MOBILE HEALTH (MHEALTH): FACILITATORS AND BARRIERS OF THE INTENTION OF USE IN PATIENTS WITH CHRONIC ILLNESSES

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Abstract

Background. Mobile health (mHealth) facilitates a new form of doctor-patient communication, in which physical encounters are replaced by interactions through a mobile device. Although the potential of mobile health (mHealth) is extraordinary among the chronically ill, disabled and elderly, the implementation is still very scarce. As patients have many sources of information, investing in mHealth requires a previous knowledge of mHealth preference. The purpose of this study is to analyse preference and intention of using mobile health services by patients with chronic diseases.

Method. We have designed a structural equation model to examine how motivations (digital information, social network, improving of manual records), perceived risks (effort, inadequate privacy, inadequate information) and social influence affect the preference and the intention of using mHealth. An exploratory online survey of 181 patients with haemophilia in Spain was carried out to test the proposed model.

Results. Variables such as digital information, perceived effort and social influence increase the intention of using mHealth. On the other hand, inadequate information acts as a barrier that restrains the intention of using mHealth. These results contribute to drawing attention to the peculiarities that transferring mobile communication technologies to the field of healthcare may entail. Although participants in this exploratory study only included patients with haemophilia, the results may have implications for other types of chronic disease settings that require dealing with great amounts of information.

Conclusions. This study provides implications for designers of mHealth, health care professionals and policy-makers in order to enhance the use of mHealth. The findings of this research challenge the notion that privacy concerns are an obstacle for using mHealth. An excessive simplicity of mHealth may send out a message of mistrust.

1. Introduction

The generalized use of smartphones and the so-called "wired lifestyle" or "mobile culture" is also being transferred to the field of health services and is rapidly transforming the way in which healthcare is perceived (Yeganeh, 2019; Díaz, Schmitz, & Yagüe, 2020). Technological advances have led to a giant step forward regarding access to health information, the fluidity of interpersonal communications and obtaining medical advice. These days, in which the healthcare systems are having to confront the COVID-19 global epidemic, digital technologies such as mobile health (mHealth) have experienced exponential growth, never before achieved, becoming a fundamental tool in doctor-patient communication.

mHealth is "the application of wireless technologies to transmit different data contents and services which are accessible by health workers through mobile devices such as a personal computer, smartphone, personal digital assistant, or mobile tablet computer" (Hoque, 2016, 51). mHealth entails using mobile telecommunications and multimedia technologies to create, store, retrieve and transmit data in real time between end-users for the purpose of improving patient safety and quality of care (Akter, D'Ambra, Ray, & Hani, 2013; Idrish, Rifat, Iqbal, & Nisha, 2018). mHealth services include a wide range of tools, from mobile web-based applications on smartphones, to patient monitoring portable devices and short message service (SMS) based patient medication adherence and appointment reminders.

Historically, the convenience and profitability of mHealth has been supported (Laurenza, Quintano, Schiavone, & Vrontis, 2018) and its key role in those areas linked to the chronically ill, disabled and elderly has been highlighted (Nikou, & Bouwman, 2017; Agnihothri, Cui, Delasay, & Rajan, 2018; Ludden, & Vallgårda, 2019). The global mHealth market was valued at $ 46,000 million in 2019, and it is expected to reach $ 230,000 million by 2027, registering a compound annual growth rate of 22.3% from 2020 to 2027 (Ravi, Sanjivan, & Onkar, 2020).

It is an industry that offers a great potential to improve patient experience (Lu, Hu, Xie, Fu, Leigh, Governor, & Wang, 2018) and the accessibility and cost-efficiency of medical assistance (Parker, Karliychuk, Gillies, Mintzes, Raven, & Grundy, 2017). There are great opportunities to improve medical care in undeveloped countries (Becker, Laurenson, Winter, & Pritchard, 2014; Ernsting, Dombrowski, Oedekoven, Lo, Kanzler, Kuhlmey, & Gellert, 2017; Madan, Sharma, & Seth, 2016) or in any health system of the world (Heerden, Tomlinson, & Swartz, 2012; Nisha, Iqbal, & Rifat, 2019).

