A Survey Study on the Impact of Contextual Variables on Medical Students' Use of Health Messenger Media

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ABSTRACT

Background: Medical students receive health information from various media sources and messages. Receiving health information can have a significant impact on the students' dietary habits and healthy lifestyles. This study aimed to investigate the status of medical students' use of health media and messaging, as well as the contextual variables that affect it.

Methods: A survey study was conducted on 500 students of Shiraz University of Medical Sciences during September to December 2022 that were selected by simple random sampling. The research tool was a researcher-made questionnaire consisting of 15 items and six domains on a 4-point Likert scale, with a cutting point of 2.5. The validity of the tool was assessed using the CVI and CVR index, and its reliability was confirmed by internal consistency of 0.818. Data were collected through an e-questionnaire and analyzed using one-sample t-tests, independent t-tests, and ANOVA, using SPSS v.24 software.

Results: About 40% of the participants were male. 36.4% were BS students, 27.8% MD, 20.5% MSc degree, and the remaining were in the PhD program. 73.3% of the participants were single, 43.8% lived with their parents, and 28.8% lived in the dormitory. Among the types of health media, Internet searches (M=2.950), verbal conversations (M=2.394), scientific resources (M=2.236), and official health information websites (M=2.128) had the highest means, while mass media like radio and television were the lowest. Contextual factors such as age, field of study, place of residence, marital status, and educational level had a significant effect on the students' preference ($P<0.05$), but gender had no significant effect ($P>0.05$).

Conclusion: Students have access to the Internet and receive most of their information through this medium. Monitoring the sources and content of health information websites, as well as strengthening health media literacy among students, are of great importance.

Keywords: Distance, Science, Health, Student, Medical, Messaging, Media, Preferences

Introduction

Healthy lifestyle is among the most important tasks and the main concerns of governments (1), as healthy individuals are the basis of sustainable development (2). Among them, young people and students are very important groups whose health and quality of life are of great importance, as they play an important role in managing the future of society and their healthy habits and behaviors will have a significant impact on their quality of life in future (3). Various factors affect individual and social health, but people's reactions to disease, healthcare, and health-related behaviors are generally deeply influenced by messages conveyed through the media (4).

Messages are conveyed to the recipient with various objectives such as awareness-raising, persuasion, encouragement, anger, or calmness. Message design is a systematic and purposeful process of decision-making about the content and presentation of the message. Health messages are a category of persuasive messages designed to change individuals' behavior in the health domain. They can be used to change behaviors, such as smoking, increase physical activity and adherence to treatment regimens, and report disease cases to health organizations (5). People's reactions to disease, health care, and health-related behaviors are generally deeply influenced by messages conveyed through the media (4).

Although there are various ways to obtain health information, with the emergence of Internet technology, health information is more easily and quickly accessible to the public and helps them create positive health beliefs and behaviors, which in turn strengthens their health management (6). As a new medium, the Internet can disseminate health information and knowledge through various channels. This can persuade different target groups or individuals to accept the health knowledge presented and make it possible to improve public health (7). Scientific studies have shown that the use of media can have an impact on gaining health knowledge and individual health behaviors. For example, the "Stanford Heart Disease Prevention Program" as the beginning of health communication studies widely shows that individuals who receive abundant health information through mass communication and those who have more contact with the media can easily change their health behaviors (8).

Social media can even intervene in individual behaviors to some extent and cover various disease prevention behaviors such as physical readiness, anti-smoking behaviors, and HIV prevention (9). Gough and colleagues (2017) examined health communications on social media and found that information can be presented perfectly through new media, humorous information can attract the users' attention, and educational information can be disseminated through users (10). The researchers investigated health literacy among residents of Beijing, China, and found that health behaviors had a positive association with repeated use of traditional media such as newspapers and television (11). Other studies have showed that and Individuals who use health-related media more have positive attitudes towards health (12).

People may receive health information from various media such as books, articles, family, or social networks (13-15). However, with the development of mobile technology as a ubiquitous tool in recent decades which is available to various groups and the possibility of individuals' participation in groups and social networks, this tool also has great importance in developing individuals' health information. A large number of people use m-Health platforms and social networks to receive health-related awareness, health self-efficacy, and social support (16).

