

I Want to be Healthy: How Belief Influences the Usage Intention of Mobile-health Application

Completed Research Paper

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Abstract

Mobile-health application has a great potential to intervene unhealthy life-style. However, the adoption of mobile-health application is still low compared to other types of mobile application. There were several previous studies discussing the usage behavior of mobile-health applications in various perspective. However, there is still few discussing the usage behavior from the intrinsic factors of human, one of which is belief. This study aims to determine the impact of belief consisting of attitudinal, health, and social belief on the intention to adopt mobile-health application. This study used quantitative methodology and Partial Least Square - Structural Equation Modeling (PLS-SEM) with SmartPLS 3.0 software to analyze the data. There were 663 respondents from the online questionnaire distributed. This study found that relative advantage, compatibility, health threat, and social influence affect user's intention to use mobile health application with relative advantage as the most significant.

Keywords: mobile health, beliefs, health-related beliefs, social-related beliefs

Introduction

Unhealthy lifestyle, such as continuous sleep deprivation, lack of exercise, continuous fast food consumption, smoking and alcohol addiction are bound to increase the risk of various diseases (Šahinagić et al. 2016). Unhealthy lifestyles can cause various health problems, such as obesity that can increase the risk of other serious diseases, e.g. diabetes, heart disease, and cancer (NIDDK 2010). According to Indonesia's National Institute of Health Research and Development, the prevalence of teenager obesity in Indonesia increased five times from 2010 to 2013 (Balitbangkes 2013). There was also a trend of increasing prevalence of obesity in many countries (OECD 2017).

Mobile technology has a great potential to change and intervene unhealthy lifestyle in larger scale. The ubiquitous ability of smartphones and tablets is one of the factors that led to the development of health-related applications which aim to provide health benefit of the users (Šahinagić et al. 2016). These

health and fitness related apps running on smartphones and tablets are also represented as “mobile health application” (Leijdekkers & Gay 2013).

There are several capabilities of mobile health applications in providing health benefit to its users. For example, mobile health applications can provide useful information and guidance for users to better manage their health (Deng et al. 2014). Diet can be monitored using mobile health applications. Other apps, such as "QuitNow !: Quit smoking" support cigarette addicts to reduce smoking habits. This application can display the number of days passed without smoking, as well as provide information about the increasing health condition caused by the cessation of smoking activities. These examples show how mobile-health application can help improving individual health condition. However, the effectivity of mobile health application depends on how well it is adopted by its users. Therefore, understanding the adoption of mobile health applications is necessary to optimize the benefit of mobile health applications.

The adoption of mobile health is important; however, there are the difficulties and challenges in developing mobile health to be adopted well (Deng et al. 2014). Currently, the adoption rate of mobile health applications is still at 19%, which is considerably lower than other application categories such as game category applications (60%) (Purcell et al. 2013) and social networking applications (47%) (Fox 2013). This issue led many studies to discuss the adoption of mobile-health in various perspective (Shih et al. 2015; Venkatesh et al. 2016; Lim et al. 2011).

The study of application adoption is related to behavioral intention. In addition to external factors, behavioral intention can also be influenced by internal factors. Belief is one of concepts used to represent the internal factor and it was found closely related to behavioral intention (Yeo et al. 2017). Users make the decision on innovation adoption based on the belief they have about the innovation (Lee et al. 2011). Some beliefs related to attitude towards technology are Relative Advantage, Compatibility, Visibility Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Image, Result Demonstrability, Triability, Perceived Usefulness, Subjective Norm and Social Influence (Agarwal & Prasad, 1997; Bhattacharjee & Premkumar, 2004; Fitriani et al., 2017; Hidayanto et al., 2015; Karahanna et al. 1999; Karahanna et al. 2006; Polites & Karahanna, 2012).

In addition to those technologically related attitudinal beliefs, health-related beliefs also determine user behavior in the health context. The Health Belief Model (HBM) is one example of a theoretical framework for studying adherence to health behavior (Alatawi et al., 2016). The constructs contained in HBM are perceived health concern, health threat, susceptibility, seriousness, benefits, barriers, self-efficacy, and cues to action (Al-Muraikhi, et al. 2017; Chapman Lambert et al. 2017; Rosenstock et al. 1988). Mobile health application is related to health-related behavior so that health-belief is considered important in influencing user-behavior towards the apps.

