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Determinants of the frequency of online health information seeking: results of a web-based survey conducted in France in 2007

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Abstract

Objective

The Internet is a widespread source of health information for health-care professionals and patients. Social inequalities in Internet access have been well studied but not practices. This study was conducted to determine whether differences exist in the frequency of Internet use for health information among online health seekers.

Methods

We conducted an Internet-based survey from November 2006 to March 2007. The 3720 residents of France who had searched for health information during the previous year were considered.

Results

This study reveals different practice of online health information seeking between men, women, the general population and people who work in the health sector. Health status and active Internet use were associated with higher frequencies to varying degrees. Greater health concerns and some issues in the physician-patient relationship were associated with higher frequencies of Internet use in the general population.

Conclusions

The Internet seems to be used as a substitute information tool when issues of communication or confidence with physicians arise as well as to lead people to question physicians and medicine.

Practical implications

Physician and public health actors should remain cautious about these disparities in online health information seeking access and practices, quality issues concerning online information and about possible self-exclusion from the health-care system.

MESH Keywords Adolescent ; Adult ; Age Factors ; Attitude to Health ; Caregivers ; Consumer Health Information ; methods ; Female ; France ; Health Status ; Humans ; Internet ; Male ; Middle Aged ; Questionnaires ; Sex Factors ; Socioeconomic Factors ; Young Adult

Introduction

Communication and information technology have dramatically changed health management and health-care utilization for health-care professionals and patients. The proportion of Internet users who had previously searched for health information online reached about 80% in the U.S. in 2006 [1] and 71%, on average, in Europe in 2005 [2]. In 2005, the figures were lower ranging from 29% in France [3] to 49 % in the Paris metropolitan area [4].

The growth of interactive services and information websites dedicated to health and well-being seems to coincide with a potential desire in patients to assume more responsibilities in the management of their health. Their perception of their ability and capacity to care for themselves seems to have changed [5]. From “passive receivers” they are supposed to become “active consumers” of health information and health-care, and this position seems to be reinforced with the widespread use of the Internet [6]. At the same time, the physician-patient relationship has become less asymmetrical [7], again, because of the Internet [6 ,8]. Some studies hypothesize other positive effects of Internet use on the physician-patient relationship, mainly in terms of the quality of communication: the Internet seems to be a complementary source [9] that is sometimes useful in facilitating discussions with physicians [10 ,11]. From another perspective, some studies show a more negative perception of health-care professionals [12], who could be challenged by their patients [13 ,14]. Actually, to understand the physician-patient relationship more accurately when examining the use of the Internet for health purposes, the

main aspects to be taken into consideration are satisfaction (or dissatisfaction) with the relationship [11 ,17] and confidence in physicians [7 ,18]. However, only a few studies present socioeconomic or cultural aspects as potential factors in patients' perception of search abilities or in the physician-patient relationship [19].

Before studying the potential effect of the Internet on the physician-patient relationship, it should be noted that more general studies have pointed out a number of issues. Specifically, online health information seems to especially benefit people already privileged in terms of health, health-care utilization and socioeconomic status (SES) [20 ,21]. They are more likely to access information and also more likely to benefit from it. There are, with regard to Internet access for health information seeking (HIS), numerous disparities in terms of demographics, SES and social integration [22]. In fact, most of these disparities occur upstream as well, in Internet access and we previously underlined a double divide formed by socioeconomic, social and health disparities [4]. Moreover, the probability of having previously searched for health information on the Internet also differs according to health status, health literacy and health perceptions [2 ,4 ,23 ,24].

Given all of these disparities, it was important to determine whether social barriers persist among online health seekers in their ehealth behaviours. Most studies that evaluate specific uses or behaviours examine the impact of Web-based interventions to promoting healthy lifestyles, for example. Recently, a population-based study analyzed the effect of social characteristics and chronic conditions on the frequency of online HIS [25]. However, the analysis was performed on a sample recruited in 2000–2001 and did not distinguish between non-online health seekers and people who did not even have Internet access. The goal of our study was to determine whether differences exist in health-related online behaviours. We focused mainly on the frequency of Internet use for HIS among online health seekers living in France and wanted to assess the determinants involved in this practice among people working in the health sector or not.

Methods

Recruitment

We conducted an Internet-based survey from November 2006 to March 2007. We used and modified an open source tool that allows complex filters based on conditional responses [26]. Starting and submitting the questionnaire were considered informed consent. The recruitment process of this convenience sample was effected directly on the Internet (advertisement on 13 partner websites' banners, home pages or newsletters), by e-mail and through offline media. We increased the number of websites that displayed our questionnaire in order to reach respondents with different characteristics: we chose health-related and non-health-related, public and private, and institutional and noninstitutional websites (see the "Acknowledgments" section).