In spite of this potential, mHealth has not gained the expected popularity as neither the sanitary patients nor healthcare professionals have been convinced of the desirability of replacing face-to-face care by telephone- or video-based visits (Ananthakrishnan, & Singh, 2020). Nowadays, with the COVID-19 outbreak, mHealth has shown its usefulness for infectious disease surveillance, supporting massive healthcare intervention, decongesting hospitals, and providing timely big data (Sam, & Chib, 2020; Rahman, Peeri, Shrestha, Zaki, Haque, & Hamid, 2020). This health emergency situation is giving visibility to and bringing to the surface latent structures of mHealth which would not be appreciated in a normal situation (Vidal-Alaball, Acosta-Roja, Pastor, Sanchez, Morrison, Narejos, & Salvador, 2020). But it remains to be seen if its use is consolidated or not once normality returns.

Previous research has shown that the patients perceive great potential in mHealth but also enormous risks that inhibit the intention of use (Rai, Chen, Pye, & Baird, 2013; Schuster, Drennan, & Lings, 2013; Kulkarni, 2018; Rad, Nilashi, & Dahlan, 2018). Our work shows the results of exploratory research that examines how motivations of use (digital information, social networks, improvement of manual records), perceived risks (effort, inadequate privacy, inadequate information) and social influence affect the preference and the intention of using mHealth by patients with haemophilia.

Haemophilia is a rare, chronic, congenital illness characterised by a deficiency in a clotting factor, a protein in the blood that controls bleeding. Prophylactic therapy at home means that the patient self-administers the deficient factor by intravenous infusion daily or several times a week. Home care therapy has been a great advantage for the patients (Teital, Barnard, Israels, Lillicrap, Poon, & Sek, 2004; Franchini, 2013) but its success depends on the patients taking a good record of the administration of the treatment (number of units consumed, date, reason) and the evolution of the symptoms. Well-kept treatment diaries can help healthcare professionals monitor the incidence of bleeding episodes, factor usage and compliance with treatment regimes. An incorrect register can result in delays in seeking appropriate medical care (Walker, Sigouin, Sek, Almonte, Carruthers, Chan, & Heddle, 2004).

For rare and chronic diseases such as haemophilia, there are patients who live far away from a Treatment Centre (TC). In the cases in which long distances between the patient's home and the specialised healthcare centres prevent a quick consultation, a correct register of the data can ensure high quality and continuity of care. During the last 20 years, several digital tools have been developed to replace traditional paper diaries with an electronic documentation system. However, in most countries, the most common form of treatment documentation continues to be the paper diary (Schmoldt, 2014). Possible reasons for this are that some patients do not trust digital tools, they are not prepared to learn new procedures or they fear that others will label them as patients for using these tools (Sun & Rau 2015). Baker, Laurenson, Winter, and Pritchard (2004) point out other possible reasons such as:

- some systems were developed by just one company and therefore product-bound;
- the platforms were used only for advertising purposes;
- neither doctors nor patients were involved in the development and the systems rarely fulfilled their needs or were just too complicated to use;
- no adaption of the system to new technology;

- requirements named by medical experts or patients were not considered;

- the use of a device restricted to the application and the need of the user to carry a second device besides his/her personal mobile phone.

The studies in this field concentrate on presenting technological solutions developed to manage the information in haemophilia care, (Teixeira, Saavedra, Ferreira, & Santos 2012; Schmoldt, 2014; Khair & Holland, 2014; Jacobson & Hooke, 2016), on evaluating the perceptions of the users regarding the contents and features of said tools (Khair, Holland & Carrington, 2012; Broderick, Herbert, Latimer, Mathieu, van Doorn, & Curtin, 2012; Breakey, Warias, Ignas, White, Blanchette, & Stinson, 2013) or on analysing the impact of mHealth interventions on treatment adherence, disease-specific knowledge or quality of life (Breakey, Ignas, Warias, White, Blanchette, & Stinson, 2014; Lara, Duncan, McGuinn, & Chapin, 2015; Jacobson & Hooke, 2016; Cuesta-Barriuso, López-Pina, Nieto-Munuera, Sagarra-Valls, Panisello-Royo, & Torres-Ortuño, 2018; Santandreu, Sánchez-Raga, Massanet, Sureda, Delgado, Sampol, & Canaro, 2018). It should be noted that Qian, Lam, Lam, Li, & Cheung (2019) carry out a systematic review of the literature on telehealth interventions to improve the adherence to the treatment of patients with haemophilia, observing that such interventions are effective.

