Prevalence of Internet use amongst an elective spinal surgery outpatient population

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Abstract Nationally 62% of individuals in Ireland have internet access. Previous published work has suggested that internet use is higher among those with low back pain. We aimed to determine the levels of internet access and use amongst an elective spinal outpatient population and determine what characteristics influence these. We distributed a self-designed questionnaire to patients attending elective spinal outpatient clinics. Data including demographics, history of surgery, number of visits, level of satisfaction with previous consultations, access to the internet, possession of health insurance, and details regarding use of the internet to research one's spinal complaint were collected. 213 patients completed the questionnaire. 159 (75%) had access to the internet. Of this group 48 (23%) used the internet to research their spinal condition. Increasing age, higher education level, and possession of health insurance were all significantly associated with access to the internet ($p < 0.05$). A higher education level predicted greater internet use while possession of insurance weakly predicted non-use ($p < 0.05$). In our practice, internet access is consistent with national statistics and use is comparable to previous reports. Approximately, one quarter of outpatients will use the internet to research their spinal condition. Should we use this medium to disseminate information we need to be aware some groups may not have access.

Keywords Internet · Outpatient clinic

Introduction

The internet continues to grow globally. In the Republic of Ireland, access continues to increase with 62% of households across the nation connected in 2008 [1]. Patients and surgeons can both utilize this source to find information on a seemingly infinite number of health-related topics. If one performs a search for 'back pain' using the Google internet search engine, 52,700,000 links are provided in 0.34 s [2]. If 'discectomy' is searched for, 260,000 links are provided in only 0.25 s (searches performed on 21 July 2009).

It is clear from previous work that patients access the internet to research their orthopedic condition [3–8]. Patients presenting to outpatient clinics with low back pain have previously showed a non-significant trend ($p > 0.05$) towards greater use of the internet as an information-seeking tool—a finding reproduced in previous work from our unit (unpublished data) [3].

We first aimed to establish amongst out practice population the level of internet access. We then aimed to establish the prevalence of internet use within this group to gain information about one's spinal condition and define the characteristics influencing this practice. Overall, we hoped to gain an indication of the feasibility of directed information provision via this medium.

Materials and methods

We distributed a self-developed questionnaire to consecutive patients attending both public and private elective spinal outpatient clinic over a 2-week period. The clinics

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included were elective spinal outpatient clinics (that is, cases excluding spinal trauma) in the public setting and private outpatient clinics in each of the spinal surgeon's private settings. This questionnaire had been successfully used in a previous study in our department (unpublished). Patient consent was obtained at the time of consultation. Information gathered included basic demographics, highest attained education level, history of surgery, number of clinic visits, confidence of knowing ones diagnosis, satisfaction with information provided at the previous clinic visit, and insurance status. The level of satisfaction was recorded on a visual analog scale from 0 (least satisfied) to 100 (most satisfied). Patients were specifically asked whether they had access to the internet (defined as access to the internet within their own home) and whether they had used the internet to search for complaint-specific information. They were also asked whether they had sought information from their family physician, printed texts or friends. A body map was used for patients to confirm the location of their principal complaint. Those not indicating the spine were excluded from analysis.

Access to internet, and using the internet to search for information on orthopaedic condition were explored initially with univariate logistic regression, followed by multivariate logistic regression, using a backward stepwise entry procedure. Between-subject *t* test was used to compare satisfaction levels between those who had searched the internet and those who had not. Analyses were performed with SPSS 17.0.2.

Results

Two hundred thirteen consecutive patients completed the questionnaire (86 males; 127 females). Six patients did not complete the questionnaire: five did not have their reading glasses and one deferred due to having other medical forms to complete. All patients indicated a spinal complaint on the body map. The highest attained level of education was primary in 23 (11%), secondary in 99 (46%), trade qualification or equivalent in 28 (13%), and a tertiary education 58 (27%). 39 (18%) patients had a history of surgery for their spinal condition. 99 (46%) patients were attending their first outpatient session, 47 (22%) had attended 2–5 sessions, 8 (4%) had attended 6–10 sessions, while 6 (3%) had attended more than 10. Private health insurance was held by 146 (69%) while three did not answer this question. 209 (98%) patient had a regular General Practitioner (GP). 159 (75%) patients had access to the internet and three did not answer this question.

Overall, 154 (72%) patients reported having researched their spinal condition in some way. 19 (9%) had consulted with friends, 10 (9%) had consulted books or printed texts,

48 (23%) accessed the internet, and 125 (59%) at some point consulted their family physician. Of those with internet access 30% had used it to research their condition.

Twelve cases (5.6%) were removed prior to further analysis because of missing values. Both univariate and multivariate analyses (Table 1) found that lower age, higher education level, and having health insurance were all significantly associated with having greater access to the internet.

Considering only those ($n = 151$) who had access to the internet, gender, age, surgical history, or whether it was a first visit did not predict use of the internet to research the patient's condition. Internet searching was, however, predicted by increasing education level, and by having insurance. The multivariate model found that in combination those two variables did more strongly and significantly predict internet searching (Table 2).

