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# The Web-Surfing Bariatric Patient: the Role of the Internet in the Decision-Making Process

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## Abstract

**Background** Health-related information on the Internet is constantly increasing, but its quality and accountability are difficult to assess. Patients browse the Net to get more information, but the impact of the Internet on their decisions about surgical techniques, referral centers, or surgeon choice are still not clear. This study aimed to describe the role of the Internet in the decision-making process of obese patients seeking bariatric surgery.

**Methods** Two hundred and twelve candidates for bariatric surgery were asked to answer a questionnaire evaluating their access to the Internet, the usefulness and trustworthiness of

Internet-retrieved information, the verification of the information, and the role of the information in the decision-making process.

**Results** Two hundred and twelve patients answered the questionnaire. Of these, 95.1 % had access to the Internet and 77.8 % reported having researched about bariatric surgery. Their main interests were the surgical techniques (81.4 %) and other patients' experiences (72.3 %). The favorite Web sites were those affiliated to public hospitals or edited by other patients. The accountability of the e-information was mainly evaluated by discussion with the general practitioner (GP) (83.0 %) or family members and friends (46.8 %). One patient in four decided to undergo bariatric surgery mainly based on e-information, while discussion about treatment options with the GP and the hospital reputation were taken into account in 77.8 and 51.7 % of cases, respectively.

**Conclusions** Most patients seeking bariatric surgery search for health information online. E-information seems to have an important role in the decision-making process of patients who are candidates for bariatric surgery.

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**Keywords** Internet · Bariatric surgery · Obesity · Information

## Introduction

In the last decade, the diffusion of the Internet on a large scale has dramatically changed access to knowledge. In this context, medical information, simplified and freely accessible, has been particularly demanded by Internet users. Several studies have found a rate of up to 79 % of health-related research among Internet users in the USA, and similar rates have been reported in Europe [1]. This trend is modifying patients' attitudes who are

progressively evolving from “passive receivers” to “active consumers” of health information. At the same time, the relationship between doctors and patients is developing in the direction of a greater symmetry. Patients browse the Net before consulting a physician for a better comprehension of the health problem [2, 3] and return online after the visit to verify or simply reinforce the professional proposals [4]. In this dynamic of information seeking, patients appreciate integrating e-information during the discussion with their doctor [5] and, when possible, they like to be referred to good-quality health care Web sites [6]. Nevertheless, patients still consider caregivers the most trustworthy source of information [1, 7–10].

Several studies have investigated the typical profile of the health Internet user and the main topics of research [2, 3, 10–12]. The most frequent characteristics of the Web-surfer patient are female gender, younger age, a chronic illness, and a high level of education. With regard to the topics of interest, besides general information about a specific disease, patients appreciate using social networks [13] in order to share experiences with other patients and give or receive emotional support. In this context, obese people seeking bariatric surgery could match with this profile. In fact, most bariatric patients are female, young, and have a long history of being overweight [2].

This study was conducted on obese patients seeking bariatric surgery. The aim of this work was to estimate the use of the Internet in this population, to explore the main topics of research, to evaluate patients' perception of the trustworthiness and quality of the available information, and to analyze the impact of e-information on the decision-making process for bariatric surgery.

**Table 1** Demographic characteristics of the study population

	Number	Percent (%)
Age		
≤34	71	35.0
35–44	62	30.5
45–54	44	21.7
≥55	26	12.8
Gender		
Male	39	19.2
Female	164	80.8
Education		
<High school	67	33.0
High school	74	36.5
University	45	22.2
NA	17	8.4
Total	203	100

NA not available

## Materials and Methods

### Study Design

This was a multicenter cross-sectional survey conducted on a cohort of obese patients. Data were collected between January 2012 and February 2012 and between June 2013 and July 2013 in three different hospitals. A self-administered questionnaire was distributed in the waiting rooms to patients attending for ambulatory visits. Eligibility criteria were as follows: French-speaking adults (>18 years) eligible for bariatric surgery (body mass index >40 kg/m<sup>2</sup> or between 35 and 40 kg/m<sup>2</sup> with comorbidities). Questionnaires were completed anonymously and were not mentioned during the visit with the surgeon. Informed consent was obtained from all individual participants included in the study.

### Questionnaire

In 2004, the French government charged the National Authority for Health (“Haute Autorité de Santé” (HAS)) to set up a procedure of certification for health-related Web sites. The methodology for this mission was based on the methods for recommendations of clinical practice. One of the first steps of this project was to realize a systematic review called the “Web-surfing patient,” which investigated patient attitude toward health-related information on the Internet. The questionnaire we used in this study is based on this review. In the first part, respondents were asked to provide information about their gender, age, education, Internet access, and Internet use (questions 1 to 5). Internet use was defined as the use of the Internet for researching an obesity-related topic in the last 12 months.

