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FACTORS INFLUENCING THE ADOPTION OF MENTAL HEALTH APPLICATIONS AMONG UNIVERSITY STUDENTS

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Abstract:

The rising issue of mental health problems is not common in society. Mental health, which includes anxiety, depression, and anything related to a stress disorder, is a common phenomenon, especially among university students. One alternative to address this issue is the innovation of mental health applications. This solution might provide cost savings and be easy to access. However, the inconsistent adoption of mental health applications among students might impact the statistics of mental health illness among youth, especially university students. Therefore, this study explored the factors influencing the intention to adopt mental health applications among university students. In this study, the Technology Acceptance Model (TAM) model by (Davis et al., 1989) was the most suitable model to be tested with an interactivity element. The objective of this study is to identify the factors that contribute to the intention to adopt mental health apps among university students in Malaysia.

Keywords:

Technology Acceptance Model (TAM), Mental Health Applications, University Students, Malaysia

Background of Study

Nowadays, there are a lot of people who are suffering from mental health disorders. In 2019, the Institute for Health Metric and Evaluation (2019) recognized that approximately 450 million people suffer from mental health disorders. Whereby this statistic also leads to causes of health illness and disability. At the same time, the World Health Organization (2020) reported that 264 million people suffer from depression worldwide.

Adoption Intention to Use Mental Health

Many factors influence the intention to adopt mental health apps. For instance, perceived usefulness, perceived ease of use, culture, technology, social media, and others (An & Lee, 2018a; Chan, Torous, Hinton, & Yellowlees, 2014; Huang & Bashir, 2017; Kim, Xu, & Wang, 2022; Nogueira-Leite, Marques-Cruz, & Cruz-Correia, 2023). In this study, the researcher selected the indicator based on the relevant literature review that supports this study's objective. In many research, mental health apps are usually tested using the depression anxiety stress test (DASS). The DASS test is used to determine the severity of the core symptoms of depression, anxiety, and stress. This study is more towards the adoption intention to use mental health apps.

Literature Review

Technology Acceptance Model (TAM)

This study applied the Technology Acceptance Model (TAM) (Davis, 1989) as a fundamental framework to investigate the factors influencing the use of mental health applications. The Technology Acceptance Model (TAM) states that perceived usefulness and perceived ease of use are the key determinants of technology acceptance. TAM also emphasized the significance of external elements, like interface design, societal influence, and others. As illustrated in the Technology Adoption Model (TAM), attitude is a mediating variable for behavioral intention and indirectly facilitates the adoption of technology. Behavioral intention is a more reliable predictor of an individual's anticipated behavior prior to utilizing any proposed technology, whereas actual use or acceptance in the Technology Acceptance Model (TAM) reflects actual behavior.

TAM also proposed the integration of external antecedents as predictors in assessing perceived ease of use and perceived usefulness of anticipated technology. External variables may vary depending on the study context. For instance, (Gani, Rahman, Bag, & Mia, 2024a) use social influence and smart health technology as external variables to establish the connection between perceived usefulness and perceived ease of use. (Wang, Zhang, Zhou, & Lai, 2019) emphasized emotional support and privacy concerns., while Collier, Hagemann, Trinidad, and Vigil-Hayes, (2022) concentrated on interactivity human-to-computer. This study comprised interactivity variables suitable for current mobile application needs. Consequently, interactivity was utilized to depict the external variable.

This model has extensively been used in prior studies. Especially for mobile applications, for instance, learning applications (Nur Nabihah Mohamad Nizar, 2023); university applications (Paganin, Apolinário-Hagen, & Simbula, 2023), banking sector (Tanjung & Herwindhani, 2024), health sector (Fadaizadeh, Sanaat, Yousefi, & Alizadeh, 2022) and other industries as well.

Technology Reasoned Action, Theory of Planned Behaviour, and Unified Theory of Acceptance and Use of Technology are among the numerous technology acceptance theories that are relatively well-known and utilized globally. TAM is a valid and robust paradigm for obtaining general information about individuals' perceptions of the use of technology, particularly in mobile application research. Ozekici (2022) conducted a TAM meta-analysis that disclosed this. It is imperative to select TAM as a grounded theory in order to evaluate the use of mental health applications among university students in Malaysia.