Currently, there were studies discussed mobile health adoption focusing on external factors such as how the persuasive design of mobile health affects the usage behavior of mobile health (Lehto et al. 2012; Lehto & Oinas-Kukkonen 2015). Other studies were more concerned with internal factors such as the influence of belief on the mobile-health application adoption (Shareef et al. 2014). However, the current studies discussing belief factors and mobile health adoption have not included all types of belief, especially health-related belief. Considering that the lack of research on belief and mobile health applications usage intention, this study aims to see the impact of the user belief on the adoption of mobile health application.

Literature Study

In general, belief refers to people’s subjective opinion about aspects that can be distinguished cognitively. It is subjective due to personal understanding about themselves and their environment. Belief can nurture relationship between object, values and concepts which can influence people to do certain behavior (Fishbein & Ajzen 1975). This study includes three types of belief which are attitudinal belief, normative belief, and health-related belief.

Attitudinal Belief

Belief that become the basis of an individual to perform certain behavior or attitude is called as attitudinal belief (Ajzen & Fishbein, 1980). There have been several theories that explain beliefs, namely Theory of Reasoned Action (Ajzen and Fishbein, 1980), Theory of Planned Behavior (Ajzen, 1991), Technology Acceptance Model and Innovation Diffusion Theory.

Two factors in TRA which are attitude and subjective norm are used to determine behavioral intention. As an illustration, if a person's attitude changes, the intention for a particular behavior may also change. Theory of Planned Behavior (TPB) developed by Ajzen (1991) has been widely used to predict and explain various health related behaviors such as smoking, drinking, utilization of health care, breastfeeding and drug use behaviour. In this theory, it is stated that the change of behavior depends on intention and behavioral control. TPB divides beliefs into behavioral, normative, and control. TPB consists of six constructs that collectively represent the actual control of a person over certain behavior. The six constructs are attitude, behavioral intention, subjective norm, social norm, perceived power, and perceived behavioral control.

Another theory related with Attitudinal Belief is the Technology Acceptance Model (TAM) proposed by Davis (1989). TAM is based on constructs and relationships described in TRA. In TAM, the antecedent of intention to use a technology is determined by one's attitude toward the use of technology which are influenced by user beliefs about perceived usefulness (PU) and ease of use (EU). PU is the level at which a person believes that the use of the system will improve his performance (Venkatesh & Davis 1996). The EU represents the extent to which a person believes that using a particular system would be easy to do (Venkatesh & Davis 1996).

In Innovation Diffusion Theory (IDT), there are five characteristics of innovation that can affect one's opinion about innovation and can influence the level of user adoption of a technology (Karahanna et al. 1999). The set of characteristics described by Roger (2003) in his research includes relative advantage, compatibility, complexity, trialability and observability. Several decades later, the characteristics used in IDT has been expanded and refined to include two more characteristics which are perceived using innovation and perception of volunteerism (Moore & Benbasat 1991).

Health-Related Belief

The Health Belief Model (HBM) is a theoretical framework that models factors influencing the adherence of a person regarding health behavior (Alatawi et al. 2016). Rosenstock et al. (1988) explained that HBM determined health-related behavior through the following factors: (1) health motivation (or health problems); (2) belief that a person is vulnerable to serious health problems which is often called perceived threat, and (3) belief that following a specific health recommendation will be beneficial in reducing perceived health threats; at acceptable cost. In this case, cost refers to perceived barriers that must be overcome to perform the health recommendations, which includes, but is not limited to, financial expenses. Since its inception, HBM has undergone several changes.

Glanz et al. (2008) defined five constructs in HBM which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. In the further study, Becker, Haefner and Maiman (1977) added health motivation in HBM. Meanwhile, Rosenstock (1988) and Xu (2009) included health threat as one of HBM construct.

Social-Related Belief

In Theory of Planned Behavior (TPB), subjective norms are related to one's beliefs about whether peers or those important to the person think that he or she should do certain behavior. Subjective norms are defined as "the perceived social pressure to perform or not to perform a certain behavior" (Ajzen 1991). Subjective norms were found to have an influence on the intention to behave (Yau & Ho 2015). According to Yau and Ho (2015), subjective norm can be defined as social influence. Eckhard et al. (2010), Malhotra and Galletta (1999), and Prieto et al. (2017) in their research found that social influence plays an important role in determining the behavior of acceptance or adoption of an information technology.

