

How Diabetes Mellitus-related Health Information is Received by Egyptian Internet Users? A Cross-sectional Study

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Abstract

Background: The Internet has become a fundamental source of health-related information especially for chronic diseases as Diabetes Mellitus. The aim of this study was to explain the health information-seeking behavior using internet health information among Egyptian adults with diabetes. **Subjects and Methods:** This cross-sectional study was conducted from June to October 2019. A Web-based questionnaire was sent to Egyptian internet users aged 18 years and older (N=380) of a popular Arabic-language health information website. The online questionnaire form included personal characteristics, preference of using internet health information and explore the impact of obtained health information on users' health behavior. **Results:** A total of 283 participants completed the Web-based questionnaire with a response rate of 74.5 % (283/380). Personal characteristics of the participants showed that 161 (56.8 %) participants were aged under 35 years, 182 (64.3%) were female, and 110(38.8%) had a good general health status. Participants prefer seeking OHI for an existing health problem were 138 (48.8%), while 106 (37.4%) participants seek OHI when having a new health problem. Internet health information helped 192 (67.9%) participants to improve their understanding of their health problem, 160 (56.7%) participants reported has decreased their unnecessary visits to their physicians, helped 179 (63.4%) participants to take an active role in their diabetes health management, and 186 (65.9%) participants reported applying healthy changes in their lifestyle. **Conclusions:** Younger individuals with higher education more likely to seek health information from the internet. Participants mentioned convenience and anonymity as the main reasons to search for diabetes health information on the internet. Internet health information can promote users' healthy behavior changes.

Keywords: Online health, health information-seeking behavior

Introduction

Diabetes Mellitus is a global public health problem with a particular raising prevalence in low-income and middle-income countries⁽¹⁾. This increase in diabetes

prevalence is associated with high mortality and morbidity⁽²⁾. Diabetes self-management education is a cornerstone for effective DM management. Various methods have been used to encourage diabetic patients to search for health-related

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information including online health information (OHI)⁽³⁾. Health-information seeking behavior (HISB) is the way that individuals search health information related to their health status. HISB describes how the individual searches and obtains health and medical information about health risks, diseases and illnesses, and health promotion activities^(4,5). Previous studies have found that the commonly used sources of health information are the internet, physicians, social media, radio and television, pharmacists, and parents⁽⁶⁾. The number of Egyptian Internet users who search for health-related information has increased from 29.7% in 2015 to 32.4% in 2019 from total Egyptian Internet users as reported by the Egyptian Ministry of Communication and Information Technology⁽⁷⁾. Many studies found that the most common information sought was related to the management of chronic illnesses, such as diabetes and hypertension⁽⁸⁾. Although the internet has become a common source of health information for many diabetic patients, others still prefer direct contact with their physicians to ask and understand their health concerns from their physicians personally⁽⁹⁾. However, seeking health information directly from physicians may not be possible all the time due to the availability and geographical barriers as well as the busy schedules of their physicians. Therefore, health information seekers search for alternative sources of health-related information particularly from modern technology such as the internet⁽¹⁰⁾. Diabetic patients are actively searching for diabetes-related information. However, some patients receive information accidentally during their daily activities from a variety of sources such as watching a TV program or reading a newspaper⁽¹¹⁾. The advantages of preferring DM-related internet health information has been reported in many studies which included convenience of use, availability of a wide variety of health

information, improve personal understanding of health information related to their problems, and being able to express and discuss their concerns with their physicians^(12,13). Additionally, the anonymity of users is another attraction of online health information-seeking behavior⁽¹⁴⁾. The motivation for seeking Online health information related to DM is affected by patient needs, the type of information available, mental background, and estimated cost and benefit of active information seeking⁽¹⁵⁾. Understanding the HISB of diabetic patients can share in the development of health information resources in the management of these patients. The final goal of all information-seeking behavior is to satisfy the information needs of the people. However, limited studies can explain how diabetic Egyptians seek OHI and how they obtained health information affects their behavior. The aim of the current study was to understand the online health information-seeking behavior of Egyptian adults with diabetes.