Variables

The outcome variable was the response to the question "In the past 12 months, how often did you use the Internet to search for health information or advice?", for which there were three options: "every week", "every month" and "less often".

The respondents' SES was characterized by the following variables: level of education, occupational status and health insurance status. Since the survey dealt with health information behaviours, we also distinguished between respondents on the basis of their type of occupation in the health sector: health professionals (physicians and pharmacists), other caregivers (nurses, psychologists and other (para)medical personnel), health students, people who worked in the health sector or in health research but who were not caregivers ("other health workers" in this paper) and, lastly, all others (the "general population"). Demographic data were also collected (gender, age, nationality), as well as data on the region and the size of the population of the city of residence. Social integration was measured by family situation, children, and an indicator of perceived-isolation.

To discern disease experience, we considered self-perceived general health ("How would you rate your overall health?") and mental health ("How would you rate your psychological and emotional health?") on the day of the survey using a 5-points likert scale (from very good to poor). We also asked people if they had a chronic health condition, a disability or a handicap.

Lastly, we identified people (such as caregivers, relatives and volunteers) who were looking after someone who was sick or handicapped. Additionally, declarative data were collected on health-care system utilization during the previous year: having or not having consulted a general practitioner or a specialist, used traditional or alternative medicine or, more generally, having a regular physician or not.

The respondents were also asked about their health attitudes and representations concerning medicine and their experiences with physicians (Table 1). All the variables were dichotomized between "Yes" (if the respondent strongly or somewhat agreed with the statement) and "No" (if he/she strongly or somewhat disagreed).

Lastly, information on general Internet use was collected. We asked people if they had a home connection, how long they had been using the Internet and if they felt comfortable using it. We also created a variable combining activity status and the frequency of use.

People were considered active users if they were used to buying on the Internet, taking part in virtual communities, or managing websites at least once a week; or passive users if they only searched for information or surfed the Internet, with no or only rare such active use.

Statistical analysis

We first compared the distribution of some characteristics with those of the French Family and Living Conditions Survey (a representative random sample of the French population conducted in the fall of 2005). To reduce the potential sampling bias, we tested two methods to weight our study sample: propensity scoring [27] and poststratification adjustment for age and gender [28].

Of the 4543 respondents, we considered the 3720 residents of France who had searched for health information during the previous year and for whom there were no missing values for our outcome (frequency of online HIS) or for the two stratification variables used (gender and working in the health sector). However, since we did not require people to answer each question, there were some missing values (an average of 1.9% of missing values per variable), and a complete-case analysis would have led to a loss of 33.2% of the data. We therefore decided to use an imputation strategy. Assuming that these data were missing at random (MAR), we performed multiple imputation using IVEware with SAS [29] to estimate the parameters and the variation in missing values more accurately. We performed an analysis using multinomial logistic regressions, adjusting for age, level of education, and source of the recorded questionnaire. We first selected potential covariates associated with a P_value of 0.25; we then put all of the selected covariates in a complete model and backward-selected the final model (significance threshold fixed at 0.05). We tested all the plausible interaction (but none were found to be significant). Lastly, a sensitivity analysis was performed to test the MAR assumption.

Results

Our study sample was not fully representative of the reference population of online health seekers but over-represented usual health-seekers characterstics. For example, the proportion of women (68.0%) and that of people who reported having a chronic condition (41.9%) were higher than in the reference population (59.4% and 29.2%, respectively). The level of education was higher as well (only 19.3% of the respondents did not have a postsecondary degree compared to 57.1%), but the median age of the health seekers (39 years; interquartile: 28–52) and the proportion of French citizens (96.4%) were very close, and almost all regions of France were represented. Approximately 17.1% of the respondents were health professionals, caregivers or students, and 25.7% were other health workers. Since neither of the two weighting methods tested seemed to have a significant effect on any of the covariate distributions, we decided not to weight our subsequent analyses.

In all, 30.4% of the respondents used the Internet for HIS every week, 36.3% every month and 33.3% less often (i.e., every year). Women in the general population searched more frequently online for health information than men (22.1% vs. 12.9% every week), but among the respondents with a health-related occupation, women searched less frequently than men (44.4% vs. 49.7% every week). We performed all the analyses for the general population and people working in the health sector separately and further distinguished between men and women. Table 2 presents the final logistic regression models.

