USEFULNESS AND EASE OF USE OF THE SICARE APLLICATION AS AN EDUCATIONAL MEDIA ABOUT CHRONIC ENERGY DEFICIENCY

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ABSTRACT

Background: SICARE is an application developed as a heatlh education tool to inclease knowledge about Chronic Energy Deficiency (CED). However, the extent of its perceived usefulness and ease of use among high school students remains unknown. his study aims to describe the perceived usefulness and ease of use of the SICARE application in enhancing knowledge about CED among high school students. **Methods:** This research is a descriptive quantitative study with a cross-sectional design, conducted from November 2023 to January 2024. The sample consisted of high school students who used the SICARE application as an educational media on CED, selected through consecutive sampling. Data were collected using the *Technology Acceptance Model* (TAM) questionnaire, which included components of *Perceived Ease of Use* (PEOU) and *Perceived Usefulness* (PU). Data were analyzed using univariate analysis. **Results:** The findings show that the SICARE application was well-received by students and perceived as both useful and easy to use for health education, particularly regarding CED. **Conclusions:** The SICARE application was perceived as easy to use and beneficial by the majority of respondents. These findings suggest that mobile-based health education tools can effectively support knowledge improvement on Chronic Energy Deficiency (CED) among adolescents.

Keywords: Chronic Energy Deficiency, E-Health, Perceived Ease Of Use, Perceived Usevulness, Smartphone

Introduction

The World Health Organization (WHO) reports that approximately 462 million people worldwide are underweight. In 2020 alone, 45 million individuals were classified as wasted, primarily due to chronic malnutrition (WHO, 2021). In Indonesia, the 2018 Basic Health Research (Riskesdas) revealed that the prevalence of Chronic Energy Deficiency (CED) among women aged 15–49 years was 17.3% in pregnant women and 14.5% in non-pregnant women. Alarmingly, the highest-risk group was adolescent girls aged 15–19 years, with a prevalence of 36.6%, indicating a critical need for targeted interventions at this age group.

The high prevalence of CED among adolescent girls is influenced by various internal and external factors. Internal factors include nutritional status,

infectious diseases, food intake, and body mass index (BMI), while external factors encompass environmental conditions, family income, access to healthcare, education level, knowledge, and attitudes (Darmasetya, 2020; Fakhriyah et al., 2022). Among these, inadequate awareness and knowledge about CED remain central issues. Knowledge plays a vital role in shaping health behavior, and health education has long been recognized as a strategic intervention to promote healthy practices (Induniasih & Ratna, 2017; Sitoayu et al., 2023).

As adolescents increasingly engage with digital technologies, there is growing potential to deliver health education through innovative media. Devices like smartphones are especially favored by this demographic due to their portability, accessibility, and integration into daily life (Sudiarto et al., 2019; Suryani et al., 2018). In the context of the Fourth Industrial Revolution, digital health interventions—such as eHealth and mHealth—are rapidly evolving, providing new avenues to improve health outcomes through mobile applications (Nutbeam, 2021). A meta-analysis by Fedele et al. (2017) supports the effectiveness of mobile health (mHealth) technologies in enhancing adolescents' health knowledge and behaviors.

Despite these advancements, limited studies have specifically examined the effectiveness of mobile applications like SICARE in the context of adolescent girls, particularly within the local Indonesian setting. Existing literature often focuses on general populations or different health topics, leaving a gap in understanding how digital interventions impact nutritional knowledge and health behaviors among adolescent females, who are at highest risk of CED. Furthermore, research evaluating user perceptions of usefulness and ease of use which are critical determinants of digital adoption and sustained engagement—is still lacking for locally developed tools like SICARE.
Therefore, this study aims to assess the perceived usefulness and ease of use of the SICARE application in enhancing knowledge about Chronic Energy Deficiency among high school students. Findings from this research are expected to fill the current gap by providing insight into the user experience and potential of mobile-based health education tools tailored to the needs of Indonesian adolescents.

Methods

This study employed a quantitative descriptive design focusing on the usability and user satisfaction of the SICARE application among adolescent girls.

The research was conducted at MAN 3 Kalibawang from November 2023 to January 2024. A total of 59 female students in grades 10 and 11 participated in the study. Inclusion criteria included willingness to participate, possession of a smartphone, and stable internet access.

Participants were given access to download the SICARE application via the Google Play Store and received guidance on its use. The application includes educational content related to Chronic

Energy Deficiency (CED), a chat feature enabling direct contact with the researcher via WhatsApp, and a built-in questionnaire linked to Google Forms for completing the research instrument.

The questionnaire assessing Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) was distributed during the second week of use. The instrument was adapted from the Technology Acceptance Model (TAM) by Davis (1989), as modified by Handayani, Hapsari, and Widyandana (2017). PEOU was assessed using 11 open-ended items (7 unfavorable, 4 favorable), while PU was measured using 11 items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Data were analyzed by calculating mean, median, minimum, and maximum scores for each domain. Scores were also converted to percentages by dividing by the maximum possible score and multiplying by 100%.

