Use of ICT (Information and Communication Technologies) in Health Facilities During the COVID-19 Pandemic: Case of Morocco

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Abstract

Background: The Covid-19 pandemic represents an unprecedented global crisis. It has placed many strains on the health systems of countries around the world. They had to, among other things, fight simultaneously against this pandemic, treat the affected people, preserve the rest of the population, while continuing to take care of the other patients. Faced with this situation, the development of the use of ICT in health establishments is a necessity today more than ever in order to limit any kind of contamination in hospitals, especially that caused by the spread of covid-19 on the one hand, and to digitize the relationship between caregiver and patient on the other hand. All these challenges require the availability of digital tools in health institutions and require health professionals well informed and trained in this sense. In this respect, the use of digital tools and telehealth (E-health, telemedicine, telecare....) is a priority step to consolidate health systems, as these new technologies allow patients to receive accessible, safe and adapted virtual care.**Objective:** The aim of our study is to evaluate the level of adaptation of the Moroccan health system to the covid-19 pandemic through the use of information and communication technologies (ICT) in health facilities (hospitals and primary health care facilities), in order to combat coronavirus contamination in the latter (stop contamination: professional to professional, professional to patient and patient to patient). **Methods:** The online questionnaire technique allowed us to collect 500 responses from health professionals spread over all Moroccan regions. **Results:** (86%) of the interviewees declared the existence of a covid-19 service within their institutions, with a majority of (91%) never received training in the use of ICT. (51%) of the health, professionals confirmed the absence of digital tools in the covid-19 services. (87%) announced that the covid-19 services do not have applications for the registration of patients suspected or affected by SARS covid-19. In addition, (79%) of the respondents expressed their dissatisfaction with the use of ICT. In the same context, (72%) of the participants stated that the use of ICT can limit the spread of SARS covid-19 in health facilities.

Conclusion: The health crisis has confirmed the importance of digitalization in the health sector. To do so, the state must place digital tools at the center of its interests as a major reform project for the Moroccan health system. The adoption of new technologies in the health sector can help health care practitioners to efficiently provide quality care to patients in order to limit any kind of contamination.

***Keywords**: ICT, covid-19, health facility, digitalization, telehealth.*

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Introduction

Digital health, or "e-health", refers to all areas where information and communication technologies (ICT) are used for health purposes [(1)]. According to

the World Health Organization (WHO), "e-health" is defined as the use of information and communication technologies (ICT) to support health care, and these technologies form the backbone of services to prevent, diagnose and treat disease [2].

Since December 2019, the world is facing a new pandemic known as SARS-CoV-2 (Covid-19), which has spared virtually no country. Its expansion and exponential contagiousness have imposed the confinement of most, if not all, countries in the world, and have left hospitals out of breath and decimated a significant portion of health care personnel [3]. Telehealth has been the means of both containing the health crisis and ensuring the continuity of care [1].

In France, as a derogation, to deal with the Covid-19 pandemic, healthcare professionals can use digital tools and "general public" communication applications when they take care of patients.[1] ICT enable remote collaboration between healthcare professionals and a relationship between healthcare professionals and the patient at a distance, rather than in contact.[4]

In addition, the use of telehealth offers, firstly, the possibility of ensuring the remote management of patients with Covid-19 and, secondly, an effective response to the risk of spreading the virus. It also provides an effective response to the risk of spreading the virus, as it protects healthcare professionals from infection, as well as the patients they care for.[1]

Similarly, the practical value of telemedicine was brought to light by the health crisis related to the Covid-19 pandemic, which facilitated its social acceptance by health professionals and patients.