Subjects and Methods

This cross-sectional study was conducted from January to October 2019. Participants of the study were selected randomly among the Egyptian OHI seekers who search for Diabetes-related health information from a widely used Arabic language health information website. The eligibility criteria of the participants to take part in the study were being Egyptian, diabetic, aged 18 years or older, and previously sought the internet for health information related to DM which were 360 Egyptian internet health information seekers. Invitations to participate in the study were sent by the website administrator. This invitation included information about the aim and the objectives of the study and a link to join the online structured questionnaire as well as the contact details of the main

researcher. Two reminders were sent to the selected participants to improve the response rate. When joining the link to the survey, participants checked to accept the consent form on the first page of the questionnaire. They moved to the structured questionnaire afterward. The study questionnaire was developed and adopted based upon a literature review of previous studies that have examined the use of

internet health literacy^(9,16), which included the following: 1) Personal characteristics of diabetic internet health information seekers, 2) Self-assessed general health status, 3) Reasons for preferring internet health information, 4) The limitations on seeking diabetes-related health information online, 5) How do they search for internet health information, and 6) the effect of OHI on diabetes self-management practice.

Table 1. Personal characteristics of diabetic internet health information seekers (N=283)		
Sociodemographic variables		No. (%)
Age (years)	18<25	21 (7.4%)
	25<35	140 (49.4%)
	35<45	78 (27.6%)
	45<55	26 (9.2%)
	≥55	18 (6.4%)
Gender	Male	101 (35.7%)
	Female	182 (64.3%)
Educational degree	High school	12 (4.2%)
	Bachelor	54 (19.1%)
	University students	63 (22.3%)
	University/ post degree	154 (54.4%)
Marital status	Single	87 (30.7%)
	Married	183 (64.7%)
	Divorced/ widow/ widower	13 (4.6%)
Number of children <16 who live in the same household	non	193 (68.2%)
	1 or more	90 (31.8%)
Employment	Employed	193 (68.2%)
	Unemployed ^a	90 (31.8%)
Having a valid health insurance	Yes	181 (64%)
Self-assessed general health	Very good	65(15.1%)
	Good	110(38.8%)
	Fair	60(21.2%)
	Poor	48(16.9%)
Having a chronic health problem ^b	Yes	220 (77.7%)

^a Includes unemployed, housewife, or retired.

^b Having one or more chronic health problems or disability

Statistical Analysis

Data were first cleaned, filtered then coded and entered into Microsoft Excel then statistical analysis was performed using SPSS statistical software (version 22;

SPSS Inc). Descriptive statistics were used in the initial data analysis. Chi-square analysis was used to examine whether significant associations exist between sociodemographic factors, discussion of Web-based information with health providers, and

perceived impact of gathering information from Web resources on medical encounters. The level of statistical significance was set at a P value < .05. The study was approved by the Ethics and Research Committee of The Faculty of Medicine, Suez Canal University, Egypt.

Results

A total of 283 participants completed the Web-based questionnaire with a response rate of 74.5 % (283/380). Results are presented as a proportion of the total number of responses to each question (Table 1). As presented in Table 1, 161 (56.8 %) participants were aged under 35 years, 182 (64.3%) were female, and 154 (54.4%) had a university degree or higher qualification. Regarding health insurance, 181 (64%) participants reported having valid health insurance coverage. Concerning the per-

sonal general health, 175 (61.7%) participants rated their health as good or very good, 220 (77.7%) participants reported having more than one long-standing illness, disability. Regarding the common source of health information sought by the participants, 128 (45.2%) prefer to seek health information from their physicians when they have a new health problem, while only 75 (26.5%) participants seek physicians for an existing health problem. The second commonly used source of health information was the OHI by 106 (37.4%) participants with new health inquiries and 138 (48.8%) participants seek the internet for an exciting health problem. Participants mentioned seeking health information from other sources such as newspapers or magazine articles (Figure 1).