Instrument validity was based on previous research by Handayani et al. (2017), where Pearson's product-moment correlations for PEOU ranged from 0.325 to 0.635 and for PU from 0.366 to 0.677—both exceeding the critical value (r = 0.227). Reliability testing using Cronbach's alpha resulted in values of 0.687 for PEOU and 0.774 for PU, indicating acceptable internal consistency.
Content validity and feasibility were assessed by three expert reviewers with Master's-level qualifications in nursing. Aiken's V values ranged from 0.667 to 1.000, confirming content validity. Application feasibility was evaluated using an alpha testing questionnaire with a 5-point Likert scale, resulting in a usability score of 74.45, categorizing the SICARE application as suitable for use.
The study received ethical approval from the Health Research Ethics Committee (KE/FK/1198/EC/2023).

Results

The characteristics of respondents in this study include age, father's education, mother's education, economy, experience, information/mass media (Table 1). This study shows that most respondents are aged 15-17 years and have never had experience in obtaining information about chronic energy deficiency. The results of the descriptive analysis of the study related to the usefulness and ease of use are presented in Table 2. Table 2 shows that the SICARE application is easy to use as an educational medium about chronic energy deficiency. The results of the descriptive analysis related to the usefulness of the SICARE application are presented in Table 3. Table 3 shows that most respondents stated that the SICARE application is useful as a health education medium related to chronic energy deficiency.

Tabel 1. Respondent Characteristics (n=59)

Variables		N	%
Age	11 – 14	0	0,0%
	15 – 17	59	100%
	18 – 21	0	0,0%
Father's education	Elementary school	13	22,0%

	Junior high school	20	33,9%
	Senior high school	23	39,0%
	College	3	5,1%
Mother's education	Elementary school	18	30,5%
	Junior high school	22	37,3%
	Senior high school	18	30,5%
	College	1	1,7%
Economy	≤ 1.900.000	41	69,5%
	≥1.900.000	18	30,5%
Experience of attending health education on CED	Ever attended	12	20,3%
	Never attended	47	79,7%
Information/ Mass media containing CED	Never been expose	47	79,7%
	Media cetak	0	0,0%
	Internet	8	13,6%
	Petugas kesehatan	4	6,8%
	Others	0	0,0%

Tabel 2. Perceived ease of use (PEOU) of SICARE as a health education medium about chronic energy deficiency

Ease of Use/PEOU	Description		
	N	%	Median (Min-Max)
Easy	51	86,4 %	41,00 (31-55)
Not Easy	8	13,6 %	
Total	59	100%	

Tabel 3. The perceived usefulness (PU) of the SICARE application as a health education medium about chronic energy deficiency

Perceived Usefulness/PU	Description		
	N	%	Median (Min-Max)
Useful	48	81,4 %	43,00 (31-55)
Not Useful	11	18,6 %	
Total	59	100%	

Discussion

This study obtained an average Perceived Ease of Use (PEOU) score of 41.42, indicating that the majority of respondents (86.9%) considered the SICARE application easy to use as a health education tool for Chronic Energy Deficiency (CED). The key indicators of PEOU include simplicity of operation, ease of learning, clarity and comprehensibility, controllability, and flexibility. PEOU refers to the perception that information technology is easy to learn, understand, and operate (Lismidiati et al., 2022). These findings are consistent with the study by Aini and Sigit (2023), which reported that the Android-based Pojok Kampung application significantly influenced users' perceived ease of use. In this context, PEOU is defined as the degree to which a person believes that using a particular system would be free of effort or require only minimal effort, thereby facilitating user decision-making.

Beyond the quantitative results, these findings suggest that the design features of SICARE such as user-friendly navigation, concise educational materials, mobile responsiveness, and the integration of direct communication through WhatsApp contributed significantly to the positive user perceptions. The inclusion of a built-in questionnaire also gave users a sense of structure and interactivity, which may have enhanced engagement and perceived control.

However, while the majority of users reported ease of use, this study did not deeply analyze open-ended feedback, leaving potential usability issues such as

app stability, digital literacy gaps, or internet-related constraints largely unexplored. To better understand and improve user experience, future research should incorporate a qualitative component or real-time usability testing to identify barriers and optimize features for broader user demographics, including those with limited digital skills.

In terms of Perceived Usefulness (PU), this study recorded an average score of 43.00, with 81.4% of respondents agreeing that SICARE was beneficial as a health education tool. These results reinforce the findings of Aini and Sigit (2023), who observed a similar effect in the Pojok Kampung application. Other studies also support this, such as Lismidiati et al. (2022), who found that the Smart-HPV application was considered useful by respondents due to its credible, accessible, and well-organized information. Similarly, the E-Posyandu system was found to be useful by community health volunteers (Aini & Sigit, 2023).

The high PU score in this study may reflect the fact that the SICARE app was easily accessible via smartphones, with content that could be reviewed multiple times. These features enable flexible learning and are particularly advantageous in school settings, where time and access to health professionals are often limited. This reinforces the practical potential of mobile-based health education tools in supporting school health programs, especially for essential topics like adolescent nutrition and CED prevention.

From an implementation perspective, SICARE holds promise as a complementary learning tool for health promotion among adolescents.

Conclusion

The study findings indicate that the SICARE application achieved high levels of both Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) among respondents. A total of 86.9% agreed that the application was easy to use, supported by indicators such as operational simplicity, clarity, and flexibility. Additionally, 81.4% of respondents perceived the application as useful for health education on Chronic Energy Deficiency (CED). These results align with previous studies, suggesting that mobile-based health education tools like SICARE can significantly enhance accessibility and effectiveness in delivering health information to adolescents.

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