Indeed, as soon as the first contaminated cases of Covid-19 appeared and after the state of health emergency declared by the Kingdom of Morocco, the Moroccan authorities took the necessary precautions to curb its spread.[5]

From this point of view, the hospital centers in Morocco are facing a new state, in which the fight against the spread of the virus, the isolation and the healing of people affected by the coronavirus remains the major concern of all the officials of the Kingdom. Numerous measures have been decided to escape the inexorable advance of the new coronavirus, qualified as a pandemic by the WHO.[6]

Faced with this situation of confinement of the population, the use of ICT is a necessity today more than ever in order to improve access to health care, increase the efficiency of interventions, reduce barriers to participation, improve adherence to treatment....[7]

In this perspective, this study aims at testing the following hypothesis: "Increase of the use of the ICT in the hospitals equals decrease of the cases contaminated by the coronavirus". In order to assess the following points:

v Have health professionals been prepared and trained in ICT to deal with this unpredictable situation?

v The availability and use of ICT during covid-19;

v The importance of the Electronic Patient Record (EPR) in covid-19;

v The role of ICT in obtaining a computerized patient database;

v The need for a new generation of digital hospitals in Morocco;

Materials and Methods

Setting and type of study.

Our study is both qualitative and quantitative; it is focused essentially. On the use of the digital in the health establishments under the Kingdom of Morocco. This study was conducted over a period of six months,

from January 1 to June 30, 2021.

Sampling technique.

The survey was carried out via an online self-questionnaire of the "Google form" type, which lasted for a period of two months. We collected 500 responses from health professionals with different categories.

Indeed, the advantages of the online questionnaire are multiple, it is less expensive, faster, allows to question the most people, its answers are more reliable and more easily exploitable... Etc. But during this pandemic, the use of online questionnaires is a necessity in order to avoid the spread of the coronavirus.

Similarly, the present work is based on a literature review aimed primarily at scientific journals on topics related to the use of information and communication technologies in the health field. The Google Scholar scientific search engine was also used to identify more recent studies citing the identified journals or articles.

Finally, observation reflects what the researcher notices, "observes" by living with people, by sharing their activities; moreover, we experienced in a provincial hospital in the city of Sidi Kacem Morocco all the events related to the pandemic, namely the realization of covid-19 tests, the isolation of suspected cases, and the hospitalization of infected cases. The recovery and discharge of patients ...etc.

Results and Discussion

1. General:

Our study showed the participation of different categories of health professionals according to a workforce of 46% of nurses and health technicians, 28% of doctors, 14% of administrators and 12% gather other categories constitute teachers and technicians. All the respondents who answered our survey, 69% of whom are women and 31% men, cover all the regions of the Moroccan territory with 38% located in the Rabat-Salé-Kenitra region and distributed in the health establishments (H.E) as follows