Keeping in mind that healthcare is a wide and complex field that presents singularities as opposed to other contexts (Holden, & Karsh, 2010), our study is in answer to the clamour to research the intention of use of the mobile communication technologies for health (Sun, Wang, Guo, & Peng, 2013; Canhoto, & Arp, 2017; Sam, & Chib, 2020). Thus, Section 2 describes the research methodology, while the results are reported in Section 3. Section 4 presents a discussion of the results with practical implications, limitations, and future research.

2. Materials and methods

The data was gathered through an online survey to patients diagnosed with haemophilia A or haemophilia B, with or without inhibitors. All of them followed regular replacement treatment in Spain. For patients younger than 18 the key informant were their parents. 4,707 patients were sent an email invitation from the Spanish Federation of Haemophilia (SFH) (http://fedhemo.com), who collaborated in the recruitment procedure. The invitation included a short description of the study, information about confidentiality and a link to the survey. The SFH contacted by phone and sent reminder emails to those who has not responded.

A preliminary version of the survey was pretested. All items were discussed with four healthcare professionals and seven researchers. The resultant survey was pre-tested with a pilot sample of 16 patients with haemophilia.

A total of 181 Spanish patients diagnosed with haemophilia were included in the final sample with a mean age of 27 (SD=±17.9). Taking into account the approximate number of patients with haemophilia A and haemophilia B, it represents a survey response rate of 16,5 %, which can be considered acceptable in accordance with previous studies in the field (Ouchan, Sweeney, & Johnson, 2006). The characteristics of the sample are detailed in Table 1.

INSERT TABLE 1 NEAR HERE

The first part of the questionnaire gathered information on experience in the use of the Internet for health matters. In the second part, an mHealth service was described, directed toward patients with haemophilia in which their relatives, healthcare professionals and patient associations could also participate. In the third part of the questionnaire we evaluated the motivations of use of mHealth, the perceived risks and the social influence. Information was also gathered on the intention of use of mHealth and its preference compared with other alternative channels of communication. In accordance with the measurement scales used in

previous studies, we propose the model represented in Figure 1 by means of a structural

equation model (SEM). This statistical technique is appropriate to simultaneously model the

