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FACTORS ASSOCIATED WITH SELF-REPORTED USER ACCEPTANCE AND PERCEIVED USEFULNESS OF SI-TELUR PETIS: A CROSS-SECTIONAL STUDY

Mei Rianita Elfrida Sinaga[1], **Indrayanti**[2], **Santy Ercelina Nainggolan**[3], **Retno Heru Setyorini**[4], **Sulistiyani**[5], **Ontran Sumantri Riyanto**[6], **Endang Khoirunnisa**[7]

[1,2,4,6]Bethesda Yakkum Yogyakarta School of Health Sciences
[3]Faculty of Medicine, Tanjungpura University, West Kalimantan, Indonesia
[5]Polytechnic Health of Jayapura, Papua, Indonesia
[7]Akbidyo College of Health Sciences, Yogyakarta, Indonesia

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ABSTRACT

Non-communicable diseases such as hypertension and diabetes mellitus are major public health challenges in Indonesia. Mobile health applications can support preventive behaviors by improving access to health education, self-monitoring, and behavior tracking. SI-TELUR PETIS is an Indonesian telenursing application developed to facilitate user engagement in preventive actions for hypertension and diabetes. This cross-sectional study examined factors associated with self-reported user acceptance and perceived usefulness of SI-TELUR PETIS. A total of 109 participants aged 15–59 years in Yogyakarta, Indonesia, were recruited using purposive sampling. Data were collected using a 33-item validated questionnaire adapted from the Unified Theory of Acceptance and Use of Technology (UTAUT), measuring predisposing, enabling, reinforcing, system quality, safety, satisfaction, and application use factors. Spearman rank correlation showed significant associations between employment status, enabling factors, system quality, safety, and satisfaction with self-reported user acceptance and perceived usefulness ($p < 0.05$). Multiple linear regression indicated that satisfaction, safety, and system quality were significant predictors, with variance inflation factors (VIF) below 3. These results highlight that user-centered design, perceived privacy, reliable system performance, and clear content are key to supporting engagement with telenursing applications. Due to the cross-sectional design, purposive sampling, and predominance of female respondents (97.2% female, 81.7% housewives), findings indicate associations rather than causal effects. Future longitudinal studies with more diverse participants and objective health measures are recommended.

Corresponding Author:
Mei Rianita Elfrida Sinaga
Bethesda Yakkum Yogyakarta School of Health Sciences
Email: mei@stikesbethesda.ac.id

1. INTRODUCTION

Hypertension and diabetes mellitus are two of the most prevalent non-communicable diseases (NCDs), responsible for nearly 70% of global deaths [1]. It is necessary to use health technology to support one of the SDGs goals in ensuring a healthy life and encouraging welfare for all age groups, especially the productive age through promotive and preventive efforts against the increase in non-communicable diseases [2]. The double burden faced by Indonesia cause serious problems due to the increasing prevalence of infectious and non-communicable diseases. In low- and middle-income countries (LMICs), including Indonesia, NCDs present significant health and economic burdens. Yogyakarta Province is among the regions with the highest prevalence of hypertension and diabetes mellitus [3], [4]. Data from the Yogyakarta city Health Office recorded DIY in fourth place as a province with high cases of Hypertension followed by Diabetes mellitus, as well as being the fourth with the highest prevalence of positive confirmed cases of COVID-19 in Indonesia [5], [6].

Health information technology is defined by the American Medical Informatics Association (AMIA) as the application of computer and information science and biomedical science principles to facilitate acquisition, processing, interpretation, enhanced use, and communication of health-related data, focusing on the patient and care process to enhance service quality and efficiency [7]. In nursing, information technology refers to computer-based systems that assist in managing and processing information to support healthcare services, including patient information management, clinical planning and delivery, education for patients and staff, clinical research, and service support such as diagnostics, therapy, and administration [8].

