

Psychiatr Q (2008) 79:301–309
DOI 10.1007/s11126-008-9083-1

ORIGINAL PAPER

Internet Use by Patients with Psychiatric Disorders in Search for General and Medical Informations

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Published online: 28 August 2008
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Abstract *Background* Internet is commonly used by the general population, notably for health information-seeking. There has been little research into its use by patients treated for a psychiatric disorder. *Aim* To evaluate the use of internet by patients with psychiatric disorders in searching for general and medical information. *Methods* In 2007, 319 patients followed in a university hospital psychiatric out-patient clinic, completed a 28-items self-administered questionnaire. *Results* Two hundred patients surveyed were internet users. Most of them (68.5%) used internet in order to find health-related information. Only a small part of the patients knew and used criteria reflecting the quality of contents of the websites consulted. Knowledge of English and private Internet access were the factors significantly associated with the search of information on health on Internet. *Conclusions* Internet is currently used by patients treated for psychiatric disorders, especially for medical seeking information.

Keywords Internet · Information services · Service users · Psychiatric disorders

Introduction

Internet is increasingly used as a source of information on health related issues [1] which are becoming one the most searched for topics on the web [2]. In a questionnaire survey of a representative sample of the British general population [3], 18% of all internet users and 31.5% of internet users with a past history of mental health problems had used the internet for information related to mental health issues. The anonymous status on the internet [4, 5], the diversity and the importance of accessible data [6] seem to partially explain this success.

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Reasons to visit medical websites are most frequently to seek information or advice on certain medical condition, symptoms, diseases, or treatments [7].

The young age [4], knowledge of English [8], higher incomes [8], a higher level of education [9], the urbanization [10], the chronicity of the disorder [11], the number of chronic disorders [12] and their severity [10] were associated with increased frequency of searching for medical information on the web.

In spite of published studies evaluating internet use based mental health therapies [13] or assessing the quality of information on mental health websites [14], there has been little work on evaluation of internet use, aiming to find information related to the mental health [3]. To our knowledge no previous study has investigated internet use by patients seeking treatment in a mental health clinic.

The aim of the present study are to investigate 1-the general use of Internet, 2-the use of internet for searching medical information, and 3-the factors linked to internet use for medical purpose in a sample of patients treated in an out-patient university clinic.

Method

Procedure and Measurements

Between January and April 2007, a 28-item questionnaire was proposed to out-patients treated in the Department of Psychiatry, University Hospital Lausanne, Switzerland (a French language clinic).

Four hundred questionnaires were distributed to health care providers, with the instruction to propose the study to the patient at the time of consultation. All medical doctors, psychologists and nurses of one outpatient unit were involved in the study. The 400 questionnaires corresponded at the time of the study to the total number of patients treated by the clinician involved in the study. The questionnaires were completed by patients alone and anonymously. Several patients however asked for complimentary explanations regarding some questions of the questionnaire. The data was then treated in a confidential manner.

Inclusion criteria were: to be an adult patient, treated in the out patient clinic of the Department of Psychiatry. Exclusion criteria were mental retardation, and an insufficient knowledge of the language in which the questionnaire was proposed.

The 28-items questionnaire assessed socio-demographic data, educational level, knowledge of English, occupational status, date of onset of the psychiatric disorder actually treated, history of a previous hospitalisation in psychiatric institutions, the satisfaction level for treatment actually received, the level of confidence in the treating doctor, the ease with which questions can be asked to the doctor, being or not a user of a patient's association, computer use and ownership, internet access, frequency of internet use, use of internet for medical and non medical purpose, the ease at which the searched information is found, if the information is comprehensible, and if it seemed exact, having knowledge of the quality label "Health On the Net: HON". This quality label [15, 16] attributed by the HON foundation for medical sites takes into account the following points: disclosure of authorship, sources, updating of information, disclosure of editorial and publicity policy, as well as confidentiality.

The questionnaire also explored the criteria used by the persons to evaluate the quality of the information found (authorship, accountability, references, presence of information on therapeutic alternatives or secondary effects) and finally if they discuss the information

with their doctor or a family member. Diagnostic categories were recorded according to the unit of distribution of the questionnaire, which was allowed by the organization of the clinic into specialized sections: Mood and anxiety disorders, psychotic disorders, personality disorders and substance abuse disorders.

The current study was approved by the appropriate Ethical committee.