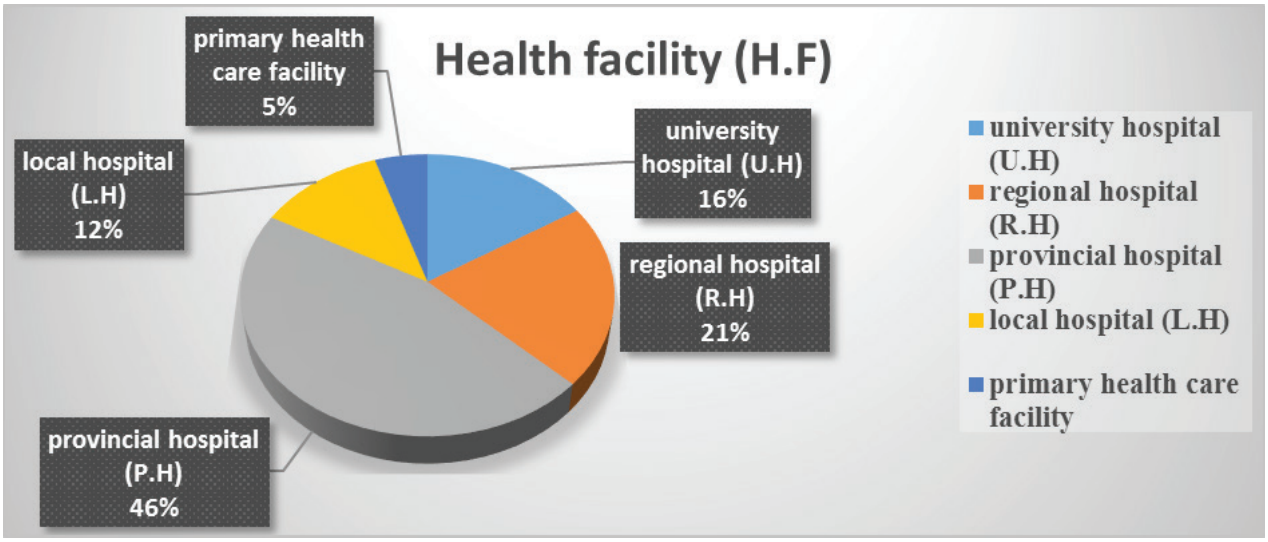


Figure 1: Distribution of health professionals by health facility.

A percentage of 86.3% of the interviewees declared the existence of a covid-19 service within their facilities (about 432 people in our sample) while 13.7% confirmed the non-existence of this service in these health facilities. Of these professionals, 79% had the opportunity to work in the covid-19 service at different times. (26.7% having worked for a period of one month, 36.7% having worked between one month and six months and 36.6% having worked from the beginning of the pandemic).

2. Knowledge and availability of ICT.

According to the results of our survey, we found that only 28.4% of the health professionals in our sample have knowledge about ICT, while 71.6% do not. A majority of 91% have never received training in the use of these technologies, while 9% have. Furthermore, 89% of the participants are unaware of the terms related to digital health (e-health, telehealth, telecare).

We can explain this ignorance of ICT by the lack of programs related to digital health in basic and continuing education during the educational and professional pathway, a Moroccan study has highlighted the lack of integration of ICT in initial or continuing medical training. On the other hand, 42.5% of the students surveyed declared that they had difficulties using ICT for their training.[8]

About 90% of these interviews stated that their health institutions had never organized a training session on the importance of using ICT during the covid-19 pandemic. From these results, we can deduce that the use of ICT in the basic training programs of health professionals is necessary for future professionals qualified in digital health.