The use of telenursing applications can enhance access to healthcare services, facilitate remote monitoring of health status, reduce healthcare costs, expand coverage, overcome workforce shortages, shorten travel and wait times, and provide opportunities for health education [9], [10]. Systematic reviews indicate that digital interventions are associated with improved user engagement in chronic disease management, including hypertension and diabetes mellitus [11]. Digital health solutions, including mobile health (mHealth) and telenursing, are recognized as tools to promote user acceptance and perceived usefulness, supporting self-management and preventive behaviors [12], [13]. However, most studies focus primarily on usability and validation rather than the determinants of user acceptance and perceived usefulness in real-world settings[14],

Although previous studies have documented the usability of mHealth applications, evidence regarding factors associated with user acceptance and perceived usefulness in chronic disease prevention remains limited. SI-TELUR PETIS has previously been validated as a telenursing application with high usability scores[16]. However, little is known about how internal factors such as predisposing, enabling, and reinforcing factors, as well as external factors such as system quality, safety, and satisfaction, are associated with its self-reported use, user acceptance, and perceived usefulness in supporting hypertension and diabetes mellitus preventive actions. This study therefore aimed to examine factors associated with self-reported user acceptance and perceived usefulness of SI-TELUR PETIS among working-age users in Yogyakarta, Indonesia.

2. RESEARCH METHOD

2.1 Research Design

This study employed a quantitative cross-sectional design using an anonymous self-administered questionnaire to examine factors associated with self-reported user acceptance and perceived usefulness of the SI-TELUR PETIS application at a single point in time. The design ensured no identifiable personal information was collected, maintaining confidentiality and data integrity.

2.2 Setting and Samples

The study was conducted in Yogyakarta, Indonesia, from August 2022 to October 2024. The target population included individuals aged 15–59 years who were potential users of SI-TELUR PETIS. A total of 109 participants were recruited through purposive sampling in community settings where female respondents and housewives predominated (97.2% female, 81.7% housewives). The study sample was predominantly female (97.2%) and housewives (81.7%) because recruitment occurred in community settings where these demographics were highly represented. This demographic composition limits generalizability to the broader working-age population, and findings should primarily reflect female community participants.

a. Inclusion criteria: Age 15–59, access to an Android smartphone, ability to read and write, voluntary consent.

b. Exclusion criteria: Inability to attend scheduled data collection due to illness, urgent personal matters, or other unavoidable circumstances.

Recruitment Procedures:

a. Participants were invited to village meeting halls.

b. The research team introduced SI-TELUR PETIS using a standardized explanation.

c. Participants interacted with the application for at least one week prior to completing the questionnaire to ensure adequate exposure.

d. Only technical guidance was provided during questionnaire completion; no influence on responses was given.

Sample Size and Representation:

a. No formal sample size calculation was conducted; the sample size reflects available eligible participants.

b. Statistical power limitations and potential biases due to purposive sampling are explicitly acknowledged.

Rationale for High R^2 in Regression:

a. The relatively homogeneous sample and self-reported measures may contribute to a high proportion of variance explained ($R^2 = 0.872$).

b. Overlap among constructs (satisfaction, system quality, safety, user acceptance, perceived usefulness) and reliance on self-report data can inflate explained variance.

c. Although VIF values < 3 indicate no problematic multicollinearity, the high R^2 should be interpreted considering these methodological factors, acknowledging potential common-method bias.

2.3 Measurement and Data Collection

Data were collected using a structured 33-item self-administered questionnaire adapted from validated UTAUT-based instruments. Constructs included:

a. Internal factors: Predisposing (prior knowledge, attitudes, readiness), Enabling (availability of resources such as smartphone, internet, device capacity, guidance), Reinforcing (support from health workers, family, peers)

b. External factors: System quality (ease of access, clarity, reliability, navigability), Safety (perceived privacy, confidentiality, security), Satisfaction (overall satisfaction with content, usability, perceived benefit)

c. Outcome: Self-reported user acceptance and perceived usefulness, measured on a 5-point Likert scale (higher scores indicate more favorable perceptions).

Prior to main data collection, the questionnaire underwent pilot testing with 30 respondents. Item-total correlation ($r \geq 0.361$) confirmed construct validity; Cronbach's $alpha = 0.957$ indicated high internal consistency.

2.4 Data Analysis

Descriptive statistics summarized demographic characteristics and factor scores. Normality was assessed using the Kolmogorov-Smirnov test. Spearman rank correlation was used due to non-normal distribution, examining associations between demographic/internal/external factors and self-reported user acceptance and perceived usefulness. Multiple linear regression was applied to identify significant predictors. Justification: although outcomes were ordinal Likert-scale scores, previous literature supports treating summed scores as approximately continuous for regression when assumptions are met. Regression assumptions (linearity, independence, homoscedasticity) were verified. $P < 0.05$ was considered statistically significant.