Related Previous Studies

Polites and Karahanna (2012) discussed the influence of motivation to continuance of use, belief and intention to use a new system. In their model, the intention to use the system is influenced by attitudinal belief and normative belief. The attitudinal belief consists of perceived ease of use and relative advantage and the normative belief consists of subjective norms. In their study, it was found that subjective norm was an important factor in influencing people to change. Ease of use and relative advantage were also found to positively affect the intention to use the new system. Polites and Karahanna (2012) studies provided perspective on the relationship between subjective norms, ease of use, relative advantage, and systems use behavior.

Meanwhile, Shareef et al.'s (2014) study aims to find out the factors that influence the adoption of mobile healthcare services. Factors studied were perceived usefulness (PU), perceived ease of use (PEOU), perceived compatibility (PCOM), perceived security and privacy (PSP) and perceived reliability (PREL). Shareef et al. (2014) found that PU, PEOU, PSP and PREL positively affect user adoption to mobile healthcare services. From the result of this study, we inferred that PEOU, PU, PSP, and PREL are important beliefs that may affect the adoption of mobile health applications.

Another related study was from Alatawi et al. (2016) about the association between health belief and adherence to medication among patients with diabetes type 2. This study did not discuss about the acceptance or adoption of technology but provided perspective about health belief and health behavior. Factors on health belief discussed in this study are perceived susceptibility, perceived severity, perceived benefits, perceived self-efficacy, as well as the perceived cues to action.

In other studies, Perceived Usefulness, which has a similar meaning to Relative Advantage, were also used to model user behavior (Karahanna et al. 1999; Karahanna et al. 2006). In addition, Perceived Ease of Use and Compatibility also often appears to predict the adoption or acceptance of a system. Based on literature studies, we found that those factors were important in adoption of a systems. Therefore, this study included Relative Advantage, Perceived Ease of Use and Compatibility which are grouped in Attitudinal Belief as the factors that influence the intention to adopt mobile health applications.

For social-related beliefs, Karahanna et al. (1999) and Polites and Karahanna (2012) used subjective norm constructs while Eckhard et al. (2010) and Malhotra and Galletta (1999) used social influence. Both terms have the same meaning (Yau & Ho, 2015). This study used social influence as the belief factor in the social-related belief category. As for health-related beliefs, there were several studies discussed health-related beliefs and its application (Alatawi et al. 2016; Al-Muraikhi et al. 2016; Chapman Lambert et al. 2017; Glanz et al. 2008; Rosenstock et al. 1988). Those studies were analyzed in this study to determine the health belief factors that influence the usage intention of mobile health application.

Research Hypotheses Development

From literature review, we found several important belief factors that might influence the adoption of mobile health application. This study combined those belief factors to develop the research model. The belief factors are grouped into three groups which are attitudinal belief, health-related belief and social-related belief. The constructs on attitudinal beliefs are relative advantage, ease of use and compatibility. The construct on health-related belief are health threat and health motivation. Meanwhile in social-related belief, this study used one construct which is social influence. We use control variables of age, sex and personal innovativeness in the specific domain of IT (PIIT). The hypotheses developed from the research model are described in the following sub-sections.

Relationship between Relative Advantage and Intention to Adopt Mobile Health

Among other attitudinal belief attributes, relative advantage, ease of use and compatibility are the most commonly found factors to understand the intention to adopt technology (Liao et al. 1999; Mian & Rizwan 2013; Papias & Clement, 2008). Meanwhile, perceived benefit is commonly used in various theories as an antecedent of the intention to adopt technology (Karahanna et al. 1999; Polites &

Karahanna, 2012; El-Masri & Tarhini, 2017). Given the health benefits of mobile health applications, relative advantage was considered as important construct that influence the intention to adopt mobile health applications. Based on the arguments, the following hypothesis was proposed.

H1: relative advantage affects the intention to adopt mobile health

Relationship between Ease of Use and Intention to Adopt Mobile Health

Mobile health applications help users to more easily monitor health related activities. Ease of use in mobile health applications was predicted to have influences on the intention to adopt mobile health applications. Ease of use was commonly used in various theories as antecedents of the intention to adopt technology (Karahanna et al. 1999; Polites & Karahanna, 2012). Thus, this study aims to answer whether the ease of use of mobile health applications affects the intention to adopt mobile health applications. Based on the arguments, the following hypothesis was proposed.

