



# Perception of change and ethical issues in the use of information and communication technologies in the health sector: Results of an online survey

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## ABSTRACT

For several decades, information and communication technologies (ICT) applied to health have undergone a revolutionary development, whether they are e-health, telemedicine or others, these digital changes have marked the global care system. Today, internet is the common source of information to many uses, and it is considered as the wealthiest mine of information for any kind including those of health. This survey, which interviews both Moroccan practitioners and users, is conducted online by distributing two questionnaires. The aim of this study is to discover the perception that Moroccan doctors and users have concerning the change ICTs have been able to bring about without neglecting the ethical and deontological issues involved. The results showed that doctors are already using the web in their daily practice and are open to eHealth practices such as telemedicine. As for users, the practices of eHealth are an asset that should become more widespread. Further research is needed to confirm and further explore the results of this study.

**KEYWORDS:** ICT, e-Health, ethics.

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## INTRODUCTION

One of the main sources of change in the health system is computerization, digitalization and technical networking that affect both the management, organization and delivery of care and service [1]. In the field of health, the Internet has changed the way people find and receive health information, from passive information comes from physicians advise and the media to active information sought through the Web [2]. As a result, a number of studies have examined the role of the Internet in health care and its influence on the traditional relationship between consumers and health professionals [3,4].

EHealth is a broad concept that is defined as any activity in which an electronic means is used to provide health information, resources and services. It covers a large number of areas, including [5]: electronic health records, mobile health, telemedicine.

Telemedicine is starting to spread little by little in Morocco. According to the WHO, telemedicine as a practice of distance

medicine through ICT must improve the performance of health care systems by promoting equity, efficiency and the accessibility of health systems [6]. In June 2018, the Moroccan Society of Telemedicine is born, it assigns for mission the establishment of a technological infrastructure for the development of the telemedicine activities for the benefit of the populations of the rural and enclaved zones.

In the practice of telemedicine, the development of a code of ethical and professional conduct is recommended. It specifies the duties of doctors practicing telemedicine towards patients (quality of care, information and patient consent, security and confidentiality), as well as the responsibilities and ethical guidelines related to the practice of telemedicine [7].

To date, no study in Morocco has examined the issues of perceptions of change that new technologies have brought to health, as well as issues of ethics and accountability affecting physicians and patients in the practice of health. telemedicine in Morocco. To do this, we proposed to study the ethical issues

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and perceptions of change in the use of ICTs in the health sector by questioning doctors and users.

This study aims to achieve the following objectives:

- Clear the place of ICT in the supply and demand of care in Morocco;
- Know if doctors in Morocco use eHealth practices in their work;
- Find out how doctors respect the ethical rules in their practices of eHealth solutions such as telemedicine newly introduced by the Moroccan Ministry of Health;
- Detect if users have ever used telemedicine;
- Know if users are aware of the confidentiality of their medical information during an online service.

## METHODS

### Study Design

To carry out this research, two questionnaires were designed online using the Google Forms platform, with all types of closed, open and multiple choice questions having a direct relationship to the research topic and which were based on specific criteria to extract as much information as possible about the place of eHealth in the work of Moroccan practitioners and users while respecting the ethical rules related thereto.

The first questionnaire is for physicians and contains 36 questions distributed over three sections. Section 1: Presentation of the socio-professional status; Section 2: The Physicians' Report to ICTs in the Practice of their Profession; Section 3: Ethical Issues and Change Perceptions of eHealth. The second is for users and consists of 22 questions distributed over three sections. Section 1: Presentation of the socio-professional status; Section 2: Health issues facing the web; Section 3: E-Health: Perceptions and Practices.

The survey was open and accessible to respondents at <https://docs.google.com> from June 02, 2019 to June 12, 2019.

### Study Population and Sampling

For both questionnaires we followed a snowball recruitment strategy to recruit a minimum online sample of 100 physicians and 200 users.

This snowball sampling method, based on the recommendation of friends, focus groups, and Internet forum websites, is effective in recruiting survey participants [8]. Virtual response via social media excels traditional survey techniques [9]. But during this investigation we were faced with two essential limitations:

- The time constraint because the questionnaires are published on June 2, 2019 and closed on June 12, 2019 to analyze them as soon as possible;
- A low response rate.

## RESULTS

To obtain the snowball sampling effect, we asked the respondents to distribute the hypertext link also to their personal contacts, but despite this, we only accumulated 27 responses from the questionnaire intended for physicians, and 68 responses from the questionnaire intended for users.