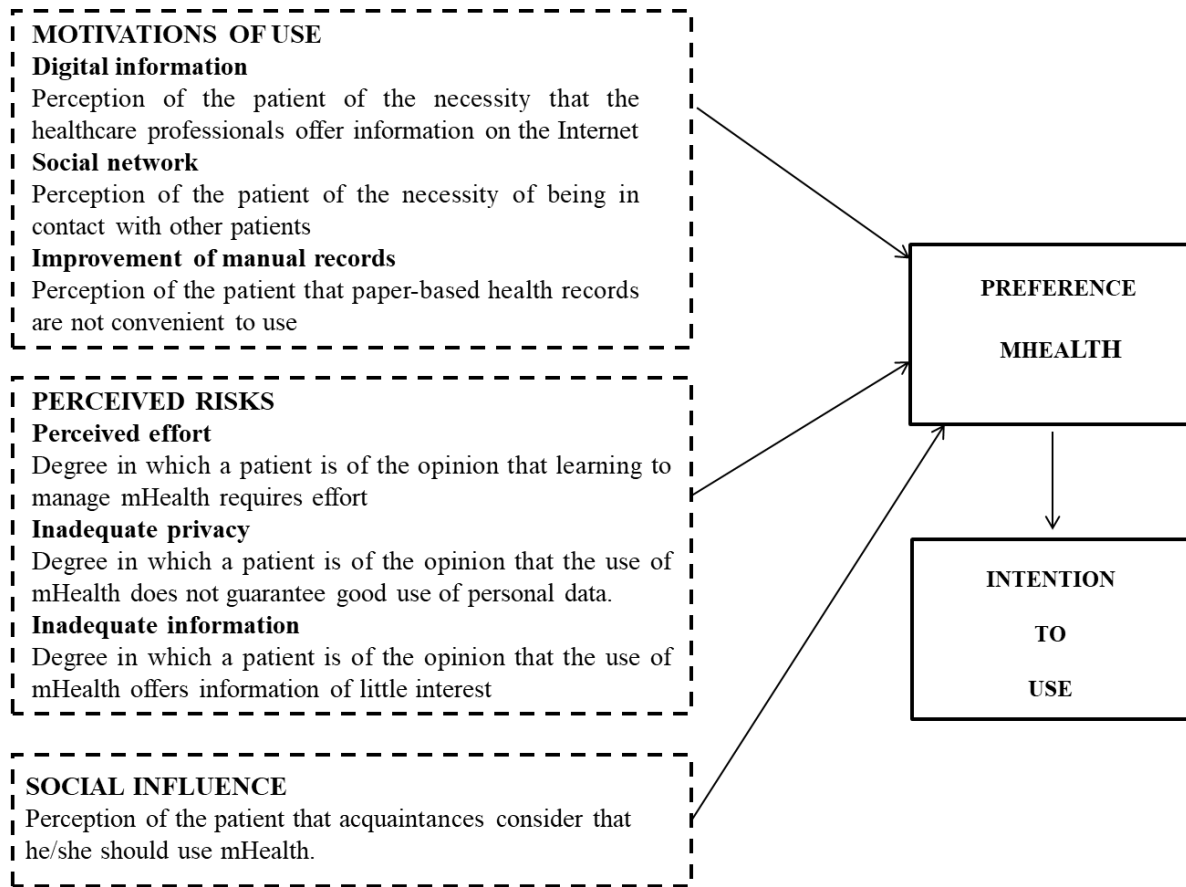pathways of influence of multiple variables on outcomes of interest.

Finally, in the fourth part of the questionnaire, there were questions of sociodemographic and

disease-specific characteristics such as the type of haemophilia, the type of treatment and the

severity.

INSERT FIGURE 1 NEAR HERE

Table 1. Characteristics of the sample (n = 181).

	Mean (SD)	%
Age	26.8 (17.9)	
Experience with the illness	23.8 (16.2)	
Type of haemophilia	Haemophilia A	83.4
	Haemophilia B	16.6
Severity of haemophilia	Severe	65.7
	Moderate	16.6
	Mild	17.7
Frequency of the treatment	Very frequently (every week)	60.8
	Less frequently (once, twice or three times a month)	12.7
	Infrequently (every five or more weeks)	26.5
Type of residence	City	58.6
	Town	29.8
	Village	11.6
Family income (euros)	Less than 1,000	5.1
	Between 1,000 and 2,000	40.2
	Between 2,000 and 3,000	29.5
	More than 3,000	25.2
Level of studies	Primary	16.0
	Secondary	30.2
	Graduate-postgraduate	53.8

Figure 1. Proposed variables to explain the intention of using mHealth.

MOTIVATIONS OF USE
Digital information
Perception of the patient of the necessity that the healthcare professionals offer information on the Internet
Social network
Perception of the patient of the necessity of being in contact with other patients
Improvement of manual records
Perception of the patient that paper-based health records are not convenient to use

PERCEIVED RISKS
Perceived effort
Degree in which a patient is of the opinion that learning to manage mHealth requires effort
Inadequate privacy
Degree in which a patient is of the opinion that the use of mHealth does not guarantee good use of personal data.
Inadequate information
Degree in which a patient is of the opinion that the use of mHealth offers information of little interest

SOCIAL INFLUENCE
Perception of the patient that acquaintances consider that he/she should use mHealth.

