

Original Research Article

Health Information on the Internet: The Case of Greece

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ABSTRACT

Objectives: The aim of the present study was to investigate the trends among the Greek population regarding their frequency of search, level of satisfaction, and trust towards the Internet as a source for health information; its use as a self-diagnostic tool; and as a source of information for the purchase of medication.

Methods: Data was collected in Greece in September 2013, via the conduct of a telephone survey, which focused on the public opinion concerning health risks and health information. A representative national sample of 1,227 adults (687 males and 540 females) was selected. Data analysis was performed using descriptive statistics and logistic regression.

Results: The results demonstrated that the majority of respondents often sought health information on websites (89%) and were more satisfied (85.4%) with the quality of health information extracted from them, compared to respective data from blogs and social media. Furthermore, the interviewees seemed to have confidence (82%) in the health information provided from websites, in comparison to relevant blogs and social media outlets.

Conclusions: This is one of the first studies in Greece to explore health information seeking online in relation to socio-demographic characteristics. Further investigation in the kind of health information found in Internet sources is needed, in order to identify in detail the special features of the health information-seeking behaviour.

Key words: Internet; Health Information; Greece.

INTRODUCTION

“Health information” has been defined as information for a) staying healthy, b) preventing disease, c) managing disease, and d) making health and healthcare decisions. ^[1] Health information might provide assistance to individuals in order to improve their health decisions and, probably, health outcomes as well. ^[2] Internet usage by citizens in order to seek health information is considered a rather common contemporary phenomenon. ^[3-5] In fact, it has been gradually emerging as the

leading health information source, thus replacing other traditional sources, such as books, newspapers, magazines, and even health professionals, family and friends. ^[6] Internet nowadays plays an important role in the dissemination of health information, but it is still obvious that the quality of health information varies significantly among sources. ^[7] A variety of studies have demonstrated that despite widespread Internet usage, the most common and trustworthy source of health information is still the healthcare provider, ^[8,9] while

Internet is used more than is deemed trustworthy by the lay public. ^[10] Some of the Internet's advantages as a health information source, however, are its accessibility by people with disabilities and/or limited access to healthcare services, as well as its vital contribution in enhancing self-education (e.g. in terms of disease prevention, personal healthcare, etc.). ^[11]

Internet use as a source for health information has been found to be directly associated with the following five factors: a) the importance given to the written media in searches for health information, b) the importance given to the opinions of physicians and other health professionals, c) the perceived usefulness of the information, d) the concern for personal health, and e) the amount of trust in the information available on the internet source (i.e. website). Some of the advantages of the internet as a source for health information seeking is that internet is easily accessible by persons with disabilities and/or limited access to healthcare services, and is useful for enhancing self-education (e.g. in terms of prevention, personal care, etc.). ^[11]

Also, the assessment of health information seeking behaviours of individuals is important, especially for community health educators ^[12] policy makers, physicians and other health professionals who plan to target populations for program development. Additionally, prior experience and behavioural intention have been found to have positive direct effects on internet health information seeking behaviour for older adults, in specific. ^[11]

The consequences of Internet usage on the provision and demand of healthcare services remain obscure, while its widespread popularity has raised issues regarding its impact on individual health behaviour and outcome on public health. ^[6]

There is evidence confirming a strong positive correlation between frequent personal Internet usage as a health information source and the probable modification of individual health behaviour. ^[13] Furthermore, prior experience and behavioural intention have been found to positively and directly affect the behaviour of older adults in seeking health information via the Internet. ^[11] In addition, online searches have been found to be the prime source of health information for university students, compared to any other age group. ^[14] It has been reported that the possibility of health information-seeking behaviour; time spent online surfing; and the perceived site relevance of Internet-based health information sources, have been significantly correlated –inter alia– with content relevance among a sample of college students, who belong in the 18-30 age group. ^[15] Adolescents have been found considering online health information as important ^[16] as well, while young adults also seem attracted to health information provided via social media (e.g. Facebook, Myspace, etc.) regarding topics such as sun safety and quitting smoking. ^[17]

