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SYSTEMS-LEVEL QUALITY IMPROVEMENT

Use of Information and Communication Technologies in Clinical Practice Related to the Treatment of Pain. Influence on the Professional Activity and the Doctor-Patient Relationship

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Abstract The increasing relevance of Information and Communication Technologies (ICTs) in medical care is indisputable. This evidence makes it necessary to start studies that analyse the scope these new forms of access to information and understanding of medicine have on the professional activity of the physician, on the attitude and on the knowledge of patients or, on the doctor-patient relationship. The purpose of this study is to explore some of these aspects in a group of physicians whose clinical activity is related to one of the greatest social impact health problems which is the treatment of chronic pain. Starting with the completion of a questionnaire, in the study group it is observed that the interaction between social structure, increase of information flows and ICTs generate transformations in social practices and behaviour of the actors of the health system. Internet is confirmed as an information space on the subject, but is shown as an underutilized space of interaction between the doctor and his patient.

Keywords Information and communication technologies · Doctor-patient relationship · Pain · Continuous medical education

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Introduction

The revolution of network information offers the actors of the health systems an information space, a place of interaction and a tool for the provision of services. Five major areas of study have been identified: (1) the quality of health information available on the Internet; (2) the use of this information; (3) the effects of the Internet on doctor-patient relationship; (4) virtual communities and on-line groups of mutual help and, finally (5) providing on-line health services based on information [1–3].

The use of ICTs generates an explosion of ideas, of people, of so many possibilities that at times, can be excessive [4]. For some users, the Internet generates closeness, empathy, understanding and at the same time, confusion, discussion, struggle and conflicts [5, 6].

On the other hand, the almost instantaneous exchange of ideas, knowledge and archives have fostered collaborative work among professionals. With the help of content management systems, it is possible to work on shared documents at the same time. The Internet allows remote access to other computers and information is stored easily, wherever they may be. Health management is oriented towards tele-assistance, telemedicine and medical informatics (electronic medical records, call centers, etc.) [7, 8].

All this points to the relevance of ICT in the social dimension of health systems. The World Health Organization (WHO) and the Organization for Economic Cooperation and Development (OECD) highlight the potential of ICTs to improve the performance of health systems by increasing the quality of service delivery; accessibility to the health system; the co-responsibility of individuals on their own health, efficiency and sustainability and, finally, the challenge of applying health policies that promote equity [9, 10].

While some studies highlight the positive effects these technologies might have on increases in productivity in the sector, reduced spending and increased quality of services [11, 12] others [13] highlight the difficulty of generalizing effects on the decrease of the expense or the increases in the productivity.

However, there is a substantial increase in the level of autonomy of the individual with respect to institutions, since it affects both the capacity to make decisions about their own health or that of their relatives, as well as their levels of exigency and trust in the Health systems [5]. Both tendencies transform the traditionally passive role of patients and make them citizens with rights and duties regarding their health [11, 12].

The aim of this study is to identify some of the determinants in the use of ICTs by medical professionals in their clinical practice and their influence on the doctor-patient relationship. To this end, a group of physicians with a common point has been selected, their intervention from multidisciplinary domains in the treatment of pain.

Material and methods

We selected a group of professionals whose clinical practice was related to one of the fundamental problems of public health, the treatment of pain, addressed mostly from specialized units. 370 doctors were sent an online questionnaire. The anonymity of the respondents has been respected at all times.

The online survey tool used to construct the questionnaire was the Netquest Survey Manager application, designed to work through the Web. The design, implementation and delivery of the questionnaires, as well as the reception and storage of the data was done online through the applications and servers of Netquest. The questionnaire consisted of 21 items organized in sub-sections related to: general data of the sample, such as age, sex, place of work and medical specialty; use of the internet as a source of information; internet for communication and information exchange; valuation of ICTs by medical professionals; ICT as a form of clinical management; and, the ICTs in the doctor-patient relationship.

