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Original Article

## Factors affecting seeking health-related information through the internet among patients in Kuwait

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### ABSTRACT

**Background:** The internet is a powerful worldwide communication medium that provides its users with immediate information irrespective of their location, culture, language and time. E-health service will have a great impact in reducing the costs of health care, increasing satisfaction of patients and health professionals, and minimizing the burden on health facilities.

**Objective:** This study aims to determine the proportion of patients who obtain health-related information through the internet as well as factors that could affect using the internet for seeking health information.

**Subjects and methods:** This study was conducted in six general hospitals in Kuwait. A cross-sectional study was adopted to determine the proportion of patients who obtain health-related information through the internet. It was followed by a case-control study to determine factors that could be associated with on-line search of health information. A questionnaire was used which included data related to socio-demographic characteristics, clinical history and computer experience. The final analysis included 220 participants.

**Results:** The majority of participants (93.2%) mentioned that they have used the internet for one or more purposes. Only 129 participants (62.9%) used the internet for obtaining health related information. All studied socio-demographic factors, except age and marital state, and computer skills variables had significant effect on on-line search for health information. After adjustment for confounding, only gender, nationality, level of education, and using computer at work were proved to be significant determinants of the outcome of interest.

**Conclusion:** It is important to close the gap in health literacy and increase the use of health information technology to support patient self-management. The creation of an eHealth-literate population should be a priority in Kuwaiti public health policy.

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### 1. Introduction

The technology in the present days has covered all the sectors in the society including health all over the world.<sup>1</sup> E-health is a term that used to describe the use of internet and other electronic technologies to enhance health. In other words, e-health refers to the use of information and communications technology (ICT) to enhance health care services.<sup>2</sup>

Since ancient times, diseased people have made great effort to obtain remote information or contact expertise not available at

the patient's bedside. This approach to telemedicine is still used today in some remote areas.<sup>3</sup>

E-health means a wide range of health aspects that use the internet and associated technologies to provide health information and health services. Usually, patients depend upon the healthcare workers to provide health-related information for diagnosis and therapy. Patient health education in the past has included a group of independent health information that mainly distributed in written and video materials. E-health has begun to grow or increase rapidly in which health professionals and health stakeholders develop and search information.<sup>4</sup>

The internet is a powerful worldwide communication medium that provides its users with immediate information irrespective of their location, cultural, language, and time. Recently, a great number of research articles that studied health professionals and

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consumers' perception and attitude towards e-health has been available.<sup>5</sup>

A study was conducted on samples from the general population in different European countries, in 2007, to investigate the pattern of using internet in the field of health, its consequences, and people expectations about physicians' provision of e-health services. The authors reported differences between the users of internet health services and the general population due to health status and social-demographic variables.<sup>6</sup>

Another article that was conducted in Australia described the effect of using the internet on patient knowledge, education, and its subsidiary impact upon the medical decision taken by the patient and clinician. The author found that higher approachability to the internet has provided patients with a new method of access to health-related information and has a great role in decision-making. The extent to which the technology of e-health to be effective depends upon patients' ability to approach, understand, and discuss this knowledge with their physicians.<sup>4</sup>

This study aims to determine the proportion of patients who used to seek health-related information through the internet as well as factors that could affect using the internet for seeking health information.

## 2. Subjects and methods

This study was conducted in the six general hospitals (one in each health region of Kuwait). It is a part of a larger multi-centric descriptive one that was conducted during the period June 2015 – June 2016. The details of the methodology can be found elsewhere.<sup>7</sup> In brief, a cross-sectional study was adopted to determine the proportion of patients who used to seek health-related information through the internet, followed by a case-control study to determine factors that could be associated with patient obtaining health information using the internet. All adult patients visiting the out-patient clinics in the selected general hospitals within the study period were asked to participate in the study. Mentally retarded and physically severe ill patients and those who were less than 18 years old were excluded.

