sectional study conducted in 2017 in Tabriz University of Medical Sciences. The research community included all the undergraduate, and postgraduate students. Total number of the study population was determined based the statistics obtained from the educational deputy of Tabriz University of Medical Sciences in terms of different schools. The sample size of study was computed using the following Cochran formula [17] and the sample size obtained for the study was 350.

$$n = \frac{\frac{z^2 pq}{d^2}}{1 + \frac{1}{N} \left(\frac{z^2 pq}{d^2} - 1 \right)} \quad (1)$$

In this study, random stratified sampling method was used so that each faculty was considered as a cluster and samples were randomly selected among the clusters. A researcher-made questionnaire was used to collect the data. The questionnaire included demographic variables such as age, gender, educational level, field of study, faculty and having digital devices, and variables such as search skills, health information search reasons, information retrieval sources, information search tools, type of health information, health information content, barriers and search benefits and search results. The questionnaire consists of 24 questions (5 point Likert scale) in 12 aspects and some yes-no questions.

The content and structural validity of the questionnaire of health information seeking behavior of students was confirmed by experts of health information management and medical librarianship, and its reliability has been confirmed in a pilot study with a Cronbach's alpha of 0.75. Researchers distributed questionnaires to the students and described in person the purpose of the research and instructed the students on how to complete it.

RESULTS

Basic characteristics of the subjects

259 out of 350 questionnaires were fully completed by participants (response rate=74%). The inclusion criteria for the students to be entered in the research were as follows: they must have passed at least one semester in the university and they must have given consent to participate in the research. The age range of subjects was between 18 and 40 years old with an average of 23.11 (standard deviation of 3.06 years). 57.9% of students were male students (150) and 42.1% were female

students (109). About fifty percent of the subjects were students of undergraduate degree while 22.8 percent of them were studying in a master's degree and 27.4% were students of doctorate degree.

Devices, language and content type

As Fig 1 illustrates the majority of respondents had cellphones (95.5%), personal computers (73.7%), laptops (72.6%), and (25.5%) tablets. Among the facilities and equipment used to search for health information, cellphones with 89.9% and personal computers with 59.3% were the most used devices for health information search among students. Almost half of the students (49%) use Farsi language, 16.3% use English and 33.9% use both English and Farsi to search for their health information. The most informational content of students was textual (83.9%) and then imagery (57.4%), video (51.2%) and finally audio (16%).

Students' self-assessments of the required skills

During the survey, students were asked to rate their skills related to health information seeking behavior. Average self-assessment score for computer skills was obtained higher than moderate (76.8 %). When the students asked about their skills on accessing health information using the Internet, the use of health databases and searching health information, the average scores were 3.75, 3.23 and 3.39 respectively. Average score of 3.39 were obtained in the skill of seeking health information (82%).

The highest score for the benefits of the Internet searching compared with other methods was obtained for the easier access to the health information (4.16) and the lowest score was achieved for the availability of additional links (3.82).

In response to the question on the type of information searched by students, it was revealed that more than 75% of students had the experience of searching information for healthy nutrition (78.2%), and physical activity and physical health (71.8%), medical prescription side effects (65.2%), drug instructions (63.4%), instructions for medication use (60.2%), and therapy-treatment risks and complications (60%). And the lowest amount of searched health information by the students was related to drug addiction and its treatment (22.8%) and traditional medicine (30.2%).

In response to the question of what participants did after finding health information they sought, it was found that 68.2% of the participants decided to visit physician, 60.2% felt the relief of their anxiety, 53.5% of them got interested in changing their diet and 19.8% of the participants reported that they have decided to change their medication without

consulting their doctor. Summary of all above mentioned descriptive findings are presented in Fig. 1.

Differences in information seeking behavior according to different variables

As Table 1 shows the health information seeking behavior of students was evaluated in 4 dimensions including 35 components. Then the association among these components and gender, educational level and age was assessed. The dimension of access source to health information with 12 components, the dimension of health information seeking with 5 components, the dimension of health information reliability with 12 components and the dimension of obstacles in health information seeking with 6 components were investigated.