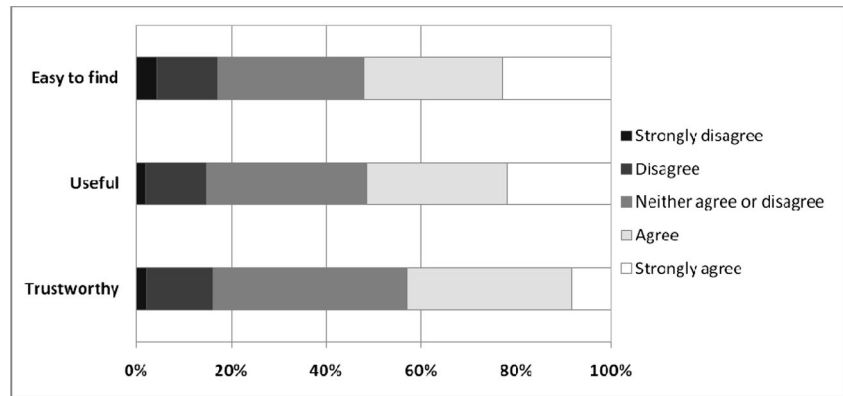
The second part of the questionnaire was related to the search for obesity-related information on the Net. In particular, patients were asked about the following:

**Table 2** Multivariate analysis of Internet use

		Internet use, % (n)	Adjusted OR (95 % CI)	P value
Age (years)	≤34	88.7 (63)	Reference	
	35–44	77.4 (48)	0.49 (0.17–1.4)	0.185
	45–54	77.3 (34)	0.41 (0.14–1.2)	0.105
	≥55	50 (13)	0.11 (0.03–0.33)	0.000
Gender	Male	76.9 (30)	Reference	
	Female	78 (128)	0.87 (0.33–2.34)	0.787
Education	<High school	80.6 (54)	Reference	
	High school	77 (57)	0.69 (0.28–1.67)	0.411
	University	82.2 (37)	0.74 (0.26–2.12)	0.577

OR odds ratio

**Fig. 1** Accessibility, usefulness, and trustworthiness of obesity-related information on the Internet (questions 6–8)



1. The access to information (question 6: “How easily accessible do you consider Internet information on bariatric surgery?”)
2. Web sites’ usefulness (question 7: “How useful do you consider Internet information on bariatric surgery?”)
3. Web sites’ trustworthiness (question 8: “How trustworthy do you consider Internet information on bariatric surgery?”)
4. Main obesity-related topics of interest (question 9: “Which are the obesity-related topics you search for on the Internet?”)
5. The degree of trust attributed to each website according to the affiliation (private or public hospital Web sites, patients’ blogs and forums, popular media Web sites, pharmaceutical industry Web sites) (question 10: “What kind of Web site do you trust most?”)
6. Information checking (question 11: “How do you check the information retrieved on the Internet?”)
7. The role of the Internet in the choice of hospital and surgeon for surgery (question 12: “Do you rely on Internet information to choose your doctor/hospital?”)

8. Other sources of information used in the choosing process (question 13: “What other sources do you take into account when choosing your doctor/hospital?”)

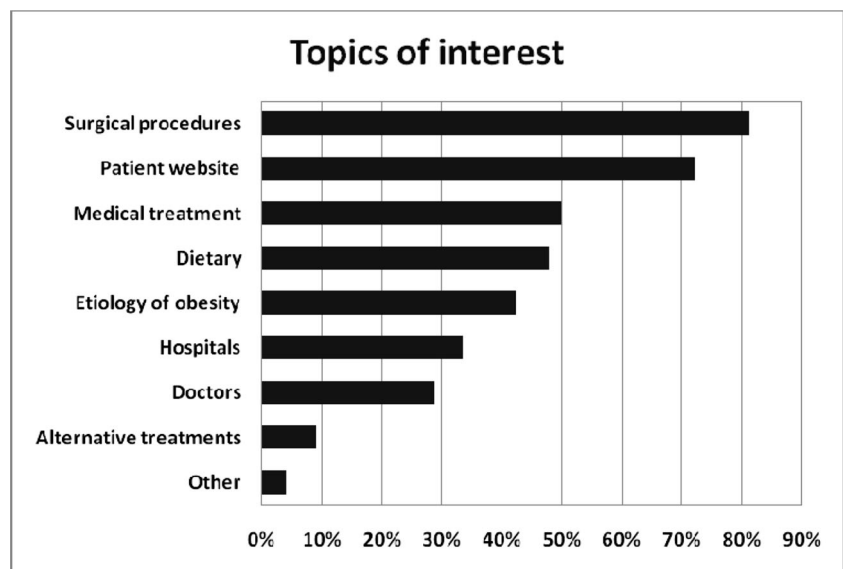
Possible answers were either dichotomous or ordinal ranging from 1 to 5 (the Likert scale was used, where 1=“strongly disagree” and 5=“strongly agree”).

