

# Undergraduate Psychology Students' Perceptions About the Use of ICT for Health Purposes

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**Abstract:** Objective: Information and communication technologies (ICT) have great potential for health care. In this study we explore undergraduate psychology students' perceptions about different specific uses of ICT for health (i.e. online interventions, health information websites, telehealth and online social networks).

A total of 113 students answered an online survey designed to gather their perceptions about the use of these four types of interventions for health purposes.

Results: Results showed that online interventions and telehealth were assessed as the best ways of using ICT for health, while the worst way was using social networks for health. The most frequently mentioned advantages were related to the fact that ICT can help with access to information and/or treatments, and that they are comfortable. The most frequently mentioned disadvantages were related to the quality of the information (for social networks and health information websites) and the fact that they were considered impersonal (for telehealth and online interventions).

Conclusions: Students were not very enthusiastic about the use of ICT for health. Education is needed to change these perceptions and increase the likelihood that they will incorporate ICT in their future practice.

**Keywords:** Anova, health, information and communication technologies, perceptions, psychology students, telehealth.

## INTRODUCTION

Information and communication technologies (ICT) represent a revolution for health that can be used in many different ways. For example, they have been used extensively (and their use is growing) to create online interventions that have proved to be effective for different health problems [1-3]. These interventions usually encompass different materials (written and multimedia) aimed to provide education and teach skills to improve coping with health conditions. Some of these interventions include support from others (including health professionals or coaches), whereas others are totally self-directed.

Furthermore, ICT allow patients the possibility of making contact with professionals in real time from a distance to manage a health issue through what is known as telehealth. The possibilities here are enormous, depending on the technology that can be employed, the purpose of the contact, and the health issue [4, 5].

Beyond telehealth, ICT can also be used to provide health information. In fact, the number of people searching for information on the Internet is increasing over time, and health professionals have been obliged to use the internet to

better inform citizens about health issues. Health information on the Internet can promote a change in the patient's role, as patients can become more active and access information that is relevant to their condition [3, 6].

Online social networks are another way to use ICT for health purposes. Their use has pervasively penetrated in our everyday lives, which means they have great potential for health care. These tools make it possible to create groups to share knowledge and resources among peers interested in a specific health topic (see, for example, the work by Farmer *et al.*, [7] for a recent search of groups for health in facebook). Although few studies are available, interest in these groups and in the use of social networks for health is also increasing in the scientific literature, as they have proven to have some effects on health, social support and empowerment [8-10].

In general terms, among the main advantages of using ICT for health, the following can be highlighted [11, 12]: easier access to professionals with specific training in a specific disorder; convenience for patients (they can follow interventions when and where it is convenient for them); better management of professionals' time (they can use ICT-based interventions, saving "face-to-face time" for those who require a more intensive intervention or have complicated problems); reduction in health disparities (evidence-based treatments can be widely disseminated); reduction in the

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stigma associated with some treatments; increase in user and supplier control of the intervention; decrease in health care costs (although more research is needed [13]).

Therefore, it seems clear that ICT are useful for health, and their use is increasing. If psychologists used and/or enhanced the use of ICT for health purposes, everyone could obtain significant benefits. However, during their undergraduate education, psychologists often do not receive specific training about how ICT can play a role in providing health care services. In fact, most of the curricula for the bachelor's degree in psychology, at least in Spain, do not include specific training in the use of ICT for health.

An important point would be to assess psychology students' perceptions about the use of ICT for health. As students have not received specific training and do not have extensive knowledge about this field, examining their views would allow us to explore their original perceptions and their willingness to gain knowledge about this area, drawing future lines of education for them. This issue is important, since with adequate knowledge students can be a key element in creating a real challenge in favor of using ICT for practicing health psychology.

Our goal is to evaluate what undergraduate psychology students think about different specific uses of ICT for health (i.e. online interventions, health information websites, telehealth and online social networks). For this purpose, we have created an online survey and preliminarily applied it to a group of students from the Universitat Oberta de Catalunya.

## MATERIALS AND METHODOLOGY

### Participants

Data for the study were collected from May to June 2011. Students in the Psychology Degree Program at the Universitat Oberta de Catalunya (UOC) were invited to participate.

### Procedure

The UOC is an online university whose mission is to provide people with lifelong learning and education opportunities. All the academic activity is performed online.