As an attempt to consider the effect of internet searching, amongst returning patients who had internet access, the mean satisfaction with information provided at the previous clinic visit(s) overall was 66/100. However, this satisfaction level did not differ between those who searched the internet (64/100) and those who had not (68/100), $t(32) = 0.4$, $p = 0.7$.

Discussion

We set out to establish the level of internet access within a sample of patients attending elective spinal surgery outpatient clinics and define characteristics that could predict internet use.

The level of access to the internet (75%, 95% CI: 69–81%) was somewhat higher than the national average (62%). Nationally, 49% of the population hold private health insurance while in this cohort insurance was held by 69% (95% CI: 63–75%) [9]. Using private health insurance as a marker of socioeconomic level we believe that this higher level may reflect the socioeconomic group sampled, and indeed the level of access was significantly higher among those with insurance than those without.

We believe that the cohort is otherwise representative of the nation's population. Central government statistics show the highest attained level of education is primary in 15%, secondary in 47%, tertiary in 16%, and trade level in 9% of the population [10], with these being similar to those observed in this study, where highest levels of education were primary 11% (95% CI: 7–15%), secondary 46% (95% CI: 46–53%), tertiary 27% (95% CI: 21–33%), and trade 13% (95% CI: 8–18%).

There was a greater level of internet access among the younger age group—this is a factor to consider if one proposes to disseminate information via the internet as the

Table 1 Odds ratios and *p* values for univariate and multivariate logistic regression models for variables influencing access to the internet

Variable	Has access <i>n</i> = 151 <i>n</i> (%)	No access <i>n</i> = 50 <i>n</i> (%)	Univariate		Multivariate	
			Odds ratio (95% CI)	<i>p</i> Value	Odds ratio (95% CI)	<i>p</i> Value
Sex (female)	93 (62)	27 (54)	1.37 (0.72–2.61)	0.344	^a	
Age				<0.001		<0.001
<50	98 (65)	13 (26)	1		1	
50–65	35 (23)	15 (30)	0.31 (0.13–0.72)	0.006	0.32 (0.12–0.85)	0.022
65<	18 (12)	22 (44)	0.11 (0.05–.25)	<0.001	0.07 (0.02–0.20)	<0.001
Education				<0.001		0.017
Primary	7 (5)	14 (28)	1		1	
Secondary	67 (44)	28 (56)	4.79 (1.75–13.12)	0.002	1.61 (0.49–5.29)	0.437
Post-school	77 (51)	8 (16)	19.25 (6.01–61.61)	<0.001	5.41 (1.41–20.80)	0.014
Insurance	118 (78)	22 (44)	20.80 (2.79–155.30)	0.003	6.35 (2.57–15.70)	<0.001

^a Variable removed from model using backward stepwise procedure

Table 2 Odds ratios and *p* values for univariate and multivariate logistic regression models for variables influencing searching the internet for information on spine problem

Variable	Searched internet <i>n</i> = 45 <i>n</i> (%)	No search <i>n</i> = 106 <i>n</i> (%)	Univariate		Multivariate	
			Odds ratio (95% CI)	<i>p</i> Value	Odds ratio (95% CI)	<i>p</i> Value
Sex (female)	19 (42)	39 (37)	0.80 (0.39–1.62)	0.531	^a	
Age				0.318	^a	
<50	33 (34)	65 (66)	1			
50–65	7 (20)	28 (80)	0.49 (0.20–1.25)	0.135	^a	
65<	5 (28)	13 (72)	0.76 (0.25–2.31)	0.625	^a	
Education				0.045		0.018
Primary	1 (2)	6 (6)	1		1	
Secondary	14 (31)	53 (50)	1.59 (0.18–14.27)	0.681	1.93 (0.21–18.10)	0.567 ^b
Post-school	30 (67)	47 (44)	3.83 (0.44–33.41)	0.224	5.48 (0.59–51.17)	0.135 ^b
Insurance	31 (69)	87 (82)	0.48 (0.22–1.08)	0.076	0.36 (0.15–0.87)	0.022
Surgery	7 (16)	18 (17)	0.90 (0.35–2.33)	0.829	^a	
First visit	29 (64)	81 (76)	0.56 (0.26–1.19)	0.133	^a	

^a Variable removed from model using backward stepwise procedure

^b Variable kept in model due to significant omnibus test for education

older patient groups may not benefit. This finding is reflected in previous work showing older age groups are less likely to actively use computers and are less likely to have access [11, 12].

The finding that 30% of patients with access actually used the internet for researching their condition is consistent with the findings of Beall et al. [3] that 28% of patient with low back pain used this medium.

Once an individual has access to the internet, we failed to find any good predictor of using this medium for researching one's condition. However, there was a trend toward greater use among the better educated but more

unusual perhaps was that possession of private health insurance showed a trend towards lower use among those who did have access. This latter effect may be explained by individuals who do not have insurance and are reliant on the public health service, waiting for a long period before their initial consultation. The waiting times for first-time elective outpatient appointments have traditionally been longer in the public system than in the private, and we believe that use during this extended waiting time by patients availing of the public hospital system is the most likely explanation for this. Alternatively, those patients using the public system may also see non-consultant grade

staff and this may have a bearing on quality of information provided.