2.5 Ethical Considerations

The study received approval from the Research Ethics Committee of Sekolah Tinggi Ilmu Kesehatan Bethesda Yakkum Yogyakarta, Indonesia (No.136/KEPK.02.02/VII/2022). Written informed consent was obtained from all participants and, for respondents under 18, from their parents or legal guardians. Respondents were fully briefed on study objectives, procedures, anticipated benefits, and their right to withdraw at any time. Continuous guidance ensured accurate and informed participation throughout the study.

Table 1: Demographic Characteristics of the Respondents

Demographic Characteristics	f	%
Age (years)		
12–16	0	0.0
17–25	22	20.2
26–35	49	45.0
36–45	38	34.9
46–55	0	0.0
56–65	0	0.0
Gender		
Female	106	97.2
Male	3	2.8
Marital Status		
Married	84	77.1
Single	17	15.6
Widow/Widower	8	7.3
Education Level		
No Schooling	0	0.0
Elementary School	0	0.0
Junior High School	17	15.6
Senior High School	77	70.6
Graduate and Above	15	13.8
Employment Status		
Housewife	89	81.7
Self-employed	15	13.8
Student	5	4.6

3. RESULT AND ANALYSIS

3.1 Demographic characteristics of the respondents

Table 1 shows that the majority of respondents were aged 26 to 35 years old (45%), female (97.2%), married (77.1%), senior high school (70.6%), and housewife (81.7%).

3.2 Overview of internal and external factors in use of application "SI-TELUR PETIS"

Table 2 shows that the effectiveness of the use of applications can be seen from internal and external factors. Enabling factors have the highest score of internal factors in the effectiveness of the use of the application, while the quality of system has the highest score of external factors in the user acceptance.

Table 2: Mean Scores of Internal and External Factors in Relation to Self-Reported User Acceptance and Perceived Usefulness

Variables	Mean (SD)
Internal Factors	
Predisposing	15.79 (1.86)
Enabling	18.85 (2.38)
Reinforcing	6.47 (0.80)
External Factors	
System Quality	36.29 (4.01)
Safety	12.94 (1.51)
Satisfaction	18.77 (1.71)
Application Usage	13.37 (6.78)

Note: Enabling factors had the highest mean score among internal factors, whereas system quality showed the highest mean score among external factors.

3.3 Factors related to the effectiveness of the use application "SI-TELUR PETIS"

Table 3 presents variables associated with SI-TELUR PETIS use. Employment status, enabling factors, system quality, safety, and satisfaction showed statistically significant associations with application use ($p < 0.05$). Age, gender, marital status, education level, income, predisposing factors, and reinforcing factors were not significantly associated with application use. Spearman rank correlation examined associations between participant

characteristics, internal/external factors, and self-reported user acceptance

Table 3: Factors Related to Self-Reported User Acceptance and Perceived Usefulness

Variables	r	**p-value**
Age	0.024	0.805
Gender	-0.181	0.060
Marital Status	0.118	0.220
Education Level	-0.103	0.288
Employment Status	-0.195	0.042*
Income	0.127	0.187
Predisposing	-0.024	0.801
Enabling	0.714	0.001*
Reinforcing	-0.077	0.424
System Quality	0.769	0.001*
Safety	0.802	0.001*
Satisfaction	0.914	0.001*

Note: $^*p < 0.05$ indicates statistical significance. All correlations are reported in relation to self-reported user acceptance and perceived usefulness.

3.4 Dominant Factors Related to Self-Reported User Acceptance and Perceived Usefulness

Multiple linear regression indicated that satisfaction, safety, and system quality were significant predictors of self-reported user acceptance and perceived usefulness of SI-TELUR PETIS. The model explained $R^2 = 0.872$ of the variances. The unusually high R^2 may be due to the relatively homogeneous sample and self-reported measures. Variance Inflation Factor (VIF) values below 3 indicate no serious multicollinearity. Results should be interpreted as associations rather than causal effects; predictors such as satisfaction, safety, and system quality are significant correlates, not evidence of causation.

Table 4: Dominant Factors Related to Self-Reported User Acceptance and Perceived Usefulness

Variable	**B**	β	**p-value**	**VIF**
Employment Status	-0.020	-0.027	0.497	1.1
Enabling	0.046	0.070	0.314	1.4
System Quality	**0.138**	**0.229**	**0.011***	2.1
Safety	**0.192**	**0.616**	**0.002***	2.6
Satisfaction	**0.645**	**0.867**	< 0.001*	2.7

Note: Outcome measured as self-reported user acceptance and perceived usefulness. Significant predictors are shown in bold. $^*p < 0.05$. Variance inflation factor (VIF) values below 5 indicate the absence of problematic multicollinearity.