Students were invited to participate through different messages sent into different spaces of the UOC virtual campus. These spaces include informal virtual spaces (e.g. the space of the psychology group where a lot of psychology students work together to organize activities and share knowledge) and formal virtual spaces (e.g. all the virtual classrooms of subjects coordinated by the first author of this work). In the message inviting them to participate, we briefly introduced the study's purpose. If students were interested, they were asked to agree online to participate and complete the online survey, which took about 20 minutes.

### Measures

An ad-hoc online survey with 46 items was created to gather psychology students' perceptions about the use of ICT for health, since, to our knowledge, no standard survey exists.

With this survey we wanted to gather their opinions about four different ways ICTs can be used for health: online interventions, telehealth, health information websites and social networks. We chose to include online interventions, health information websites and telehealth because they have received considerable attention in the scientific literature, as the introduction describes. Moreover, we included social networks because, although they have not received much attention in the scientific literature, they have strong potential as they are widely used by the population.

In the survey, for each type of intervention, we first provided a brief introduction explaining to what we were referring. After this, we asked students to what extent they thought each form of intervention could: 1) improve the way of taking care of health; 2) improve their health; 3) substitute face-to-face health services; and 4) be used as a complement to other face-to-face health services. They were asked to rate each of these 4 outcomes on a 0-10 scale (0-Not at all, 10-extremely). We also asked them to report up to 5 advantages and disadvantages of each form of intervention, using open questions. Questions gathering socio-demographic information and asking about the use of the Internet in their daily lives were also included for descriptive purposes.

The online survey was implemented using Limesurvey (<http://www.limesurvey.org/>).

### Data Analyses

All the analyses were performed using the SSS 20.0 statistical package. Descriptive statistics were computed for the socio-demographic data and the use of ICT. Descriptive statistics and ANOVAs of repeated measures were computed for the four different ways of using ICT for health explored in this study. We checked the assumptions of sphericity (Mauchly test) and applied the necessary corrections in the absence of homogeneity (i.e. Lower-Bound estimate). With these analyses, we wanted to explore the general perception of the usefulness of each form of intervention, considering and comparing the perceived utility of the 4 different types of intervention.

A qualitative analysis of the contents was performed to analyze advantages and disadvantages of each form of intervention. Two authors (EA and MB) independently reviewed the narrative responses and agreed on categories within each question. Any differences were discussed until agreement was reached. Cohen's kappa coefficient was between 80 % and 86 % for all the categorizations performed.

## RESULTS

### Participants' Sociodemographic Characteristics and the Use of ICT in Daily Life

A total of 128 students accessed the online survey. Of them, the data from 113 have been included in the analyses: 101 completed the entire survey; 9 additional students only completed information about two of the four ways of using ICT for health that we asked about (health information websites and online interventions); 3 students only completed information about three of the four ways of using ICT that we asked about (health information websites, online

treatments and telehealth). 15 students did not provide any information or they only provided sociodemographic data and were not included in any of the analyses. Unfortunately, we do not have information about how many students received the enrollment message. Therefore, we cannot estimate the response rate.

Mean age for the sample was 24.31 years (*SD*: 9.44; range: 18-68). Most of them were female (82.3 %) and worked at a paid job in addition to studying (84.1 %). Most of them had been studying psychology for one year or less (43.3 %). The rest had been studying psychology for the following periods: 13.3 % between 2 and 3 years; 24.8 % between 4 and 6 years; 18.6 % for more than six years.

Table 1 displays descriptive data for the use of the Internet. As the table shows, the participants accessed the Internet quite often, basically from their home or workplace,

**Table 1. Use of ICT Descriptive Statistics.**

Frequency of connection to internet	
At least once a day	99.1 %
At least once a week	0.9 %
Places from where they connect to internet	
Home ( % yes)	99.1 %
Workplace ( % yes)	43.4 %
Place of study ( % yes)	9.7 %
Point from the Administration ( % yes)	0.9 %
Other ( % yes)	0.9 %
Devices used to connect to internet	
Desktop computer	56.6 %
Laptop	80.5 %
Mobile phone	24.8 %
Tablet	4.4 %
Hours per week of connection to internet for personal purposes	54.9 %
0 - 10 hours	27.4 %
11 - 20 hours	10.6 %
21 - 30 hours	2.7 %
31 - 40 hours	2.7 %
41 - 50 hours	
Hours per week of connection to internet for academic/professional purposes	13.3 %
0 - 10 hours	31 %
11 - 20 hours	21.2 %
21 - 30 hours	18.6 %
31 - 40 hours	8 %
41 - 50 hours	8 %
More than 50 hours	

and using a desktop computer or a laptop. Most of them used the Internet for personal purposes no more than 10 hours per

week, and between 11 and 20 hours per week for academic or professional purposes.