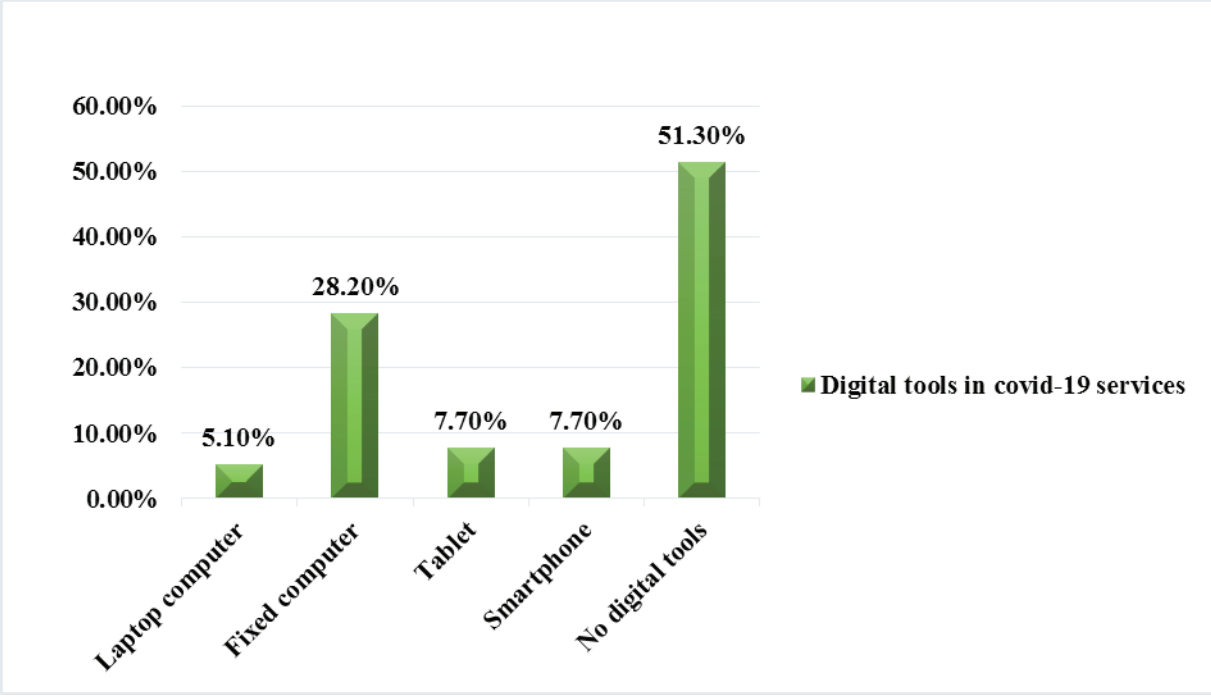


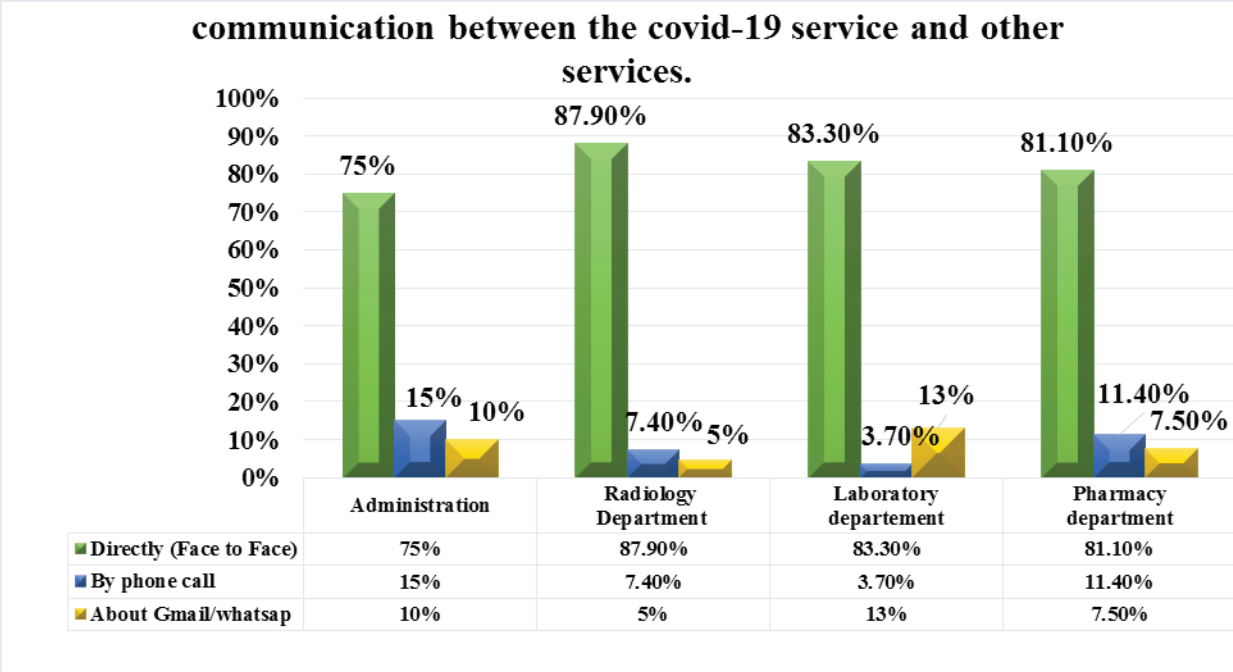
Figure 2: availability of digital tools in the covid-19 service.

The results show that, 51.30% of the health professionals confirm the absence of digital tools in the covid-19 services, of which 28.20% estimate the availability of fixed computers, while 15.40% announce the existence of tablets and smartphones, while only 5.10% chose the answer in accordance with the existence of laptops. On the other hand, 42% claim that Internet access is unavailable in their establishments, while 58% of the professionals announce that Internet access is available. The latter are less satisfied with this accessibility and unanimously agree that access is available only for professionals and not for patients.