Assuming that the percentage of patients who did not use to obtain health-related information through the internet was 30% ( $p = 30\%$ ), the probability of obtaining health information via the internet was estimated to be  $(1 - p = 0.70)$ , and a value of 0.05 is chosen as the acceptable limit of precision at 95% confidence intervals where ( $z = 1.96$ ), a minimal sample size was estimated to be 244 patients.<sup>8</sup> Equal numbers of participants were recruited from each selected hospital. Recruitment of patients continued till reaching the required number from each hospital. All participants were classified into two groups according to the outcome of interest (using and not using the internet for obtaining health-related information). Comparison between the two groups was carried out to determine the predictor variables.

A pre-designed structured interview was designated for data collection. It included data related to socio-demographic characteristics (age, gender, occupation, education, housing, family income, and marital status); clinical history (chronic diseases, quality of health, and number of visits to health care setting during the year prior to the survey), and computer experience (level of computer skill, use of smart phone, use of internet, purpose of use of internet, obtaining health related information through the internet, use of computer at work (if he/she is working), main source of health information).

All ethical issues related to research were addressed according to the guidelines of standard and universal research ethical review. All the required approvals for conducting the study were obtained as that of the Kuwait Ministry of Health Ethical Committee. The

permission of the Undersecretary Ministry of Health in Kuwait as well as director of each selected hospital were obtained. Confidentiality of collected information was ensured. Participants had the right to withdraw at any time of the interview without any constraints. A pilot study was conducted prior to the field work on a small sample of participants aiming to test the clarity of the questions, questionnaire validity, and its suitability of use in Kuwaiti culture. The questionnaire was valid and 25 min were sufficient for the interview.<sup>9</sup> The process of interview with participants was performed in a predefined room in each selected hospital after obtaining his/her approval for participation in the survey.

### 2.1. Statistical analysis

Data were revised for completeness. Questionnaire with missing data related to independent variables in the logistic regression model were excluded, so analysis of results did not contain missing values. Thirty questionnaires were excluded due to missing data. For categorical variables, frequency and percentage distribution were used. For quantitative variables, the mean and standard deviation were used. For comparison between the two studied groups, a series of bivariate analyses were first conducted using Chi-square test, followed by multiple logistic regression analysis to avoid the effect confounding between the studied variables. Results of multiple logistic regression analysis were expressed in the form of odds ratio (OR) with 95% confidence intervals (95% CIs). All the studied variables in the multiple regression model were categorized into two or more levels (R = reference category). SPSS version 22 was used for data entry and analysis.

## 3. Results

Recruitment effort resulted in participation of 250 patients. Thirty questionnaires were excluded from the analysis as they contained missed data.

### 3.1. General characteristics of the study population

Males constituted four fifths (79.5) of the study participants versus 20.5% for females. The age ranged from 19 to 72 years with a mean equals  $37.1 \pm 11.0$  years with the highest proportion. in the age category 30–39 (36.8%). The proportion of Kuwaiti participants was 36.4% versus 63.6% for the non-Kuwaitis. Two fifths of participants had secondary or diploma certificate (41.4%), 23.2% had intermediate or less education and 35.5% completed the university level of education. Two thirds of participants were clerks, 18.6% were workers, 15.0% were unemployed or retired and only 3.6% served in the military. Regarding the present, or previous job for retired participants, 38.6% had a governmental job, 30.5% had a non-governmental job, and 15.9% worked in the private sector. A quarter of participants were single, 70.5% were married and only 5.0% were divorced or widow. Two fifths of participants had a monthly family income <500 KD, 37.7% had income from 500 to 999 KD, and 20.5% had income  $\geq 1000$  KD.

Clinical history revealed that 61.4% of participants were free from chronic disease, 30.9% had one chronic disease and only 7.7% had two or more chronic diseases. Regarding their visits to a health care setting within the 12 months prior to the survey, 40.5% declared that they did not need medical care, 20.0% visited a health care setting once or twice, and 39.5 visited a health care setting more than twice. Only 7.7% of participants rated their health as accepted, and 31.8 as good, 40.9% as very good, and 19.5% as excellent.

Regarding computer experience, 13.2% of the participants did not know how to use the computer, 21.4% had minor skill, 16.4% rated their skill as accepted, 27.3% as good, and 21.8% as excellent. The majority of participants (93.2%) mentioned that they have used the internet for one or more purpose. Within the internet users, the purpose of use was entertainment in 61.5%, work in 62.0%, communication in 65.4%, obtaining general news in 72.7%, or search for general information in 70.7%. Only 129 participants (62.9%) used the internet for obtaining health related information.