Analyses

Statistical analyses were performed by the SPSS 12.0 program. An initial exploratory analysis involved calculation of proportions as well as means and standard deviation of the outcome values. When appropriate, χ^2 and *T*-tests were used to compare groups.

The instrument under study is a 28 items questionnaire. Factor analysis was first used to examine the loadings of factors with a view to reduce the items with continuous numerical values to a more meaningful, smaller set of variables. To test whether the Factor analysis is satisfactory, the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were used to measure the sampling adequacy. The KMO measure should be greater than 0.5 to proceed with the Factor analysis, while the Bartlett's test of sphericity should be statistically significant at the 0.05 level, meaning that the correlation matrix is not an identity matrix.

Two criteria for deciding how many factors to retain were observed: the Kaiser rule and the Cattell scree plot obtained by principal components extraction. The Kaiser rule states that all factors with eigen values greater than 1 should be retained. Although this rule seems conservative or old fashioned, one has to bear in mind that eigen values less than 1 originate from factors that account for less variance than the original variables. The Cattell scree plot, i.e. a graph which shows the magnitude of the eigen values versus the components serve to confirm these factors: the rule being that factors above the inflexion point of the slope must be retained. The extraction of the factors was made by variance maximizing (varimax) rotation of the original variable space, ensuring that these factors are uncorrelated or orthogonal to each other.

Finally, the significant factors extracted and the categorical variables not suitable for Factor analysis were analyzed together through a logistic regression with the view to predicting the proportion of patients who search information on health through Internet.

For all analyses, a significance level of $P \leq 0.05$ was used.

Results

Response Rates

A total of 319 questionnaires were filled by patients, and sent back. Eighty-one questionnaires were not sent back: (38 questionnaires were not distributed by the healthcare providers) and (43 patients refused to participate in the study). After exclusion of 10 unclear questionnaires, the adjusted response rate was 77.25%.

General Characteristics of the Sample

Patients' main socio-demographic characteristics are shown in Table 1.

Most of the participants (93.9%) achieved their obligatory school (93.9%) and 44.8% could read and understand English. A large part of the patients was unemployed (87.1%)

Table 1 Sample characteristics: 309

	Internet users <i>N</i> = 200	Non internet users <i>N</i> = 109	Whole sample <i>N</i> = 309
Age years: mean (standard deviation)	38 (11.4)	44.7 (9.9)	40 (11.4)
Women (%)	42.2	41.3	41.5
Educational level (%)			
Mandatory school	25.8	39.6	30
Professional school	47.5	39.6	44.7
Higher school or university	26.8	20.7	25.2
Home computer access (%)	67.5	7.5	46.5
Home Internet access (%)	59	6.5	39.8

and only 15.8% live in a residential setting. The monthly income from the disability pension (in Switzerland) received by a large part of unemployed patients is on average around two thousand US dollars.

Onset of the actual psychiatric disorder was 9.4 years ago (± 9.3 years) resulting in a history of at least one hospitalization in psychiatric institution for 68.1% of them. In the present sample, (48.1%) of the patients were treated for mood or anxiety disorders, (14.2%) for substance abuse or dependence, (3.5%) for personality disorders and (33.2%) for schizophrenia or other psychotic disorders. Amongst the responders, 17.5% were part of a patient's association.

Internet Use for General Purposes

After exclusion of 10 unclear questionnaires, 309 questionnaires were analysed. Two hundred patients (64.7%) were internet users, most of them (67.5%) had a computer at home and 59% had an internet connexion at home. Internet users, who had no internet at home, had their preferential internet access at several patients associations (51%), cybercafés (16.8%), friends or family (25%) or work (7.2%).

Patients used internet for forums (24.4%), to meet someone (17.5%), to buy something (25.5%), to hear music or see movies (41%), to find general information (85.5%), to find a health related information (68.5%) or for other purposes (42%). Use of internet is relatively frequent: more than once a week (69%) and several times per day (16.5%).

Internet users differ from non-internet users by a younger age ($t = -5.15$ and $P < 0.0005$), a higher education level ($\chi^2 = 6.30$ and $P = 0.04$), a higher proportion of home computer access ($\chi^2 = 124.6$ and $P < 0.0005$) as well as a higher proportion of home internet access. No sex differences were found in between ($\chi^2 = 0.02$ and $P = 0.9$).

Internet Use for Seeking Medical Information

Among the 200 internet users, 137 (68.5%) searched information concerning health issues and 44% searched for medical information more than once a month (Table 2).

