

# **EXPLORING THE ROLE OF DIGITAL TECHNOLOGIES IN FOSTERING PATIENTS' ENGAGEMENT.**

## **ABSTRACT**

Patient engagement has emerged as the next evolution in healthcare marketing research. However, the role of digital technologies in fostering patient engagement remains unexplored. This study aims to fill this gap by exploring the role of Italian patients' engagement as perceived by health experts and how digital technologies affect patients' engagement.

## **Introduction**

Digital transformation represents, for the healthcare sector, an extraordinary leverage for innovation and efficiency, not only in reference to the processes of prevention, care and assistance of people, but also for defining new models and solutions capable of responding to the growing complexity of the environment and its impact on health (demographic growth, aging of the population, new health emergencies connected to the phenomenon of globalization etc.).

Digital technologies, such as artificial intelligence, robotics, wearable devices, apps applied to healthcare, together with the exponential increase in data processing capacity and the consequent reduction of its costs, bring about changes and offer great opportunities for the sector. In order to obtain the maximum benefits from the opportunities offered by the digital healthcare revolution, it becomes a priority for healthcare organizations to identify the most suitable ways to stimulate engagement. Patient engagement is currently considered the cornerstone of the health care system revolution for its positive impact on health outcomes and health care costs.

The present study aims at understanding the perception of Italian health professionals regarding the main factors that affect patient engagement and the role of digital technologies. Adopting an explorative study, results show the positive effect of healthcare IT to the improvement of patients' engagement.

## **Literature background**

### ***Patient' engagement***

Literature debate on patient engagement started only about a decade ago (Barello et al., 2012). However, interest in the concept has greatly increased in recent years. Patient engagement in health research has emerged as an opportunity to involve patients in decision making related to health research while improving health outcomes (e.g., Esmail et al., 2015; Graffigna et al., 2014). Despite this growing interest on the topic, no consensus has yet been reached on a shared definition of patient engagement, and several perspectives coexist. Furthermore, several different disciplines have approached the topic of patient engagement (i.e., medicine, nursing, political science, management, psychology, social science, and even computer science, see e.g., Barello et al., 2014), thus leading to a plethora of different perspectives.

Patient engagement refers to the different aspects (not only subjective, but also contextual, relational and organizational) that may foster or hinder the patients' ability

to truly become positioned at the center of their own care. Particularly, the concept of patient is an “umbrella” term that qualifies the systemic relationship that occurs between the “supply” and the “demand” of healthcare – at different levels and in different contexts (Graffigna and Barelo, 2015).

The dynamic nature of patient engagement is well described by Graffigna et al. (2013; 2015), who define this phenomenon as a “*multi-dimensional psychosocial process resulting from the conjoint cognitive, emotional, and behavioral enactment of individuals toward their health condition and management.*”

Patient engagement is therefore a complex and multi-faceted experience which cannot be reduced to the mere consideration of the patient’s ability to adhere to medical prescriptions. Precisely, patient engagement is characterized by:

- *A Behavioral dimension (What the patient does)*: connected to all the activities the patient acts out to face the disease and the treatments;
- *A Cognitive dimension (What the patient thinks and knows)*: connected to what the patient knows, understands and how he/she makes sense of the disease, its treatments, its possible developments, its monitoring;
- *An Emotional dimension (What the patient feels)*: connected to the psychological and emotional reactions the patients experience when adjusting to (and elaborating) the onset of the disease and new life condition linked to it.

Prior works on patient engagement show that it positively affects patients’ trust toward their clinicians (Becker and Roblin, 2008), that engaged patients are more likely to adhere to treatment prescriptions and less likely to experience adverse clinical events and hospital readmissions (Hibbard et al., 2008). Moreover, patient engagement is helpful in fostering personal growth and integration by promoting satisfaction, opportunities for action, and self-expression (Martinez et al., 2009; Heesen et al., 2011; Bolderston, 2016), contributing to enhancing quality of life with the goal of increasing wellness and generating strengths and resilience in individuals after acute events (Haywood et al., 2017). Finally, the patient’s engagement, in terms of better sensitization, knowledge, and empowerment in his/her process of care and cure, contributes to reducing the direct costs of the healthcare system (Laurance et al., 2014; Graffigna et al., 2016).