H2: ease of use affects the intention to adopt mobile health

Relationship between Compatibility and Intention to Adopt Mobile Health

Compatibility is also as one of the important factors in mobile health applications. Mobile health applications can be personalized to accommodate user preference based on previous experience or other means. The personalization aspect represents the ability of mobile application to be compatible to user's needs. Compatibility affects the adoption of technology because it shows the alignment between the technology and user needs. Greater compatibility between individual needs and technology is a good thing because it allows technology to be interpreted in a more intimate context (Longraya & Van 2015). Based on these evidence, it was predicted that compatibility affects the intention to adopt mobile health applications as formulated on the following hypothesis.

H3: compatibility affects the intention to adopt mobile health

Relationship between Social Influence and Intention to Adopt Mobile Health

Users of mobile health applications were socially influencing each other, for example, through their update on social media when their health-related target was achieved. In health domain, social influence is found in studies related to health belief, but referred to as Cues to Action. Social influence is also used to predict the intention to adopt in persuasive system (Brauer et al. 2016). Social influence has been found to have relationship with the intention to adopt technology which were empirically supported in many previous studies (Lee et al. 2003; Venkatesh et al. 2003). There are social activities in mobile-health application; therefore, this study aims to find whether social influence affect the intention to adopt mobile health as proposed by the following hypothesis.

H4: social influence affects the intention to adopt mobile health

Relationship between Health Belief and Intention to Adopt Mobile Health

To broaden the perspective in this study, health-related factors are used because mobile health applications are developed to support health related activities. In the theory of health belief, there are two health-related constructs which are health threat and health motivation. Health threats represent a person's belief that he/she is vulnerable to serious health problems in the future. The more person perceived that they have health threats, the more likely he/she will be to adopt mobile health applications (Kim & Park 2012). Therefore, this study aims to find whether health-threat perceived by users affect the intention to adopt mobile health.

The next construct in health belief is health motivation. Health motivation is one of the most important factors in determining healthy behavior (Xu 2009). Someone who is not motivated to be healthy, will not obey or act in healthy behavior (Rosenstock et al. 1988). Therefore, it can be predicted that someone with good health motivation will have healthy behavior, which can be represented through their usage of mobile health application. Health motivation is considered to influence the intention to adopt mobile health. Based on those arguments, this study proposed the following hypotheses.

H5: health threat affects the intention to adopt mobile health

H6: health motivation affects the intention to adopt mobile health

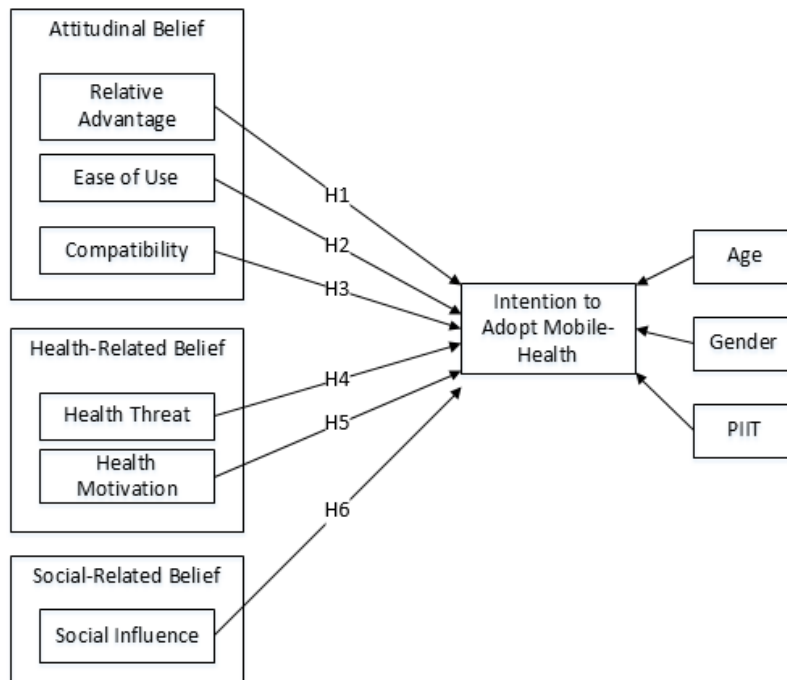


Figure 1. Research Model

Figure 1 shows this study research model which consists of six belief factors. The belief factors are grouped into attitudinal belief, health-related belief and social-related belief. Within the attitudinal beliefs, there are three factors which are relative advantage, ease of use and compatibility. Within health-related belief, there are two factors which are health threat and health Motivation. Lastly, within social-related Belief, there is one factor which is social influence. The controlled variables are age, sex and personal innovativeness in the specific domain of IT (PIIT).