An information note explaining the purpose of the study was provided with the questionnaire, and consent to participate in the study was obtained from each patient.

**Statistical Analysis**

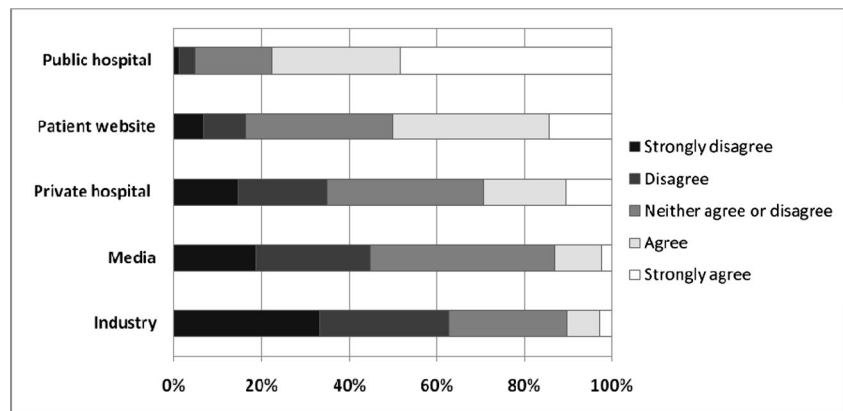
Statistical analysis was carried out using SPSS (IBM SPSS Statistics 20®). We performed a descriptive analysis of sociodemographic variables. A Likert scale was used to assess patients’ opinion on the accessibility, usefulness, and trustworthiness of e-information and to evaluate patients’ trust in Web sites according to their affiliation.

**Fig. 2** Obesity-related topics of interest in patients’ research (question 9)





**Fig. 3** Web sites' trustworthiness according to affiliation (question 10)



A multivariate analysis was performed using logistic regression to assess the influence of sociodemographics variable on the use of the Internet for obesity-related research. Statistical significance was set at  $P < 0.05$ .

**Results**

Two hundred and twelve questionnaires were returned, and 203 (95.7 %) had valid answers and were included for analysis. The demographic characteristics of patients are reported in Table 1. The mean age of the whole cohort was  $40.4 \pm 11.8$  with a sex ratio (M/F) of about 1 to 4. Internet access was available to 95.1 % of patients, of whom 77.8 % used the Internet in the last 12 months to research obesity-related topics. Table 2 shows multivariate analysis of Internet use: only age  $>55$  had a significant inverse relation with Internet use.

Patients' opinion on the accessibility, usefulness, and trustworthiness of Internet health information about bariatric surgery is reported in Fig. 1. Most patients found the e-information easy or very easy to find (52.1 %),

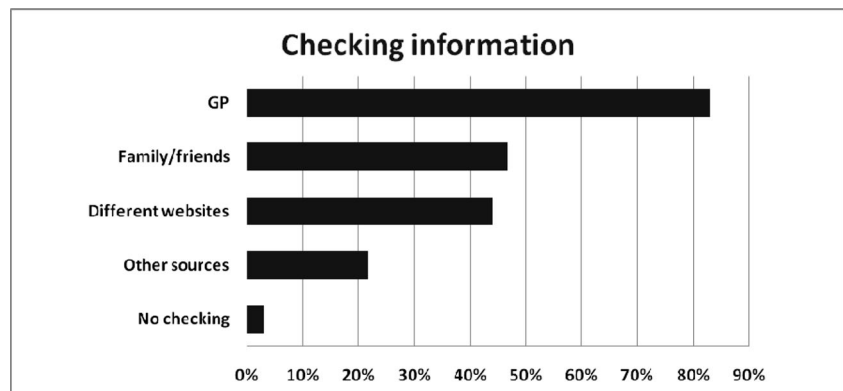
useless or very useful (51.6 %), and 43.0 % of patients considered it at least trustworthy.

Among the obesity-related topics researched on the Internet, the two most common were surgical procedures (81.4 %) and other patients' experience (72.3 %) (Fig. 2). Patients' trust in Web sites according to affiliation is described in Fig. 3. Information provided by Web sites promoted by pharmaceutical industries and popular media (TV, radio, and press) is significantly distrusted compared to patients' private pages and public hospitals' Web sites.

The majority of patients (92.6 %) admit to verifying the information retrieved on the Internet with other sources. Among those who check the information, general practitioners are largely the most common interlocutors (83.0 %), followed by family and friends (46.8 %) (Fig. 4).