### The Results of the Doctor's Questionnaire

**Table 1: Demographic data**

Your gender?	Women	50%
	Man	50%
Your age?	40 years and under	75%
	41 to 50 years	16,7%
	51 to 60 years	8,3%
	60 years and over	0%
You practice in?	The public sector	58,3%
	The private sector	25%
	Military Hospitals	4,2%
	University sector	12,5%
You are?	A general practitioner	37,5%
	A specialist doctor	45,8%
	A dentist	16,7%
You have been practicing your profession since?	Less than a year	16,7%
	1 to 5 years	37,5%
	6 to 10 years	20,8%
	11 to 15 years	4,2%
	More than 15 years	20,8%

**Table 2: Physicians' attitude towards ICTs in the field of health**

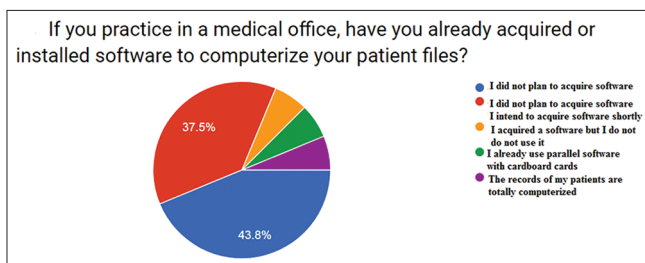
Questions	Answers		
	Yes	No	No response
Do you use the web as a source of knowledge when carrying out your work?	100%	0%	0%
Do you think that the web helps you better understand the pathology of your patient?	87,50%	12,5%	0%
Would you agree during consultations that your patients share with you information about their symptoms or pathologies found on the web?	58,30%	41,7%	0%
Do you think that the new technologies of information and communication will be able to replace, one day, the role of the doctor?	95,80%	4,20%	0%
Do you think that eHealth will change the practices of medicine?	50%	50%	0%
Have you ever received eHealth training?	8.3%	79.2%	12.5%

**Table 3: The practice of telemedicine by Moroccan doctors**

Questions	Often	Some- times	Rarely	Never
Do you offer a medical teleconsultation service to your patients (remote consultation)?	4,2%	25%	25%	45,8%
Do you offer a medical remote monitoring service to your patients (monitoring your patients remotely)?	4,3%	34,8%	8,7%	52,2%

**Table 4: Corresponding answers to the ethics and deontology of the practice of medicine**

Questions	Yes	No
Do you think that the consent of the patient is necessary above all actions of telemedicine (teleconsultation, tele-assistant ..)?	95,8%	4,2%
Do you think that eHealth dehumanizes the care relationship?	54,2%	45,8%
In your opinion, the use of communication technologies in the field of health could affect the quality of care?	43,5%	56,5%
Do you think there can be a medico-legal risk when practicing telemedicine?	73,9%	26,1%
Are you willing to electronically transmit extracts of medical data from your patients necessary for their care to other health providers?	37,5%	62,5%
Do you believe that the practice of telemedicine increases the risk of violation of the confidentiality of patient information shared by technological means?	75%	25%
Do you think that the signature in advance of a statement by a patient who will benefit from one of the actions of telemedicine (teleconsultation, tele-assistant ..) informing him on all the risks related to his shared data online is an action to minimize the responsibility of the doctor?	41,7%	12,5%

**Figure 1: The use of software for patient records management.**

## The Results of users' Questionnaire

**Table 5: Demographic data**

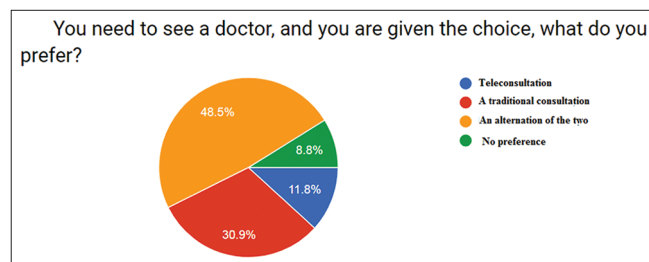
Your gender?	Women	52,9%
	Man	47,1%
Your age?	Under20 years	0%
	From 21 to 40 years	69,1%
	From 41 to 60 years	30,9%
	More than 60 years	0%
Your highest level of education?	No diploma	0%
	A Bachelor's degree	5,9%
	A license	32,4%
	A master's degree	39,7%
	A PhD	22,1%

**Table 6: Searching for health information online**

Questions	Answers		
	Yes	No	Some-times
Do you use the internet to search for information about symptoms of diseases that may arise?	92,6%	7,4%	0%
In your opinion, the web helps you better understand your symptoms?	88,2%	11,8%	0%
Generally, after a medical consultation, do you research on the web about the treatment prescribed by your doctor?	44,1%	7,4%	48,5%
Are you registered in web-based groups sharing content related to health?	52,9%	47,1%	0%

**Table 7: Users' perceptions of the confidentiality of their medical data**

Questions	Yes	No
Have you already benefited from a remote consultation (Teleconsultation) or a follow-up of your doctor at a distance (remote surveillance) through one of the existing means of communication?	19,1%	80,9%
If no, would you like to benefit from the services of telemedicine (Teleconsultation and / or Remote surveillance)?	80,3%	19,7%
Would you agree that your doctor shares your medical information with one or more colleagues to seek an opinion (Tele-expertise)?	83,8%	16,2%
Would you like to have access to your medical file online if this option existed?	86,8%	13,2%
Would you accept that your medical record with your history of medical care is accessible online to the various care providers?	33,8%	50%
Are you aware that your research on the internet about your health is a gold mine for large companies that exploit this data in their activities?	38,2%	45,6%
Would you agree before a telemedicine action (teleconsultation, tele-assistant ..) to sign beforehand a statement informing you about all risks associated with sharing your data online?	77,9%	22,1%