As it is shown in Table 1, there were no significant differences between men and women in the components of reasons for seeking health information as well as the obstacles of searching for health information. Also there was no significant difference between the components of the health information seeking obstacles and the educational level of the students. Similarly, Pearson correlation coefficient showed no significant difference between age and source of access to health information, reasons for seeking health information, the level of trust on health information and health information seeking obstacles ($P < 0.05$).

Mann-Whitney test showed that there was only a significant difference between men and women in terms of family and friends as the source of health information ($P < 0.02$). Majority of the students of Tabriz University of Medical Sciences had used the Internet (92.3%), followed by the people with the same illness (75.6%), direct communication with the physician (69.1%), family and friends (65.1%) and television (61.7%) as the main sources to seek health information. The source with the least usage among the students was radio podcasts (19.6%).

As the result of Mann-Whitney test revealed in the component of having direct access to a physician, there was a significant difference between men and women in trusting health information ($P < 0.01$).

Students showed the highest degree of trust to having direct access to a physician, the Internet, and the people with similar illnesses, with an average score of 3.79, 3.48 and 3.42 respectively. The lowest degree of trust was shown to belong to the radio podcasts with average score of 2.72.

Table 1 represents more details of significant difference (based on Kruskal-Wallis test) observed among some components of access source of the health information, reasons for seeking health information as well as the reliability of health information with the educational levels of students.

Fig 1: Devices, language and content type

Table 1: Comparison of four dimensions of health information seeking behavior with gender and educational status of students of Tabriz University of Medical Sciences; 2017.

Dimensions	Component	P- value Mann-Whitney	P- value Kruskal Wallis
		Gender	Educational status
Source of access to health information	Pharmacy	0.32	0.00
	Television	0.22	0.00
	Family and Friends	0.02	0.48
	Direct access to a physician	0.87	0.17
	Brochures in physicians' offices	0.18	0.46
	Radio podcasts	0.2	0.23
	Newspapers and magazines	0.85	0.43
	Health magazines	0.67	0.45
	Presentations and health conferences	0.44	0.9
	Internet (health databases, forums, mobile apps)	0.65	0.48
	Experienced people with the same illness	0.07	0.06
	Library resources	0.93	0.42
The reason for seeking health information	Prevention of diseases	0.10	0.01
	General health knowledge	0.42	0.03
	Diagnosis of signs and symptoms	0.55	0.01
	health Management	0.07	0.07
	Answering specific health questions	0.23	0.21
Reliability of health information	Direct access to a physician	0.01	0.08
	Pharmacy	0.09	0.00
	Television	0.98	0.01
	Brochures in physicians' offices	0.39	0.34
	Radio podcasts	0.98	0.12
	Newspapers and magazines	0.23	0.16
	Health magazines	0.29	0.31
	Family and Friends	0.21	0.19
	Presentations and health conferences	0.26	0.79
	Internet (health databases, forums, mobile apps)	0.15	0.21
	Experienced people with the same illness	0.77	0.27
	Library resources	0.47	0.32
Obstacles of health information seeking	Time consuming access to information	0.44	0.62
	Lack of access to health information resources	0.91	0.97
	Lack of knowledge to use the services	0.32	0.72
	Lack of trust in health information resources	0.15	0.38
	Lack of skill in seeking health information	0.8	0.78
	Monetary resources	0.16	0.48

DISCUSSION

Important basic characteristics observed in the health information seeking behavior of the students was related to the considerable use of English language used for the search. This might be attributed to the availability of more information sources in English language or due to the students' perception on high trust ability of English information sources compared with Farsi language.

According to the findings of the Yoon study [18] entitled "Internet use by international graduate students in the USA seeking health information", Korean graduate students sought health information using Korean and English sources. They used Korean web search engines to find Korean websites. Yoon's study [18] suggests that despite the relatively high skill of post-graduate students in understanding English, these students are faced with language barriers in finding and understanding health information. This differs from the result of our research.