### 3.2. Factors affecting seeking health-related information through the internet

Factors that could affect participants seeking health-related information through the internet were studied. They could be classified into socio-demographics characteristics, clinical history and computer skills.

Table 1 shows that all socio-demographic factors had an effect on seeking health-related information through the internet except age and marital state. Female participants presented 25.6% of those who got health-related information through the internet as compared to only 13.2% in the other group ( $P = 0.03$ ). Also, Kuwaiti participants were more keen to obtain health information than non-Kuwaitis (45.0% versus 24.2%,  $P = 0.002$ ). As the level of socio-economic level increased, as indicated by the level of education and monthly family income, the proportion of participants who used to obtain health-related information through the internet

increased significantly. Participants with university certificate or higher level of education were more keen to use the internet for that purpose (48.8% versus 16.5%,  $P < 0.001$ ). Almost the same pattern was seen regarding monthly income. More clerks and less workers used to seek health-related information through the internet significantly (72.1% versus 49.5% and 10.9% versus 29.7% respectively,  $P = 0.002$ ). The proportion was higher in participants in governmental jobs than other positions (47.1% versus 26.4%,  $P = 0.003$ )

Table 2 shows that none of the studied clinical factors had significant effect on seeking health-related information through the internet. However, the proportion of participants who used the internet for seeking health information was higher among those who complained from two or more chronic diseases and those who visited health care setting three or more times during the 12 months prior to the survey

Table 3 shows that all the studied factors significantly affect obtaining health related information through the internet. Higher proportions of participants who used the internet for seeking health information were found among those who had good or excellent computer skill (62.8% versus 29.7%,  $P < 0.001$ ), those who used smart phone (97.7% versus 82.4%,  $P < 0.001$ ), and those who used the computer at work (71.3% versus 40.7%,  $P < 0.001$ ).

After adjustment for confounding effect only gender, nationality, level of education, and using computer at work were proved to be significant determinants of the outcome of interest. Females and Kuwaiti participants were more liable to use the internet for

**Table 1**

Distribution of participants according to seeking health related information through the internet and socio-demographic characteristics.

Socio-demographic characteristics	Getting health-related information				Significance
	Yes		No		
	n	%	n	%	
Gender					
Male	96	74.4	79	86.8	$\chi^2 = 5.04$ $P = 0.03$
Female	33	25.6	12	13.2	
Age (years)					
<30	33	25.6	24	26.4	$\chi^2 = 1.44$ $P = 0.70$
30–39	50	38.8	31	34.1	
40–49	29	22.5	19	20.9	
≥50	17	13.2	17	18.7	
Nationality					
Non-Kuwaiti	71	55.0	69	75.8	$\chi^2 = 9.96$ $P = 0.002$
Kuwaiti	58	45.0	22	24.2	
Education					
Intermediate or less	13	10.1	38	41.8	$\chi^2 = 38.8$ $P < 0.001$
Secondary/Diploma	53	41.1	38	41.8	
University or higher	63	48.8	15	16.5	
Occupation					
Unemployed/retired	18	14.0	15	16.5	$\chi^2 = 14.94$ $P = 0.002$
Worker	14	10.9	27	29.7	
Clerks	93	72.1	45	49.5	
Military	4	3.1	4	4.4	
Job					
Governmental	61	47.3	24	26.4	$\chi^2 = 13.89$ $P = 0.003$
Non-governmental	35	27.1	32	35.2	
Private	13	10.1	22	24.2	
Others	20	15.5	13	14.3	
Marital state					
Single	31	24.0	23	25.3	$\chi^2 = 0.14$ $P = 0.93$
Married	92	71.3	63	69.2	
Divorced/widowed	6	4.7	5	5.5	
Family income/month (KD)					
<500	35	27.1	57	62.6	$\chi^2 = 28.96$ $P < 0.001$
500–999	64	49.6	19	20.9	
1000+	30	23.3	15	16.5	
Total	129	100.0	91	100.0	

**Table 2**  
Distribution of participants according to seeking health related information through the internet and clinical history.