According to Norman et al., (2007) electronic health interventions can be divided into several categories. The first category involves participants using computer-based content such as handouts, reports, and newsletters. The second category involves Internet-based education provided through email, CDs, and pocket computers. The third category involves the use of mobile phones as pocket computers, and users often

use messaging apps such as Telegram to exchange text messages, photos, videos, tags, sound, and files (17, 18). Mobile applications are practical programs designed for the users' use and installed on electronic devices such as smartphones and tablets (19). Messaging apps are, in fact, a category of practical applications or apps that allow individuals to communicate with others, discuss and exchange views, share images and videos they like, and have the opportunity to comment on the interests and topics of others as well as publish their own content according to their taste and opinion (20). Some of these apps include WhatsApp, Telegram, and Instagram. Messaging apps are one of the main strategies for delivering and enhancing health education (21) and, as they are of the same generation as students and young people, they are one of their main choices for exchanging information, including health information and health behaviors.

Evidence shows that students are not sufficiently concerned about their health and well-being, and because they are young and strong, they are less likely to pay attention to their health. Studies have shown that unhealthy behaviors are common among students. They have low responsibility for their own health (22); many skip breakfast (23), consume unhealthy foods (24), live a sedentary lifestyle (25, 26), and are potentially more susceptible to unhealthy lifestyles, smoking, unhealthy eating, increased stress, and physical inactivity (26). On the other hand, students have access to various communication and information tools, and they receive a significant portion of health information through various media. Identifying these media and student preferences can be effective in planning and managing the health and healthy lifestyle of students, especially since medical students are also health messengers and have an impact on the social awareness of other segments of society. This study aimed to investigate student preferences for the use of different health media and messengers and the underlying factors affecting them.

Methods

Study Design

This research was conducted using a descriptive survey method on the students of Shiraz University of Medical Sciences(SUMS), Shiraz, Iran during September to December 2022

Sampling

The statistical population of this research included all the students studying at SUMS in 2022 (about 5000 students). Using the Cochran formula (27) and based on the formula values: N=5000, study confidence level=95%, estimated error=0.05, z value=1.96, and p and q value of approximately 0.5 were considered, and the sample size was calculated using the following formula. The sample size was estimated to be about 357, but due to the low response rate of electronic questionnaires reported in previous studies, we sent emails to 550 students, and ultimately 500 completed questionnaires were returned. The sampling method was random sampling by drawing lots from the email list of students.

Inclusion and Exclusion Criteria

The inclusion criteria were all the students studying at SUMS in 2022, willingness to participate, and access to a mobile phone. The exclusion criterion was the samples that had not answered more than 20% of the questions.

Research Tool

The research tool was a self-made questionnaire consisting of 15 items and 6 components, including Academic Resource, Formal News and Information, Mass Media, Internet Search, Social Networks and Applications, and Informal Conversation. The content validity of the tool was confirmed using the CVI and CVR method (28, 29) by 10 experts in health education and medical education with a CVI= and CVR=values. Also, the construct validity of the tool was confirmed. The questionnaire was designed in a 4-point Likert scale, and the score range was between 1 and 4 with a cut-off point of 2.5.

Data Collection Method

After approving the research plan and obtaining the ethical code from the Ethics Committee of Shiraz University of Medical Sciences, and after coordination with the university, we obtained the email list of students with the permission of the Education Deputy. Then, an electronic questionnaire link was sent randomly to 550 students via email.

Data Analysis

To compare the mean of the total questionnaire and its components with the cut-off point or the expected minimum mean, we used the one-sample t-test, and the results were examined by background variables using independent t-tests and ANOVA. Additionally, the Pearson correlation test was used to examine the relationship between the components of the two questionnaires. SPSS 24 software was used to analyze the data.

Results

Based on the demographic characteristics of the research sample, a total of 500 complete questionnaires were collected. The demographic characteristics are presented in Table 1.

Examining the mean of the components, we found that among health media types, Internet search (M=2.950), informal conversation (M=2.394), academic resources (M=2.236), and formal sources of health information (M=2.128) had the highest mean, and mass media such as radio and television had the lowest role (M=1.701) (Table 2).

