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Enhancing Public Understanding of Self-Medication through The Android-Based "E-Farmasi" Application at Alif Pharmacy, Sidrap Regency

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ABSTRACT

Self-medication is defined as the practice of treating minor ailments without a doctor's prescription, which, if not carried out properly, may pose significant health risks. A lack of understanding regarding the appropriate use of medicines remains a major challenge in self-medication practices. This study aims to analyze the effect of utilizing the Android-based "E-Farmasi" application on public understanding of self-medication, implemented at Alif Pharmacy, Sidrap Regency. The research employed a quantitative approach with a quasi-experimental method, using a pretest–posttest design involving 53 respondents who met the inclusion and exclusion criteria. The results demonstrated that the mean understanding scores of respondents before and after the intervention were 7.00±0.94 and 9.21±0.99, respectively, with a p-value of 0.000 < 0.05 based on the Wilcoxon Signed Rank Test. These findings indicate a significant effect on respondents' understanding of independent medication use after utilizing the application. The educational and interactive features of "E-Farmasi" proved effective in providing accurate and easily accessible information regarding drug types, dosages, and side effects. This study recommends further development of the application as a practical and modern public health education strategy, with future research conducted across multiple pharmacies.

Keywords: *Android Application, E-Farmasi, Self-Medication*

INTRODUCTION

Self-medication is a common practice among the general population, undertaken to manage symptoms or illnesses without prior consultation with a healthcare professional (Madania et al., 2021). This practice is generally applied in the management of minor ailments such as influenza, headache, cough, digestive complaints, mild pain, and other minor health conditions (Hadiq et al., 2024). In most developing countries, self-medication is predominantly performed for minor health problems, as it represents a low-cost, convenient, and time-efficient alternative to formal healthcare services (Susilo & Meinisasti, 2022). The practice of self-medication is closely associated with the utilization of over-the-counter (OTC) medicines for minor ailments (Sitindaon, 2020). Medications used in self-medication include all categories of drugs that can be dispensed without a medical prescription, such as OTC medicines, limited OTC medicines, pharmacy-only medicines (OWA), and traditional medicines (TR) (Ilmi et al., 2021).

With the increasing accessibility of health-related information in developing countries, the prevalence of self-medication has shown a marked rise (Susilo & Meinisasti, 2022). A previous study reported that 84.1% of respondents engaged in self-medication, with non-prescription drugs obtained from pharmacies being the most frequently used (50.5%) (Susilo & Meinisasti, 2022). In Indonesia, the prevalence of self-medication remains considerably high. Data from the 2018 Basic Health Research (Riskesdas) indicated that approximately 89.1% of Indonesians had practiced self-medication within the past month. Nevertheless,

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public understanding regarding the rational and safe use of medicines remains suboptimal, particularly in rural areas (Balitbangkes, 2018). Many individuals lack adequate knowledge concerning dosage regimens, potential adverse effects, and drug–drug interactions, which may pose serious health risks if medications are used inappropriately. Sidenreng Rappang Regency (Sidrap), a district in South Sulawesi, faces similar challenges. Access to accurate and educational drug-related information remains limited, and health promotion activities conducted by pharmacists have not yet reached all segments of the community.

Along with the advancement of digital technology, Android-based applications have the potential to serve as effective health education media. Mobile applications can enhance public access to valid health information, including safe self-medication practices (Moorhead et al., 2013). However, in the current era of modernization, there remain few digital applications that integrate multiple self-medication information platforms within a single application. As demonstrated by Puteri (2018) and Fitrah et al. (2023), their studies focused on the development of applications in the field of pharmaceutical supply management, particularly related to drug sales and drug storage (Ilahi et al., 2023; Noviandhiny, 2018). The “E-Farmasi” application was developed as an information technology innovation incorporating various features such as drug information, self-medication guidelines, and pharmacist consultation. The advantages of this application lie in its accessibility, interactivity, and its capacity to deliver continuous education.