In the general population, the effect of age and level of education was neither continuous nor always significant: older women seemed to use the Internet to search for HIS less frequently than younger women and those with a postsecondary education lower than a master's degree seemed to search for health information online less frequently than those with a lower or higher level of education. Searches conducted for professional reasons were more frequent than for personal reasons. Even if respondents stated that they did not work in the health sector, certain occupations sometimes involve such searches. Adjusted for all of the covariates, a greater experience of Internet use, personal and relative's experience of illness and having children were associated with a higher frequency of online HIS. In addition, having greater health concerns was associated with a higher frequency of HIS, as was a negative perception of the relationship with one's doctor. In contrast to the other covariates (where the effects were higher in the highest-frequency category), the probability of weekly online HIS was lower among women who reported that they prefer waiting before going to see a doctor and higher among those who reported that they had seen a physician during the previous year.

Among men in the general population, a few covariates were significantly associated with an increased frequency of online HIS: reporting having a disability (in women, a chronic condition instead), taking care of someone sick, and active use of the Internet. Two characteristics of health representations (similar for women, but with stronger effects) were significantly associated with the frequency of HIS: having greater health concerns and wanting to be listened more closely by their doctor.

As for women in the general population, there was no clear effect of age or level of education in those working in the health sector. Adjusted for all covariates, the probability of online HIS was higher when searches were done for professional reasons. We found similar effects for Internet experience in women in the general population. Reporting having a disability and taking care of someone sick were associated with a higher frequency of online HIS, but our data did not show self-rated status or having children to have an effect. Lastly, the frequency of HIS was higher in women who indicated that they did not have enough time to go and see a physician because of job or family responsibilities.

The last model performed, in men working in the health sector, may have suffered from a lack of statistical power because of the small sample size. However, the data showed that the probability of online HIS increased with age and level of education. Active Internet use was found to have a positive effect, as were occupational status and the reasons for searching. There was no significant association with health status, but the probability of weekly HIS was higher in men who thought that it is not easy to ask physicians certain questions.

Discussion and Conclusion

Discussion

Our study shows different uses of the Internet according to occupation (working or not working in the health sector). If some studies examine online HIS in specific populations of health-care providers [30 ,31], only a few general population-based studies [10 ,32] have made the distinction between health-related occupation that allows us to do specific interpretation for both health professionals and the general population. We also showed a difference by gender. Women in the general population used the Internet for health reasons more frequently, which is consistent the gender effect showed on the use of online health information tools [2 ,4 ,33 –35] a gender-based social role: mothers – rather than fathers – are still the main managers of children's health and illness in families [37 ,38]. However, among people working in the health sector, men were more frequent users: those who searched more frequently for health information were health professionals (physicians and pharmacists), who, in our dataset, were also more likely to be men.

While age and level of education are found to be major barriers when studying HIS disparities in terms of use and nonuse [2 ,4 ,16 ,33 –35], our analysis did not show any obvious effect on the frequency of online HIS (the level of income, sometimes described as a barrier, was not available in our dataset), when all barriers to access are overcome. Another proxy of SES used in our analyses was people's health insurance status. Studies carried out the United States found that people who have private insurance are more likely to search for health information [23 ,25]. In the general context of the French welfare state, we did not note such an association in this study, just as we did not in previous studies in France [3 ,4]. The socioeconomic position which both impacts on Internet access and then on Internet use for HIS [4] seems not to be a barrier anymore in terms of behaviors.

Even if the Internet penetration and high-speed connection rates are still increasing, geographical barriers to Internet access persist [39]. Given geographical disparities in access to primary care [40] and in physician density [41], it could certainly be assumed that once the barriers to Internet access are overcome, the Internet could become a substitute source of health information in rural or medically undeserved areas [20]. However, our data do not support this hypothesis. We did not find a difference in the frequency of use according to geographical characteristics and raw data showed that only 15.8% of the respondents used the Internet instead of going to see a physician. All these results suggest that Internet use is not really a problem of substitution, but rather that it is highly associated with the need for information, sometimes as a complement to medical consultations.

This study confims that another important dimension associated with online HIS behaviors is health in terms of experiences, perceptions and attitudes. We found a positive association with health status, as previously shown with online HIS [2 ,4 ,23] and the frequency of such use [25]. More generally, experiences of illness concern both one own's health and that of relatives. In our dataset indeed, people used the Internet to search for health information for themselves (75.8%) as much as for relatives (74.8%), while other studies show that people use the Internet more often for someone else's concerns [1 ,42]. Greater health concerns was also found to be a determinant of the frequency of use in almost all the groups, as previously shown with online HIS [4 ,24]. Lastly, poor perceived health status independently increased the probability of using the Internet more frequently for health purposes among women in the general population. Here, too, gender differences in health representations and management in everyday life in general could explain this difference, illness, sickness and health perceptions or feelings playing different roles in men and women. This additional explanatory dimension could reveal a greater discriminating power or even a social gradient in self-rated health among women [43].