The last two questions (questions 12 and 13) explore the way patients choose the hospital and/or the surgeon for their bariatric procedure. Almost one in four patients (27.6 %) relies on Internet information. Conversely, most patients take into account their general practitioner's advice (77.8 %), the hospital reputation

**Fig. 4** Other sources that patients employ to check Internet information (question 11)



(51.7 %), family or friends' suggestions (44.8 %), and geographical proximity (28.6 %).

## Conclusions

This study shows that the great majority of patients interested in bariatric surgery seek health information on the Internet (77.8 %). This percentage is higher than previously reported in other studies [2, 3, 6, 14] on patients with chronic diseases such as lupus [12], inflammatory bowel disease [15], rheumatologic disease [16], or in larger surveys on general population [2, 10]. To our knowledge, only one study on pregnant women found a higher rate of Internet e-health seekers (95 %) [17].

Furthermore, we found more similarities than differences in the studied population: only age was statistically different between Internet users and nonusers, with a greater familiarity with the Internet among younger patients, but neither gender nor education level showed any significant difference. It was previously reported by other authors that female gender and higher educational level were more common across Internet users [2, 3]. The difference in the rate of Internet users and in their profile could be explained by the study population. In most previous surveys, the selection of the sample is based on the pathology of interest (e.g., breast cancer and lupus), or it is applied to the general population. This study was not conducted on a group of generic obese persons but on a population of patients seeking bariatric surgery. The patients of this subsample are more active consumers than passive receivers in health care. They take action to query surgical treatment and probably this dynamic is the conclusion of a process of information seeking where the Internet plays a major role.

In our study, we state that the two main topics of interest are surgical procedures and other patients' experience. Bariatric surgery has greatly and rapidly evolved over the last two decades. Some procedures have become increasingly popular while others have been abandoned. Currently, three different techniques (gastric banding, gastric bypass, and sleeve gastrectomy) are mainly practiced in France [18, 19], and even if the indications for bariatric surgery are well defined [18], the choice of a particular procedure is less consensual. It seems natural, therefore, that patients wish to better understand the differences among surgical procedures.

The second major issue in information seeking is eminently social. Patients are very interested in interacting with other patients with similar conditions in order to share experiences and give or receive emotional support. In fact, recent studies show that 60 % of the population search for medical information on social networks, that 29 % actively participate in sharing contents, and that 20 % of the subjects discussed in social networks are focused on health topics [20]. Furthermore, a study by Magnezi et al [13] showed that people suffering from

eating disorders are particularly interested by social health networking.

Besides the type of information available online, the trustworthiness of such information is a real issue. Only a minority of patients (16.2 %) do not consider e-health information as credible. On further analysis, trust is strictly associated with Web site affiliation. Information coming from public hospitals or from patients' associations is largely preferred. In contrast, Web sites from media and industry are globally mistrusted as only 13.1 and 10.4 % of patients, respectively, consider their information worthy of confidence. Nevertheless, patients' preference for a type of Web site remains, in our opinion, purely theoretical, as we have no information about the real ability of patients to discern Web site affiliation.

Not surprisingly, patients continue to rely on their GP to verify the information retrieved online. GPs remain the most common interlocutor (77.8 % of cases) when it comes to choosing the surgeon or hospital for bariatric surgery. Yet, one fourth of patients rely on the Internet only to choose their surgeon. However, how the reputation of a hospital or doctor is built on the Web remains unclear. In France, as in most European countries, doctors are strictly prohibited from advertising their practice. Health professionals can set up a Web site with the purpose of providing information, but the threshold between informing and advertising can be thin. Besides public Web sites, patients often interact anonymously on private forum sections, where they exchange opinions on their health professionals, contributing to their renown (either positive or negative). This aspect needs to be better defined and surely deserves further study.

This study has some limitations. As a cross-sectional questionnaire-based survey, the reliability of the results is based on the quality of the self-reported data. Moreover, the risk of overestimation of Internet use may be related to the percentage of obese patients who returned the questionnaire.

In conclusion, health professionals should neither ignore nor show disdain for health information online as the Internet has already become an important source of knowledge in patients' decision-making process. We should instead create or promote independent high-quality health care Web sites and integrate them into discussions with our patients.

**Conflict of Interest** Luca Paolino declares no conflict of interest. Laurent Genser declares no conflict of interest. Nicola de' Angelis declares no conflict of interest. Sylvie Fritsch declares no conflict of interest. Daniel Azoulay declares no conflict of interest. Andrea Lazzati declares no conflict of interest.

**Statement of Human and Animal Rights** This article does not contain any studies with human participants or animals performed by any of the authors.

**Statement of Informed Consent** Informed consent was obtained from all individual participants included in the study.

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