Among all the items, the use of content published on domestic (Iranian) social networks had the lowest usage, and the highest item was related to the portals and reputable health websites. (Table 3) It is worth mentioning that at the time of the research, the social network Telegram was filtered in Iran, and people were using it with a VPN.

Table 1: Demographic characteristics of the participants

Characteristics	Sub-categories	Frequency	
		N	**%**
Gender	Male	200	40
	Female	300	60
	Total	500	100
Age	18<Year<25	276	55.8
	26<Year<35	147	29.7
	36<Year	72	14.5
	Total	495	100.0
Field of Study	Clinical (Medicine and Dentistry)	125	25.0
	Basic medical Sciences (Biochemistry, Immunology, Physiology, Anatomy…)	85	17.0
	Para Medical (Nursing, Midwifery, Health care, Physiotherapy,…)	232	46.5
	None Medical Sciences (Computer, English language, Education,…)	58	11.6
	Total	500	100.0
Grade	BSc	181	36.4
	Professional Doctorate	138	27.8
	MSc	102	20.5
	PhD/Clinical Residents	76	15.3
	Total	497	100.0
Marital status	Single	366	73.3
	Married	134	26.7
	Total	500	100.0
Residential status	With parents	219	43.8
	Independent	137	27.4
	Dormitory	144	28.8
	Total	500	100.0

Table 2: Mean score of the use of Health Messenger Media from the of students' perspective

Components	Mean	SD	df	t	Sig
Academic Resource	2.236	0.795	499	-7.416	<0.001
Formal News and Information	2.128	0.901	500	-9.243	<0.001
Mass Media	1.701	0.573	500	-31.147	<0.001
Internet Search	2.950	0.773	500	13.000	<0.001
Social Networks and Applications	1.847	0.759	500	-19.262	<0.001
Informal Conversation	2.394	0.831	499	-2.849	<0.001

Table 3: Mean score of Health Messenger Media items from the students' perspective

Components	Items	Mean	SD
Academic Resource	Scientific books and articles	2.55	0.937
	Scientific conferences, webinars and meetings	1.93	0.896
Formal News and Information	Health messages and news from the Ministry of Health (SMS)	2.20	1.019
	The website of the SUMS or the Ministry of Health	2.05	1.011
Mass Media	Radio	1.36	0.614
	Television	2.15	0.968
	Public Magazines and newspapers	1.60	0.773
Internet Search	Search health related websites	2.69	0.935
	Search for information on Google	3.21	0.864
Social Networks and Applications	Health-related groups on WhatsApp	2.00	1.064
	Health-related groups on on Instagram	2.15	1.095
	Health-related groups on Telegram	1.94	1.051
	Health-related groups on local messengers	1.30	0.722
Informal Conversation	Conversation and exchanging news with the family	2.31	1.038
	Conversation and exchanging news with colleagues and classmates	2.47	0.898

Among the items, the highest mean score was related to searching for information on Google (M=3.21), searching health-related websites (M=2.69), scientific books and articles (M=2.55), and conversation and exchanging news with colleagues and classmates (M=2.47), while the lowest mean score was related to the use of domestic Iranian social networks (M=1.30) and radio (M=1.36).

*The Use of Health Messaging by Demographic Variables*

Age: According to the research results, individuals with higher age groups significantly used academic resources (P<0.001) and reputable websites related to the Ministry of Health, Treatment, and Medical Education (P<0.001) to obtain health information. Most individuals who searched the Internet were in the age range of 26-35 years (P<0.016). Regarding social networks and mobile-based applications, most students were from the age group of 18-25 years, and regarding informal methods (conversation with colleagues and classmates and family), most of them were from the age group of 26-35 years. No significant differences were observed in the use of mass media (P<0.455) (Table 4).

Field of study: As to the preferences of students for obtaining health information, by field of study, the preferences of students in different majors were significantly different in using formal sources (P<0.001), mass media (P<0.001), social networks and mobile-based applications (P<0.001), and informal sources (P<0.001), while no significant differences were observed in Internet search (P=0.493) and formal sources (P=0.092). The intergroup differences are shown in Figure 1.