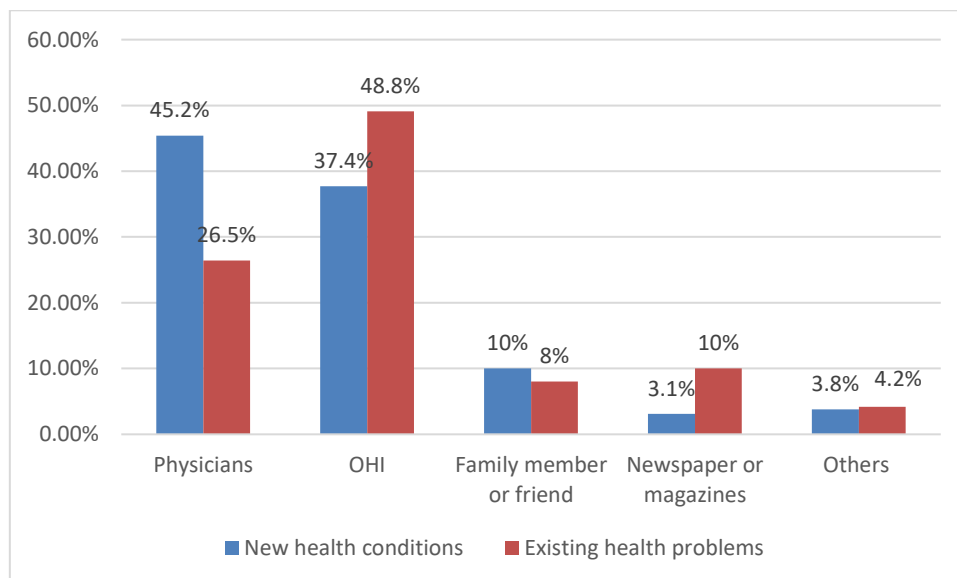


Figure 1. Commonly used DM-related internet health information with new or existing health concerns.

Participants explained their DM-related health information-seeking behavior in Table 2. As showed in the results; 124 (43.8%) participants reported that they always use the internet to seek health information while only 28(9.9%) of the participants use

the OHI rarely. Participants who registered on the health information website between 6 to 12 months were 134 (47.3%) participants, while only 29(10.3%) participants were registered for more than three years. Participants who spent around two

hours/week on seeking OHI were 130 (46.1%) participants. Participants who reported seeking OHI for themselves were

86 (30.3%) participants, while 151 (53.4%) participants seek OHI for both themselves and for a family member or a friend.

Table 2. The health information-seeking behavior of the study participants to find health information on the internet (N=283)		
OHI seeking behavior of the study participants		n (%)
How often do you seek health or medical information on the Internet	Always	124 (43.8%)
	Often	69 (24.4%)
	Sometimes	62 (21.9%)
	Rarely	28 (9.9%)
How long have you registered in the health information web-site?	Less than 6 months	87 (30.7%)
	6-12 months	134 (47.3%)
	1-3 years	33 (11.7%)
	> 3 years	29(10.3%)
Average time spent on Health information Web-pages (hour/week)	<2	131 (46.3%)
	3-5	86 (30.4%)
	>5	66 (23.3%)
Preferred search location for OHI	Work	54 (19.1%)
	Home	166 (58.7%)
	Public places (library, cybercafe, etc.)	51 (18%)
	Other places	12 (4.2%)
How competent you are in using the internet to find OHI?	very competent	41 (14.8%)
	Competent	235 (47.9%)
	Fair	100 (20.4%)
	Poor	83 (16.9%)
Looking for OHI	For themselves	86 (30.3%)
	For someone else	46 (16.3%)
	Both	151 (53.4%)