PREFERENCE MHEALTH

INTENTION TO USE

3. Results

3.1. Descriptive results

Table 2 shows the main sample characteristics.

INSERT TABLE 2 NEAR HERE

With regard to the mHealth service described in the questionnaire for the patients with haemophilia, Table 3 shows a summary of the statistics of the variables used to explain the intention of use of the mHealth initiative during the following month. Confirmatory factor analysis (using EQS 6.2.) was employed to evaluate the psychometric properties of the measurement scales used. The measurement model fits the data well. Furthermore, tests provide evidence of reliability, convergent validity and discriminant validity.

INSERT TABLE 3 NEAR HERE

Table 2. Use of the Internet and experience in health matters (n = 181).

Use of the Internet	%
Daily or 5 days a week	87.8
Every week but not daily	9.4
A few times a month or very occasionally	2.8
Use of the Internet via the mobile phone	
Yes	82.2
No	17.8
On the Internet, which social networks do you use?	
Facebook	65.2
Twitter	26.5
YouTube	40.9
LinkedIn	15.5
Others	6.1
None	23.8
Use of the Internet for health matters (haemophilia or others)	
During the last week	60.1
During the last month	28.1
More than a month ago	11.8

3.2. Structural model testing

The goodness-of-fit indices are satisfactory, which indicates that the structure of the model is reasonably reliable and accurate. As shown in Figure 2, of the eight relations analysed five are significant and three are not. Thus, it is verified that the variables social network, difficulties in manual records and privacy concern do not influence significantly in the preference of mHealth as a means of communication compared with other alternatives. On the other hand, the variables digital information, effort and social influence have a positive and significant effect on the preference of mHealth. It is also observed that the variable inadequate information has a negative and significant effect on the preference of mHealth.

Table 3. Variables used (and summary statistics) to explain the intention of using mHealth (n=181)

Variable and measurement items*	Mean	SD
Motivation of use: digital information	3.01	1.19
because my healthcare professionals publish content on the Internet.		
because my healthcare professionals recommend websites.		
because my healthcare professionals use it to record my treatment data.		
Motivation of use: social network	**2.42**	**0.98**
To talk about my illness (haemophilia) with people other than my relatives.		
To know more people with my illness.		
To get in touch with other patients of foreign countries or people who live far away from me.		
To be more in touch with other patients.		
Motivation of use: improvement of manual records	**2.30**	**1.34**
I find it comfortable to take notes on my illness.		
It helps me keep track of my medication.		
It helps me file or save the information the doctors give me.		
Perceived risk: perceived effort	**2.59**	**0.79**
It is time consuming to learn about the functioning of the mobile health tool or technology.		
I have to carry out many tasks (register, see or make comments, receive emails, or others…).		
It requires a lot of time.		
Perceived risk: inadequate privacy	**3.08**	**1.11**
It is very likely that other people can see my data without me knowing.		
It is very likely that other people will release my data against my will.		
It is very difficult to maintain the data totally protected.		
It is very difficult to ensure that good use is made of the data.		
Perceived risk: inadequate information	**2.46**	**0.75**
Often contains information which is not up to date (outdated).		
Very likely to include errors (very unreliable).		
Provides little information (of little interest).		
Social influence	**3.64**	**0.94**
The patients that I know …		
will like the fact that I use the mobile health tools or technologies.		
will want me to use them.		
will encourage me to use them.		
will do everything possible to make me use their services.		
Preference compared with other alternative methods of communication	**3.52**	**0.99**
It's the best means.		
It's the most useful means.		
It's the most comfortable means.		
It's the most economic means.		
It's the preferred means.		
Intention to use	**3.80**	**1.07**
I will register for that tool or mobile technology.		
I will endeavour to discover what I can do through that tool or mobile technology.		
I will try to learn how it works.		
I will try to use it every or almost every day.		
I will try to take as much advantage of it as possible.		

*Responses were measured on a five point Likert scale ranging from strongly disagree (1) to strongly agree (5).