The statistical analysis of the data was performed analysing the frequency of the variables and the relevant statistically significant relationships with a significance level of $P < 0,001$. A causal analysis was then carried out to estimate the presence or absence of a given characteristic according to the values of a set of predictor or independent variables that are statistically associated. To carry out this type of analysis, a logistic regression methodology was employed through the logit binomial model.

Results

Regarding the general characteristics of the study group, 210 are males, while 160 are females. By age group, the highest number of professionals is between 31 and 40 years old, while only 10% are older than 50 years (Fig. 1).

51% of the professionals work belong to Units of Pain; 21% are employed in Palliative Care; and 15% in Primary Care Centers. The rest, 13%, develop their work in pain-related medical services. Among the medical specialties are Anaesthesiology (34.5%), Surgical Specialties (22%) Family Medicine (7.8%) and Internal Medicine (6.6%). 4.9% are dedicated exclusively to management tasks in the Pain Units.

General factors of ICT use

98.37% of the respondents stated that they use the Internet in their professional practice, while 10.11% do not use it. Nevertheless, our data showed that 73% considered the Internet very useful in their professional practice; 24.5% considered it useful; 1.8% considered it not very helpful, while only 0.5% declared that it is not useful in their professional practice. The highest percentage of professionals who use the Internet belong to Hospitals and Primary Care Centers. We

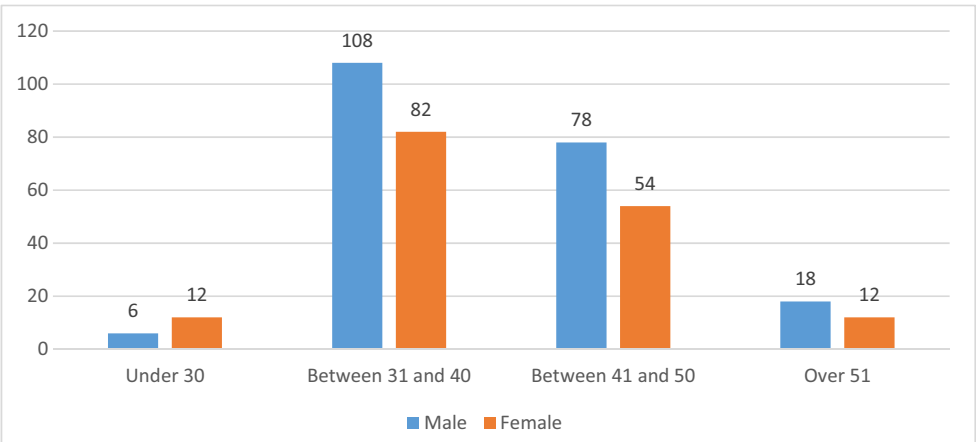

Fig. 1 Professionals grouped by age and gender

observed a significant statistical relationship that emphasizes that the professionals who develop their activity in hospitals consult the Internet more frequently than the rest. However, there were no significant differences between specialties.

Although our sample stands out for the high percentage of physicians who use the Internet, a significant relationship between age and their use in professional practice was observed. This relationship shows that the younger ones use these technologies the most. However, neither gender, nor specialty, nor professional activity are significantly related to the use of the Internet in clinical practice.

The activities most frequently performed by medical professionals on the Internet in relation to the treatment of pain are bibliographic searches (frequent or very frequent in 80.3%). It is striking how the lower frequency of use is related to the disclosure of their own work (exceptional 45.6%).

Internet as a correlation space

Approximately 89.1% of the doctors surveyed stated that they use the Internet or e-mail to communicate with other professionals in the health sector. However, this percentage decreases to 21.9% in the case of communication with patients. Thus, 8.8% of professionals who use electronic mail to communicate with patients do so frequently; 31.7% frequently and 59.1% in an exceptional manner. The professionals between 31 and 45 years stand out as the most active when it comes to communicating with other agents through the use of ICTs.

Although the professionals who work in hospitals are those who use these forms of communication more frequently with their colleagues, there are no significant differences in this regard in relation to the medical specialty. However, they do exist when considering the frequency of communication with patients. The obtained data show that professionals of specialties other than Family Medicine are those who use Internet or electronic mail to communicate with their patients. In summary, the use of these communication modalities is not associated to the comprehensive and continuous care practice offered by Primary Care.