At the time of the survey, 97.3 % had searched for health information on the Internet, 10.9 % had used social networks for health purposes, 8.7 % had used telehealth, and 2.6 % had followed an online intervention for health purposes.

**Assessment of Four Different Ways of Using ICT for Health**

As Table 2 shows, in general terms, online interventions and telehealth were the best assessed ways of using ICT for health, whereas the worst was using social networks for health. Below, we give detailed information about each outcome assessed.

On improving how to take care of health, online interventions received the highest ratings (mean of 5.3, in a scale of 0 to 10), followed by health information websites, telehealth and social networks. ANOVA results showed that there were significant differences among the means for the four forms of intervention ( $F = 19.74$ ;  $df: 3$ ;  $p < .001$ ). An examination of paired contrasts (see Table 2) showed that these significant differences were due to the fact that social networks were considered significantly worse than the other three intervention options for improving how to take care of health. Please, see Table 2 for complete descriptive information and ANOVA results for this outcome and the other three outcomes assessed.

For improving health, the best rated form of intervention was again online interventions, followed by telehealth, health information websites and social networks (the latter received a 1.5 mean score of usefulness that was very low compared to the others). The ANOVA results showed that there were significant differences in the mean values of the four types of interventions ( $F = 65.29$ ;  $df: 1$ ;  $p < .001$ ). Paired comparisons showed that social networks were rated significantly worse than the other three forms of interventions for improving health. Moreover, online interventions were rated significantly higher than looking for information.

As for being a substitution for a professional opinion, telehealth was the best option, followed by online interventions, social networks and health information websites. In all cases, the mean scores were under 4, and especially low for health information websites. The ANOVA results showed that there were significant differences among the four means ( $F = 19.71$ ;  $df: 1$ ;  $p < .001$ ). Paired comparisons showed that health information websites were rated significantly worse than the other three types of interventions, and that both online interventions and telehealth were considered better than social networks.

Finally, when students were asked to rate the four ways of using ICT as a complement, the highest ratings were for online interventions, followed by telehealth, health information websites and social networks. In this case, the ANOVA also showed significant differences ( $F = 31.17$ ;  $df: 1$ ;  $p < .001$ ). Paired tests suggested that social networks were again considered significantly worse as a complement than the other three ways of using ICT. Online interventions and telehealth were considered equally, and online interventions

**Table 2. Assessment of four different types of intervention.**

	Health information websites (1)	Online Intervention (2)	Telehealth(3)	Social Network (4)	Pair, Comparisons (IC 95% of dif)
Improve how you take care of your health	5.13 (2.27)	5.27 (2.57)	4.73 (2.66)	3.30 (2.59)	1 = 2 ( - 0.85÷0.57) 1 = 3 ( - 0.5÷1.29) 1 > 4* (0.99÷2.67) 2 = 3 ( - 0.21÷1.28) 2 > 4* (1.24-2.7) 3 > 4* (0.74÷-2.13)
Improve your health	4.06 (2.32)	5.06 (2.58)	4.93 (2.49)	1.5 (2.10)	1 < 2** ( - 1.77÷--0.23)) 1 = 3 ( - 1.76÷0.14) 1 > 4* (1.88÷3.25) 2 = 3 ( - 0.67÷0.93) 2 > 4* (2.86÷4.27) 3 > 4* (2.61÷4.26)
Can substitute professional's opinion	1.73 (2.02)	3.61 (2.64)	3.75 (2.80)	2.67 (2.65)	1 < 2* ( - 2.68÷ - 1.08) 1 < 3* ( - 2.83÷ - 1.21) 1 < 4** ( - 1.64÷ - 0.24) 2 = 3 ( - 0.9÷0.63) 2 > 4*** (0.07÷1.81) 3 > 4** (0.21÷1.95)
It is a good complement to the professional's opinion	4.70 (2.81)	5.83 (3.11)	5.51 (2.89)	3.11 (3.03)	1 < 2* ( - 1.93÷ - 0.33) 1 = 3 ( - 1.74÷0.12) 1 > 4* (0.68÷2.51) 2 = 3 ( - 0.42÷1.05) 2 > 4* (1.92÷3.52) 3 > 4* (1.62÷3.19)

\*p<.001; \*\*p<.01; \*\*\*p<.05

were considered significantly better than health information websites.