One of the most significant developments in recent years within the field of pharmaceutical services has been the integration of telepharmacy in community pharmacies. Telepharmacy services generally encompass a broad range of health-related activities, including support for safe self-medication. Alif Pharmacy in Sidrap Regency represents one of the pioneering facilities in implementing information technology as a means to improve public literacy on drug use. The implementation of the “E-Pharmacy” application is anticipated to promote more rational and responsible self-medication practices. Therefore, it is essential to evaluate the effectiveness of the “E-Pharmacy” application in enhancing community knowledge of self-medication, thereby providing a foundation for the development of technology-based intervention models in community pharmacy practice.

MATERIALS AND METHODS

Equipment and Materials

The instruments used in this study consisted of the Android-based “E-Farmasi” application and a structured questionnaire designed to measure patients’ level of understanding regarding self-medication. “E-Farmasi” is an Android-based application developed as a tool to support self-medication by facilitating public access to information on self-care practices, minor illnesses, and medications commonly used in self-medication. The questionnaire comprised demographic data and ten items assessing respondents’ understanding of self-medication before and after using the “E-Farmasi” application. Demographic data included age, educational background, and occupation. The ten questions were adapted to evaluate knowledge related to self-medication, types of illnesses and medications suitable for self-treatment, as well as aspects of obtaining, using, storing, and disposing of medicines. These included considerations when acquiring medicines, recognition of symbols and logos on packaging, instructions for appropriate use, and proper methods of storage and disposal. The questionnaire had undergone prior validity and reliability testing.

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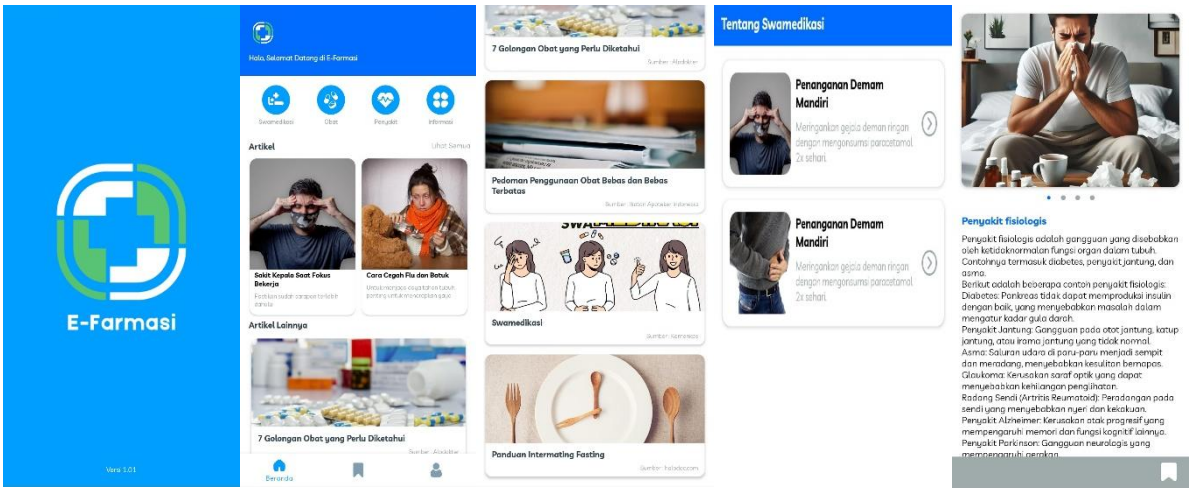

Methods

The research design employed was quasi-experimental, conducted without a control group due to practical and ethical constraints. Moreover, the primary aim of this study was not to compare two groups, but rather to assess changes within a single group using a pretest–posttest design (Hallberg et al., 2018). To minimize the influence of external factors and strengthen causal inference, the pretest–posttest assessments were carried out within a relatively short time frame, using valid and reliable measurement instruments (Holgado-Tello et al., 2016; MacIejewski et al., 2013).

The study population comprised individuals visiting Alif Farma Pharmacy to purchase medicines while receiving self-medication services. Samples were selected through purposive sampling, yielding a total of 53 respondents who met the inclusion and exclusion criteria. Inclusion criteria included patients aged ≥17 years who independently visited the pharmacy with minor complaints, seeking self-medication advice for obtaining medicines. Exclusion criteria were patients unwilling to allocate time for the offered intervention or to participate as respondents in this study. The independent variable was the use of the Android-based "E-Farmasi" application, while the dependent variable was the level of understanding of self-medication among community respondents.