Dealing with health-care utilization, some studies have found that the probability of online HIS increases with the number of visits to a physician [2 ,3]. However the contrary could also be assumed (in which case online HIS could be seen as a substitute for a lack of "real" medical visits). In our study, both hypotheses could be corroborated. Women who are not excluded from the health-care system (have seen a physician during the previous year) are those who monthly search for online HIS: as some researchers have suggested [20 ,21], this result confirms that online health information especially benefits the already privileged, in this case in terms of health-care utilization. However, being socially more distant from medical services was also associated with a higher frequency of online HIS. Reporting not having enough time to go and see a physician was associated with more frequent use of the Internet for health purposes among women working in the health sector, as was preferring to wait before going to see a doctor among women in the general population (but not, for these women, to the point of going online every week). This is overall consistent with the hypothesis which assumes that people use the Internet rather than the other traditional health information sources - including doctors - to reduce costs of searches, both in terms of time and money [23 ,44].

Numerous studies have also examined the effect of online HIS on the physician-patient relationship in various populations of patients with chronic conditions (but rarely in the general population). Interestingly, we found that, in men working in the health sector, those who

think that it is not always easy to ask their physician certain questions did more frequent online HIS. This finding is probably a confidentiality-related rather than a knowledge-related problem: they might go online rather than ask a physician or a close colleague about sensitive issues, for example. Our study also suggests that trust issues and communication issues with caregivers were both associated with a higher frequency of online HIS. A quantitative study based on a representative sample found that americans who reported that they had a fair or poor rating of the care provided by their regular physician were more likely to search for health information online than those who reported a higher rating [16]. Certain qualitative studies also suggest that patients who use the Internet would need more information from their physician [11], do not receive enough attention [45], or perceive a decrease in trust [46]. Of course, because of our study's cross-sectional design, we cannot determine the direction of this association (let alone interpret it in terms of causality) or conclude whether the Internet is a useful information tool that compensates for disappointing communication, distrust of physicians or whether online HIS leads to reduced confidence in and relationships with health-care providers. Be that as it may, all of the estimated effects of the above-mentioned representations of health and of the physician-patient relationship may explain why we did not find, in our analyses, SES to have a clear effect when all barriers to access are overcome. Some studies show that SES is higly associated with the physician-patient relationship [7][17][7 ,47]. Thus we could assume that we did not observe SES to have an effect because it is moderated by representations of health and of the physician-patient relationship or at least that these representations seem to be much strongly associated with the frequency of online HIS than socioeconomic status.

Finally, the online design of this study resulted in three main limitations. First, the validity and reliability of data obtained by online surveys compared to paper-and-pencil surveys still differ according to different published reviews [48 ,49]. Second, since our study was based on a convenience sample, our analyses only reflected the respondents' characteristics and we cannot make any generalization to the Internet health seeker population in France. Third, even if we had increased the number of sources of recruitment, our study might have suffered from sampling and coverage biases. For instance, the respondents were more likely to be women and to report poor perceived health or having a chronic condition in comparison with a reference population. However, it is well known that women can be considered those who usually look after health matters and health management in their families [37 ,43], and they are also known to be more likely to search online for health information [2 –4 ,33 ,34]. At the same time, while people with Internet access [4] and those who respond to online questionnaires [50] are more likely to be in better health, people who report having a chronic condition are more likely to have previously searched for health information on the Internet [2 ,4 ,23]. Thus, our study sample actually (over)represented certain health seeker characteristics and this selection bias could be interpreted as a feature of the actual demographic distribution of health seekers. One possible way to limit these sample biases was to weight the data, but as mentioned above, neither of the two methods tested yielded a significant gain in representativeness. Moreover, the estimate from the final multivariate regression analysis did not differ whether weighted data were used or not (except for age and level of education) and findings from the sensitivity analysis reinforced the results obtained.

Conclusion

In conclusion, this study performed on a dataset from 3720 health seekers living in France reveals different uses of the Internet for health information seeking between men and women and between the general population and people who work in the health sector. Our analyses did not show significant or clear associations between the frequency of online HIS and other demographic, socioeconomic or geographic characteristics. Among men, the frequency of online HIS is notably associated with having a health problem and active Internet use, while among women, it is also associated with perceptions and representations. A lack of confidence in and higher expectations from health-care providers lead to more frequent use of the Internet for health information. In the context of the information age, the question is not to know whether the Internet is used as a substitute information tool when issues of communication or confidence with physicians arise or whether the Internet leads people to question physicians and medicine. Both hypotheses are likely true, even for a given individual, depending on the context and the time.

Practice Implications

This study confirms that the Internet now plays an important role in health management in everyday life (at least among Internet users) and that it could affect relationships with healthcare providers in different ways. We must now view the "traditional" medical authority and the physician-patient relationship in light of the Internet as a third entity. This increased use of online tools for health information seeking is consistent with current public health policies that promote the development of the "informed patient", but we should remain cautious about quality issues concerning online information and about possible self-exclusion from the health-care system. A longitudinal study would be necessary in order to gain a deeper understanding of the effect of online HIS on Internet user health-care utilization.