Clinical characteristics	Getting health-related information				Significance
	Yes		No		
	n	%	n	%	
Number of chronic diseases					
None	81	62.8	54	59.3	$\chi^2 = 3.77$
One	35	27.1	33	36.3	$P = 0.15$
Two or more	13	10.1	4	4.4	
Number of visits to physician last year					
None	50	38.8	39	42.9	$\chi^2 = 0.41$
1–2	26	20.2	18	19.8	$P = 0.81$
Three or more	53	41.1	34	37.4	
Quality of health self-rating					
Accepted	10	7.8	7	7.7	$\chi^2 = 0.14$
Good	40	31.0	30	33.0	$P = 0.99$
Very good	54	41.9	36	39.6	
Excellent	25	19.4	18	19.8	
Total	129	100.0	91	100.0	

**Table 3**  
Distribution of participants according to seeking health related information through the internet and computer experience.

Computer experience variables	Getting health related information				Significance
	Yes		No		
	n	%	n	%	
Level of computer skills					
Do not know how to use	2	1.6	27	29.7	$\chi^2 = 44.27$
Not bad	26	20.2	21	23.1	$P < 0.001$
Accepted	20	15.5	16	17.6	
Good/excellent	81	62.8	27	29.7	
Use of smart phone					
No	3	2.3	16	17.6	$\chi^2 = 15.74$
Yes	126	97.7	75	82.4	$P < 0.001$
Use of computer at work					
No	37	28.7	54	59.3	$\chi^2 = 20.68$
Yes	92	71.3	37	40.7	$P = 0.001$
Total	129	100.0	91	100.0	

seeking health information (OR = 1.96, CIs: 1.11–5.00) and (OR = 2.72, CIs: 1.40–3.99) respectively. As compared to intermediate or less level of education, those with university certificate or higher education were more prone to be users of the internet regarding seeking health information (OR = 3.23, CIs: 1.20–8.33). The same was found regarding use of computer at work (OR = 1.11, CIs: 1.39–7.14) (Table 4).

**Table 4**  
Factors associated with seeking health related information through the internet, results of multivariate logistic regression analysis.

Variables	Odds ratio	95% CIs
Gender		
Male <sup>R</sup>	1	
Female	1.96	(1.11 – 5.00)
Nationality		
Non-Kuwaiti <sup>R</sup>	1	
Kuwaiti	2.72	(1.40 – 3.99)
Level of education		
Intermediate or less <sup>R</sup>	1	
Secondary/diplo	1.54	(0.62 – 3.70)
University/higher	3.23	(1.20 – 8.33)
Use of computer at work		
No <sup>R</sup>	1	
Yes	1.11	(1.39 – 7.14)

OR = Odds ratio, CIs = Confidence intervals.

<sup>R</sup> Reference category.

#### 4. Discussion

There is an increasing need for health information in the population, and the internet is considered as an important, but with a diversity levels of precision and quality, source of this information.<sup>10,11</sup> A study that was carried in 12 Arabic countries showed that the personal computer using rate is generally lower than the global rate. However, the rates were relatively higher in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.<sup>12,13</sup> This could be attributed to the wide use of the smart phone and the availability of high speed internet within these countries.

The majority of participants (205 out of 220) (93.2%) mentioned that they have used the internet for one or more purpose. Within the internet users, the purpose of use was entertainment in 61.5%, work in 62.0%, communication in 65.4%, obtaining general news in 72.7%, or search for general information in 70.7%. Only 129 participants (62.9%) used the internet for obtaining health related information. As compared to our findings, Andreassen et al., in their study, found that general reading was the main purpose of using the internet by people, followed by following-up a physician appointment by a quarter of respondents. The authors concluded that the use of the internet could support the ordinary health services rather than replacing them.<sup>6</sup> Also, Schwartz et al, in their study, found that of the 1289 patients who participated in the study, 844 (65%) reported access to the Internet and 622 (48% of all participants/74% of participants reporting Internet



access) had used the Internet to find information for themselves or family members regarding health issues or medical conditions.<sup>14</sup>