Moreover, poor subjective physical and mental health have been associated with greater likelihood for Internet searches on health information, as well as less actual Internet usage. ^[18] There is evidence that patients with Internet access can benefit from the potential it provides them in terms of seeking out health information; viewing their personal medical records and communicating with their healthcare providers. Additionally, Internet-based health information-seeking behaviour does not differ for the majority of health literate patients, compared to those of low health literacy. ^[19]

Despite the fact that most pregnant women have reported to be seeking health information primarily from their physician,

one half of them have also sought out the same kind of information online because the information they received from their physician was unclear; or because they wanted to assure themselves regarding a decision they had already taken; or to confirm their current level of health knowledge. [20]

With regard to online self-diagnosis, i.e. searching the Internet for information in order to interpret individual symptoms, it is gradually becoming common procedure among users, taking into account that: 35% of the adult population in the United States have reported that they attempt to diagnose their own symptoms online; 29% of older adults (aged 50-64) have used the Internet for the same purpose; and 13% of users aged 65 or more, have also stated that they use the Internet in order to diagnose their own personal symptoms. [21] According to a recent study, [22] Internet usage has been found to not influence in any way the length of time spent by patients before seeking medical advice for their symptoms. However, 49% of them reported that the health information they found online persuaded them that their symptoms were not serious. In addition, 15% of them reported that their online health information-seeking behaviour had no effect whatsoever on their final decisions. [22]

Another relevant issue is Internet usage as a source of prescription medication. There is an increasing number of individuals who buy medicines online, since Internet is a convenient, cheap and discreet way to purchase such products. [23,24] A 2010 study, however, found low rates of online prescription drugs purchases, while medication dealers, friends or relatives, and physicians appeared as the three leading sources for such purchases. [25]

The aim of the present study was to investigate the trends among the Greek population regarding their frequency of

search, level of satisfaction, and trust towards the Internet as a source for health information; its use as a self-diagnostic tool; and as a source of information to purchase medication.

MATERIALS AND METHODS

Data was collected in September 2013, via a telephone survey focusing on the public opinion regarding health risks and health information. The telephone survey was conducted using a structured (“fixed-choice”) 51-item questionnaire. The development of the questionnaire survey was based on an literature review and available instruments, and was informed –in part– by the Health Information National Trends Survey (HINTS) 4 - Cycle 2 (official website: <http://hints.cancer.gov/hints4.aspx>). The survey was applied via electronic questionnaire with the use of the Computer-Assisted Web Interviewing (CAWI) system. A representative national sample of 1,227 adult individuals (687 males and 540 females) was randomly selected, aged above 18 and living in the 13 administrative regions of Greece – according to the 2001 National Demographic Census of the Hellenic Statistical Authority (EL.STAT.) The highest standard error of sample statistics was 2.8%, with a respective confidence interval of 95%. For more information on the socio-demographic characteristics of the sample, please see headers on Tables 1 and 2.

Study Variables: Three questions were set in order to assess the frequency of Internet surfing; the users’ level of satisfaction by the results of their search; and trust towards Internet as a source of health information, divided into three sub-categories of Internet sources: websites, blogs, and social networking sites. The rationale for creating these specific sub-categories was that websites usually provide information from official sources such as international health

agencies and press releases of public health bodies and scientific journals. Social media, on the other hand, are commonly used as an open forum of informal information exchange (including health-related information), to a much greater extent than blogs, which are usually oriented to specific issues. Furthermore, people are using social media to seek health information, but they are more likely to act as information consumers, rather than actively contributing to the dialogue. [5] Apart from this, there is an ongoing debate about the differences between social media and blogging - the latter commonly referred to as the primary source of information, while social media is considered to be used as a secondary one.