Among the tools and equipment used to seek health information, students had mostly used cellphones and computers (including PCs and Laptops). This reflects the high penetration of information technologies particularly cellphones among the university students [19]. The study by Ajuwon [19], entitled "Computer and internet use by first year clinical and nursing students in a Nigerian teaching hospital", showed that, in general, only 42.6 percent of students could use computers, and more than half of medical students (58%) have computer literacy. Also, the study done by Boruff [20] entitled "Mobile devices in medicine: a survey of how medical students, residents, and faculty use smartphones and other mobile devices to find information", showed that medical students use cellphones to search for information about narcotic drugs, doing clinical calculations and taking notes. However, a significant proportion of participants in this study used cellphones to search journal articles. The present study also revealed that, among students of Tabriz University of Medical Sciences, cellphones and computers are used more than other tools to search health information.

In addition in terms of their self-assessment, students' computer skills the results of this study are not consistent with the study of Ajuwon [19], so that in the present study, students had evaluated themselves as highly skilled users of computers.

Findings on the type of information that were searched by the students showed that, students carried out majority of searches about nutrition, physical activity and physical health, medical prescription side effects, drug instructions, therapy-treatment risks and complications. Also, the least searches were done about addiction, its treatment

and traditional medicine. Yoon study [18], also emphasize that the commonly used health information is about fitness, exercise, diet, nutrition, and medications. Generally speaking, students are more likely to improve their lifestyles.

Findings on the response of participants after seeking health information suggest that most participants decide to visit a physician after they found the health information they sought. Moreover, they reported the behaviors such as an anxiety reduction, diet change and decision to change their medication without consulting their doctor. These findings are comparable with the responses reported in the study of Lambert [6], entitled "health information—seeking behavior" and it has highlighted the response of health information seekers as following: (A) cognitive outcomes such as increased knowledge, informed decision making, increased understanding of control and coping; (B) Behavioral outcomes such as increasing self-care abilities and adherence to treatment, and changing behavior in health; (C) physical results, such as increasing the physical quality of life; and (d) emotional outcomes, including reducing anxiety, fear and discomfort, and increasing hope and empowerment. It was also found in the findings of Medlock et al. [7] that elderly people decided to meet a physician to fully understand their health status after finding health information about their conditions.

Analytical section

There was a significant difference in the component of obtaining health information from family members between men and woman. In the study by Escoffery and et al. [21] entitled "Internet use for health information among college students", it was mentioned the difference in using internet as the source of access to health information among men and women. They had reported similar difference in terms of experience level of the informants. Studies have shown that women ask more questions than men and therefore receive more health information, and majority of women use the Internet to access health information [21]. While the results of our study revealed that women sought and received most of their health information from their family members. This might be attributed to the cultural differences among our society and needs to be investigated further.

As the results showed the perceived reliability of health information received directly from a physician was significantly different between men and women, so that its average score among women was higher than that among men. In fact, the percentage of the women who had reported greater trust to the information received from a physician was higher than that of the men. This is probably

due to differences in health issues between these two groups. Contrary to the results of this study, Kiley [22] in his study, "consumer health information seeking on the Internet: the state of the art" points out that women tend to use the Internet more than men to access healthcare sites and receive health information as a consequence of their role in the family's health care.

In the study by Kahouei et al. [12] entitled "Use of information resources for clinical decisions by nurses and nursing students, and its barriers after introducing information technology", it was found that the lack of belief in evidence-based performance and lack of skill in using the library were two important barriers to searching by the students. The inability to find appropriate articles, the difficulty of understanding scientific texts, and the lack of access to scientific texts in clinical settings revealed a significant difference between nurses and nursing students. However, in our study there was not any of the factors mentioned in the studies of Kahouei et al. [12] as barriers to access to health information, and time consuming processes of access to information as well as the lack of access to information resources were determined as barriers to information access by the university students in Tabriz University of Medical Sciences. In order to overcome the barriers related to time-consuming access to health information and lack of access to information resources, it seems that authorities of the University of Medical Sciences should take steps to provide high-speed internet and purchase all databases providing health information.

The study of the components of access to health information with students' educational level showed that the component of obtaining health information from pharmacy and television between Ph.D, Master and Bachelor degrees is significant and the average score of the component of obtaining health information from the pharmacy in Master students is lower than the other two groups. Also, the average score of receiving health information from television at doctoral level is lower than the other two groups. This is probably due to time shortage of Ph.D students to view various TV programs. Considering that these students do research work, this can be justifiable.

