

The Effect of the Internet on the Patient-Doctor Relationship from the Patient's Perspective: A Survey from Primary Care

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ABSTRACT: **Background:** Internet use by patients as a source of information on health and disease is expanding rapidly with obvious effects on the doctor-patient relationship. Many of these effects remain undocumented or are poorly understood.

Objectives: To assess the use of the internet for health information by patients in primary care in Israel and their perception of the effects of internet use on their relationship with their doctor.

Methods: A cross-sectional survey was conducted among a convenience sample of patients visiting 10 primary care clinics in central Israel using a questionnaire developed for this survey. The survey examined attitudes to using the internet for health-related information and attitudes to sharing this information with doctors. Associations between demographic variables, internet use and patient satisfaction with the doctor's response were tested using the chi-square statistic and *t*-tests.

Results: Completed questionnaires were received from 138 patients; the response rate was 69%. Patients in the study sample had a high rate of internet access (87%), with many using the internet as a source of health information (41%) although most patients using the internet never share this information with their doctor (81%). Among those who share information with the doctor, most felt that this has a positive effect on the relationship (87%). Few patients reported being referred to websites by the doctor (28%).

Conclusions: Internet use is prevalent in this population, though physicians may be unaware of this. Future study could examine the effects of doctors who ask patients actively about their internet use and inform them of relevant health information sources online.

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KEY WORDS: internet, doctor-patient relationship, family medicine, Israel, survey

Widespread use of the internet as a source of health information has had an effect on health knowledge, attitudes and practices of the general population as well as on the doctor-patient relationship. With hundreds of thousands of health-related websites and millions of health-related computer searches conducted each day [1], the possibilities for rapid changes in health behaviors are enormous. The majority of health-related internet searches by patients are for specific medical conditions. They are carried out before the clinical encounter, to seek information to manage their own health care independently, to decide whether they need professional help, or to overcome reticence in discussing personal issues. Searches are also carried out after the encounter for reassurance or because of dissatisfaction during the encounter [2].

Along with the benefits of easily accessible information, there are concerns about the quality of information obtained and its effect on the doctor-patient relationship [3]. Concerns include poor-quality information leading to misguided self-treatment and misdiagnosis, linguistic barriers, commercial biases, longer clinical consultations resulting from disagreement over information presented by the patient to the doctor, and unnecessary tests and treatments arising from the information [4-6]. Thus, the physician's insight, experience and input are required to help patients accurately interpret and apply these data.

Little is known about the frequency with which information from the internet is actually presented within primary care consultations, or the meaning of this activity for the patient's experience of health and illness and for their relationship with health care practitioners [7,8]. More specifically, little is known about the effect of web-based health information in Israel. In many developed countries the internet has become a familiar health care tool [9,10] and its use for health-related purposes is on the rise [11]. In Israel 38% of the population reported that they search for medical information on the internet. A recent study of primary care physicians' responses to patients' use of online information in Israel found that most physicians responded

favorably to patients bringing information obtained online to the consultation [12]. The purpose of the present study was to assess internet use for health-related concerns by a sample of primary care patients in Israel and to assess patient perceptions of presentation of this information to doctors on the doctor-patient relationship.

METHODS

The study population was a convenience sample of patients from Clalit Health Services, the largest of four health management organizations in Israel. The patients, aged 18 to 70, attended clinics in the Sharon area in Israel during the first half of 2006. The Sharon region, situated in central Israel, serves 167,412 patients in 39 primary care clinics staffed by 92 doctors. A subset of 10 clinics serving 108,922 patients with 56 doctors was chosen for this study for an average list size of 1814 patients per doctor. A sample-size calculation was performed on this subset using Epi-Info STATCALC software. Hypothesizing a prevalence of 10% internet use by patients, a sample of 138 patients drawn from the study population would be required to estimate the true prevalence of internet use by patients, plus or minus 5%, at the 0.05 significance level. Although some published reports found a 38% prevalence of internet use, we chose the lower figure of 10% as a worst case scenario to avoid missing the phenomenon of interest.