INSERT FIGURE 2 NEAR HERE

Figure 2. Results of structural equation model analyses (n=181).
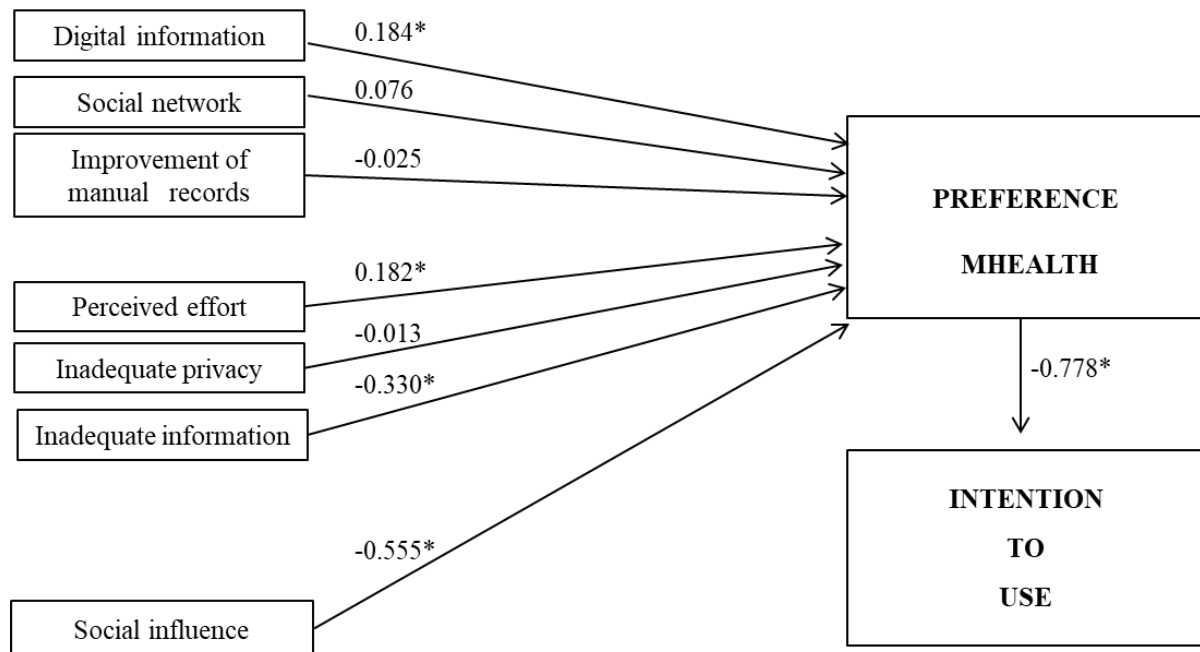
Goodness of fit indices

χ^2 S-B (499) = 779.9765 (p=0.00000)   BBNNFI= 0.920   CFI= 0.928   RMSEA= 0.069

* Relation is significant at the 95% level.

4. Discussion

Since the use of mHealth is not widespread, and traditionally the patients have used other means to obtain information on illnesses, mHealth preference was evaluated and it was considered that this concept reflects the effect of the motivations of use of mHealth, the perceived risks and social influence. The results obtained support this approach and show that the intention of the patients with haemophilia to use mHealth is conditioned by their perception of the qualities that mHealth presents compared with other means that also provide information on haemophilia (mHealth preference).

With regard to the motivations to use mHealth, it is shown that the perception that the healthcare professionals provide electronic information on haemophilia has a significant and positive effect on mHealth preference. In other words, the information on health put forward by healthcare professionals can serve as a stimulus or attract interest in mHealth. This indicates that mHealth service providers should involve healthcare professionals so that they participate in the platform of mHealth, offering and publishing information, as well as recommending webs or other Internet sites. Healthcare professionals can use different video and image tools to help the patients assimilate the information on the diagnosis and treatment of the disease.