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Footnotes:

Conflicts of interest: No conflict of interest

References:

- 1 . Fox S . Online health search 2006 . 2006 ; October 29 2006 [cited June 2008]; Available from: http://www.pewinternet.org/pdfs/PIP_Online_Health_2006.pdf . Archived at
- 2 . Andreassen HK , Bujnowska-Fedak MM , Chronaki CE , Dumitru RC , Pudule I , Santana S . European citizens' use of E-health services: A study of seven countries . BMC Public Health . April 10 2007 ; 7 : (1) 53 -
- 3 . Renahy E , Parizot I , Chauvin P . Internet and health: Lessons learned from the French national survey on households living conditions in 2005 . Rev Epidemiol Sante Publique . 2008 ; 56 : (2) 117 - 25
- 4 . Renahy E , Parizot I , Chauvin P . Health information seeking on the Internet: A double divide? Results from a representative survey in the Paris metropolitan area, France, 2005–2006 . BMC Public Health . 2008 ; 8 : 69 -
- 5 . Herzlich C . Illness and Self in Society . Johns Hopkins University Press . Johns Hopkins University Press ; 1987 ; 288 -
- 6 . Anderson JG , Rainey MR , Eysenbach G . The impact of CyberHealthcare on the physician-patient relationship . J Med Syst . 2003 ; Feb 27 : (1) 67 - 84
- 7 . Hammer R . La confiance dans son médecin . Primary Care . 2006 ; 6 : (18) 337 - 9
- 8 . Hardey M . Doctor in the house: The Internet as a source of lay health knowledge and the challenge to expertise . Sociol Health Illn . 1999 ; 21 : (6) 820 - 35
- 9 . Stevenson FA , Kerr C , Murray E , Nazareth I . Information from the Internet and the doctor-patient relationship: the patient perspective - a qualitative study . BMC Fam Pract . 2007 ; Aug 16 8 : (1) 47 -
- 10 . HON . Analysis of 9th HON Survey of Health and Medical Internet Users . Health On the Net Fondation ; 2005 ;
- 11 . Kivits J . Informed Patients and the Internet: A Mediated Context for Consultations with Health Professionals . J Health Psychol . March 1 2006 ; 11 : (2) 269 - 82
- 12 . Ahmad F , Hudak P , Bercovitz K , Hollenberg E , Levinson W . Are physicians ready for patients with Internet-based health information? . J Med Internet Res . 2006 ; 8 : (3) e22 -
- 13 . Eysenbach G . The impact of the Internet on cancer outcomes . CA Cancer J Clin . 2003 ; Nov–Dec 53 : (6) 356 - 71
- 14 . Lowrey W , Anderson WB . The impact of internet use on the public perception of physicians: a perspective from the sociology of professions literature . Health Commun . 2006 ; 19 : (2) 125 - 31
- 15 . Broom A . Virtually he@lthy: the impact of Internet use on disease experience and the doctor-patient relationship . Qual Health Res . 2005 ; Mar 15 : (3) 325 - 45
- 16 . Murray E , Lo B , Pollack L , Donelan K , Catania J , White M . The impact of health information on the internet on the physician-patient relationship: patient perceptions . Arch Intern Med . 2003 ; Jul 28 163 : (14) 1727 - 34
- 17 . Anderson LA , Zimmerman MA . Patient and physician perceptions of their relationship and patient satisfaction: A study of chronic disease management . Patient Educ Couns . 1993 ; 20 : (1) 27 - 36
- 18 . Andreassen HK , Trondsen M , Kummervold PE , Gammon D , Hjortdahl P . Patients who use e-mediated communication with their doctor: New constructions of trust in the patient-doctor relationship . Qual Health Res . February 1 2006 ; 16 : (2) 238 - 48
- 19 . Street RL Jr , Gordon H , Haidet P . Physicians' communication and perceptions of patients: Is it how they look, how they talk, or is it just the doctor? . Soc Sci Med . 2007 ; 65 : (3) 586 - 98
- 20 . Eng TR , Maxfield A , Patrick K , Deering MJ , Ratzan SC , Gustafson DH . Access to health information and support: a public highway or a private road? . Jama . 1998 ; Oct 21 280 : (15) 1371 - 5
- 21 . Gilmour JA . Reducing disparities in the access and use of Internet health information. A discussion paper . Int J Nurs Stud . 2007 ; Sep 44 : (7) 1270 - 8
- 22 . Renahy E , Chauvin P . Internet uses for health information seeking: a literature review . Rev Epidemiol Sante Publique . 2006 ; 54 : (3) 263 - 75