Each of the 10 clinics in the study population received 20 questionnaires for distribution. All Hebrew-speaking adults between the ages of 18 and 70 who were willing to complete the questionnaire were included in the study population. The questionnaire was developed in Hebrew for this study, using items derived from a literature review on patient internet use [3,9,13]. The questionnaire was pre-tested with seven patients to ensure that the instrument was understandable and easy to complete, that all areas of interest were covered, and that no questions were ambiguous. It took approximately 5 minutes to complete. The questionnaire is presented in Appendix 1.

Patients attending a primary care clinic in central Israel were asked to fill out the anonymous questionnaire that was handed to them at the entrance to the clinic by the administrative staff. The questionnaire comprised 31 items including questions about patient information-seeking behavior and perceptions of its effect on the doctor-patient relationship. Data from the questionnaires were entered on an electronic spreadsheet and analyzed with EPI-INFO software. Frequency distributions of all variables were calculated and associations between variables were computed using the chi-squared statistic for categorical variables and *t*-tests for continuous variables. Significance was set at the 0.05 level.

"Seekers" were defined as people who searched for health information on the internet "seldom," "sometimes" or "often." "Sharers" were defined as people who presented health infor-

mation from the internet to their primary care physician "seldom," "sometimes" or "often."

The responses "agree very much" and "agree" were grouped as "agree," while "partially disagree" and "disagree" were grouped as "disagree" for the analysis of associations with demographic variables.

RESULTS

Of the 200 questionnaires given to the 10 primary care clinics for distribution, 138 were completed and returned; the response rate was 69%. The 10 clinics in the sample serving 108,922 patients, staffed by 56 doctors, represent a mean list size of 1814 patients per doctor, a mean clinic size of 10,899 patients, and a mean number of 5.9 doctors per clinic. The socioeconomic status of the study population in this sample is described as upper middle class.

The demographic characteristics of the study population are given in Table 1. The average age of the respondents was 38.7 years (SD 15); 60.7% were female and 80% were born in Israel. Most (59%) of the respondents were married and 40% had children under the age of 18. Most (71.1%) had university-level education and 60% stated their income as average. Chronic illness was reported by 18.9% and 20.3% took chronic medication.

Table 1. Demographic characteristics of the study population (n=138)

Mean age (SD)	38 years (SD 15.6)
Gender	
Female	82 (60.7%)
Male	53 (39.3%)
Marital status	
Married	79 (59%)
Single	49 (36.6%)
Divorced	6 (4.5%)
Children under 18	
0	81 (60.4%)
1	26 (19.4%)
2	16 (11.9%)
3	10 (7.5%)
4	1 (0.7%)
Education	
Elementary	5 (3.7%)
High School	34 (25.2%)
University	96 (71.1%)
Income	
Below national average	21 (16.2%)
Average	78 (60%)
Above average	31 (23.8%)
Chronic illness	
No	107 (81.1%)
Yes	25 (18.9%)
Chronic medication	
No	106 (79.7%)
Yes	27 (20.3%)

Table 2. The relationship between patient satisfaction and internet use (n=138)

	Seekers (N=95)		Non-seekers (N=43)		Pvalue
	Agree	Disagree	Agree	Disagree	
I feel that my doctor listens to me	97.8% (92/94)	2.1% (2/94)	88.6% (31/35)	11.4% (4/35)	NS
I feel that my doctor allocates enough time for my questions	97.8% (92/94)	2.1% (2/94)	88.6% (31/35)	11.4% (4/35)	NS
At the end of a consultation I feel I received satisfactory information about my health	92.6% (87/94)	7.4% (7/94)	88.3% (30/34)	11.7% (4/34)	0.026
I would like to be more involved with decisions concerning my health	85% (79/93)	15% (14/93)	97.3% (35/36)	2.8% (1/36)	NS

Table 3. Demographic differences between patients who seek health information on the internet ("seekers") and "non-seekers"

	Seekers (N=95)	Non-seekers (N=43)	Pvalue
Average age	39.5	36.9	NS
Gender			
F/M ratio	1.58	1.71	NS
M/F ratio	0.63	0.58	
(Male Female)	(38.7% 61.3%)	(40.5% 69.5%)	
No. of children under 18	0.78	0.46	NS (0.08)
Education			
Elementary	2.2%	7%	0.004
High school	18.3%	40.5%	
University	79.6%	52.5%	
Income			
Below average	13.3%	22.5%	0.011
Average	55.6%	70%	
Above average	31.1%	7.5%	
Chronic illness			
Yes	21.7%	12.5%	NS
No	78.3%	87.5%	
Chronic medication			
Yes	22.6%	15%	NS
No	77.4%	85%	

INTERNET ACCESS

Use of a personal computer with Internet access was reported by 87% of the patients, and the majority (78.8%) described their search skills as good or very good.