As local and regional health authorities around the world work tirelessly to respond effectively to the covid-19 crisis, it is extremely important to recognize that, in times of crisis or beyond, digital tools must act as a catalyst to achieve the goals of the relevant authorities. They must safeguard the health of citizens, promote social cohesion, and protect human rights, including at the digital level.[6]

3. ICT usage: professional to professional:

According to the results, the coronavirus disease affected about 59.5% of the health professionals in our sample, of which 55.6% of them announced that the coronavirus contamination was in the hospital environment, 33.3% during the exercise at the covid-19 service and 11.1% outside the hospital.



	Administration	Radiology Department	Laboratory departement	Pharmacy department
Directly (Face to Face)	75%	87.90%	83.30%	81.10%
By phone call	15%	7.40%	3.70%	11.40%
About Gmail/whatsap	10%	5%	13%	7.50%

Figure 3: Communication between the covid-19 service and other services.

It should be noted that communication between the covid-19 service and the various hospital services (Administration, Radiology, Laboratory, Pharmacy) is most often carried out by direct contact (face to face) as shown in the statistics in (Figure 3) a study has shown that the transition to "paperless" has enabled us to significantly reduce the risk of contamination of the covid-19 when exchanging documents from hand to hand.[7]

On the other hand, the majority (82%) of these interviews never participated in a remote meeting

organized by their managers during this pandemic, while 18% rarely participated in such meetings.

In addition, the purpose of medical teleassistance is to allow a medical professional to remotely assist another health professional during the performance of an act. The participants confirm that the technique of medical teleassistance is adopted by 37.8% of them against 62.2%.Despite the importance of this technique; health professionals timidly adopt it.[9]

The answers to the question "Have any texts been adopted to ease the conditions for the use of ICT during this pandemic?" show that 82.4% of the respondents have never received an organizational text, from either the government or the Ministry of Health.

In addition, several countries have relaxed telehealth laws during this pandemic, for example, In the United States the U.S. Department of Health and Human Services (HHS) relaxed the requirements of the Health Insurance Portability and Accountability Act (HIPAA) early in the pandemic, so that health care professionals could quickly implement new telemedicine and video interactions.[10]

4. ICT usage: professional to patient:

Medical teleconsultation allows a health professional to carry out a remote consultation with a patient, through the use of an information transmission medium [11], despite the importance of this technique, especially in this period of covid-19. 63.9% have never used it, 19.4% rarely used it and 16.70% are often adopted this technique.