Patients' search targeted a large spectrum of psychiatric disorders as well as substance use. They searched information on diagnosis (72.7%), treatments along with different options (84.6%) and the side effects of medications (81.8%). More rarely, they searched information on an association (17.4%) or a clinic (16.4%). The language of the medical

Table 2 Pattern of internet-health seeking information

Seeking internet health related information ^a (%) (<i>N</i> = 137)	
For himself	84.5
For a family member or a friend	41.9
For other reasons	42.6
Frequency of internet use for medical purpose (%)	
Less than once a month	56.1
Between once a week and once a month	31.8
More than once a week	12.1
Seeking information on ^a (%)	
Alcohol	31
Anxiety disorders	47
Depression	56
Substance abuse	34
Schizophrenia	37
Bipolar disorders	29.5
Personality disorders	34
Other disorders	49.2
Seeking information on ^a (%)	
Treatment	81
Treatment centers, clinics	16.7
Patient's association	17.4
Diagnosis	72.7
The information was usually (%)	
Partially found	53.1
Totally found	43.6
Not found	2.3

^a Cumulative percents, more than one condition is possible for each person

information websites was in French for the whole sample and in English and French for people who reported English knowledge. In addition, Spanish and German language websites were consulted by several persons.

The information was found with relative difficulty (56 ± 27) measured by the score on a visual analogue scale ranging from 0 (as a scale for a very difficult to find) to 100 (very easy to find). The information sought for was only partially found or not found at all by 55.4% of the users. The comprehension of information is sometimes difficult, scoring (64 ± 23) on the visual analogue scale ranging from 0 (information totally incomprehensible) to 100 information totally comprehensible). Once found, the information was perceived as exact to a level of (63 ± 23.2) on the visual analogue scale going from 0 (totally false) to 100 (entirely exact).

Only a part of the patients checked the objectives of a site (48.9%), the identity of the authors (46.7%), the references (38.7%) or the existence of a sponsor for the given information (13.9%). Near a third of the users (27%) did not verify any of this quality indicator. In order to test the degree of belief in the exactitude of the medical websites information, the users of these sites were invited to score on a visual analogue scale the following assertion: « a medical information on a website is always exact » from 0 (not at all true) to 100 (totally true). Average score obtained was: 39.7 ± 25.7 . Moreover, among the users, 51 have a score ≥ 50 .

Only 3% of users of internet for seeking medical information knew the HON label.

Once information was found, 72.1% talked about it to a friend, and only 55.5% discussed it with their doctor.

Factors Linked to Internet Use for Medical Purposes (Table 3)

Factor Analysis Results The KMO measure (0.522) and the statistically significant Barlett's test ($P < 0.0005$) show that we can proceed with the Factor analysis by Principal components method, 4 factors out the 10 original continuous variables have been extracted with eigen values greater than 1. Similarly, the Cattell scree plot also produced by the Principal Component method confirmed the presence of these 4 factors. Looking at the rotated component matrix, we see that the variables "degree of ease to comprehend information", "degree of apparent exactitude" and degree of ease to find information" load on factor 1. The items sorted in this factor express an ability to search for, to process the information and could be combined into a scale labelled "internet skills". The variables "satisfaction vis-à-vis the treatment received" and "satisfaction in his doctor", load on factor 2 named « treatment satisfaction ». These items may be included into a global scale called "treatment satisfaction". The variables "duration of the disease", age of the patient load on factor 3 which may be named "disease chronicity" and finally, the variable "degree of belief in the exactitude of the information" load on factor 4. These 4 factors accounted for 61% of the variance.

Table 3 Sample characteristics of internet users who seek health information vs. those who do not seek health related information

	Internet users ($N = 200$)	
	Seeking health information ($N = 137$)	No seek health information ($N = 63$)
Age mean (SD)	38 (11.2)	38 (11.6)
Women (%)	44.4	37
Educational level (%)		
Obligatory schooling	20.3	34.4
Apprenticeship or professional school	57.2	59
Higher school or university	22.6	6.6
English knowledge (%)	63.4	37.7
Employment (%)	19.4	12.9
House (%)		
Alone	39.1	41.3
With friend, or family	46.6	49.2
Institution	14.3	9.5
At least one previous hospitalization in psychiatric hospital (%)	65.4	58
Computer access at home (%)	66.2	46
Frequency of general Internet use (%)		
Up to once a week	21.1	49.2
1/week < internet use < 1/day	46.6	36.5
At least once a day	32.3	14.2

Logistic Regression Results Categorical variables not suitable for Factor analysis like (gender, knowledge of English, computer ownership, private Internet access, educational level, previous psychiatric hospitalisations, psychiatric diagnosis, relation with a patient's association, job status, residential setting) were analysed by preliminary χ^2 tests to ascertain a potential link with the dependent variable (search of information on health through Internet). These χ^2 tests showed that only English knowledge, private Internet access and educational level were significantly associated with the search of information on health through Internet ($\chi^2 = 11.2$ and $P = 0.001$, $\chi^2 = 8$ and $P = 0.005$, $\chi^2 = 7.9$ and $P = 0.02$, respectively).