Table 4: Comparison of the scores of using Health Messenger Media based on age groups

Components	Groups	N	Mean	SD	F	Sig
Academic Resource	18-25 Years	276	2.06	0.728	16.772	0.000
	26-35 Years	146	2.45	0.871		
	36-65 Years	72	2.50	0.721		
	Total	494	2.24	0.797		
Formal News and Information	18-25 Years	276	1.98	0.811	9.118	0.000
	26-35 Years	147	2.22	1.003		
	36-65 Years	72	2.45	0.933		
	Total	495	2.12	0.904		
Mass Media	18-25 Years	276	1.67	0.559	0.788	0.455
	26-35 Years	147	1.73	0.629		
	36-65 Years	72	1.72	0.513		
	Total	495	1.69	0.574		
Internet Search	18-25 Years	276	2.87	0.786	4.189	0.016
	26-35 Years	147	3.10	0.760		
	36-65 Years	72	2.90	0.720		
	Total	495	2.94	0.774		
Social Networks and Applications	18-25 Years	276	1.70	0.712	11.052	0.000
	26-35 Years	147	2.04	0.778		
	36-65 Years	72	1.95	0.782		
	Total	495	1.84	0.758		
Informal Conversation	18-25 Years	276	2.30	0.807	3.350	0.036
	26-35 Years	146	2.51	0.835		
	36-65 Years	72	2.47	0.899		
	Total	494	2.39	0.833		
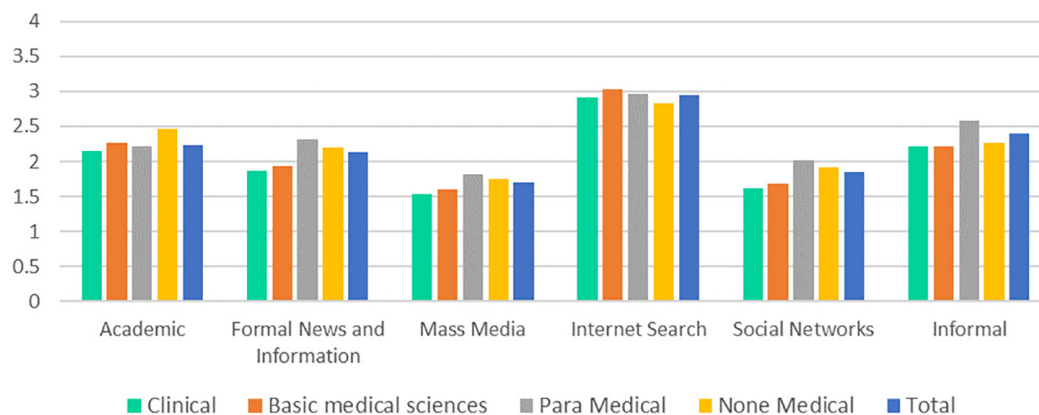
Figure 1: Comparison of the students' preferences of Health Messenger Media based on the fields of study

Gender: There was no significant relationship between the use of health messaging and gender.

Place of residence: Regarding mass media, individuals who lived with their parents used mass media more than other students (P=0.004), and there was no significant difference between groups in other communication methods.

Marital status: No significant difference was observed in Internet search and informal sources, but in the use of academic resources (P=0.002), formal sources (P=0.001), mass media (P=0.013), and social networks and mobile-based applications (P=0.021), married individuals sought more health information than single individuals (Table 5).

Table 5: Comparison of the scores of using Health Messenger Media by marital status

Components	Marital status.	N	Mean	SD	t	Sig
Academic Resource	Single	366	2.17	0.772	-3.092	0.002
	Married	133	2.41	0.832		
Formal News and Information	Single	366	2.05	0.842	-3.207	0.001
	Married	134	2.33	1.019		
Mass Media	Single	366	1.66	0.552	-2.480	0.013
	Married	134	1.80	0.620		
Internet Search	Single	366	2.93	0.785	-0.498	0.618
	Married	134	2.97	0.740		
Social Networks and Applications	Single	366	1.79	0.744	-2.308	0.021
	Married	134	1.97	0.786		
Informal Conversation	Single	366	2.35	0.824	-1.841	0.066
	Married	133	2.50	0.846		