Note: Outcome measured as self-reported user acceptance and perceived usefulness. $^*p < 0.05$ indicates statistical significance. Variance inflation factor (VIF) values below 5 indicate the absence of problematic multicollinearity.

Model Fit: $R^2 = 0.872, F = 52.36, p < 0.001$
Interpretation: Satisfaction, safety, and system quality were significant predictors of self-reported user acceptance and perceived usefulness.
Multicollinearity: VIF values < 3 for all predictors, indicating no problematic collinearity.

Note: Outcome measured as self-reported engagement; not objective clinical outcomes. Regression diagnostics confirm assumptions of linearity, independence, and homoscedasticity.

3.5 Analysis

This study aimed to identify factors influencing self-reported user acceptance and perceived usefulness of the Si-Telur Petis telenursing application in supporting preventive actions for hypertension and diabetes. The majority of respondents were aged 26–35, representing early adulthood, a developmental stage characterized by high productivity, independence, strong work ethic, attention to spirituality, and future-oriented perspectives. [17], [18]. Previous research indicated that ease of use was significantly associated with the willingness to use applications, whereas respondent characteristics did not significantly influence usage [19].

Satisfaction, perceived safety, and system quality were the strongest predictors of self-reported user acceptance and perceived usefulness. Internal factors, such as enabling resources (internet access, device capacity, user guides), supported adoption, while external factors including system quality, clarity of content, trustworthiness, and overall satisfaction reinforced acceptance [16], [20], [21].

The SI-TELUR PETIS application incorporates a questionnaire assessing user knowledge, health education content, and a daily diary for preventive behaviors. Personalization, reminders, and user-friendly design elements, emphasized in prior studies, align with the observed influence on user acceptance and engagement [12], [22]. Globally, system quality and data security are critical for digital health adoption, particularly in LMICs where digital literacy and privacy concerns pose barriers [23], [24], [13]. The use of web-based applications during the COVID-19 pandemic further illustrates the importance of accessibility and safety for preventive health actions [25], [20], [26].

Barriers such as limited infrastructure, inconsistent connectivity, financial constraints, and organizational factors affect adoption and equitable access [21], [23], [27]. Provider commitment, continuous training, leadership practices, and transparency in information delivery enhance successful implementation. Security features, including anonymized check-in/out, are crucial for maintaining confidentiality and user trust [24]. Demographic variables (age, education, income) were not significant predictors, emphasizing the primacy of usability and design over participant characteristics [15].

This study has several limitations. Purposive sampling and the predominance of female respondents (97.2% female, 81.7% housewives) limit generalizability. Self-reported outcomes may introduce common-method bias, and the cross-sectional design precludes causal inference. Sample size was not formally calculated. Findings underscore the importance of user-centered design, clear content, reliable system performance, and perceived privacy. Future studies should employ probability sampling, include more diverse participants, and utilize longitudinal or experimental designs to evaluate actual behavioral and clinical outcomes [16], [25], [26].

4. CONCLUSION

This cross-sectional study found that user satisfaction, perceived safety, and system quality are key factors associated with self-reported user acceptance and perceived usefulness of SI-TELUR PETIS in supporting preventive actions for hypertension and diabetes. Findings indicate that internal enabling resources, such as internet access, device capacity, and user guides, as well as external factors like system reliability, content clarity, and perceived privacy, play crucial roles in promoting engagement and adoption. Due to purposive sampling, predominance of female participants (97.2% female, 81.7% housewives), and reliance on self-reported outcomes, results should be interpreted as associations rather than causal effects. No formal sample size calculation was conducted, which may limit statistical power. Implications highlight the importance of user-centered design, clear and trustworthy content, reliable system performance, and privacy considerations in telenursing-based mHealth applications. Addressing barriers such as digital literacy, infrastructure limitations, and security concerns is critical for equitable adoption in LMICs.

Future studies should employ probability sampling, include more demographically diverse participants, and utilize longitudinal or experimental designs to evaluate actual behavioral and clinical outcomes. Such approaches will provide stronger evidence for the impact of SI-TELUR PETIS on preventive health behaviors. Overall, this study contributes insights into the factors influencing self-reported user acceptance and perceived usefulness in mHealth interventions, supporting the design and implementation of culturally adapted and locally validated digital health solutions in low- and middle-income settings.

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