Internet and e-mail allow for communication processes that go beyond individual-to-individual interaction. E-mail lists, discussion groups and forums facilitate communication and interaction processes between more than two agents. As shown in Tables 1, 79.3% of the respondents stated that they had never participated as advisors in websites related to patient groups; 52.7% stated that they never participate in websites where there are discussion groups on pain; 25.3% never access discussion lists or search for pain websites when they have questions related to the topic. Professionals see on the Internet a source of specialized information, although the percentages of participation in the generation of this information are low, either to contribute information in specialist websites or in webs related to patients.

Relevance of contents and medical-patient relationship

The main use of the Internet for health issues is related to the search for content. The amount of resources available in the Network confronts all the agents of the health system with new challenges related to the use of these contents, their quality and relevance.

Medical professionals considered that the information offered on the Internet on the subject of chronic pain is generally very relevant (10.1%) or relevant (65.1%). The percentage of professionals who declared that the information is not relevant is 19.4% and those who considered that the information is not relevant reach 5.4% of the respondents.

There is a significant relationship between the relevance of the contents and the recommendation by the doctor to his patients. 49.7% of the professionals who consider relevant or highly relevant network content recommend their patients to consult medical information sites in the Network. A similar percentage of respondents, despite considering relevant or very relevant content, never recommend to their patients to consult the Internet for health issues.

Approximately half of the respondents stated that some patients usually share or discuss health information with them. 24.2% indicated that few patients perform this activity; 10.7% indicated that there are many and 8.3% stated that none of their patients share with them information consulted on the Internet.

On the other hand, there is a significant relationship between sharing available health information and recommending health websites to patients. Thus, professionals who recommend websites to their patients often

Table 1 Periodicity in the use of the Internet for the interaction in the network (percentages)

	Very frequent	Frequent	Almost never	Never
Use a discussion list or search pain websites to resolve questions	10,3	36,1	28,3	25,3
Contribute to specialized websites where there are discussion groups on pain	0,5	9,1	37,7	52,7
Uses to participate as an advisor in websites where there are groups of patients	0	2,6	18,1	79,3

share or discuss with them the information they have consulted in a higher percentage than those who do not recommend Internet as a source of information.

Table 2 shows the results of the surveys assessing the consequences of the search for content on the communication processes in the doctor-patient relationship in the opinion of professionals.

More than 80% of professionals considered that the increase of information patients have access to on the Internet has few consequences on the improvement of the doctor-patient relationship. Nevertheless there is a significant relationship between the relevance of the contents and the consequences that medical information on the Internet has on improving the doctor-patient relationship. Those professionals who consider that the information offered is relevant or very relevant believe that consulting information on the Internet would improve the patient doctor relationship in a higher percentage than those doctors who consider that the information offered on the Internet is little or nothing relevant.

The relationship between recommending websites to patients and the effect of this action on the doctor-patient relationship is also significant. Practitioners who believe that the doctor-patient relationship would improve recommend their patients to consult medical or health information sites on the Internet in a higher percentage than other professionals.

Protocols, clinical information management and telemedicine

More than 50% of the respondents had used or would use ICTs to develop actions related to the management of information about their patients (Table 3). Thus, in the case of the consultation of clinical records and databases, it is emphasized that more than 50% use these formulas or would use them if they had that possibility. Regarding the use of ICTs for the sending of prescriptions, the doctors who work in Primary Care Centers show the most acceptance. In this sense, the youngest respond more favourably to the use or possible use of these technologies.

Table 2 Consequences of information consultation on the Internet (percentages)

	Most	Some	Few	Nothing
Would the doctor-patient relationship improve?	0	16,5	40,2	43,3
Can it lead to questioning the doctor's knowledge?	20	47,5	24,0	8,5
Does it improve the patient's knowledge and facilitate their treatment?	11,4	45,0	33,5	10,1

Discussion

As we gather in the results of our study the growing role of ICT in health care generates concern among professionals. Physicians are faced with the benefits and risks posed by the introduction of ICTs, especially the Internet, in the field of health [6, 11, 14, 15].