- 23 . Bundorf MK , Wagner TH , Singer SJ , Baker LC . Who searches the internet for health information? . Health Serv Res . 2006 ; 41 : (3P1) 819 - 36
- 24 . Dutta-Bergman MJ . Health attitudes, health cognitions, and health behaviors among Internet health information seekers: Population-based survey . J Med Internet Res . 2004 ; 6 : (2) e15 -
- 25 . Ayers SL , Kronenfeld JJ . Chronic illness and health-seeking information on the Internet . Health (London) . July 1 2007 ; 11 : (3) 327 - 47
- 26 . Holmes JW . Unit Command Climate Assessment and Survey System . 2004 ; [cited June 2008]; Available from: http://www.bigredspark.com/survey.html
- 27 . Schonlau M , Van Soest A , Couper M , Winter J , Kapteyn A . Attempting to adjust for selection bias in Web surveys with propensity scores: the case of the Health and Retirement Survey (HRS) . Proceedings of the American Statistical Association 2004 2004 Toronto 2004 ;
- 28 . Sautory O . Calmar: a SAS ® macro for post-stratification adjustments . 1993 ; [cited June 2008]; Available from: http://www.insee.fr/fr/nom_def_met/outils_stat/calmar/cal_res.htm
- 29 . Raghunathan TE , Lepkowski JM , VanHoewyk J , Solenberger P . A Multivariate Technique for Multiply Imputing Missing Values Using a Sequence of Regression Models . Survey Methodology . 2001 ; 27 : 85 - 95
- 30 . James N , Daniels H , Rahman R , McConkey C , Derry J , Young A . A study of information seeking by cancer patients and their carers . Clin Oncol (R Coll Radiol) . 2007 ; Jun 19 : (5) 356 - 62
- 31 . Podichetty VK , Booher J , Whitfield M , Biscup RS . Assessment of internet use and effects among healthcare professionals: a cross sectional survey . Postgrad Med J . 2006 ; Apr 82 : (966) 274 - 79
- 32 . Ayme S , Rath A , Thibaudeau V , Urbero B , Fonteny V , Levi-Strauss M . Rare diseases: what sources of information for health care professionals and for patients? . Reanimation . 2007 ; 16 : (4) 276 - 80
- 33 . Bansil P , Keenan NL , Zlot AI , Gilliland JC . Health-related information on the Web: results from the HealthStyles Survey, 2002–2003 . Prev Chronic Dis . April 1 2006 ; 3 : (2) A36 -
- 34 . Ybarra ML , Suman M . Help seeking behavior and the Internet: A national survey . Int J Med Inform . 2006 ; 75 : (1) 29 - 41
- 35 . Rice RE . Influences, usage, and outcomes of Internet health information searching: Multivariate results from the Pew surveys . Int J Med Inform . 2006 ; 75 : (1) 8 - 28
- 36 . Marical F . Health insurance: a generalization that will not erase disparities . Paris Institut national de la statistique et des études économiques ; 2007 ;
- 37 . Cresson G . Le travail domestique de santé . Paris L'Harmattan ; 1998 ;
- 38 . Young R . The household context for women's health care decisions: impacts of U.K. policy changes . Soc Sci Med . 1996 ; Mar 42 : (6) 949 - 63
- 39 . Bigot R . Information and communication technology diffusion in the French society . Paris Crédoc ; 2006 ;
- 40 . Chaix B , Veugelers PJ , Boelle PY , Chauvin P . Access to general practitioner services: the disabled elderly lag behind in underserved areas . Eur J Public Health . 2005 ; Jun 15 : (3) 282 - 7
- 41 . Hilico C , Poulos D . Metropolitan departments: socioeconomic similarities and oppositions . Paris Institut national de la statistique et des études économiques ; 2004 ;
- 42 . Ferguson T . From patients to end users . Bmj . 2002 ; Mar 9 324 : (7337) 555 - 6
- 43 . Bartley M , Sacker A , Firth D , Fitzpatrick R . Social position, social roles and women's health in England: changing relationships 1984–1993 . Soc Sci Med . 1999 ; Jan 48 : (1) 99 - 115
- 44 . Pandey SK , Hart JJ , Tiwary S . Women's health and the Internet: understanding emerging trends and implications . Soc Sci Med . 2003 ; 56 : (1) 179 - 91
- 45 . Hoch D , Ferguson T . What I've learned from E-patients . PLoS Med . 2005 ; Aug 2 : (8) e206 -
- 46 . Ziebland S . The importance of being expert: the quest for cancer information on the Internet . Soc Sci Med . 2004 ; 59 : (9) 1783 - 93