### ***The role of digital technologies in fostering patients’ engagement***

In the field of healthcare, digital technologies for health are recognized to have tremendous potential for fostering patient engagement. These tools allow to develop integrated, sustainable and patient-centered services and promote effective exchanges among the actors involved in the care process (Barelo et al., 2016).

Digital health covers eHealth, mHealth and emerging fields. Mobile health (mHealth) refers to the provision of health services and information through mobile technology, and mHealth belongs to electronic health (eHealth; WHO, 2019). A large number of digital technologies such as the Internet of Things and artificial intelligence (AI) are widely used in health care (WHO, 2019). Telecare, telehealth, telemedicine, mHealth, digital health and eHealth services are collectively referred to as technology enabled care, which integrates medical technology, digital, media and mobile communications. Common patients’ engagement platforms (PEPs) include patient portals, mobile applications for android/iOS platforms, and messaging chatbots (Campbell et al., 2020). Most PEPs can be accessed by patients on their smartphone, tablet, or computer.

Digital technologies (e.g., mobile devices, wearable devices) have been viewed as driving positive health behavior change through patient engagement. It has been shown

that these tools enable patients to be engaged in self-monitoring, thereby directing patients toward healthy eating, enhancing attendance rate (e.g., Downer et al., 2005; Stockwell et al., 2012), improving medication adherence (e.g., Kay-Lambkin et al., 2011), and increasing knowledge about disease and treatment (e.g., Sawesi et al., 2016).

### **Purpose of the research**

A key driver of healthcare transformation is digital technologies and an increasing patient-centred healthcare. However, literature debate on the relationship between digital technologies implementations and patient engagement is still in its infancy. Moreover, there is a lack of shared guidelines for orienting interventions in not only improving clinical effectiveness but also in making the patients' care experience positive, sustainable and oriented to achieve stable well-being. Therefore, the following study aims to explore which factors influence patients' engagement and the role of digital technologies in the Italian healthcare system. Formally, our main research questions are the following:

*RQ1: What is the engagement level of Italian patients and which and how digital technologies can help patients to be more active in the therapeutic decision-making process?*

*RQ2: What is the use of digital health technologies and the perception in terms of importance, usability and effectiveness for the management of patients in the Italian healthcare system?*

### **Study 1**

#### ***Methodology***

An exploratory study was adopted as the main objective of this research is to provide insights and understanding of this new phenomenon (Yaman & Shaw, 2002). The aim is to explore the role of digital technologies in the Italian healthcare system and its impact on patient engagement.

An online questionnaire was administered to a sample of ten experts in the healthcare field (i.e., doctors). Questions on patient engagement were proposed and measured with a 7-points Likert scale (1= completely disagree – 7= completely agree). Specifically, we focused on the following aspects linked to patients' engagement: proactive decision-making behavior in the diagnosis and treatment process and active involvement during the medical examination, the quality of the doctor-patient interaction and the opinions of the family. Then we examined the reduction of information asymmetry between doctors and patients; experts' perceptions on the ability of digital platforms (blogs, online forums, websites and social media) to reduce information asymmetry was also investigated. Respondents were then asked about the use of personalized digital technologies and their role to foster patient engagement. Personalized digital technologies (apps for booking examinations or monitoring health status, telemedicine, wearable devices, etc.) refer to all those technologies that enable a direct, personalized and remote relationship between a specific patient and a specific medical facility, aimed at providing information, diagnosis and treatment. Questions to investigate the perceived level of importance, usability, reliability and effectiveness of different personalized digital technologies were also asked.

#### ***Results***

Ten experts took part in the explorative study ( $M_{age}=53$ ). Participants belong to different medical specialization fields, namely endocrinology, urology, occupational medicine, pediatric surgery, clinical pharmacology, clinical toxicology, and internal medicine.