### Main Advantages and Disadvantages of the Four Different Types of Intervention

A total of 6 categories of advantages and 6 for disadvantages were isolated from the students' responses (the same categories were used for the four different forms of intervention). Please, see Table 3 for a description of these categories and examples or quotes.

Tables 4 and 5 summarize the percentages of responses for each category. Percentages in each category were calculated on the basis of the total responses for each question. Characteristics with a percentage above 10 % are highlighted in bold.

Regarding the advantages (Please, see Table 4) of health information websites, the most important advantage was the "Access/Support" category. The next most frequently-cited advantage category was "Immediacy". Finally, the

"Comfortable/Time saving" category received a percentage of responses of 11.8 % . For online interventions, "Comfortable/Time saving" and "Access/Support" were also among the most frequently cited categories. The third most frequent response was the category "Privacy/anonymity" (15.3 % ). For telehealth, the three main categories of advantages were the same as those suggested for health information websites, but in a different order, considering the percentage of responses: "Comfortable/Time saving" (33.1 % ), "Immediacy" (28.1 % ), "Access/Support" (22.3 % ). Additionally, the category "Privacy/Anonymity" obtained a frequency of 12.9 % for this form of intervention. Finally, for social networks, the most frequent advantage was Access/Support (79.7 % ), followed by the "Wide-ranging" category (10.2 % ). In relation to the advantages it is worth noting that the category "Cost saving" was also highlighted, but its frequency was not superior to 10 % for any of the four types of interventions.

**Table 3. Categories of advantages and disadvantages.**

ADVANTAGES		
Category	Brief definition	Examples of quotes
Access/Support	Facilitates access to knowledge, and/or access to help or support.	“Facilitate the access to a professional” “Feeling of support in case of emergency or need” “Contact with other people with similar problems”
Comfortable/Time saving	Comfortable for using it from home, at the most convenient time, and easily. It also makes it possible to optimize personal time.	“It’s easy to access the information” “It is not necessary to move”
Immediacy	Immediate access and obtaining what you need immediately.	“You can find a response quickly” “Obtaining feedback about questions-responses immediately” “Quick solution to problems”
Wide-ranging	Multiple sources and options are available.	“Diversity of opinions” “Different treatment options” “Diversity”
Cost savings	Makes it possible to reduce costs.	“It can be cheaper than a face-to-face treatment” “The cost is lower”
Privacy / Anonymity	They respect users’ anonymity, intimacy and/or confidentiality.	“Confidentiality” “They can be helpful for people with shyness or social problems who do not feel comfortable being in front of a professional, because they maintain their identity”
DISADVANTAGES		
Category	Brief definition	Examples of quotes
Negative psychological perception	The use of a particular ICT resource can lead to negative thoughts, beliefs, emotions and/or perceptions as a consequence of the resource’s characteristics or contents.	“Written information can be misinterpreted”. “To create false expectations or erroneous ideas in relation to a specific health topic”
Negative self-management	ICT can lead to self-diagnosis, self-treatment, self-assessment of the health situation and/or negative beliefs or decisions in relation to health management.	“To adopt the belief that with this intervention you will never need the physician’s intervention” “People daring to self-medicate based on what they have read on the Internet”
Quality	Aspects related to the reliability, credibility, rigor, control of the resource and/or professionals.	“The difficulty of knowing whether the person attending to you is a qualified professional” “The main problem is related to the truthfulness of the information”
Impersonal	The lack of human contact and the loss of details related to the human interaction.	“Depersonalization” “Losing face-to-face information”
Difficulty in selecting	Difficulty in selecting adequate information and/or resources among the multiple sources available.	“To select valid information” “Difficulties related to choosing relevant information”
Technology	It is necessary to have technological devices to access the information and resources, to know how to use these devices, and/or knowing that you are exposed to dangers related to their use.	“Previous knowledge about ICT use is needed” “Internet can fail, you can be hacked, ...”