- 47 . Boltanski L . Les usages sociaux du corps . Annales ESC . 1971 ; 26 : 205 - 33
- 48 . Eysenbach G , Wyatt J . Using the Internet for surveys and health research . J Med Internet Res . 2002 ; Apr–Nov 4 : (2) e13 -
- 49 . Whitehead LC . Methodological and ethical issues in Internet-mediated research in the field of health: An integrated review of the literature . Soc Sci Med . 2007 ; 65 : (4) 782 - 91
- 50 . Couper MP , Kapteyn A , Schonlau M , Winter J . Noncoverage and nonresponse in an Internet survey . Soc Sci Res . 2007 ; 36 : (1) 131 - 48

Table 1

Survey questions related to health attitudes and representations concerning medicine and their experiences with physicians

Health Attitudes & Representations
My body seems to resist illness very well
I worry easily about my health when something goes wrong
I have a healthy lifestyle
In the future, I expect to have better health than other people I know
I was so sick once I thought I might die
I worry about my health more than others
Attitudes Concerning Health-care Utilization
I don't have the time to go and see a doctor because of my job or family responsibilities
I hesitate to go to the doctor's for financial reasons
My doctor's office is too far away, I don't have any means of transportation
I 'm afraid of going to the doctor's having medical examinations or receiving medical treatment
I prefer to wait and see if I feel better before going to see a doctor
I don't know any good doctors
Representation of Medicine
Doctors are the ones who know the best what's good for sick people
Medicine has effective solutions to all health problems
Representation of the Physician-patient Relationship
It's not easy to ask physicians certain questions
I would like doctors to give me more explanations about my health or medical treatments
I would like doctors to listen to me more close about my health problems or treatments
I think doctors don't tell me everything about my health
Health Literacy
The information provided by doctors is difficult to understand
The health advice and recommendations provided by doctors are difficult to apply in daily life

Table 2

Multinomial multivariate logistic regression for frequency of online health information seeking

	GENERAL POPULATION										HEALTH SECTOR									
	WOMEN (n=1387)					MEN (n=744)					WOMEN (n=1153)			MEN (n=436)						
	Every month (n=531)		Every week (n=306)			Every month (n=255)		Every week (n=96)			Every month (n=427)	Every week (n=513)		Every month (n=139)		Every week (n=216)				
	aOR	95%CI	aOR	95%CI	P	aOR	95%CI	aOR	95%CI	P	aOR	aOR	P	aOR	95%CI	aOR	95%CI	P		
Works in a health sector																				

Health professional											1.04	(0.81–1.33)	2.14	(1.68–2.72)	<.0001	1.61	(1.15–2.24)	2.50	(1.82–3.44)	<.0001
Caregiver			NA				NA				1.01	(0.87–1.17)	0.84	(0.72–0.99)	.003	1.37	(0.98–1.93)	2.82	(2.01–3.94)	<.0001
Health student											0.74	(0.57–0.96)	1.20	(0.93–1.56)	<.0001	0.66	(0.37–1.19)	1.63	(0.94–2.83)	<.0001
Other health worker											1	-	1	-		1	-	1	-	
HIS context																				
Personal only	1	-	1	-							1	-	1	-	1	-	1	-	1	-
Personal and professional	1.59	(1.06–2.39)	0.77	(0.35–1.70)	.060						0.97	(0.75–1.27)	4.10	(3.18–5.29)	<.0001	2.90	(2.00–4.21)	14.36	(9.85–20.93)	<.0001
Professional only	2.09	(1.81–2.40)	2.85	(2.40–3.40)	<.0001						3.12	(2.72–3.57)	6.96	(5.96–8.12)	<.0001	3.96	(3.15–4.98)	7.52	(5.80–9.76)	<.0001
Age group (years)																				
18–29	1.52	(1.25–1.85)	1.28	(1.01–1.64)	.116	1.35	(1.12–1.64)	0.77	(0.57–1.04)	<.0001	0.64	(0.49–0.83)	0.75	(0.56–1.00)	.129	0.76	(0.54–1.06)	1.03	(0.70–1.52)	.046
30–39	1.47	(1.23–1.77)	1.80	(1.45–2.24)	.030	1.00	(0.83–1.20)	0.80	(0.62–1.05)	.090	0.63	(0.48–0.82)	1.08	(0.81–1.45)	<.0001	0.50	(0.36–0.69)	1.47	(1.02–2.12)	<.0001
40–49	0.82	(0.69–0.99)	1.22	(0.99–1.52)	<.0001	1.49	(1.22–1.83)	1.17	(0.89–1.54)	.061	0.50	(0.38–0.66)	0.94	(0.70–1.26)	<.0001	0.43	(0.30–0.60)	1.36	(0.94–1.99)	<.0001
50–59	0.69	(0.57–0.82)	0.97	(0.79–1.20)	<.0001	1.08	(0.90–1.31)	0.97	(0.75–1.24)	.344	0.65	(0.50–0.85)	0.96	(0.72–1.28)	<.0001	0.85	(0.60–1.21)	2.54	(1.73–3.72)	<.0001
≥60	1	-	1	-		1	-	1	-		1	-	1	-		1	-	1	-	
Level of education																				
Secondary or less	1	-	1	-		1	-	1	-		1	-	1	-		1	-	1	-	
Postsecondary below master's degree	0.81	(0.72–0.91)	0.71	(0.62–0.81)	.019	1.08	(0.93–1.26)	0.68	(0.56–0.84)	<.0001	0.67	(0.56–0.79)	0.60	(0.50–0.72)	.126	0.94	(0.67–1.31)	1.56	(1.07–2.27).	002
Postsecondary higher than master's degree	0.87	(0.75–1.02)	0.97	(0.80–1.18)	.229	1.29	(1.08–1.54)	0.94	(0.73–1.21)	.011	0.78	(0.63–0.96)	0.93	(0.75–1.16)	.025	0.99	(0.69–1.41)	2.37	(1.60–3.52)	<.0001
Internet use																				
Passive	1	-	1	-		1	-	1	-		1	-	1	-		1	-	1	-	
Active	1.59	(1.43–1.78)	3.51	(3.09–3.98)	<.0001	1.08	(0.95–1.23)	2.10	(1.74–2.54)	<.0001	1.96	(1.65–2.31)	3.19	(2.69–3.77)	<.0001	1.00	(0.79–1.25)	2.33	(1.87–2.91)	<.0001
Feels comfortable using the Internet																				
No	1	-	1	-							1	-	1	-						
Yes	3.29	(2.53–4.27)	4.46	(3.09–6.46)	.095						1.37	(1.07–1.77)	5.18	(3.77–7.10)	<.0001					
Home connection																				
No																1	-	1	-	
Yes																1.73	(1.33–2.25)	3.66	(2.71–4.94)	<.0001
Has children																				
No	1	-	1	-																