Results show that most of the respondents assess a fairly high level of patient engagement both during the medical examination (60%) and in the treatment decision-making process (80%). We also investigated the factors that can increase health consumer activism. 90% of the respondents strongly or completely agreed with the importance of focusing on a quality relationship for the effectiveness of health treatment. About the family's opinion on patient engagement, 80% of the doctors recognize its influence. Also 80% of the sample believed that reducing the information asymmetry between doctor and patient is an important factor in increasing engagement. Our first research question also sought to understand the role of digital technologies in increasing patient engagement. Specifically, we aimed to explore the role of web platforms (blogs, online forums, websites, and social media), wearable devices and telemedicine. Respondents were asked whether the use of blogs, online forums, websites, and social media was considered an effective means of communication with the patient: half of respondents (50%) agreed with the usefulness of these tools for communication. On the other hand, with regard to the usefulness of these web platforms in increasing the level of engagement, 30% of the respondents strongly agreed. Finally, about wearable devices, 80% of the sample agreed with the ability of these tools to increase involvement. It is noteworthy that the specialist in internal medicine considered the adoption of wearable devices not applicable to their field.

It was also asked whether online visits decrease patient engagement. The results show that 30% of the sample believes that it decreases patient engagement (the medical fields of these respondents are: internal medicine, urology and occupational medicine), 20% are neutral, 50% disagree. Therefore, it is possible to state that according to the respondents, the contribution of digital technologies to increasing patient engagement varies depending on the field of medical specialization and the type of technology being analyzed. In particular, wearable devices were rated positively in stimulating health consumer engagement.

We then explore the role of digital technologies regarding their current use, with questions on apps, wearables, artificial intelligence and telemedicine, and the perceived degree of importance, usability and effectiveness for patient management. Regarding the contribution of ICT to improving the doctor-patient relationship, it was found that 70% of the sample agreed with this statement. Results also show that personalized digital technologies are perceived able to assist the patient in correctly adhering to the prescribed therapy. Also, personalized ICT can help to better meet patients' expectations and facilitate the performance of the medical profession.

Looking at the specific role of digital apps, results show that most of the respondents believe that health apps are more important for the management of chronic patients than those with acute illnesses. However, respondents also report that healthcare apps are still not completely efficient (60%). Wearable devices are considered an important tool for patient management (70%), even though 50% of respondents do not consider the data collected by the devices to be reliable. Regarding the ability of wearable devices to encourage people to engage in health promotion and prevention behaviors, most of respondents agreed (70%), as well as for the efficacy of wearable devices in achieving greater patient adherence to medical recommendations (60%). We can conclude that the experts' opinion regarding the importance of digital technologies varies according

to the type of ICT and in particular the type of patient (chronic/acute). It was also found that the level of confidence of professionals in the efficiency of health apps and the reliability of wearable devices in data collection is currently not high. At the same time, professionals attribute to these tools some benefits for patients, especially in relation to the adoption of health promotion and prevention behaviors, improved compliance with medical recommendations, engagement and satisfaction.

### **Conclusion and Implications**

This exploratory study aimed at understanding the perception of Italian healthcare experts regarding the main factors affecting patient engagement and the contribution of digital technologies in achieving it. The research objective was to assess i) the level of engagement as experienced by physicians, ii) what factors allow to increase patient engagement in both preventive and decision-making behavior and adherence to treatment, and iii) the role of digital technologies in this regard. Our study shows that patients are actively involved both in the diagnosis and treatment process and during the medical visit. The quality of the interaction with the doctor, the views of the family and a reduction in the doctor-patient information asymmetry appear to be positively correlated with patient engagement. The contribution of digital technologies to increasing patient engagement varies depending on the field of medical specialization and the type of technology being analyzed.

In order to support the digital evolution of the health sector, it becomes necessary to make efforts to create an ecosystem of engagement, in which coordinated actions at different levels of the health system are oriented towards promoting a cultural change, aimed at increasing health and technological literacy and enhancing the centrality of people in their health journey. Physicians could be given the tools to manage a shared decision-making process and patients the tools to take more responsibility (including in the selection of the sources on which they report). Marketing professionals can assist the health system in this process by identifying the needs, expectations and preferences of health consumers regarding the application of technologies for the adoption of preventive and therapeutic behaviors, in order to define the most appropriate engagement strategies.

**References:** available upon request