To confirm or to invalidate these links, these potential candidates were then analysed together with the 4 aforementioned factors in a logistic regression with the view to predicting the proportion of psychiatric patients who search information on health through Internet.

The logistic regression showed, on one hand, a high correlation between knowledge of English and educational level so that the latter, the least associated with the dependent variable, was dropped from the regression. On the other hand, none of the 4 factors seemed to be significantly associated with the dependent variable.

A second logistic regression was then performed taking into account the above observations. It showed that private access to Internet and knowledge of English were the only statistically significant predictors of the search of information on health ($P = 0.02$, OR = 2.4 et IC [1.2; 4.8] and ($P = 0.005$, OR = 2.7 et IC [1.4; 5.3], respectively). This means that people who were able to connect at home were 2.4 times more likely to search information on health on Internet than the others. Similarly, people who were skilled in English were 2.6 times more likely than those who were not to search information on health over the Internet. Although the classification table displays a good overall score (72% of the cases correctly classified), the Nagelkerke R^2 , the explained variance statistics is relatively poor ($R^2 = 12.2$), leading us to hypothesize that other unknown variables are involved in this behaviour.

Discussion

The results of this study show that internet is frequently used (64.7%) by patients undergoing psychiatric treatment in a European university hospital outpatient clinic. The frequency of use of internet in our population of patients (64.7%) is relatively close to that reported in the general population in Europe [3], and this despite a level of employment particularly low. This frequency is twice the one, found 6 years ago, in a study of patients undergoing gastroenterological or somatic treatment in Switzerland [10]. This may be explained partially by the spread of internet use in Switzerland and Europe.

In the current study, nearly two-thirds of internet users consulted the net for information related to health, more often for questions related to mental health and/or substance use and dependence. This proportion is nearly double the one that is reported, in, Powell's study 2006, for patients with a past history of mental health problems, in the general population. This can be explained by the fact that this study was conducted in rather chronically ill population possibly presenting several or more severe mental disorders. This correspond to the association already found between chronicity of the disorders [11], the number of chronic disorders [12], their severity [10] and the search for medical information on the internet.

Despite the importance of the search of information using Internet, around half the users are partially satisfied in terms of accessibility and comprehension of the information found. We can observe that, on one hand, patients are relatively confident about the quality of the contents of the sites visited, and on the other hand, they are not aware of the quality criteria of the websites. (i.e. HON label, accountability...). This large use of internet is contradictory to the generally poor quality of the sites [17].

A part of the patients found sites mostly inaccurate. This observation may be explained by the level of psychoeducation already received by the patients.

The knowledge of English language and internet access at home are the two factors associated with the search of medical information on the internet, probably making it easier.

Although 72% of the cases were correctly classified according to the search of medical information over the internet, the explained variance statistics is relatively poor ($R^2 = 12.2$), leading us to hypothesize that other unknown variables are involved in this behaviour: anxiety related to the diagnosis, worries about treatment side effects, recent modifications of the diagnosis or treatment which are not investigated in the current cross sectional study.

A few limitations have to be considered upon interpretation of the present study results, especially its cross-sectional design, lack of structured psychiatric diagnosis of the participants, lack of control group as well as lack of data about non-responders.

We cannot exclude a lower internet use in persons who refused participation in the study. The relative high response rate, however limit its impact on the study results effect.

The study found however that Internet is commonly used by patients treated for psychiatric disorders for seeking general as well as, medical information. A better diffusion of information about criteria defining the quality of the contents of websites, and about useful methods for searching such needed information, can be particularly useful to this population of patients.

Since only half of the patients engage in a discussion with their doctor on the fruit of their search on the internet, doctors should be systematically invited to ask about the use of internet by their patients and invite them to discuss their queries and findings.

Acknowledgements To the patients who participated in the study and their healthcare providers. To Dr. Jean Gabriel Jeannot for his support.

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