Research Methodology

This research used quantitative methodology which used survey to collect the data. Online questionnaire was used as the method of survey. The following section explains the instrument of survey, data collection and data analysis process.

Instrument Development

The questionnaire was consisted of two parts. The first part was focused on gathering the participants’ demographic data (age, gender, and address). The second part was composed of 24 items of Likert type question with seven intervals (1-7). Each item reflects the variables of the model. The measurement items used in this study were created based on various studies. The following table presents the measurement items for each construct.

Table 1. Measurement Items

Constructs	Measure
Relative Advantage (RA) (Polites & Karahanna 2012; Karahanna et al. 1999; Agarwal & Prasad 1997)	<ul style="list-style-type: none"> Using the application allows me to perform a healthier lifestyle with a more efficient time (RA-1) Using the application allows me to live healthier life more effectively, than without using the app at all (RA-2)

	<ul style="list-style-type: none"> • Using the application, I feel more supported to implement a healthier lifestyle than without using the app at all (RA-3) • Using the application, I can improve the quality of my healthy lifestyle (RA-4) • My control of a healthy lifestyle is improved when I am using the application (RA-5)
Ease of Use (EU) (Polites & Karahanna 2012; Karahanna et al. 2006; Viridiananto et al. 2016)	<ul style="list-style-type: none"> • The application is easy to use (EU-1) • I find it is easy to get the application to do what I want it to do (EU-2) • It is easy for me to become skillful in using the application (EU-3)
Compatibility (CO) (Handayani et al. 2017; Karahanna et al. 1999; Karahanna et al. 2006)	<ul style="list-style-type: none"> • The application can be customized to my healthy lifestyle (CO-1) • Using the application fits my preferred routines in performing a healthy lifestyle (CO-2) • The application allows me to live a healthier life in the way that I prefer (CO-3) • Use of the application is consistent with the way I think a healthy lifestyle should be performed (CO-4)
Social Influence (SI) (Polites & Karahanna 2012; Karahanna et al. 1999)	<ul style="list-style-type: none"> • My colleagues (at school, college, office, or neighborhood, etc.) think I should use application to perform a healthy lifestyle (SI-1) • My community thinks I should use apps to perform a healthy lifestyle (SI-2) • According to people who are more knowledgeable about healthy lifestyles (e.g. fitness instructors, doctors, or more experienced friends, etc.), I should use the application to perform a healthy lifestyle (SI-3).
Health Motivation (HM) (Al-Muraikhi et al. 2016; Sun et al. 2006)	<ul style="list-style-type: none"> • I am interested in discussing healthy lifestyles with health experts / health instructors (HM-1) • I am interested in attending seminars or classes to improve my knowledge about a healthy lifestyle (HM-2) • I feel that I can perform a healthy lifestyle on a regular basis (HM-3) • I believe that other important things (such as money, fame, etc.) will be meaningless if someone does not have a good health condition (HM-4)
Health Threat (HT) (Al-Muraikhi et al. 2016)	<ul style="list-style-type: none"> • I think that the risks posed by living unhealthy lifestyles are serious risks (e.g. hereditary or congenital anomalies, obesity, or unhealthy weight) (HT-1) • If I am exposed to the risk posed by living unhealthy lifestyle, it will affect my career / aspiration (HT-2).
Intention to Use (IA) (Polites & Karahanna 2012)	<ul style="list-style-type: none"> • I intend to use the application to perform healthy lifestyle activities in the future (IA-1) • I plan on using the application to perform healthy lifestyle activities in the future (IA-2).
Personal innovativeness in the specific domain of IT (PIIT) (Polites & Karahanna 2012)	<ul style="list-style-type: none"> • When I hear about the latest information technology (like apps, software, etc.), I'll look for ways to experiment with the technology (PIIT-1) • Among my friends, I'm usually the first to try out the latest information technology (PIIT-2)