Perceived Usefulness towards Adoption Intention to Use Mental Health Applications
Perceived usefulness is one indicator of intention acceptance technologies, which have been tested in many research models and theories. The Technology Acceptance Model (TAM) was the established model that tested and proved the adoption of information technology (IT). Multiple studies have shown that perceived usefulness positively influences the intention to use technology tools, artificial intelligence (AI) tools, and others (Fred D. Davis, 1989; Gani, Rahman, Bag, & Mia, 2024b; Park & Kim, 2023).

A study in South Korea reported that perceived usefulness significantly affects behavioral intention to use mental health apps (An & Lee, 2018a). Their study adapted the Health Belief Model (HBM). It extended it with the Technology Acceptance Model (TAM) (F D Davis et al., 1989) tested on behavioral intention to use mental health apps. A collective of findings proved that perceived usefulness is pivotal in adapting technology such as mental health apps. However, the studies undertaken in Malaysia are still less, and the numbers of youth with mental health illnesses are still rising.

Perceived Ease of Use Towards Adoption Intention to Use Mental Health Applications
Perceived ease of use (PEOU)is similar to perceived usefulness, and its indicators have proven that it impacts factors influencing adoption behavior towards information technology(Fred D. Davis, 1989; Park & Kim, 2023; Ramayah & Ignatius, 2005). Perceived ease of use was one of the indicators tested in the Technology Acceptance Model (TAM) (Fred D. Davis, 1989). It is well-known worldwide and has been used for decades in many research studies. The results contradicted a survey in South Korea focusing on mental health apps for youths; perceived ease of use is still minimal in studies. The reason this situation happened might be social influence, which was taken into account (Kim et al., 2022).

Moreover, it is undeniable that perceived ease of use can also be influenced by other factors, such as cultural and demographic variables (Funnell, Spadaro, Martin-Key, Benacek, & Bahn, 2023). Therefore, although many studies justified perceived ease of use, there is a possibility that a different result might appear. Understanding the factors influencing using mental health apps based on their situation or scenario is essential.
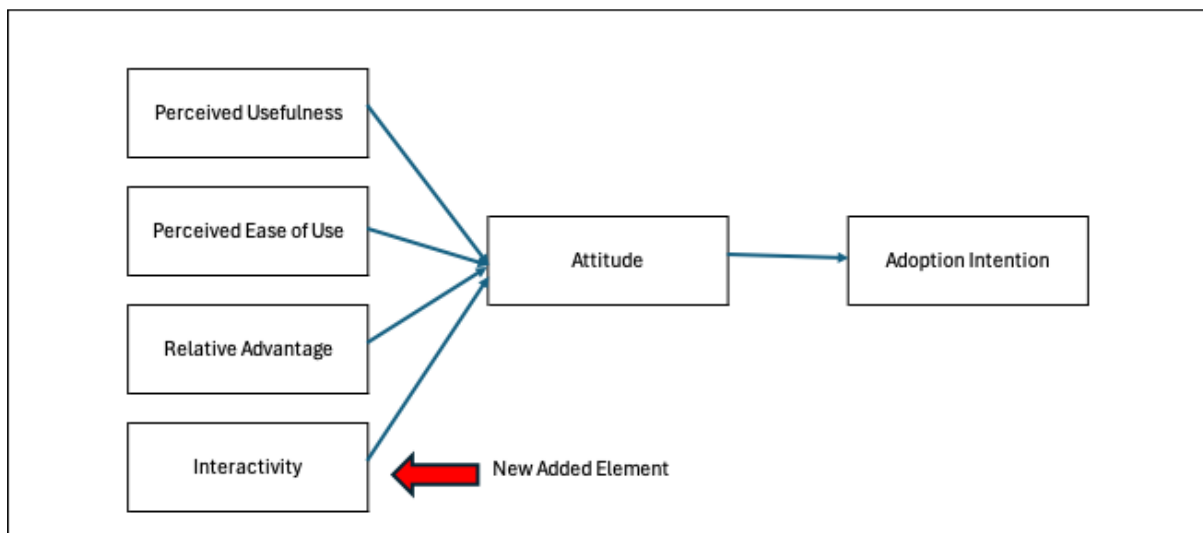
Relative Advantage towards Adoption Intention to Use Mental Health Applications
Other than perceived usefulness and perceived ease of use, relative advantage also impacts adoption. Relative advantage is described from the point of view of benefits and advancements in the use of mental health applications compared to the traditional way. The use of mental health apps gives the alternative to the user to use their apps even from home. The situation may reduce the stigma users need to seek in person, such as a psychologist or counselor (Alqahtani & Orji, 2020; Padaliya, Arya, & Kumar, 2022).