Discussion

The present study showed that the highest mean usage of health messaging among students of Shiraz University of Medical Sciences was related to Internet searches, informal sources of conversation, scientific sources, and official sources of the Ministry of Health, respectively. Among these, students obtain the most health information through searching for information on Google, searching reputable websites related to health, scientific books and articles, friends and classmates, and finally, family members. These findings are consistent with the results of the study by Soroudi and colleagues (2021), which aimed to investigate the impact of social media use on depression in students of the School of Paramedical Sciences in Mashhad, and showed showing that students of SUMS obtain more information through the internet Internet and are very dependent on it for gaining information (30). The results of the study by Ghaffari and colleagues (2019) also support our research findings. In their study, which aimed to investigate the status of information dissemination and seeking by librarians of public libraries in Kerman province regarding health information, they stated that the main method of information seeking for librarians is was through the Internet, and they heavily rely relied on it for gaining information (31). Overall, improving awareness and dissemination of health information to students can contribute to improving their own health and that of the community.

One of the justifications for this issue is the availability, wide application, and extensive coverage of information on the Internet, especially since Internet searches are often text-based and do not require specialized knowledge or a large Internet volume, and are easily accessible to various groups. Students can use their mobile phones to access the Internet and obtain health information when needed. Searching on Google and the web has no time or location constraints, and students can access information at any time and place with their mobile phones. This finding is consistent with the results of the study by Ghaffari and colleagues (2019), who stated that searching websites was one of the most important ways of obtaining information among students (31). In another study conducted by Bannor and colleagues (2017), the use of mass media for transmitting and receiving health messages was found to be much more effective than traditional media (32). Similarly, the findings of the present study are consistent with those of the study by Atkinson and colleagues (33). Overall, the availability of mobile phones provides an easier platform for searching for information, allowing the users to receive a vast amount of health information from health professionals and health-oriented organizations based on their needs. It also enables the individuals, whether sick or healthy, to communicate

with physicians and others to meet their information, emotional, and psychological needs (33). Indeed, some studies have had different results. In another study conducted by Tarnaha et al. (2021), the use of radio was found to be the best method for transmitting health messages, including alcohol abuse, drug abuse, smoking, and other related behaviors, good hygiene practices, use of contraceptive drugs, and avoidance of risky sexual behaviors (34). This finding was not consistent with those of our study, and the reason for this discrepancy may be different study populations in both studies. In the present study, the study population consisted of a group of young people who have a higher health literacy due to their medical education background and can often search for health information consciously; because they are mostly from the new generation, they are more familiar with the Internet. However, the general audience prefers mass media. As in the study of Tran et al., the study population consisted of people who mostly obtained their health messages through the radio. Additionally, medical students work in the field of health; therefore, they can analyze and differentiate correct information from incorrect information. For this reason, access to scientific sources through the Internet can be helpful and facilitates their search for new information. Another point is that medical students have less access to television and radio when working in clinical departments, but they always have their mobile phones with them, and in fact, the common feature between mobile phones and health care providers is their "mobility." This creates a closer proximity between them.

In the second part of the study, we explored whether students' choices are influenced by temporal and age-related variables. The results showed significant differences in the use of health messaging apps, scientific sources, official sources of the Ministry of Health, Internet searches, mobile-based social networks, and informal verbal sources of health information across different age groups. The age group of 36 to 60 years old received more health information from scientific sources, while the age group of 26 to 35 years old relied more on mass media and Internet searches. Similarly, the age group of 18 to 25 years old obtained the most health information through Internet searches. Individuals in the age group of 36 to 60 years old, due to their greater scientific experience and maturity, are more likely to obtain their health information from scientific sources, while individuals in the age group of 26 to 35 years old, who are usually new to the work environment and have limited time, tend to rely on the Internet as a more accessible source of health information.

