

The Influence of Long-term Orientation on Patients' Continuous Usage Intention of Digital Health: A Cross-country Study in Germany and Iran

Abstract

The new German Digital Healthcare Act (Digitale-Versorgung-Gesetz), which incentivizes statutory insured patients through reimbursement to use certain digital health apps for long-term treatment of their health condition, has catapulted Germany into the league of front-runners in digital health policy (Gerke et al. 2020). However, mobile app acceptance in Germany is still a major issue, especially continuous acceptance. Reviewing the relevant literature revealed important factors influencing mobile app acceptance, which we classified into person-oriented and app-oriented factors. It is largely unknown (a) whether these factors actually have a significant impact on patients' intention towards the continuous use of mobile health apps and (b) whether such factors also have an effect in other cultural contexts where patients are less long-term oriented concerning their health. The paper aims to address these knowledge gaps through a cross-country vignette study in Germany (a country with a long-term orientation) and Iran (a country with a short-term orientation).

Keywords: M-Health app, Patients' continuous usage intention, Technology acceptance models, Vignette study

Introduction

Mobile health promotes patient-centered care by allowing patients to manage their disease more effectively and proactively (Hoque, 2016). Self-monitoring of health-related issues via mobile apps promotes patients' awareness and knowledge. Despite considerable benefits, mobile health faces many challenges, including reimbursement, data privacy, cultural and attitudinal barriers to acceptance by patients (Hoque, 2016; Gerke et al. 2020).

The reimbursement barrier is one of the key challenges for the widespread use of mobile health. To overcome this challenge, Germany passed the Digital Healthcare Act in December 2019, which allows doctors to prescribe certified digital health solutions listed in the new DiGA directory so that statutory health insurance will cover the costs (Gerke et al. 2020). To date, however, there is no evidence whether such an incentive as a social factor actually has a significant impact on patients' intention towards the

use of mobile health apps. So, mobile app acceptance in Germany is still a major issue, especially *continuous acceptance*. While most digital health apps require continued usage over a longer time period to have a positive effect on a patient's health, studies have shown that most patients abandon health apps already after relatively few weeks and after only a few uses (Vaghefi and Tulu 2019). Thus, what are the factors that influence patients' intention towards the continuous use of mobile health apps?

However, research results are abundant on the influencing factors of users' intention and use of mobile health apps; most empirical studies focus on a traditional survey that leads to a low internal validity caused by the multicollinearity of measured variables and the passive way of taking measurements. The vignette study tries to overcome this limitation by combining the traditional survey with a vignette experiment.

To the best of our knowledge, no vignette study has investigated the influencing factors of users' intention towards the use of mobile health apps. There are also very limited empirical studies that have examined users' continuous usage intention. Thus, it is largely unknown: (a) *whether these factors actually have a significant impact on patients' intention towards the continuous use of mobile health apps through a vignette study.*

Furthermore, people of different national cultures have distinctive cognition patterns, perceptions, thinking styles, and values (Alsswey et al. 2019; Hofstede, 1998), so individuals' attitudes in different cultural contexts may lead to different user intentions towards the use of mobile health apps. Hofstede (1998) and Schwartz (1997) have developed two comprehensive frameworks to understand and test antecedents of national culture. Based on a combination of empirical and eclectic analyses, the Hofstede model was developed and regarded as the most influential national cultural framework for cross-national studies (Steenkamp, 2001). Hofstede Insights reports that Germany with a high long-term orientation has a significant cultural distance from Iran's low long-term orientation. Cultural values such as persistence, adaptations of traditions to new circumstances, and personal adaptability determine a coun-

try's long-term orientation (Everdingen, 2003). Accordingly, these values may influence people's intention to use mobile health apps. However, it is still broadly unknown: (b) *whether the influencing factors also have an effect in other cultural contexts where patients are less long-term oriented concerning their health through a vignette study.*

Therefore, the paper aims to investigate the factors influencing users' continuous usage intention of mobile health apps through a cross-country vignette study in Germany (a country with a long-term orientation) and Iran (a country with a short-term orientation).

Theoretical Foundation and Model Development

To understand and study an individual's technology adoption in general, the Information Systems field has developed and employed different theories and models, such as the Theory of Planned Behavior (TPB), the Theory of Reasoned Action (TRA), and the Technology Acceptance Model (TAM). These theories and models have focused on the individual's attitude towards certain behaviors, including the adoption and utilization of new technologies.

One of the technologies that have grabbed the attention of numerous researchers in the last decade is mobile health app (Kahn et al. 2010; Sam, 2017). The availability and widespread adoption of powerful smartphones and mobile apps may drastically transform the delivery of health care services and information on both organizational and personal levels. The last few years have witnessed an increased availability of m-health apps that support patient care, monitor patients' vital signs, collect community and clinical health data, encourage healthy behavior, and enhance health information awareness (Househ et al. 2012). Despite their benefits, they have encountered numerous challenges and difficulties in being accepted by patients. Therefore, many studies have tried to adapt technology acceptance models in digital health care, including the m-health app.