Regarding all the sub-categories of Internet sources, it was clarified to the study participants that they should take into consideration all types of Internet sources in their answers as to their searches for health information, including those not necessarily focusing on health or health-related issues. The frequency of Internet usage as a health information source was assessed by asking: 'Within the past year, how often have you searched for health information via Internet?' Satisfaction from using the Internet as a health information source was assessed using the question: 'How satisfied are you from the adequacy of information you receive via the Internet regarding health issues?' Trust in Internet as a health information source was assessed using the question: 'Would you say that you trust the information you receive via Internet regarding health issues?' Three more questions were used, relevant to Internet usage as a self-diagnostic tool and a source for purchasing medication. Internet usage for self-diagnostic purposes was assessed using the question: 'Have you ever tried to perform self-diagnosis of your symptoms based on information you found on the Internet?' Trust in the Internet as a kind of

self-diagnostic tool was assessed by asking: 'In general, do you trust the online diagnostic tools?' The final question, on Internet usage as a source for purchasing medication, was assessed by asking: 'Have you ever purchased medication via Internet?' The option 'I don't know/I don't want to say' was available as a response for all submitted questions, and when applied was treated as missing values in the statistical analysis.

Statistical Analysis: The association of the questions concerning Internet usage and socio-demographic indicators was initially investigated using Pearson's chi-square. The variable of Internet usage for self-diagnosis was further analysed by conducting a logistic regression model. Socio-demographic factors significantly associated with the variable under examination were also included in the model. Only significantly associated factors with the dependent variable remained in the final model. Statistical significance was set at $p < .05$. All analyses were performed using the SPSS version 19.0.

RESULTS

As demonstrated in Tables 1 and 2 study participants searched, in order to seek out health information, more on websites (89%) than blogs or social networking sites. Furthermore, the vast majority was satisfied (85.4%) with the adequacy of health information extracted from websites, and showed their trust (82%) in them. Women used websites more (91.7%) as a source of health information than men. Moreover, women were satisfied by their searches to a greater extent (90.5%) and reported that they trusted websites more (84.8%) than men. The latter, however, bought medication online in a higher percentage (12.3%) than women.

Table 1. Distribution (%) of search, satisfaction and trust levels from health information through the Internet, purchase of medication and use of the Internet for diagnosis and self-diagnosis by socio-economic indicators (i.e. gender, age, occupation).

	Total	Gender			Age (years old)					Occupation						
		Male	Female	Sig.	18-34	35-44	45-54	55+	Sig.	Public sector worker	Private sector worker	Freelancer/ Agricultur l worker/ Company owner	Retired	Unemployed	Student/ Housewife/ Other	Sig.
	(n=1227)	(n=687)	(n=540)		(n=147)	(n=426)	(n=393)	(n=258)		(n=225)	(n=408)	(n=246)	(n=144)	(n=123)	(n=63)	
search																
Websites	89.0	86.8	91.7	0.007	93.9	91.5	83.8	89.5	0.001	88.0	86.8	88.9	95.8	92.7	85.7	0.040
Blogs	54.7	53.7	55.9	0.453	57.1	63.1	47.3	51.2	<0.001	58.1	50.7	48.8	64.6	68.3	42.9	<0.001
Social networking sites	25.7	24.2	27.5	0.191	34.7	25.7	21.7	26.7	0.022	20.3	24.6	22.2	41.7	31.7	23.8	<0.001
satisfied																
Websites	85.4	81.3	90.5	<0.001	83.3	90.1	84.5	81.0	0.006	82.7	88.7	85.4	87.0	78.0	90.5	0.036
Blogs	61.2	57.6	66.0	0.006	62.2	71.7	53.6	52.9	<0.001	59.4	62.3	59.2	63.4	59.0	72.2	0.540
Social networking sites	34.2	30.3	40.0	0.003	36.4	39.8	27.0	36.4	0.009	27.8	36.4	28.6	46.2	30.3	47.1	0.003
trust																
Websites	82.0	79.7	84.8	0.022	80.9	88.7	78.6	76.5	<0.001	78.7	82.8	80.2	87.2	82.9	81.0	0.402
Blogs	56.8	54.9	59.4	0.128	48.9	67.7	48.0	57.9	<0.001	49.3	55.6	52.6	71.4	66.7	61.1	<0.001
Social networking sites	30.9	26.7	36.4	0.001	26.3	32.8	25.8	38.7	0.006	22.1	28.4	25.0	58.5	34.2	35.3	<0.001
Bought medication through internet	11.1	12.3	9.5	0.117	10.2	11.3	7.0	17.4	0.001	10.7	10.4	9.9	22.9	7.3	0.0	<0.001
Self-diagnosis via internet	62.1	61.5	62.8	0.649	66.7	66.7	58.0	58.8	0.030	66.7	57.5	61.0	76.6	58.5	57.1	0.001
Trust methods of diagnosis in internet	34.8	34.5	35.2	0.796	37.5	31.2	32.3	42.4	0.016	28.8	34.6	35.4	54.2	25.6	28.6	<0.001