These findings are consistent with those of Wong et al. (35) and Li et al.'s (36) studies, indicating that age is one of the influential factors affecting how health information is obtained, and with increasing age, the level of experience and trust in health messaging apps is affected. These results were also in line with the findings of Moradi et al. (2018) (37), who investigated the relationship between social networks and health-related quality of life in adults in Tehran. The researcher stated that the use of health messaging apps was significantly related to age. However, these findings were not consistent with those of Forghani et al. (2018) (38), who aimed to investigate the effect of virtual social networks on lifestyle. The researcher stated that there was an inverse relationship between age and the use of health messaging apps. The results also showed that the use of health messaging apps differed significantly by field of study, in terms of official sources of the Ministry of Health, mass media, mobile-based social networks, and informal verbal sources of health information. Non-medical fields relied more on scientific sources, while clinical fields such as medicine and dentistry obtained their health information from official sources of the Ministry of Health, mobile-based social networks, and less from mass media and Internet searches. These findings were consistent with the results of Chen et al. (39) and Cotten et al. (40), who identified the field of study as one of the influential factors

affecting how health information is obtained. It is natural that non-medical fields would turn to credible scientific sources to ensure the accuracy of health information. However, students in clinical fields, due to their familiarity with clinical health information, have easier access to scientific sources such as professors and information transmitted in their clinical environment based on clinical guidelines. They also have a higher level of health media literacy and may prefer Internet searches as a source of information. In fact, medical and dental students can more easily verify the accuracy of scientific health information they find online, compared to non-medical students.

Additionally, the growth, development, and diversity of web-based applications have significantly increased the richness of the Internet media. Interactive web applications provide the ability to communicate through text chat or even video chat, allowing for the transmission of audio and visual cues, instant feedback, and the use of sound and images to create personal interactions. With these features, the possibility of delivering health messages to Internet users has been improved.

Another findings of our study was that the use of health messaging apps differed by place of residence. These results were consistent with the findings of Moradi et al. (2018), who aimed to investigate the relationship between social networks and health-related quality of life in adults in Tehran (37). In our study, it was found that students living with parents used mass media more than dormitory students. This could be due to the fact that these students have more access to television, radio, and newspapers, while dormitory students have to use shared facilities, and people's preferences for watching or listening to public media vary.

Based on the results of the present study, there was no significant difference in the use of health messaging apps by gender, but there was a significant difference in the use of scientific sources, official sources of the Ministry of Health, and mass media by

marital status. This finding is consistent with the results of Kulandairaj et al. (2014), who investigated the impact of social media on health behaviors such as nutrition, recreation, and physical activity (41), but not consistent with the results of Cho et al. (2014) and Asiri et al. (2018) (42, 43).

This researcher identified gender as one of the influential factors in receiving information. One reason for this inconsistency could be the type of population in the present study. In this study, the study population consisted of university students, and due to their similar education and equal access to information resources, gender could not be a determining factor. However, in other societies and the general population, gender may be a determining factor. For example, it can be said that housewives have more access to information due to their free time, compared to their husbands.

Limitations and Suggestions

This study was conducted with a large sample size of 500 participants and examined a diverse set of variables related to a relatively new topic. However, it was conducted in a large medical university and may not be generalizable to different communities or population groups. The study may also be subject to limitations related to sampling methods, sample selection, and potential uncertainties in the collected data.

Conclusion

Students prefer credible scientific methods and have wide and fast access to scientific resources. With the development of mobile devices as a facilitator of access to the Internet and scientific information, this trend is expected to increase. Therefore, attention to strengthening the media literacy of students is of great importance. Various contextual variables also influence the students' preferences in choosing media or messaging apps, highlighting the importance of health authorities' oversight of the credibility of health media. As the use of mobile-based resources, especially the Internet, is

increasing, it emphasizes the importance of government and health, treatment, and medical education ministries' oversight of the credibility of information published on the Internet. However, given the trend of the development of the virtual environment and the independence of individuals in accessing health information, perhaps the most important measure is to strengthen the media literacy of people in searching for optimal ways, identifying, and applying health information.

Authors' Contribution

M.M participated in research design and data collection. Z.K was responsible for research design, data analysis and interpretation, and writing the article. NZ participated in research design, and critically reviewing the manuscript. All authors critically evaluated and approved the final article.

Conflict of Interest: None declared.

Ethics Approval and Participants Consent

We informed the students of the research objectives. All participants provided their consent by completing the informed consent form and answered the questions. The data were compiled and analyzed anonymously, and the results were provided to the relevant authorities. The ethical standards of the research have been approved by the National Ethics Committee in Biomedical Research under code SUMS.REC.1400.680

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