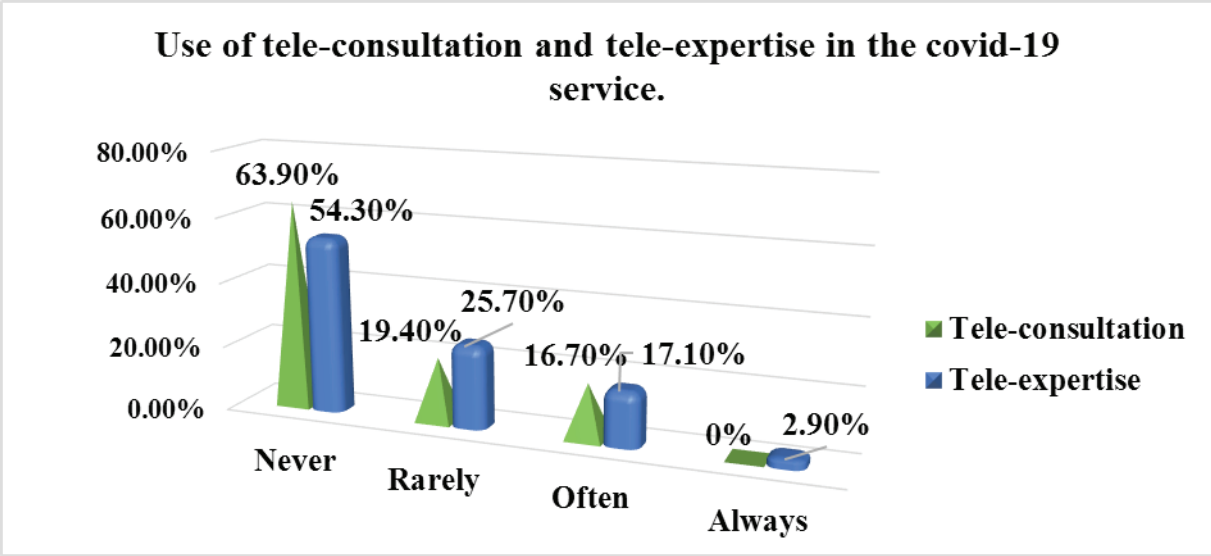


Figure 4: Use of teleconsultation and tele-expertise in the covid-19 service.

A French study has shown that, "The contribution of teleconsultation has been major because it has made it possible to absorb a volume of patients that we would not otherwise have been able to handle.[11] Easy to implement, teleconsultation is characterized by its absence of risk of contamination, and allows us to isolate suspected patients directly and, if necessary, to refer them to the appropriate care structure ".[12]

Similarly, the purpose of tele-expertise is to allow a medical professional (known as the "requesting" medical professional) to seek the opinion of one or more medical professionals (known as the "requested" medical professional) remotely, on the basis of their

training or particular skills, on the basis of medical information related to the management of a patient.[13]

However, 54.3% have never used this technique. Furthermore, a French study shows that the tele-expertise platform allows the GP's initial requests to be redirected, thus allowing for better care to be provided. It is undoubtedly through the speed and precision of the advice given on a difficult diagnosis, with reasoned and precise requests for additional examinations, or the scheduling of a closer consultation, that the platform allows for a reduction in hospitalizations in a given territory.[14]For all these reasons, the benefits of this technique are so important during this pandemic.

It should be noted that the majority, namely 87.1%, say that covid-19 services do not have applications for the registration of patients suspected or affected by SARS-covid-19.At the same time, and in the interest of digitizing the relationship between caregiver and patient, because in the era of the coronavirus, digital tools are major assets in the prevention of the pandemic and the detection of infected patients. Despite the importance of all the above, we found that all participants are unanimous on the non-existence of the computerized patient record (CPR) in the isolation units. Indeed, studies show that paper-based patient records have been clearly identified as vectors favoring rapid transmission of SARS-CoV-19 between patient/staff and staff/staff [6].

In addition, in the framework of limiting the contamination and reassuring the family of the patient with sars covid-19. Most of the participants, about 88%, consider that the absence of listening cells can favor the spread of the virus. In France, in the context of monitoring patients with covid-19 and in order to avoid overcrowding of the health care system and to relieve practitioners as well as to avoid hospital contaminations, the remote monitoring device COVIDOM was set up urgently at the scale of Ile de France . This shows that the creation of e-health applications with the aim of communicating with patients and their families is an alienable asset in order to absorb the volume of visitors and limit their travel[12].

In addition, 73% said that the lack of remote patient monitoring was due to the unavailability of cameras in the covid-19 wards.