Table 2. Distribution (%) of search, satisfaction and trust levels from health information through the Internet, purchase of medication and use of the Internet for diagnosis and self-diagnosis by socio-economic indicators (i.e. geographical area, marital status, health insurance, perceived household welfare).

	Total	Geographical area				Marital status			Health Insurance				Perceived household welfare		
		Attica	Central Macedonia	Other	Sig.	Married	Unmarried/ Divorced	Sig.	EOPYY ^a only	Private	None	Sig.	None/Few difficulties	Many difficulties	Sig.
	(n=1227)	(n=723)	(n=171)	(n=333)		(n=885)	(n=324)		(n=738)	(n=369)	(n=99)		(n=534)	(n=690)	
search															
Websites	89.0	88.8	89.5	89.2	0.953	88.8	88.9	0.956	90.2	87.7	81.8	0.033	86.4	90.9	0.014
Blogs	54.7	52.7	64.3	54.1	0.024	54.4	54.6	0.949	57.6	43.9	63.6	<0.001	48.9	59.0	<0.001
Social networking sites	25.7	23.8	30.9	27.0	0.139	24.4	28.7	0.129	26.6	21.5	27.3	0.158	23.7	26.9	0.213
satisfied															
Websites	85.4	84.8	93.0	82.7	0.007	84.2	88.8	0.046	84.0	87.6	84.4	0.284	87.4	83.8	0.075
Blogs	61.2	61.3	67.3	57.7	0.140	61.3	59.3	0.563	60.9	58.2	64.3	0.544	59.9	62.0	0.493
Social networking sites	34.2	37.3	38.9	26.9	0.007	34.0	34.2	0.950	34.6	30.9	29.6	0.461	32.3	35.3	0.351
trust															
Websites	82.0	84.9	80.4	76.6	0.004	80.3	85.7	0.032	82.6	81.3	75.8	0.246	81.8	82.0	0.929
Blogs	56.8	58.8	50.0	56.2	0.122	56.3	55.7	0.848	57.5	55.3	51.6	0.509	54.6	58.3	0.209
Social networking sites	30.9	29.5	31.8	33.3	0.467	30.2	33.7	0.286	32.4	27.3	26.7	0.193	28.0	33.3	0.063
Bought medication through internet	11.1	10.0	14.3	11.8	0.248	11.6	9.3	0.268	9.4	15.6	9.1	0.007	8.0	13.5	0.003
Self-diagnosis via internet	62.1	60.5	71.9	60.4	0.016	60.4	66.4	0.060	65.3	57.9	51.5	0.005	61.7	62.2	0.870
Trust methods of diagnosis in internet	34.8	35.3	38.6	31.8	0.292	32.1	42.5	0.001	31.7	38.3	43.8	0.014	37.2	33.2	0.148

Age was also found to be significantly associated with all examined variables. Young individuals (18-34 years old) reported having searched for health information on websites and social networking sites in higher percentage (93.9%) than participants belonging to the oldest age group and those between 35 and 44. Retired study participants searched in websites for health information more (95.8%) than individuals from other occupational categories and they reported in a higher percentage (87.2%) that they trust them as a source of health information. Moreover, retired participants bought medication online (22.9%) and used it as a tool for self-diagnosis (76.6%) in higher percentage than all other occupational categories.

Participants with private insurance reported that they bought medication online in higher percentage (15.6%) than the rest of the respondents. Finally, participants living in low welfare households reported higher percentage of search in websites (90.9%) or blogs (59.0%) for health information and for purchasing purposes (13.5%), compared to those living in households with none or few difficulties.