OHI = Online health information

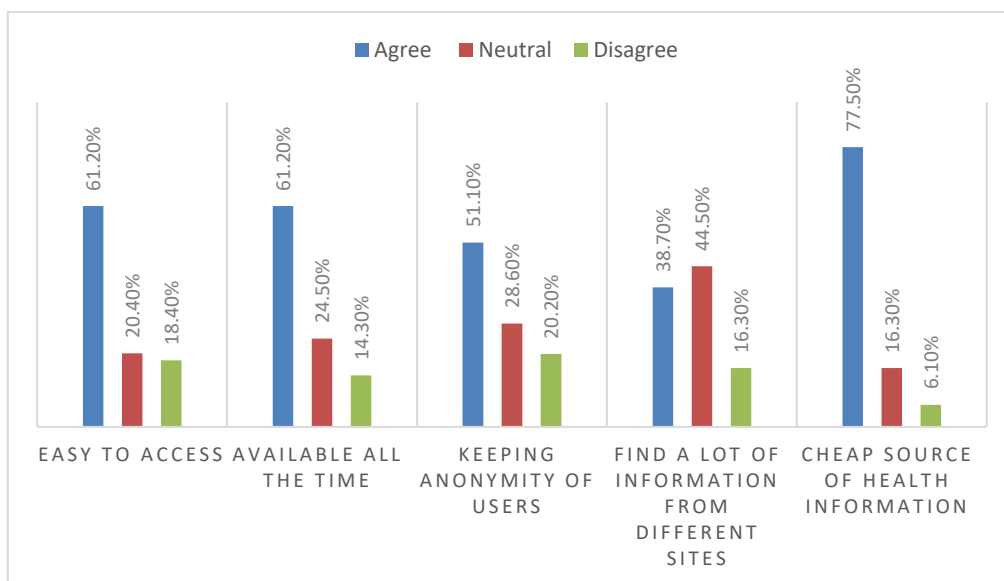


Figure 2. Reasons for seeking DM-related health information from internet health websites.

In figure 2, participants reported their reasons behind using the internet as a source of health information related to DM. Of all the respondents, 219 (77.5%) participants agreed that the Internet is a cheap source of health information, 173 (61.2%) participants agreed that it is a convenient source of health information, while 144 (51.1%) participants agreed that anonymity of users is a reason for seeking OHI related to DM. In table 3, Participants explained the impact of the obtained health information from the internet on their health behavior. Of the responses, 192 (67.9%) participants explained that OHI has improved their understanding of the health problem they were searching for. Also, 160 (56.7%) participants reported that their using of the OHI has

decreased their unnecessary visits to their physicians. participants who reported that seeking OHI helped them to take an active part in their management of their health problems were 179 (63.4%) participants. Based on using the OHI, 186 (65.9%) participants reported applying healthy changes in their lifestyle as changing their diet and practicing physical exercise. There was a significant association between participants who use the internet as the main source of health information and Improving their understanding of the health problem they were looking for (p value=.012) and Encourage them for healthy lifestyle behavior changes as changes in their diet or practicing physical exercise (p value=0.006).

Table 3. Behavioral changes associated with using the internet as the main source of diabetes-related health information by the study participants (N=283)				
Behavioral changes		n (%)	Using the internet as the main source of health information	P-value ^a
Improve their understanding of the health problem they were looking for	Yes	192 (67.8%)	205 (72.4%)	.012 ^a
Decreased unnecessary visits to their doctor	Yes	179 (63.2%)	163 (57.6%)	.75
Enabled them to take an active part in their management	Yes	179 (63.2%)	183 (64.6%)	.40
Encourage healthy behavior changes lifestyle (diet / exercise)	Yes	186 (65.7%)	186 (65.7%)	.006 ^a