Besides, healthcare providers recommend that users use mental health apps that are effective and robust in data privacy management. Current mental health apps care about pathways and support other relevant functions to be used during or while waiting for the treatment. In addition, the conversation between the user and the healthcare professional can be recorded and used for the next meeting (Huang & Bashir, 2017). Therefore, mental health apps have the relative advantage of giving users accessibility, flexibility, and personalization of mental health care, which may influence user adoption.

Interactivity towards Adoption Intention to Use Mental Health Applications
Interactivity is a critical factor in influencing the willingness to use mental health apps. Studies show that perceived usefulness and social influence positively affect the intention to use AI-powered mental health tools(Kleine, Kokje, Lermer, & Gaube, 2023). Moreover, virtual reality tools can improve patient interactions, boosting mental health professionals' interest in using them for training(Pacella, Braga, Cai, & Fernández-Caballero, 2022). Another study also reveals that perceived stress and coping mechanisms play a role in app usage, while privacy concerns can hinder adoption(Nogueira-Leite et al., 2023). Based on prior studies show that interactivity is essential to attract the use of Ai-tools, especially applications (Kleine et al., 2023; Nogueira-Leite et al., 2023; Pacella et al., 2022). The model of the Unified Theory of Acceptance and Use of Technology (UTAUT) also emphasizes that performance and effort expectations, as well as facilitating conditions, can predict young adults' adoption of mental health apps (Holtz, Kanthawala, Martin, Nelson, & Parrott, 2023). Interactive features that enhance perceived usefulness, social influence, and ease of use are crucial for adopting mental health apps. Figure 1: The relationships discussed in this paper can be transformed into a conceptual framework as below:

Based on literature reviews, the following hypotheses have been identified for this study:

H1 : Perceived usefulness positively significantly influences adoption intention to use mental health applications

H2 : Perceived ease of use positively significantly influences adoption intention to use mental health applications

H3 : Relative advantage positively significantly influences adoption intention to use mental health applications

H4 : Interactivity positively significantly influences adoption intention to use mental health applications

Methodology

This study is a cross-sectional, quantitative research that will be carried out in Klang Valley, Malaysia. The study will be conducted as a description and explanatory research to identify factors influencing the intention to adopt mental health applications among university students. In other words, it examines the relationship between perceived usefulness, perceived ease of use relative advantage and interactivity (independent variables), attitude adoption (as mediating variable), and adoption intention (dependent variable). In this study, the added value of the interactivity factor works as an external variable.

The questionnaire will be blasted to the selected university students via their official university email. This step will ensure the respondents are eligible to answer the questionnaire. The questionnaire will be created and administered using Google Forms as the most convenient data collection method.

In this study, the researcher will employ the purposive sampling methods. As recognized in this study, the response needed to be from university students. Table 1 shows the questionnaire section to be answered in the Google form.

Table 1: Questionnaire Items

Section	Factors	Elements
Section A	Demographic	Gender
		Age
		Usage of mental health applications
Section B	Perceived Cognition	Perceived usefulness
		Perceived ease of use
		Relative advantage
Section D	Interactivity	Control speed
		Range
		Mapping communication
Section D	Adoption	Attitude
		Intention

Conclusion

This study explores factors influencing the intention to adopt mental health applications among university students in Malaysia. In this study, the researcher focuses on the cognitive aspect derived from the well-known Technology Acceptance Model (TAM). The intention of adopting mental health applications may vary depending on who the users are. This paper shows that the key to adoption intention to use mental health applications lies in these four factors;

1) Perceived usefulness
2) Perceived ease of use
3) Relative advantage
4) Interactivity

This study will be collected via quantitative research and purposive sampling among university students. The study should be expanded as there will always be the digital age. Therefore, other researchers should undertake further research. Below are suggestions for future work.