- | | |
|--|--|
| | <ul style="list-style-type: none">• I like to experiment with the latest information technology (PIIT-3) |
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Data Collection

Data was collected through online questionnaire. Several social media services such as Line, Facebook, Whatsapp, Instagram and some forums like Kaskus.com and Female Daily, were used to distribute the questionnaire. Respondents were an Indonesian citizen who has experience using mobile health application. From 663 data obtained, there were 4 redundant data and 12 respondents who claimed to have never used mobile health applications. The data were discarded so that the remaining data were 647 data. From 647 responses, 59% were female, 77% ages between 18 and 24 years-old, 13% ages between 25 and 34 years-old, and 7% ages under 18% years-old. They mostly used mobile health application every once a month. Popular activities performed using mobile health application are exercising and eating habit tracking.

Data analysis

In conducting data analysis, this research applied Structural Equation Modelling (SEM). SEM is commonly used for measuring correlation between variables. Partial Least Square SEM and SmartPLS 3 application was used to perform the data analysis. PLS was used because one of the constructs measured in this research was considered formative. The construct in question was interdependent self-construal and combination of its indicators. The combination of its indicators may have its variation, and its indicators may not share the same meaning. Interdependent self-construal met the criteria of formative variable as mentioned.

Result and Analysis

Measurement model

To measure the model, this study used convergent validity, discriminant validity, and construct reliability test. These three tests were conducted using SmartPLS 3. For convergent validity test, the value of loading factor must be greater than 0.7 (Sarstedt et al. 2014). The value of loading factor for all indicators in this study is between 0.712 to 0.97 which is greater than 0.7. It means that all the indicators can represent the latent variables. In addition, the AVE value for all constructs meets the minimum requirement which is greater than 0.5 (Hair et al. 2011). The AVE range of constructs in this study is from 0.622 to 0.941. Based on these results, it can be said that the model has met the convergence validity test.

Discriminant validity tests whether measurements that are not supposed to be related are actually unrelated. To meet the discriminant validity test, the square root of AVE value for each latent variable must be greater than the correlation value with other latent variables (Hair et al. 2011). From the value of cross loading and AVE square root, we found that all the indicator values for each construct have the highest value compared to other indicators of the construct. This shows that this model passes the discriminant validity test.

Construct reliability shows whether the construct used in this study is reliable and can produce similar result if it is used by another study. The value of the composite reliability between 0.7 to 0.95 shows that the construct has high reliability (Sarstedt et al. 2014). The range of composite reliability values in this test is 0.827 to 0.97 which indicates that the indicators have a good level of reliability. As for Cronbach's Alpha (CA), the range of CA values in this test is 0.584 to 0.938. However, based on research by Green and Yang (2009), Peterson and Kim (2013), and Raykov (2001), the value of Composite Reliability is better than Cronbach's Alpha in expressing true reliability. Therefore, although the Cronbach's Alpha score of one of the constructs is not more than 0.7, the model still passes the reliability test because the composite reliability value of all constructs is more than 0.7 This indicates that the model has satisfied the reliability test.

Structural Model

Testing of structural model (inner model) was conducted to see the relationship between constructs. The value of t-statistics for relationship between relative advantage and intention to adopt mobile health is 7,624. The value of t-statistics for relationship between compatibility and the intention to adopt mobile health is 4.375. The value of t-statistics for relationship between social influence and intention to adopt mobile health is 2,694. The value of t-statistics for relationship between health threat and intention to adopt mobile health is 2,078. To be declared that a path or relationship has confidence level of 95%, the t-statistics value must be greater than 1.96. Based on the results of this study, it was found that relative advantage, compatibility, social influence and health threat affect the intention to adopt mobile health (H1, H3, H4, H6 were accepted). Among those four, relative advantage was found to be the most influential.

The relationship between ease of use and intention to adopt mobile health resulted in t-statistics value of 0.994. The relationship between health motivation and intention to adopt mobile health resulted in a t-statistics value of 0.691. The low value of these two relationships concluded that the relationship between these variables were weak; therefore, H2 and H5 were rejected.