Data collection was conducted through questionnaires administered before and after the respondents received the intervention, which introduced the purpose and usage of the Android-based "E-Farmasi" application for self-medication. The intervention provided by the research team consisted of educational sessions covering information on self-medication practices, minor illnesses, and medicines commonly used for self-treatment, along with a detailed introduction to the application. The sessions also explained the objectives, content, and features of the application, as well as instructions on how to utilize it to obtain relevant information regarding safe self-medication for minor health conditions. Prior to statistical testing, data analysis included a normality test to determine the appropriate statistical method for further analysis.

RESULT AND DISCUSSION

Validity and Reliability Assessment

In the present study, the validity and reliability of the instrument were evaluated using 10 modified items designed to assess respondents' understanding of self-medication behavior among a sample of 30 participants. An item was considered valid if its score demonstrated a significant correlation with the corresponding total score (Puspasari & Puspita, 2022). Based

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on the sample size (n = 30), the minimum required correlation coefficient (r) was 0.361. Items with r-values exceeding this threshold were deemed valid. The validity analysis confirmed that all items met the validity criteria.

Subsequently, reliability testing was performed. An instrument with two or more response options per item is regarded as reliable when repeated measurements on the same subjects yield relatively consistent results, or when equivalent instruments produce comparable outcomes (Musdalipah et al., 2018). Reliability was determined using Cronbach's Alpha, with a threshold of > 0.6 indicating acceptable internal consistency. The reliability analysis produced a Cronbach's Alpha value of 0.617, demonstrating that the instrument was reliable and exhibited a satisfactory level of internal consistency.

Respondent Characteristics

The characteristics of the study participants were categorized by age, educational background, and occupational status.

Table 1. Characteristics of Respondents

Characteristics	Frequency (n=53)	Percentage (%)
Age (years)		
26-35	8	15,1
36-45	23	43,4
46-55	17	32,1
> 55	5	9,4
Educational Level		
Primary School	3	5,7
Junior High School	5	9,4
Senior High School/Vocational School	19	35,8
Higher Edugation	26	49,1
Occupation		
Farmer	2	3,8
Private Employee	29	54,7
Housewife	15	28,3
Civil Servant	4	7,5
Retired	3	5,7

The frequency distribution of these variables is presented in Table 1. Among the 53 respondents, the largest proportion fell within the 36–45 years age group, comprising 23 individuals (43.4%). In terms of educational attainment, the majority of respondents had completed higher education, accounting for 26 participants (49.1%). With respect to occupation, most respondents were employed as company staff or workers, totaling 29 individuals (54.7%).

Normality Test

In this study, a normality test was conducted to determine the appropriate statistical method for data analysis. The normality test was performed to assess whether the residual values were normally distributed. The results showed a p-value of $0.00 \leq 0.05$ based on the Kolmogorov–Smirnov test, indicating that the data were not normally distributed. Consequently, a non-parametric test, namely the Wilcoxon Signed Rank Test, was employed for further analysis.

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Wilcoxon Signed Rank Test

The mean understanding score prior to the intervention was 7.00±0.13, whereas the post-intervention score increased to 9.21±0.14 (Table 2).

Table 2. The Wilcoxon Signed Rank Test Result

	N	Mean ± SD	p-value
Pre-Test	53	7,00 ± 0,94	0,000
Post-Test	53	9,21 ± 0,99	

Statistical analysis using a wilcoxon Signed Rank Test revealed a p-value of 0.000 (<0.05). These findings demonstrate a statistically significant difference between the pre-test and post-test mean scores, indicating that the implementation of the Android-based "E-Pharmacy" application effectively enhanced patients' comprehension of self-medication behavior patterns.

Discussion

There are three categories of respondent characteristics in this study, namely age, education, and occupation (Table 1). In the age category, it was observed that the majority of patients engaging in self-medication were between 36–45 years old (43.4%). This may be attributed to the fact that the prevalence of most diseases, including pain-related conditions, tends to increase with age. These findings are consistent with the study conducted by Tsamrotul Ilmi et al. (2021), which reported that patients aged ≥30 years constituted a greater proportion of self-medication users compared to those aged <30 years, with a percentage of 67.0% (Ilmi et al., 2021).