Theoretical Implications

In particular, the present study explores factors influencing the intention to use mental health applications among university students in Klang Valley, Malaysia. Existing research in mobile health applications(Candra, Frederica, Putri, & Loang, 2024; Liu, Zhu, Holroyd, & Seng, 2011; Ngongo, Ochola, Ndegwa, & Katuse, 2019; Pires et al., 2020) highlight the usage and benefits of using it. The minimum study focused on mental health as the setting in which applications were to be used. Even though Liashiedzi, Eto, Atinga, and Abor, (2024) did study mental health, they are more specific towards hypertension among corporate workers, not for university students. The present study answers this call by empirically aiming for university students to prevent or minimize mental health symptoms by utilizing mental health applications. The results have important implications for mental health and technology health research.

In addition, this study sheds light on factors influencing the intention to use mental health applications among university students by extending the Technology Acceptance Model (TAM) as an underpinning theory. This study extended the TAM by incorporating interactivity as an independent variable. The extension will contribute to the comprehensive understanding of the use of health applications in the context of mental health among university students. The role of the interactivity variable as an important prediction of intention to use will pick up on the notion that an external variable influences the use of mental health applications.

Undeniably, this conceptual framework and findings can serve as a foundation for future research, especially for researchers exploring digital health, such as mental health applications contexts. The extension of TAM will lead to better refinements for health applications.

Managerial Implications

Several highlighted managerial implications were derived from this study. Firstly, the study emphasizes the importance of developing mental health apps, prioritizing perceived usefulness, perceived ease of use, relative advantage, and interactivity. The factors highlighted in this study will enhance the adoption of the apps among university students. Managers in mental health services must consider these variables when creating and implementing digital interventions to ensure they align with the needs and preferences of the target audience. The empirical finding about interactivity antecedence has implications for the strategy of consumer information technology (IT) applications vendors. Remarkably, researchers suggest that interactivity factors must be added to any available mental health applications (i.e., the control speed, range, and mapping communications) that influence individuals to use mental health apps. Lastly, the Universities should work on enhancing students' digital literacy to improve their

comprehension and comfort when utilizing mental health apps. This can include giving training sessions or resources to help students understand when and how to use digital tools for their mental health needs. Students reported needing elements that encourage human contact in mental health apps. Thus, universities must explore and incorporate these aspects. Campuses can address students' reticence and doubt about app uptake by engaging with application developers to integrate choices for real-time help and community participation.

Future Work

The current research delved into fundamental theoretical and empirical aspects relating to users' tendencies to continue using mental health apps. However, it is essential to recognize specific constraints. Initially, the participants were university students residing in Klang Valley, Selangor, which limits the applicability of the results to the broader user base of mental health apps in Malaysia. Future studies suggested replicating the model in different regional contexts to improve the generalization.

Secondly, in this study, only three dimensions have been tested (perceived usefulness, perceived ease of use, relative advantage, and interactivity). These elements were suggested by prior research (An & Lee, 2018b; Kim et al., 2022; Kleine et al., 2023) for further study. Therefore, in this study, the researcher recommends that other researchers explore the technical parts of the applications themselves. The study could also attract users to use and adopt mental health apps daily.

Thirdly, data collection and analysis of this study will be achieved by employing a survey questionnaire and empirical research to mitigate various biases and enhance the research's validity. One way to increase the comprehensiveness of future research studies is to incorporate qualitative methods, such as interviews and observations, and quantitative approaches. Implementing this integrated approach will provide a more comprehensive understanding of the participant's behaviors and facilitate a more detailed comprehension of theoretical and practical implications.

Acknowledgements

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