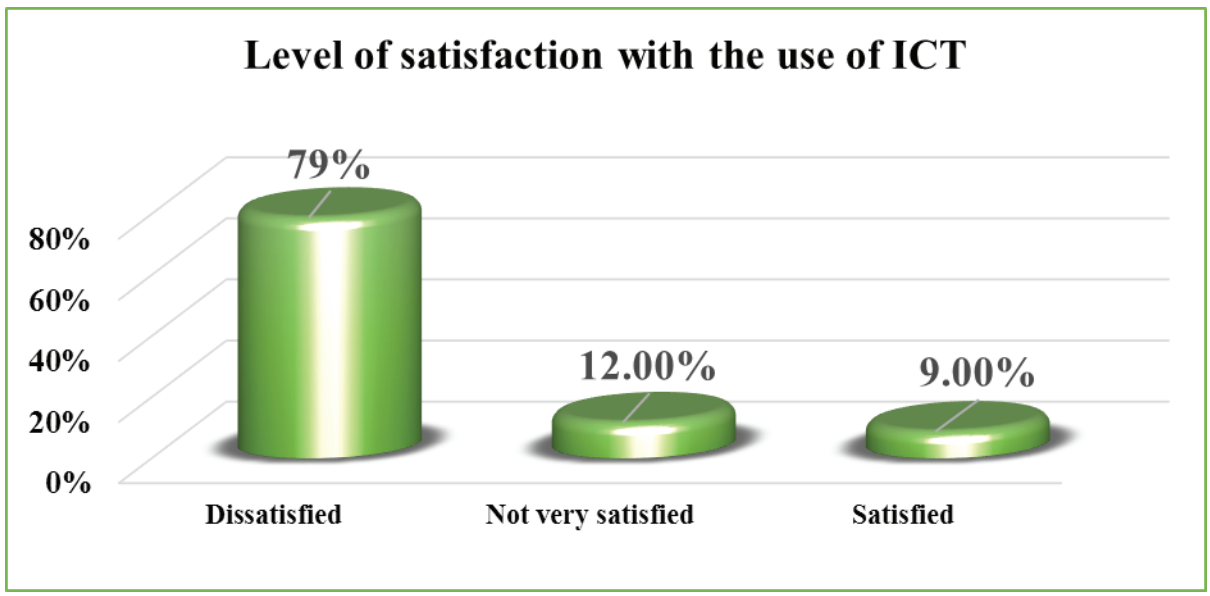


Figure 5: Healthcare professionals' level of satisfaction with ICT use.

The results concerning the use of ICT in health establishments still reflect the poor exploitation of these technologies, since more than 79% of those interviewed consider themselves dissatisfied with the use of ICT, about 12% are not very satisfied, while only 9%, i.e. 45 people of those interviewed, express their satisfaction (Figure 5).

In the same context, 72% of participants said that the use of ICT can limit the spread of covid-19 disease in health facilities, while 28% saw things differently. In a Swiss study, reports indicate that covid-19 mortality rates in Chinese populations with low access to digital health resources have exceeded those in areas of China with higher access[13].

This shows that the massive and diversified adoption of new technologies to protect against the virus and limit its spread in the hospital environment.

We have observed through this study that the use of ICT can limit the contamination by the coronavirus, and subsequently lower the rate of contamination in the ranks of health care personnel. Indeed, the unavailability of digital tools, the lack of training in these technologies and the absence of a clear will of the government regarding telehealth are the main causes of the poor exploitation of digital resources during this pandemic.

Situations experienced by respondents of our survey sample confirm that a rate of patients, asymptomatic carriers of Covid-19, come to the emergency department for consultation, they go through a circuit that begins with the contact of other patients, security guards, housekeepers, nurses and doctors.... etc.. Which generates a heavy spread of the virus. According to you, this spread is avoidable thanks to tele-consultation and the use of ICT.

Conclusion

The crisis of Covid-19 has accelerated the development of telehealth worldwide. Indeed, despite the efforts made by the Moroccan state in order to succeed the construction and the revolution of the kingdom, the investment in ICT in the health sector is still low especially in this period of Covid-19. The director of the National Health Insurance Service (NHIS) recalled that the fact that a fully digitized health system and an e-government system are already in place was instrumental in managing the pandemic. [15]

Telehealth allows for better coordination of healthcare professionals in the monitoring of patients, in particular through the shared medical record (DMP). This digital health record stores and secures all of the patient's health information (treatments, test results, allergies, etc.), which can be shared with the health professionals of their choice.[16]

At the same time, ICT are today an essential lever for the modernization of the public sector. Faced with a constantly changing environment and an increasingly demanding and diversified demand, the Administration, with all its components, is called upon to adapt and simplify its processes in order to succeed in the project of transformation through ICT and to make an electronic administration emerge. The introduction of ICT has positively changed the relationship between the Administration and its users.

In conclusion, the coronavirus crisis is a test for countries. It must be a starting point for research and investment in e-health, because the world will be exposed to other pandemics that may be more vicious than the covid-19.

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Ethical Clearance : Nil

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