^asignificant at p <.05

Discussion

In this study, we explored characteristics of Egyptian information seekers who search the internet for health information related to DM, we also investigated the influence of the obtained health information on their behavior. In this study, we had an acceptable response rate of 74.5% (283/380)⁽¹⁷⁾. Our findings showed that the personal characteristics associated with more frequent OHI searching were younger aged, females with higher

education levels, and reporting good general health. Consistent with our findings, Chu et al. found that younger respondents, who were between 18 and 45 years old, were more likely to use the internet as the main source for health information⁽¹⁸⁾. Similarly, Nölke et al. concluded that the probability of seeking OHI decreased with age as young-aged OHI seekers are more familiar with internet use⁽¹⁹⁾. In our study, participants with higher educational levels prefer OHI more than other traditional health information sources. Cotton et al. showed

similar results. He found that OHI seekers tended to have higher levels of education which confirms a link between educational level and searching OHI⁽²⁰⁾. Our analysis provides new data that significant differences exist between sicker patients and those with better self-reported health status in that sicker patients were more frequent users of Internet health information, and more likely to discuss the information they found online with their health care provider. The reason for this discrepancy is not clear but it might be argued that healthy participants focused on improving their lifestyles while people with chronic illness sought to improve their current health condition. Contrary to Fedak et al.⁽²¹⁾, who found no evidence of a relationship between Internet use and general health. Falk et al. suggested that there is minor evidence supporting the idea that the use of the Internet has a relationship with the general health status in older adults⁽²²⁾. In another study, healthier people use OHI more frequently in a proactive manner for health promotion or to maintain a healthy lifestyle⁽²³⁾. In this study, we found that participants preferred seeking OHI when they have an existing health condition rather than having a new health problem, where they prefer consulting their physicians. This could be explained by the fact that a specific condition, rather than a perceived general health status, increases the interest and the need to search for specific information or treatment⁽²⁴⁾. However, the traditional sources of health information (e.g., doctors and television) are still the primary sources of health information for many users especially older adults. They expressed their preference for personal interaction with physicians rather than using the OHI^(25,26). In our findings, the convenience, anonymity, and accessibility of OHI were behind participants' preference for using OHI. Consistent with the literature, the Internet was valued for

its convenience, breadth of information, and capacity to provide peer support and social interaction⁽²⁵⁾. Beck et al. found that confidentiality of the Internet users considered as an advantage obtaining OHI, especially when seeking personal health issues, such as mental health or sexual health advice⁽²⁷⁾. Similarly, another study focused on the advantages of the Internet as a source of health information concluded that the internet is considered a fast, convenient source of answers to general diabetes health questions. Specific information needs, such as insulin dosage adjustment⁽²⁸⁾. Our findings suggest the potential of the Internet to offer support to a large group of health consumers where they can share their health and illness experiences; they can offer special insights and reflections from the lived experiences of their specific health conditions that doctors may not be able to provide⁽²⁹⁾. A large body of research pointing towards positive effects of Internet use in older adults⁽³⁰⁾. In addition to the impact of OHI on the doctor-patient relationship, participants reported feeling more empowered and are more inclined toward being involved in their health and health decision-making with using the OHI. A study concluded that OHI empowered individuals to interact with their health professionals⁽²⁷⁾. Future research into the role of health information and the impact on the doctor-patient relationship will be important as technology and patient demand continues to evolve.

Conclusion

The Internet is an increasingly popular source of health information for users who seek DM-related health information. Personal characteristics of OHI seekers such as younger age, females, having higher levels of education and having generally good health make a difference in how frequently

they access the Internet for health information. Health information on the internet may help users to improve their understanding of their health concerns, decrease unnecessary visits to their physicians, and encourage OHI seekers to make healthy behavior changes. Most providers of Arabic language OHI websites are privately owned. Therefore, their priority may be increasing advertising revenue rather than providing reliable information. There is a need for cooperation from the health care providers to support their patients to find reliable resources of health information and to teach them how to evaluate the available OHI to achieve better health for the OHI seekers. Also, we recommend further studies to evaluate the impact of the obtained OHI on users' behavior and their health outcomes.

Limitations

We used the convenient sampling method for the recruitment of the study participants. This may limit the generalization of the results of the survey to the population.

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