However, the motivation related to "contacting other people with haemophilia" and with "difficulties in manual records" does not automatically tie in with a greater preference towards mHealth. These results suggest that ordinary online and offline channels are sufficient for the patients' needs for communication. Patients with haemophilia do not appreciate the potential advantages of mHealth platforms for such an end.

In terms of the means to register health data, paper records are not exempt of difficulties but, despite this fact, the arduousness of manual records is not related with the preference towards mHealth. This result is surprising and very relevant as the registering and electronic storage of the information offers many advantages as opposed to the registering on paper. Some of the advantages, among others, are greater accessibility and availability, legible information and in diverse formats (text, photo, video), automatic register and control providing reminders and avoiding annotation errors. Thus, the absence of a significant relation in patients with haemophilia between "difficulties in manual records" and "mHealth preference" draws attention to the way in which patients should be informed of the functions or tools offered by mHealth. It is highly advisable to communicate the advantages of mobile technologies to register health data. In addition, it could be thought that some patients may be against change,

and that they want to continue using paper records, despite electronic methods being available. Thus, for these patients, a strategy of keeping paper records but gradually increasing the use of electronic records could prove more appropriate.

Regarding the downsides of mHealth, it has been observed that the perception that the use of mHealth requires effort and time is associated to a greater preference for mHealth. This result is different from those found in other works on the adoption of mHealth by patients (Sun, & Rau 2015; Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, 2016; Hoque, 2016). In general, the works on the adoption of mobile technologies maintain that perceived ease of use of this technology has a positive and significant influence on the intention to use it. However, the results of our study in patients with haemophilia suggest the effect is the opposite: the perceived ex-ante effort to handle and use mHealth goes hand in hand with a greater intention of use of mHealth. The patients may consider that this is a sign of a good functioning of mHealth. It appears that the effort would not be a restraint or barrier to mHealth but a kind of heuristic of the effectiveness of the tool. In parallel, simplicity is considered a symptom of a lack of reliability. This result opens the question of how to obtain an adequate balance between complexity —to convey reliability— and simplicity —to avoid high rates of abandonment— . The (desirable) simplicity of the instrument should be accompanied by signs of usefulness and quality to prevent users associating it with low utility.

Another danger of mHealth is the inadequacy of the information because it is outdated or contains errors. It is observed that the provision of inadequate information has a significant and negative influence on the preference towards mHealth. This result indicates that this risk must be taken into account as it can discourage patients from using mHealth, and thus act as a barrier to mHealth.

Regarding the risk associated with privacy, it is shown that the effect of this risk on mHealth preference is not significant. This result is different from that observed in works on the privacy-personalization paradox. This paradox refers to the situation in which the users of mobile technologies want customized services but revealing the least amount of information possible (Awad, & Krishnan, 2006; Sutanto, Palme, Tan, & Phang, 2013). Previous research on mHealth dealt with the privacy-personalization paradox pointing out that privacy issues damage the intention of using mHealth services (Guo, Zhang, & Sun, 2016). However, our research shows that the relation between privacy and use might be more complex than expected. Haemophilia is a chronic and rare disease in which many alternative treatments coexist without any criteria to choose the most appropriate in each case (Athale, Giguere, Barbara, Krassova, & Iorio, 2014). It makes sense that the patients are prepared to divulge their health information and that privacy concerns are not relevant when using mHealth. Thus, in future works it would be interesting to study the privacy-personalization paradox in haemophilia, and to see if there are differences between patients according to their perception of the degree of uncertainty that haemophilia treatment decisions entail and of the necessity of receiving individualized treatment.

Our study is in accordance with the results of previous studies that verify that social influence has a positive effect on the intention to use mHealth (Sun, & Rau 2015; Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, 2016; Hoque, 2016). Within a healthcare context, social support can come from friends, relatives, peers or healthcare professionals. In the literature the importance of peers is recognized to improve chronic disease self-management and clinical outcomes (Funnell, 2010; Embuldeniya, Veinot, Bell, Bell, Nyhof-Young, Sale, & Britten, 2013). We have verified the importance of relevant others to enhance the use of mHealth in patients with haemophilia. The effort of patients is essential to make visible the benefits of these tools. Thus, we suggest developing interventions in which the peers take on

different roles or functions, among others, using these tools daily and in their frequent contacts with other patients, to encourage or recommend the use of mHealth, and to provide information and help others to begin to use mHealth.