The students of Tabriz University of Medical Sciences used Internet, experiences of people with the same illness and friends more than other sources. Yoon's study [18] revealed that Internet is the first source of health information for the purposes of health care for postgraduate students in Korea. On the other hand, mass media and print materials are less popular among postgraduate students. Yoon's [18] findings also showed that Korean graduate students studying in US universities do not use American media, including

US television and radio programs for health information, and strongly rely on their families and friends, which is consistent with the results of this study. In short, it can be argued that access to health information is also a subject of cultural affinity.

The results of this study showed that the most common reason for the search for health information was disease prevention and general health, respectively, and the least common reason was to find a response to specific medical questions. Despite the current study, Gray [23] in "Health Information-Seeking Behavior in Adolescence: The Place of the Internet" has stated that two main reasons for seeking health information are: a) for addressing specific health concerns; and b) research topics for holding health classes.

Implications and uses

This study can be used by health educational professionals, healthcare experts and medical science directors to make appropriate and practical decisions to meet students' health information needs and provide educational and cultural guidelines. This study showed that most students use personal cellphones to search for health information. Therefore, with the knowledge of this issue, administrators and officials of the University of Medical Sciences can consider mobile-based interventions, including webinar sessions on topics of interest of students (e.g. healthy eating, physical activity, sports and health, instruction on use of medicines and their complications and risks, addiction and its treatment methods). These sessions can be on a weekly basis to improve students' health behaviors. It can also be emphasized that the lack of monitoring of published content in virtual networks, which is widely used today among people and especially students may impose irreparable harm to them, their families and society. In this issue, the intervention of regulatory agencies and authorities seems to be crucial for guaranteeing the dissemination of scientific materials and health issues in the networks and social media. Priority should be given to the standard mechanisms to generate and publish health information. However, the use of cellphones, computers and Internet technology by medical students increases the efficiency of various medical areas.

Another considerable aspect of this study which is also mentioned in the Pálsdóttir's [4] study entitled "The connection between purposive information seeking and information encountering: A study of Icelanders' health and lifestyle information seeking" is the purpose of the information seeking behavior which shows that there is a need for knowledge and, at the same time, there is a lack of knowledge among the students. The need that authorities should be

taken into consideration and fill the gap in existing knowledge. For example, health lifestyle is one of the main issues facing our current community. With the knowledge of the students' information needs that we have achieved in this study, interventions can be implemented to promote the health lifestyles of each population group, especially the student group.

As the findings suggest, the information derived from information seeking behavior leads to the participation of students in decision-making on health issues, they are involved in the awareness process of health issues, treatment processes, and post-care periods, which ultimately leads to improvements of individual, family and social health issues. With the knowledge of the types of information needed by students, the managers of the Medical University can organize the educational and cultural programs in order to access the needs according to students' information seeking behavior.

The next important and contemplative issue in this study was the decision of changing medication without consulting a doctor by nearly 20% of students, which poses these questions as an unfortunate consequence: Have they been influenced by speaking to patients with the same illness and experiences with the use of different medications? Have they made this decision through communication and trust in the experiences of students in relevant fields such as medicine and pharmacy? Is it difficult for students to pay for their health costs? Is this change in medication taken for certain diseases or pandemic diseases? And is this due to the study of health and medicine by these students and their familiarity with a variety of diseases?

CONCLUSION

The results of this study indicate that most students are searching information for nutrition diet, physical activity and physical health, as well as issues of medical prescription side effects, drug instructions, instructions for medication use, and therapy-treatment risks and complications. Given that these are some factors of healthy lifestyle [24], it is of great importance and it can be considered as an opportunity to provide correct and reliable health information resources toward enhancing their lifestyle and even preventing common health misbehaviors among students in order to promote their physical and mental health. Considering the fact that this study was conducted among students of Tabriz University of Medical Sciences, the probability that it can be generalized to other universities can be challenging.

The following questions are expected to lead further and complementary research on the information seeking behavior of university students across the

country:

- How the results of this research can be generalized to the whole university community?
- Are there necessary infrastructures to apply the results of such studies to medical universities and other educational institutions in the country?
- Do managers and authorities of the educational institutions consider any training on health information seeking behaviors?

AUTHOR'S CONTRIBUTION

All the authors approved the final version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

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