**Figure 2: Type of consultation favored by users.**

## DISCUSSION

### Doctor's Questionnaire

Moroccan doctors are in close contact with the web, the questionnaire revealed that (100%) respondents said they use the web as a source of knowledge in the exercise of their profession. As well as (87.5%) of them specify that the web helps them to understand the pathologies of their patients. Also, (58.3%) of them agree to discuss with their patients information found on the web. This can be considered as a transfer of knowledge and skills between doctors and patients. That's why (50%) of physicians are aware that the practices of medicine will change over time through eHealth, despite (95.8%) of them claiming that information technology and communication can never substitute for the role of the doctor.

Through the questionnaire, (79.2%) have never benefited from training in eHealth, this action must be borne by the Ministry of Health, which must improve the level of knowledge of its practitioners by promoting training in ICT in the field of health for its doctors so that they can follow the technological developments that are in the field of health in other countries.

We observe that (45.8%) never tried a teleconsultation, and (52.2%) never offered their patients remote monitoring. This is due to the lack of training of health professionals in telemedicine.

We note that practitioners practicing in private practice still do not have computer tools for the management of patient files because only (6.3%) of the doctors have completely computerized the files of their patients. Among the solutions proposed by respondents to ensure computerization of patient records are generalizations of IT tools in health facilities with internet access and train staff on the use of these tools, and also creation of a secure information system under the supervision of the Ministry of Health shared between health professionals.

One of the great principles of ethics states that one must not harm a patient [10]. Questionnaire respondents are aware of this since (95.8%) responded that patient consent is required before any telemedicine action.

The use of communication technologies to transfer medical information, raise particular ethical and medico-legal issues [11], and this is what respondents approved with a rate of (73.9%).

Through the responses we find that (75%) of physicians believe that the practice of telemedicine increases the risk of violation of the confidentiality of patient information shared by technological means. On the other hand, according to the answers collected we discover that (37.5%) of the doctors are willing to transmit electronically extracts of medical data of their patients necessary to their care to other health providers. This is against the ethical and deontological rules.

To minimize the responsibility of the physician in a telemedicine action, (41.7%) of the respondents state that the prior signature of a statement by a patient who will benefit from one of the actions of telemedicine informing him about the risk associated with its shared data online is beneficial, however (45.8%) doctors are not sure that the signing of said statement could protect the doctor against the pursuit for violation of the rules of ethics.

### Users' Questionnaire

We observe that (92.6%) used the Internet to search for information on potential diseases (88.2%). Internet is not available in the Internet, it is not available in the social countries, is not available in the social countries, is not available to use, one also needs information on the pathologies, on the treatments, on the habits of life, on surgical procedures, on medical and alternative resources [12,13].

After a medical consultation, the reputedly declared (44.1%) were themselves searched on the Web for the treatment prescribed by the doctor to their doctor (48.5%). This can be damaged by the patient's confidence in his treatment of the proliferation of medical information.

By observing the results of the questionnaires we note that (80.9%) have never benefited from one of the practices of telemedicine but wish to benefit one day with a response rate of (80.3%). But despite this, the majority of users said they prefer alternating between traditional consultation and telemedicine with a rate of (48.5%) followed by respondents who prefer only traditional consultation with a rate of (30.9%). This means that direct contact with the doctor is very important for the population studied.

Most of the users who participated in this survey have no problem in having their doctors share their medical information with one or more colleagues to request an opinion (Tele-expertise), however (16.2%) refuses this action. For this no telemedicine action should be done without the consent of the patient. Respect for the confidentiality of personal medical data is an ethical and ethical obligation. It should also be noted that (50%) of respondents categorically refuse to have their medical records with their medical history available online to the various health care providers.

The majority of respondents prefer to be warned of the risks associated with the sharing of their information during a telemedicine action by signing a prior declaration with a rate of (77.9%), while (22.1%) between them refuse to sign a declaration. According to them, the responsibility must be shared between the carer and the patient and signing a document like this does not protect the confidentiality of their data but only covers the doctor against prosecution if he has not respected the rules of confidentiality.

## CONCLUSION

Our results showed that practitioners in Morocco are open to the practices of information and communication technologies (e-health, telemedicine) but requires training on this to be able to carry out their practices. The majority of them are aware of the rules of ethics and medical ethics that must be respected in the practice of eHealth solutions. According to the survey results, users are familiar with the search for online health information before and after medical consultations and have expressed a willingness to benefit from eHealth practices such as telemedicine.

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