Yes	1.93	(1.73–2.15)	2.14	(1.87–2.46)	.096													
Taking care of someone sick																		
No	1	-	1	-		1	-	1	-		1	-	1	-				
Yes	1.63	(1.46–1.82)	2.22	(1.95–2.53)	<.0001	1.29	(1.11–1.49)	3.27	(2.70–3.97)	<.0001	1.59	(1.40–1.81)	1.81	(1.59–2.07)	.010			
Chronic condition																		
No	1	-	1	-														
Yes	1.15	(1.04–1.27)	1.73	(1.53–1.97)	<.0001													
Disability																		
No						1	-	1	-		1	-	1	-				
Yes						2.86	(2.31–3.54)	4.62	(3.61–5.92)	<.0001	1.28	(0.97–1.71)	2.61	(1.96–3.47)	<.0001			
Self-rated health status																		
Very good	1	-	1	-														
Good	1.42	(1.27–1.58)	1.29	(1.11–1.50)	.193													
Avg, fair, poor	2.61	(2.24–3.04)	3.06	(2.52–3.70)	.068													
Had seen a physician during the previous 12 months																		
No	1	-	1	-														
Yes	3.28	(2.34–4.61)	1.02	(0.73–1.45)	<.0001													
Worries about health more than others																		
No	1	-	1	-		1	-	1	-		1	-	1	-				
Yes	1.74	(1.58–1.91)	2.66	(2.37–2.99)	<.0001	2.48	(2.20–2.78)	3.53	(2.97–4.20)	<.0001	1.29	(1.14–1.46)	1.92	(1.69–2.18)	<.0001			
Would like more attention from physician																		
No	1	-	1	-		1	-	1	-									
Yes	1.45	(1.32–1.60)	1.59	(1.40–1.81)	.124	1.49	(1.33–1.68)	1.82	(1.51–2.20)	.035								
Thinks physicians do not tell everything about own health																		
No	1	-	1	-														
Yes	1.04	(0.95–1.15)	1.69	(1.50–1.90)	<.0001													
P-ers waiting before going to see a physician																		
No	1	-	1	-														
Yes	1.20	(1.09–1.32)	0.66	(0.58–0.74)	<.0001													
Lack of time for going to see a physician																		
No											1	-	1	-				
Yes											1.37	(1.21–1.55)	1.68	(1.48–1.91)	<.0001			
Thinks that it is not easy to ask physicians certain questions																		
No																1	-	1	-	
Yes																0.68	(0.56–0.84)	1.28	(1.05–1.56)	<.0001

Notes:

aOR: controlled for all the covariates in the model and the source of the recorded questionnaire
P: Wald test comparing $aOR_{EveryWeek}$ Vs. $aOR_{EveryMonth}$