A review of the relevant literature revealed leading factors influencing *patients' intention towards the continuous use of mobile health apps*, which we categorized into person-oriented factors (*i.e., attitude,*

social influence, perceived health threat, and long-term orientation) and app-oriented factors (*i.e., perceived usefulness, perceived ease of use, privacy concerns, trust, perceived cost*). Patients' age, gender, and app experience were also considered as moderators in the proposed framework.

Therefore, to explain the continuous intention of m-health apps, we developed the following model displayed in Figure 1 based on a combination of prominent theories and models of technology acceptance.

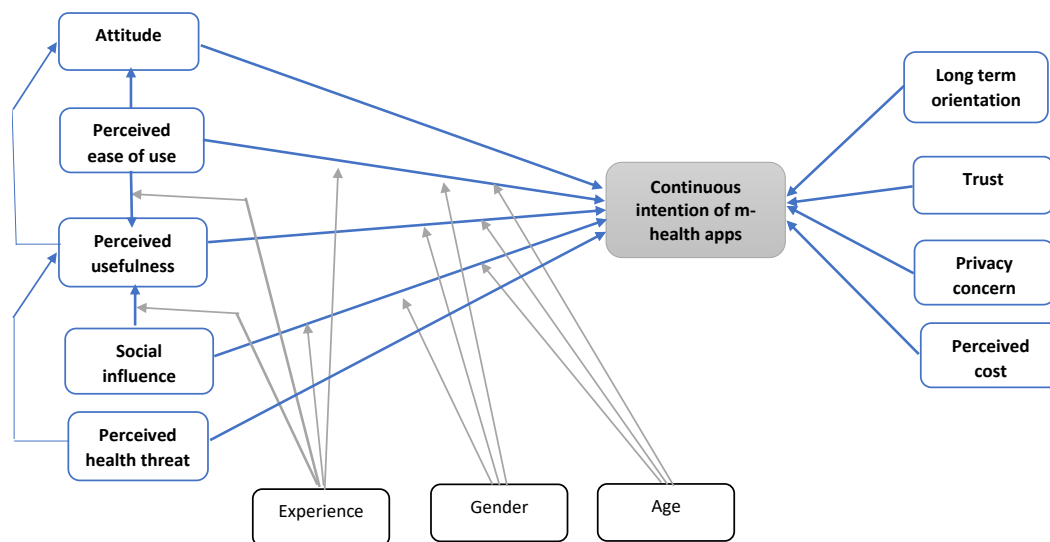


Figure. 1 Research model

Research Method

We plan to design and conduct an online experiment and recruit approximately 300 participants from Germany and Iran. While the experimental method has a long and successful tradition in social research, online experiments combine the advantages of lab experiments (e.g., control of variables) with online survey administration methods that allow hypothesis testing with larger numbers of subjects (Reips, 2002; Dandurand et al. 2008).

To test the study hypotheses, a vignette study (combination of a vignette experiment and traditional survey) among participants from Germany and Iran will be conducted. In an online survey, the partici-

pants will evaluate hypothetical situations regarding m-health apps. To increase external validity, patients of different ages, gender, and app experience will be invited to participate in the study. We plan to develop a questionnaire consisting of two parts: a traditional survey to assess person-oriented factors and a vignette experiment to assess app-oriented factors. For Sniderman and Grob (1996, p. 378) this combination of the traditional representative survey and the vignette analysis with their different strengths in external and internal validity was one of the innovational breakthroughs in the design of public opinion surveys: “the availability of multifactorial, multivalent designs has encouraged a reorientation from narrowly methodological concerns to broader substantive issues.”

Expected contribution

Users of mobile health apps around the world have their own cultural differences. Studies have shown that national culture values (*e.g., long-term orientation*) play a leading role in the acceptance of a system or product. Integrating certain cultural values of specific user groups into user interface designs may promote users’ acceptance. Thus, mobile health apps are required to provide pertinent and personalized designs that meet users’ cultural needs to enhance their utilization rate and further achieve wide participation and healthcare equity. In addition, app providers should be aware of different needs between age, gender, app experience, and health condition and produce suitable apps according to each group’s needs in society, which will have a significant impact on the acceptance of these apps.

With the spread of mobile devices and social networks, health administrations should pay more attention to digital technology related to health. Reinforcing the advantages of using mobile health apps (*e.g., usefulness, ease of use, privacy, low cost*) may promote use, help users to manage their own health, and promote the early diagnosis and prevention of diseases.

Data privacy in mobile health apps greatly influences users’ perception, which may further determine their willingness to use such apps (Wang and Qi, 2021); therefore, app providers should recognize the importance of privacy policies and inform users clearly in order to ensure data privacy. On the other hand, mobile health apps should keep a balance between data privacy and providing more functions.

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