Discussion

Mobile health applications provided benefits to users. Exercising with the help of mobile health applications provides more benefits than without mobile health applications. For example, measuring mileage when running is easier with self-tracking features in mobile health applications. The relationship between relative advantage and the intention to adopt mobile health found in this study was consistent with Karahanna et al.'s (1999) and Polites and Karahanna's (2012) studies. In addition, this finding aligned with the study of Wendel et al. (2013) on factors affecting the intention to use the health recommendation system. In that study, the advantages or usefulness of the system also affect the mobile health applications usage behavior.

In addition to relative advantage, compatibility was found to have influence on the adoption of mobile health. Mobile health applications, with its personalization capabilities, can be personalized to suit with user needs. Thus, mobile health applications provide compatibility advantage which was found to affects the intention to adopt mobile health. This finding was also consistent with Longraya and Van's (2015) study which found that compatibility influences the interpretation of technology which was then influence the intention to adopt mobile health.

Social influence can occur when users of mobile health applications share their experience or achievement in health-activities using their mobile-health application. Social influence is said to have an effect on the intention to adopt mobile health based on previous studies (Lee et al. 2003; Venkatesh et al. 2003). The relationship of social influence with the intention to adopt mobile health is also presented in TPB and HBM theory which include social influence factor in the intention to adopt a system.

In health-belief perspective, the more a person perceived that they will have health issues, the more likely he/she will do something that can reduce the risk of threats, for example, through mobile health applications. The use of mobile health applications becomes important for these people to support their health activities. The relationship between health threat and intention to adopt mobile health is also consistent with other studies (Kim & Park 2012).

The most significant factor influencing the intention to adopt mobile health is the relative advantage factor. Providing advantage is indeed the goal of mobile health applications, which is then encouraging certain user behavior and/or attitudes (Oinas-Kukkonen & Harjumaa 2009). In this case, healthy life behavior is supported by mobile health applications.

There are two insignificant variables related to intention to adopt mobile health which are ease of use and health motivation. This finding supported the research of Agarwal and Prasad (1997) which found that the influence of ease of use in IDT (Innovation Diffusion Theory) was not significant. Our respondents were people who have used mobile health applications to support their healthy lifestyles.

Ease of use in mobile health applications did not really become an issue if the function provided by the system was considered to be more important for users. A study found that people will try to overcome the complexity of a technology, if the utility of such technology is perceived to be more important (Agarwal & Prasad 1997).

Meanwhile, the relationship between health motivation and intention to adopt mobile health was also found to be insignificant. Moorman and Matulich (1993) who examined the effect of health ability and health motivation on healthy behavior found that both of these factors had no effect on healthy behavior. The finding supported and complemented the research of Moorman and Matulich (1993). Rosenstock et al. (1988) stated that health-related behavior (intention to adopt mobile health) tends to be motivated by health problems. People feel they need to do something about their health when they feel that they have a problem or threat.

Research Implications

In terms of theoretical implication, the findings of this study supported, complemented, and added new perspectives in the domain of mobile-health application usage behavior, particularly in the theory of belief. Meanwhile, the practical implication from this study is that it can be used as input for mobile health application developers to focus on the belief aspects that can improve the intention to adopt mobile health application. Developers can focus on developing mobile-health application that is useful (relative advantage), personalized (compatibility), able to support social interaction (social influence), and able to build health awareness (health threat) so that it can improve user's intention to adopt mobile health.

Conclusion

In this study, we have collected data from mobile health application users in order to study the factors affecting user intentions to adopt mobile health applications from a belief perspective. Based on the analysis of the data, we found that not all attitudinal belief factors affect the intention to adopt mobile health applications. Relative advantage and compatibility were found to have significant effect but ease of use was found to have insignificant effect. It was also found that not all health-related beliefs affect the intention to adopt mobile health applications. Health threat is influential on the intention to use mobile health application but health motivation is not. As for social-related belief, it was found that social influence affects the intention to adopt mobile health applications.

Research Limitation and Future Direction

There are several limitations in this study related to the coverage of respondents and mobile health applications. Respondents of this research are from Indonesia and dominated by young-adult users (18-24 years old). Subsequent research could target a broader scope of respondents in order to better generalize the result. In addition, this study only focused on respondents who use mobile-health application in the fitness category such as application for running, exercising or dieting. Meanwhile, there are other types of mobile health applications which were less covered in research, for example mobile health applications that are used to sleep soundly or stop smoking. Further study should include other types of mobile health application to get deeper insight on mobile-health adoption behavior.

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