Regarding the main disadvantages, for health information websites and social networks, the most frequently reported category was “Quality” (see Table 5). This was followed by the categories “Negative psychological perception” and “Negative self-management”. Additionally, for health information websites, the “Difficulty in selecting” category

also had a percentage of responses higher than 10 %. For online interventions and telehealth, the most frequent category was “Impersonal”, followed by “Quality”. Additionally, for telehealth, the categories “Negative psychological perception” and “Technology” also received percentages of responses that were higher than 10 % .

**Table 4. Advantages.**

Advantages	Health information websites (N = 246)*	Online interventions (N = 177)*	Telehealth (N = 139)*	Social networks (N = 118)*
Access/Support	61.0 %	23.2 %	22.3 %	79.7 %
Comfortable /Time saving	11.8 %	41.8 %	33.1 %	0.8 %
Immediacy	13.4 %	9.6 %	28.1 %	3.4 %
Wide-ranging	7.3 %	0.6 %	0 %	10.2 %
Cost savings	1.2 %	1.7 %	0.7 %	0 %
Privacy / Anonymity	2.8 %	15.3 %	12.9 %	1.7 %
Others	2.4 %	7.9 %	2.9 %	4.2 %

\*N refers to number of responses.

**Table 5. Disadvantages.**

Disadvantages	Health information websites (N = 235)*	Online interventions for health problems (N = 172)*	Telehealth (N = 110)*	Social networks (N = 123)*
Quality	45.1 %	22.7 %	20.0 %	44.7 %
Impersonal	1.7 %	42.4 %	30.0 %	3.3 %
Negative psychological perception	21.7 %	7.0 %	10.0 %	20.3 %
Negative self-management	14.5 %	6.4 %	4.5 %	12.2 %
Technology	0.4 %	5.2 %	13.6 %	3.3 %
Difficulty in selecting	10.2 %	0 %	0 %	6.5 %
Others	6.4 %	16.3 %	21.8 %	9.8 %

\*N refers to number of responses.

## DISCUSSION

Students perceived some usefulness of the four ways of using ICT for health explored in this study, but they were not very enthusiastic. Specifically, our results showed that online interventions and telehealth were the best rated types of interventions overall: they received a mean score of around 5 out of 10 for all the outcomes, except for being a substitute for professionals' opinions (the mean was about four for both forms of intervention). Both types of interventions were significantly better than social networks on the four outcomes. Moreover, online interventions were significantly superior to health information websites for all the outcomes, except improving how to take care of health; and telehealth was significantly superior to health information websites on being a substitute for professionals' opinions.

We expected to find a better assessment, especially for online interventions and telehealth, because both of these types of interventions have received strong support in the literature, as mentioned in the introduction [1-3]. In contrast, the ratings for health information websites can be considered more congruent with the available literature; many studies analyzing the quality of websites with information dedicated to specific health issues have shown that the quality of the

available information is not always adequate (see, for example, the following recent studies: [14-17]). Social networks received the worse rating, which is congruent with the scientific scenario and its development because, as stated in the introduction, the literature available about the use of social networks for health is scarce.

The advantages suggested by the students in general were basically related to the fact that ICT can help with access to information and/or treatments, and that they are comfortable. These results are congruent with the advantages suggested in the literature for using ICT for health [11, 12]. Regarding the disadvantages, the students suggested that the most important problem with health information websites and social networks was the quality of the information. This finding is not surprising because, as mentioned above, the quality of health information available on the internet is not always adequate. Along these lines, some studies have pointed out that patients need criteria that can help them to use and evaluate internet health information [1, 18; among others].

For telehealth and online interventions, the most frequent disadvantage was related to the fact that they were perceived as impersonal.

Finally, the results of this study can be considered preliminary. If we want to promote the use of ICT by future psychologists, we need to move forward and explore the perceptions of other groups of students in order to gain further knowledge about the situation and design effective training strategies. Basically, we think this study should be extended to psychology students from other universities because the sample for this study consisted of students at a university that uses ICT as a basis for learning. These students may be more in favor of using ICT for health than others who study in traditional universities with face-to-face teaching, as they are more used to using ICT for learning.

Although more research is needed, this preliminary study shows that psychology students are not very enthusiastic about the uses of ICT for health. We can, therefore, state that they need more training in this field in order to change their attitudes and foment the use of ICT (considering its proven advantages in the available literature) in their future professional practice.

### CONFLICT OF INTEREST

The authors confirm that this article content has no conflicts of interest.

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