INTERNET AND HEALTH

Of those surveyed, 8.6% said that they "always" use the Internet to look up medical information, 32.5% responded "often," 30.5% "rarely" and 25.8% "never" search for health-related information online. Most of the internet users (81%) seldom or never show this information to their doctor. A small number of patients (14.7%) agree that they tend to act upon advice from the internet instead of consulting their physician. Most patients surveyed (78.9%) said that they never contact their doctor via email. Most (71.9%) stated that their doctor had "never" referred them to reputable medical websites, and only

7% of primary care physicians refer patients "often," whereas 77.9% of patients would be interested in such a referral (83.7% of seekers vs. 59.2% of non-seekers, $P = 0.011$).

When examining the relationship between patient satisfaction and internet use, a higher percentage of seekers stated that they felt they had received satisfactory information about their health when compared to non-seekers [Table 2]. Internet users (seekers) tended to be better educated and had higher incomes [Table 3]. A higher percentages of sharers stated that they felt comfortable presenting the information and felt that they received more attention than the non-sharers [Table 4].

The average age of those who present information to their doctors (sharers) tends to be higher (43 years) than that of non-sharers (36 years, not significant), and they tend to have more children under the age of 18 ($P < 0.05$).

In this sample, patients with chronic disease did not seek health care information on the internet more frequently than those without a chronic illness.

DISCUSSION

This study examined the influence of the internet on the doctor-patient relationship in a sample of primary care patients in central Israel. It found a large proportion of patients who use the internet as a source of health information, a small number of whom bring the information to consultations with their doctors. Those who do this see the information as having a positive effect on their relationship with their doctor. Many patients would appreciate a doctor's referral to reputable sites, but most physicians do not refer patients to the internet.

A number of studies have used methods similar to the present study, employing convenience samples of patients attending primary care clinics. In their sample of 93 patients Budtz and Witt [14] in 2002 found that 39% had internet access and half of those patients had used the internet for health-related searches. In the same year, Grover et al. [15] found in a convenience sample of 227 general practice patients in Colorado, USA that 93% of the patients had used the internet and that 58% of those had conducted health-related searches. When asked about their needs and expectations, patients most often mentioned the wish to be able to contact their doctor and clinic staff through the new information technology available. Also in 2002 Diaz et al. [16] conducted a mail survey of patient internet use in a medical practice in Rhode Island, USA. Of the 512 patients responding, 54% stated that they had used the internet for health-related searches but only 40% of them had shared the information with their doctors. The profile of the typical internet user in that practice was a young, Caucasian, better educated, wealthier female patient.

In the largest study of health-related internet use conducted in 2005 and published in 2007, Andreassen and colleagues [17] found in a sample of close to 8000 patients in

Table 4. Attitudes of patients who present information from the internet to their doctor (“sharers”) compared to “non-sharers”

	Sharers (N=66)		Non-sharers (N=29)		P value
	Agree	Disagree	Agree	Disagree	
When I present information from the internet to my doctor I feel that he/she is dissatisfied	29.3% (17/58)	70.7% (41/58)	15.8% (3/19)	84.2% (16/19)	NS
When I present information from the internet to my doctor it causes a conflict	7.3% (4/55)	92.7% (51/55)	10.6% (2/19)	89.4% (17/19)	NS
I feel comfortable presenting information from the internet to my doctor	91.8% (56/61)	8.2% (5/61)	62.5% (15/24)	37.5% (9/24)	0.008
I feel that information from the internet enables me to see the doctor as an equal	61.3% (38/62)	38.7% (24/62)	42.3% (11/26)	57.7% (15/26)	NS (0.07)
When I present information from the internet to my doctor, he/she pays more attention to me	41.7% (25/60)	58.3% (35/60)	20% (4/20)	80% (16/20)	0.013
When I present information from the internet to my doctor, it harms our relationship	13.1% (8/61)	86.8% (53/61)	10.6% (2/19)	89.4% (17/19)	NS
When I present information from the internet to my doctor, I feel that I receive a better explanation about my illness	54.1% (33/61)	45.9% (28/61)	36.9% (7/19)	63.1% (12/19)	NS

7 European countries that 42% of respondents had internet access and of those, 71% had used the internet for health-related searches. In their sample there was a clear gradient of increasing use from south to north with higher internet use recorded in countries of northern Europe compared to southern Europe. In our study, the finding of 85% internet access and 74% health-related use is equal or greater than that found in Northern European countries. In their sample, younger women were most likely to use the internet for health purposes. They were most often seeking reassurance.