We observe that the younger professionals are the ones who most often use this technology and those who value their usefulness the most. On the one hand, they recognize that easy access to specialized information sources allows them to constantly update their knowledge [9, 10].

Another important element is the low use that the respondents do both to disseminate their work and to build their own websites. Although the Internet facilitates an increase in the information available, the use of the Internet as a communication space is not yet so widespread. This could also explain the behaviour of the medical professionals regarding the contents in the Network. While the volume of information has increased, the communication processes have not been modified and continue to focus on the face-to-face meeting [16, 17].

Physicians express their concern about the quality, relevance, and consequences of patients' use of resources on the Net, and they fear the questioning that this new source of information can imply on their knowledge [3, 6, 9, 11, 12].

It is a fact that the accessibility to a great amount of information and the use that can be made of this information supposes a transformation of the doctor-patient relationship [14], empowering patients to become increasingly involved in making decisions about their own health and to collaborate closely with their physician [18–21].

More than 80% of the professionals surveyed consider that the increase of information that patients have access to on the Internet has little influence on the doctor-patient relationship. However, there is a significant relations hip between the relevance of the contents and the improvement of the doctor-patient relationship. We suppose that the initiative of the professionals is the one that can have consequences in the relation doctor-patient and not the relevance of the contents. If the professional provides information to the patient, the patient will subsequently share the information found on the Internet with him. The main source of information continues to be the physician who uses the Internet as a further resource when approaching the process of communication with the patient. In the event that the patient is the initiator, the physician may consider the information discussion a waste of time during the face-to-face consultation or he may be concerned about the consequences of that information on the attitude and health of the patient. In short, providing patients with relevant information on the Internet would improve the doctor-patient relationship, provided that the medical professional values the content [7, 9, 11].

Table 3 Ways of information in clinical practice (percentages)

	Yes, I would	Yes, if possible	No, I won't
Follow-up of queries electronically (internet, SMS)	9,7	51,5	38,8
Sending of prescriptions electronically	33,7	54,2	12,1
Sending of official parts or reports by electronic means	7,0	43,4	49,6
Consultation of clinical records or computerized diagnostic tests	18,4	62,9	18,7

In other words, it is possible to think that the concern of the professionals is not in the consultation of information on the Internet by the patient, but in the use of this information. This reinforces the role of asymmetries of information between doctor and patient. The physician is the only one who can interpret the available information and make decisions about the health of the individual [11, 14, 19]. Undoubtedly, the visiting times of the patients stand out because of the short time of contact between these patients and the doctors, so the Network as a communication space could be used as a support for face-to-face consultations.

Furthermore, the Internet provides doctors with a new management of clinical information by offering the possibility to build and consult the patient's medical history [5–8]. In this respect, the lack of implementation of telemedicine is highlighted in this study compared with other ICTs activities. However, when searching for data and clinical records, the professionals working in the Primary Care Centers stand out since medical services are generally associated with a more comprehensive vision of the patient, and therefore the management and integration of the Clinical Information is cruzial.

The data show a beneficial conception of ICT applications for clinical practice. In the evaluation of the uses of the ICTs by the professionals emphasizes the idea that the introduction and use of this type of technologies cannot be approached from a deterministic perspective. That is, professionals are aware that these processes do not produce an adaptation of their behaviours automatically, but rather there are interactions between human, cultural, organizational and technological factors that shape both their behaviour and technology itself. Nevertheless, it is still necessary to go deeper into studies that allow us to obtain more data about the relationship between the Internet and health in the agents' daily lives, in their activities and interactions with various health media, individuals and institutions [11, 14, 19].

Conclusion

The analysis of the data collected in our study supports the idea that the Internet is nowadays a large space for information on medical topics, specifically on pain, and less frequently as a space for interaction between physicians and patients.

The use of ICTs in the patient-doctor relationship is still small given its potential. From the professional perspective, the consequences of the information consultation in the network will be positive for the patient as long as they do not question the knowledge of the doctor and do not make decisions about his health without consulting him.

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