There was no significant increase in the proportion of patients having used the internet to find relevant information after the first visit. Among returning patients the level of satisfaction was not significantly different between those who had and those who had not researched their condition on the internet. We feel that these findings suggest that, in our clinical settings at least, the current surgeon–patient relationship allows adequate explanation of the spinal complaint and patient understanding.

Internet use to gather information regarding one's medical condition has the potential to alter the patient–surgeon consultation [13]. Gupte et al. found that 52% of internet sites had good correlation with information given in an orthopedic outpatient clinic. However, over 20% reported that the internet information contradicted advice subsequently given [12]. This finding is supported by an analysis of orthopedic information available on the internet which, using carpal tunnel syndrome as an example, found that a significant amount of the information was of very limited quality [14]. We have not directly assessed the quality of information accessed from the internet by our patient cohort and this is the subject of further work.

Overall, approximately one in four patients attending the outpatient clinic has used the internet to research their spinal condition. We need to be aware that these patients may have accessed potentially inaccurate information and that this may impact on the subsequent patient–doctor encounter [13–15]. The term ‘cyberchondria’ has been coined to describe the unnecessary worry derived from attempts to self-diagnose on the internet and it has also been highlighted that information provided may be pitched at a too high a level for the general population to properly comprehend [16, 17].

In summary, we found a high level of access among our practice sample with an incidence of internet use consistent with previously reported levels. We must be aware that certain subgroups of the population may not have access to the internet if we are considering providing any service via this means. However, among those that do have access we have seen that the use is generally consistent irrespective of the various characteristics analyzed.

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References

1. Central Statistics Office I (2008) Information Society Statistics First Results 2008—Household Statistics. <http://www.cso.ie/releasespublications/documents/industry/current/isssh.pdf>. Accessed 15 Nov 2009
2. <http://www.google.com>. Accessed 21 July 2009
3. Beall MS III, Beall MS Jr, Greenfield ML, Biermann JS (2002) Patient Internet use in a community outpatient orthopaedic practice. *Iowa Orthop J* 22:103–107
4. Beall MS III, Golladay GJ, Greenfield ML, Hensinger RN, Biermann JS (2002) Use of the Internet by pediatric orthopaedic outpatients. *J Pediatr Orthop* 22:261–264
5. Brown RR (2003) The Internet—friend or foe? A questionnaire study of orthopaedic out-patients. *Ann R Coll Surg Engl* 85:143 (author reply 143–144)
6. Jariwala AC, Kandasamy MS, Abboud RJ, Wigderowitz CA (2004) Patients and the Internet: a demographic study of a cohort of orthopaedic out-patients. *Surgeon* 2:103–106
7. Krempec J, Hall J, Biermann JS (2003) Internet use by patients in orthopaedic surgery. *Iowa Orthop J* 23:80–82
8. Wright JE, Brown RR, Chadwick C, Karadaglis D (2001) The use of the Internet by orthopaedic outpatients. *J Bone Joint Surg Br* 83:1096–1097
9. Central Statistics Office (2008) Health Status and Health Service Utilisation. http://www.cso.ie/releasespublications/pr_healthsoc.htm. Accessed 15 Dec 2009
10. Central Statistics Office I (2006) Persons, males and females aged 15 years and over classified by highest level of education completed, 2006. <http://www.cso.ie/statistics/pmfaceover15edcompleted.htm>. Accessed 15 Dec 2009
11. Parekh S, Lim C, Booth R, Nazarian D (2002) Influence of the Internet in an orthopaedic practice: survey of 500 patients. *Univ Pa Orthop J* 15:61–65
12. Gupte CM, Hassan AN, McDermott ID, Thomas RD (2002) The internet—friend or foe? A questionnaire study of orthopaedic outpatients. *Ann R Coll Surg Engl* 84:187–192
13. Bader SA, Braude RM (1998) “Patient informatics”: creating new partnerships in medical decision making. *Acad Med* 73:408–411
14. Beredjiklian PK, Bozentka DJ, Steinberg, Bernstein J (2000) Evaluating the source and content of orthopaedic information on the Internet. The case of carpal tunnel syndrome. *J Bone Joint Surg Am* 82-A:1540–1543
15. Sacchetti P, Zvara P, Plante MK (1999) The Internet and patient education—resources and their reliability: focus on a select urologic topic. *Urology* 53:1117–1120
16. Badarudeen S, Sabharwal S (2008) Readability of patient education materials from the American Academy of Orthopaedic Surgeons and Pediatric Orthopaedic Society of North America web sites. *J Bone Joint Surg Am* 90:199–204
17. White R, Horvitz E (2008) Cyberchondria: studies of the escalation of medical concerns in web search. <http://scientiareview.org/pdfs/4.pdf>. Accessed 29 July 2009