Logistic regression analysis (Table 3) for the affirmative responses on Internet usage for self-diagnosis of symptoms ('often/occasionally') indicated that the youngest respondents (aged 18-34) were three times more probable to perform self-diagnosis via Internet, compared to the oldest age group (55+) (OR=3.0, $p<0.001$). Also, pensioners (OR=4.3, $p<0.001$), those with sole public health insurance (OR=1.7, $p=0.023$), and individuals living in the second largest Greek metropolitan region (i.e. Central Macedonia) (OR=1.6, $p=0.015$) were more probable to use Internet on a regular basis as a self-diagnostic tool in order to evaluate the current state of their health.

Table 3. Logistic regression analysis for 'Has it ever occurred to you to try to perform a self-diagnosis of symptoms based on information you accessed through the Internet?'^{a)} (cases in analysis N=1182).

	OR ^{b)}	95% C.I. ^{c)}		Sig.
		Lower	Upper	
Gender				
Female	1.0	0.8	1.3	.879
Male	1.0			
Age (years old)				
18-34	3.0	1.8	5.1	.000
35-44	2.5	1.7	3.8	.000
45-54	1.6	1.1	2.3	.022
55+	1.0			
Occupation				
Civil servant	1.5	0.8	2.7	.202
Private employee	0.9	0.5	1.6	.685
Free lancer/ Agriculturist/ Company owner	1.3	0.7	2.4	.349
Retired	4.3	2.1	8.6	.000
Unemployed	0.9	0.5	1.7	.720
Student/ Household/ other	1.0			
Health insurance				
EOPYY only	1.7	1.1	2.7	.023
Private	1.4	0.9	2.3	.179
None	1.0			
Geographical region				
Central Macedonia	1.6	1.1	2.4	.015
Other	0.7	0.6	1.0	.058
Attica	1.0			

Notes: a) ref. cat.= /Never ; b) OR=Odds ratio ; c) C.I.=confidence interval

DISCUSSION

Findings of the present study indicate that the majority of the respondents often searched websites in order to seek out health information and that they were more satisfied with health information received from said websites, compared to data received on social media and blogs. These findings are in line with the country's official data ^[26] (EL.STAT., 2014). In 2013, 59.9% of the population had Internet access, while 56% of the general population (aged 16-74) used Internet as a source information-seeking regarding health. Furthermore, there has been a steady increase on a European level in the percentages of the general population searching for health information online (from 42.3 % in 2005 to 52.2 % in 2007). ^[27] Women were found seeking, receiving

satisfaction from, and having trust in the Internet for health information more than men, a result confirming previous data found elsewhere. [28] The majority of respondents were found to have more trust in health information sourced from websites, in comparison to respective information from blogs and social media. Studies have indicated that individuals, who use websites as their primary informational sources, tend to verify their information with material sourced from a more traditional source or group of experts. [29]

Young adults of the age group between 18 and 34 were more likely to have attempted a self-diagnosis of their symptoms via Internet, while the age group 35-44 reported higher levels of satisfaction and trust regarding the health information extracted from online sources. These findings are in line with a recent study, [5] which found that younger age groups were more likely to take into consideration online rankings and reviews and to use social networking sites for health-related activities. Pensioners were the ones who trusted the Internet the most amongst all occupational categories, since they self-diagnosed their state of health, showed trust in the diagnostic methods and bought medication online more than anyone else.

The result above can be attributed to the fact that pensioners face health problems more often than other age groups. [30] Additionally, older adults seem to seek health information more often than the rest of the age groups, due to their having more leisure time to spend on activities concerning their own personal self-care. However, retired individuals are mainly of old age, so this finding contradicts the aforementioned results on younger Internet users. Similar mixed findings emerged from the study of Cutilli, [8] which showed that older people were more likely to use the Internet in order to gain access to health

information than younger ones. However, these contradictory results may be due to the small differences in the frequencies between the categories of study and hence can be attributed to the need for a larger sample size than the present (although, the current sample is representative of the corresponding general population) which may be necessary in order to reveal the exact leading trend.