In 2001, there were over 100,000 web sites worldwide with varying quality of health information that are used by consumers and professionals.<sup>15</sup> Previous studies in the US found that 56–79% of internet users seek health related information.<sup>16–19</sup> In the present study, 62.9% of the participants stated that they used the internet for seeking health-related information. Previous European surveys showed that the percentage using the internet for health-related purposes varied in different countries of Europe. It was most frequent in Denmark (62%), and Norway (59%) followed by Germany (49%). In the Eastern countries of Europe as Poland and Latvia the frequency was 42% and 35% respectively, whereas the Southern countries had the lowest proportion as in Portugal (30%) and Greece (23%).<sup>20,21</sup>

Many factors have been determined to affect online health information seeking. Health information-seeking behavior varies depending on type of information sought, reasons for, and experience of, searching. Research shows that women are more likely than men to search for health information and online health consumers tend to be more educated, earn more, and have high-speed internet access at home and at work.<sup>22</sup>

In the present study, after adjustment for confounding effect, only gender, nationality, the level of education, and using a computer at work were proved to be significant factors. Female Kuwaiti participants and those who had a higher level of education and using a computer at work were more prone to obtain health related information. This goes with the finding of James and Harville who reported that women, and smartphone owners were those who used the Internet as a source of health information.<sup>23</sup>

The present study showed that there was a direct relation between the increased level of education and online health information seeking. There is a complex relationship between the quality of health and education that need to be considered by policy-makers and practitioners to eradicate myths and support people with lower level of education and knowledge.<sup>24</sup>

In accordance with the present study, Andreassen and coauthors found that women, participants with higher levels of education or professional positions were more liable to use the internet for health reasons.<sup>6</sup> Also, completed university level of education was proved to be associated with frequent use of the internet for health-related purposes.<sup>10,16</sup> The most active health users of the internet were participants in the age category 30–44 years and those with chronic diseases and long-term illness.<sup>6</sup> A finding that could not be proved in the present study.

People who used computer at work usually were more knowledgeable and experienced to use the computer in different daily activities including seeking information. According to a study in Finland, people who had more experience in general use of computer applications, were more used the hospital information system.<sup>25</sup> Also, Farzandipur reported that the knowledge and skills to use computers are the main human factors affecting the successful implementation of e-health as well as a greater tendency for users to use the system.<sup>26</sup> To improve the general knowledge and skills of users in using computers, it is recommended that the ICDL courses for users should be taken seriously.

Certain patients may have health conditions that require more health care than that of the general population. It is expected for these patients to be more interested in accepting e-health to receive the additional healthcare they need and save time, effort and cost of transportation.<sup>27,28</sup> The present study, none of the variables related to the clinical history of participants was proved to affect obtaining health related information from the internet. Contrary, in their study, Andreassen et al. found that the quality of health status had an indirect association with using the internet

for health-related purposes as participants with poor health used the internet for health reasons less frequently than others.<sup>5</sup>

A study was conducted on low-income adults in the United States found no correlation between level of health literacy and access to computers and the internet. It revealed that despite low-income participants commonly used internet, they were unable to retrieve health information and consequently had lower level of health information.<sup>29</sup>

Knowing how to access online health information will allow patients to be more informed in medical decision making. This may ultimately impact health care costs, health outcomes, health care quality, and health equity.<sup>27</sup> Kuwaiti population have a disproportionately high prevalence of chronic diseases compared with other populations,<sup>30</sup> and it is in the nation's best interest to explore how new and emerging technologies can help to reduce these health disparities. One proposed way to reduce health disparities is to close the gap in health literacy and increase the use of health information technology to support patient self-management.<sup>31,32</sup>

Primary care providers should recognize that patients are using the World Wide Web as a source of medical and health information and should be prepared to offer suggestions for Web-based health resources and assist patients in evaluating the quality of medical information available on the internet.<sup>33</sup>

We acknowledge some limitations in our study. As we relied upon patient interview, the data obtained might be, to certain extent, affected by participants' answers. Also, as in any case control study, the design of the study is by definition retrospective and is subjected to recall bias. Nevertheless, the results are, to a certain degree, consistent with those coming from other studies. Also, the study did not point out the type of information sought, neither to the website to ensure accuracy and soundness of the information. Lastly, as the calculated sample required was 244, and the analysis was performed on 220 subjects after exclusion of questionnaires with missed data, the power of the study could be changed.

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