In conclusion, in these days in which healthcare systems are facing great challenges in their fight against COVID-19, healthcare, like other activities, is witnessing an accelerated digitalization in which mobile technologies have facilitated the communication and union between people. Our work contributes to draw attention to the peculiarities that transferring mobile communication technologies to the field of healthcare entails. Patients undoubtedly value the advantages of mHealth but are also concerned about the security and privacy of the considerable amount of data of personal health information generated and stored by these technologies. Being aware that this situation of paradox or tension is increasingly present (Guo, Zhang, & Sun 2016), the conclusions of this research go beyond the haemophilia field, a chronic disease in which the patient registers daily data on his/her health and communicates them to the doctor. They could also be of interest for patients of chronic illnesses that require dealing with great amounts of information.

A first conclusion is that it is relevant to know the patient's preference towards mHealth, that is, patient perceptions about mHealth versus other means of information. This conclusion reinforces the affirmations of the experts who promote value-based healthcare, in which value is not a measurement of volume, or of objective figures such as costs or the number of services provided, but that is closely related to the patient's preferences and health results (Laurenza, Quintano, Schiavone, & Vrontis, 2018; Agarwal, Dugas, Gao, & Kannan, 2020).

Through the study of the preference and intention of use of the patients with haemophilia, our work identifies barriers and facilitators of mHealth that policy-makers should consider in order to encourage the use of mHealth. Thus, patients' intention of using mHealth can be

promoted by the collaboration between healthcare professionals and mHealth designers. The commitment of the healthcare professionals to the use of mHealth is interpreted by the patients as a sign of the interest in using mHealth. Thus, the involvement of healthcare professionals is highly recommended, providing information before, during and after their direct contact with the patient. Their participation in mHealth tools can be materialized in actions such as publishing information, recommending webs or other Internet sites, offering texts, photos, graphs or videos.

Another aspect which mHealth designers should take into consideration is the apparently counterintuitive result that "the more complex, the better". The results obtained suggest that patients assume that health is a complex issue and only a complex tool can be useful to handle it. Communication campaigns on mHealth should not play down the complexity of mobile technologies but emphasise that their sophistication allows a reliable and correct exchange of information. Another aspect that the communication campaigns should also highlight is the attractiveness of such information in terms of contents and updating. These messages will help to reduce the perceived risk and, in this way, increase the preference for mHealth.

Furthermore, our results suggest that the preference towards mHealth is also increased through the positive influence exerted by the people of the immediate environment. The fifth and final conclusion leads us to ask whether or not the concern about the privacy of health information is an obstacle to the use of mHealth. In previous studies it has been observed that it is an obstacle. However, it has not proved to be so for the patients with haemophilia in our study. The sacrifice of privacy for the sake of an improved health is therefore interesting for future research.

As in other researches, there are some limitations that must be considered. The principal limitation of this study is that we have explored the intention to use mHealth, only considering

the perceptions of patients with haemophilia. It would be interesting to gather data from other potential users, from healthcare professionals to caregivers, families and other players who make up the health ecosystem or the network of services generated to meet the patient's health needs. Another limitation is that we have gathered the information from only one country and through an online questionnaire. It would be interesting to extend the study to other countries and, in particular, to low income countries. In these cases, mHealth plays a decisive role to support the treatment of complex and expensive diseases, improving the access to information and providing real-time feedback. It could also be very useful to analyse the possible influence of technical characteristics and of the aesthetic appearance of mHealth.

In short, as digitalization is changing the landscape of healthcare, our results highlight the need to bear in mind that investing in mHealth requires prior knowledge of mHealth preference, identifying which aspects increase, and which reduce, preference for mHealth compared with other communication tools.

Declaration of interest statement

The authors declare that they have no conflict of interest.

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