Regarding income, it has been found elsewhere [31] that individuals of high income use the Internet more than those of medium to low income, a finding not confirmed in the present study, since it was found that people who face more financial difficulties show higher levels of satisfaction and trust in online health information. In addition and in terms of public health, attention should be drawn to the fact that more than 62% of Greeks admitted to have attempted self-diagnosis of their symptoms via Internet. This high percentage indicates that the sample of the present study probably cannot afford a clinical examination from a health professional and/or they avoid medical examinations due to financial or other socio-demographic and psychological difficulties, [32] such as fear and the consequent possible avoidance of a clinical examination leading to a positive finding, thus confirming their deteriorating state of health or their suffering from some kind of illness [33] (Ye et al., 2012).

However, this finding is inconsistent with previous studies demonstrating that high income individuals use the Internet more than low income ones in order to search for medical treatments/procedures and various health professionals. [28,34] These discrepancies in the current findings that are in contrast with the aforementioned studies could be attributed to the fact that the present study was conducted five years later than the previous ones, which is a considerable period of time given the speed

of Internet popularity and expansion. Another explanation of the findings mentioned above could be the technological development of the last years, which has enabled more people to gain inexpensive access to a variety of devices featuring sophisticated software (smart phones, tablets, laptops); devices that can be used as tools in the clinical self-management of chronic disabilities or diseases [35] (e.g., Irvine et al., 2015). Additionally, unforeseen financial reasons (such as the European debt crisis) could have contributed to the current results; or the obvious discrepancies between the findings presented here and those found elsewhere can simply be attributed to the different cultural contexts of the places where the studies were conducted.

The participants with only public health insurance and no private health insurance were the ones searching the Internet more for the majority of the examined variables of the present study, except for the variables related to the satisfaction over information found online and the purchase of medication via Internet. This can probably be attributed to the fact that people without health insurance are probably unemployed and therefore cannot even afford the cost of a medical examination. Furthermore, unemployment is linked to a poor state of health, [36] while on the other hand, out-of-work individuals have plenty of disposable time to search online for health-related information; alternative treatments; and health professionals.

To present, no consistent evidence is available indicating that the Internet can have a direct harmful effect on its users' health [37,38] (e.g. Ferguson and Frydman, 2004; Bessell et al., 2002). However, searching health-oriented websites can be harmful for users if they are provided with inaccurate or inappropriate medical information regarding their health-related decision making. [29] Besides caution and

criticism for the use of Internet for seeking out health information, searching for online information to evaluate clinical symptoms may be a crucial factor contributing to the improvement of the health literacy on the part of the lay public. At the same time, it motivates them to visit their family doctor. Additionally, online information can help individuals evaluate possible medical errors and consequently feel reassured for the clinical practice or the credentials of health professionals. Moreover, online health information can also be used in promoting public health, such as the case of informing the public on pandemics, when done in a scientific, efficient and credible manner. [39,40]

Although the present study has yielded some preliminary findings, its design is not without limitations. Its main limitation concerns the factors of causal association between health information-seeking behaviour and the consequent behavioural change, which cannot be drawn from cross sectional data alone. Findings could have been explored more at individual level or at group-level so as the differences between the experimental groups be located. Another useful process could have been the use of a qualitative method (such as Diary research), which could provide valuable insights and explanations about the issue under investigation. Finally, respondents were asked to determine the Internet sources they searched for health information without initially specifying whether the content of these sources was focusing on health or not, a factor which might have yielded different findings in relation to the use of health-oriented websites.

CONCLUSION

The results of the present study indicate a need for further investigation of health information provided via Internet sources. The assessment of individuals'

health information seeking behaviours is crucial, especially for health educators, health policy makers, physicians and other health professionals who plan public health interventions for the general population or specific groups within it. In their turn, web professionals, media experts and public health policy makers should promote the design and implementation of effective (in terms of health education) and accessible online media (such as blogs, websites, and applications) that provide appropriate and credible health information to the public. Future studies can also utilize these findings for assessing attitude change, so as to understand whether health information found online does actually influence health behaviours.

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