In a follow-up study of this sample conducted 2 years later, internet use was found to increase from 42% to 52% of the population with significant increases in use for health-related purposes in all seven countries studied [11].

These time trends are found in other regions and in other domains outside of general practice as well. Hay and co-authors [18] reported that of the 120 new patients referred to a rheumatology clinic in 2007, 62% sought information about their condition on the internet before seeing the consultant. However, only 20% chose to share this with their physician at the clinic visit. When asked why, most stated that they feared being considered as challenging the doctor.

LIMITATIONS

The generalizability of the findings in the current study is limited by a number of possible sources of bias. The study was conducted on a convenience sample of patients attending primary care clinics. Clinic visitors may be different from non-visitors with regard to their internet use and attitudes. The study was conducted in a relatively affluent urban area with a young well-educated population and this may also influence the findings, giving a higher frequency of internet use. Two findings support this reservation. One is the relatively young mean age of 38 years, which is younger than the

average age of general practice clinic visitors. The second is the high percentage of university graduates in our sample (71%). Both these factors would tend to increase rates of internet use. Future studies conducted with random sampling from the general population are necessary for dealing with possible selection bias and for obtaining more generalizable findings.

The sample size may also have affected our ability to detect differences in attitudes and demographic variables between those who seek and share internet information with their doctors and those who do not. A larger sample may help clarify these differences between subgroups.

Despite these potential limitations, this study confirms findings from other studies in other countries regarding internet use for health-related purposes and the effects of these searches on the doctor-patient encounter.

CONCLUSIONS

The internet is an important source of health information among young educated patients in this sample of patients from primary care in central Israel. The findings suggest a shift in the role of the patient from a passive recipient of care to an active consumer of health information and this has the potential to foster greater patient engagement in health maintenance and care. These findings also suggest the need to educate health providers and patients to overcome barriers that restrict communication and foster appropriate internet use in health care.

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Appendix 1. English translation of study questionnaire on patient internet use

- I have access to the internet at home Yes No
- I have access to the internet at work Yes No
- I have been using the internet for ____ years
- I rate my skill of searching for information on the internet as:
 - very good good fair poor

The following questions have the following four options as responses:

- always often sometimes never

- I look for information about my health on the internet
- I bring my doctor information I find on the internet
- I contact my doctor via the internet
- My doctor refers me to health information sites on the internet

The following questions have the following four options as responses:

- completely disagree disagree agree completely agree

- I feel that my doctor listens to me during a clinic visit
- I feel that my doctors devotes sufficient time to my questions during a clinic visit
- At the end of a visit I feel that I have received a sufficient explanation about my health
- I want to be more involved in decisions about my health
- I act on information I find on the internet instead of consulting with my doctor
- When I present information found on the internet to my doctor I feel that he is dissatisfied

- When I present information found on the internet to my doctor I feel that this causes disagreements between us
- I feel comfortable presenting information from the internet to my doctor
- I feel that information I get from the internet allows me to interact with the doctor as an equal
- When I present information found on the internet to my doctor I feel that I get more attention
- When I present information found on the internet to my doctor I feel that this damages our relationship
- When I present information found on the internet to my doctor I feel that I get a better explanation about my illness
- I would like my doctor to refer me to internet sites about my condition
- My doctor uses the information I present and acts on it

- Age (in years)
- Gender
- Country of birth
- Marital status
- Number of children under 18
- Level of education: Elementary, Secondary, Post-Secondary
- Level of income: Below average, Average, Above Average
- I suffer from a chronic disease (e.g., diabetes, hypertension)
 - Yes No
- I take chronic medication (e.g., for diabetes or hypertension)
 - Yes No

“The most beautiful thing we can experience is the mysterious. It is the source of all true art and science”

Albert Einstein (1879-1955)