In the education category, Table 2 shows that most respondents had a higher education background, accounting for 26 respondents (49.1%). This suggests that the higher the level of education, the better an individual's ability to perform self-medication appropriately. Similar findings were reported by Marisa et al. (2022), who found that the majority of respondents practicing self-medication were those with a higher education background, totaling 176 respondents (53.0%). Individuals with higher educational attainment are generally better equipped to recognize disease symptoms and select appropriate medications based on information from advertisements, drug leaflets, or explanations provided by pharmacists (Mandala et al., 2022).

In terms of occupation, the majority of respondents were employees, comprising 29 respondents (54.7%). This is in line with the study by Yusuf (2024), which revealed that the largest group practicing self-medication were private-sector employees, with 25 respondents (25%) (Yusuf, 2024). Similarly, Tsamrotul Ilmi et al. (2021) reported that the highest proportion of respondents practicing analgesic self-medication were private employees, with 52 respondents (49.1%) (Ilmi et al., 2021). This may be explained by the nature of employment, as employees tend to have greater interaction with the community, thereby gaining more experience, knowledge, and information that shape their decision-making patterns in supporting their health (Putri & Susanto, 2022). Furthermore, the rapid development of digital technology, particularly in accessing health information, has transformed public perceptions and health-seeking behaviors. Notably, 73% of internet users seek health information online, indicating that self-medication practices are becoming increasingly common (Hernowo & Parmini, 2023).

In this study, pretest and posttest assessments were conducted on 53 respondents at Alif Farma Pharmacy, Sidrap Regency. The data were analyzed using the Wilcoxon Signed Rank Test (Table 2). The analysis yielded a p-value of 0.000 < 0.05, indicating a significant

difference in the mean scores between pretest and posttest, suggesting that the use of the Android-based "E-Farmasi" application positively influenced patients' understanding of self-medication practices. However, changes in self-medication behavior cannot be conclusively determined, as this study did not directly evaluate behavioral aspects. This finding is consistent with the literature, which highlights that improvement in understanding is a prerequisite for behavioral change but does not necessarily guarantee its occurrence (Anderson et al., 2008).

Several previous studies have demonstrated the impact of technology on public understanding of self-medication. Technology in this context includes mobile applications, mass media advertising, and the use of online resources for health information seeking. For example, Suryono et al. (2019) reported that the implementation of a Drug Information System improved rationality and skills in self-medication, with average scores increasing from 3.95 to 8.77 on a 0–9 scale after the intervention, as the system provided comprehensive information on symptoms, diseases, and medicines (Suryono et al., 2019).

Similarly, research by Hadi and Destiwati (2024) found that television drug advertisements significantly influenced self-medication practices, particularly in managing flu symptoms (Hadi & Destiwati, 2024). This highlights the effectiveness of advertising as a marketing communication tool for pharmaceutical companies, leveraging technological advancements to achieve its intended purpose. Furthermore, Hernowo and Parmini (2023) revealed a very strong positive correlation between digital information resources and self-medication decision-making. The frequency of health information searches and users' comfort with digital health technologies were identified as key factors shaping self-medication understanding (Hernowo & Parmini, 2023).

CONCLUSION

The Wilcoxon Signed Rank Test yielded a p-value of $0.000 < 0.05$, indicating that the use of the Android-based "E-Farmasi" application at Alif Pharmacy, Sidrap Regency, had a significant effect on improving public understanding of self-medication. This study was limited to analyzing the influence of the application on knowledge enhancement; therefore, further research is needed to examine behavioral patterns following the use of the application, as well as to conduct comparative studies with other health applications employing similar technologies. Moreover, future studies should include long-term evaluations in different settings with larger sample sizes and the inclusion of a control group.

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AUTHOR'S DECLARATION

Author's contributions and responsibilities

Shabran Hadiq designed and conducted the study. Shabran Hadiq and Hasrul prepared and developed the research instruments. Dewi Lidiawati and Reny Anggriany Hakim collected the data. Shabran Hadiq performed the data analysis. Shabran Hadiq, Dewi Lidiawati, and Reny Anggriany Hakim interpreted the findings. Shabran Hadiq drafted the manuscript. All authors read and approved the final version of the manuscript.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

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