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Research Article

UTILIZATION OF TELEMEDICINE AMONG UNDERGRADUATE STUDENTS AT THE FACULTY OF PUBLIC HEALTH, ANDALAS UNIVERSITY IN PADANG

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ABSTRACT

Background: Telemedicine is one of the health technology innovations that has rapidly developed during the COVID-19 pandemic. Due to physical limitations imposed by health protocols, telemedicine has become an essential alternative to maintain the continuity of healthcare services. This study aims to identify the factors influencing the use of telemedicine services and to examine the relationship between student characteristics and the utilization of telemedicine.
Methods: A cross-sectional survey method was used, targeting students who use teleconsultation applications, with a total of 105 respondents in 2025. The sampling technique used was proportionate random sampling to obtain a representative sample from each department based on population size. Variables examined in this study included respondent characteristics such as gender, academic program, menstrual status, telemedicine usage, and types of services used.
Results: The results showed that 15.2% of students actively used telemedicine services, while 84.4% had never used them. Of those who used telemedicine, 81.25% used it for registration services and 75% for counseling. Active users were mostly female public health students who had experienced menstruation. Statistical tests showed no significant relationship between gender and telemedicine use (p-value = 0.163), nor between study program and service use (p-value = 0.195). However, there was a significant relationship between menstrual status and telemedicine use (p-value = 0.001).
Conclusion: This study provides important input for the development of sustainable digital health services in Indonesia, especially among university students.

Keywords: *telemedicine, public health, student, digital health services, post-pandemic, Health care, access*

INTRODUCTION

The development of information and communication technology has brought about a major revolution in various sectors of life, including healthcare services. Telemedicine, which refers to remote medical services using digital technology, has become an integral part of modern health systems. Particularly during the COVID-19 pandemic, telemedicine played a crucial role in ensuring continuous access to healthcare services by reducing physical contact and the risk of virus transmission (1).

The global pandemic that began in early 2020 forced healthcare systems to adapt rapidly. Restrictions on mobility and infection risks in healthcare facilities led the public to shift to telemedicine services for consultations, treatment, and follow-up care (2).

The Ministry of Health encouraged all healthcare facilities to utilize and develop telemedicine services. The Ministry has launched both mobile and web-based applications to increase public access to teleconsultation services, including apps such as SehatPedia, Sisture, and Telemedicine (3).

The Ministry of Health collaborated with the Indonesian Telemedicine Alliance (ATENSI) to promote the use of telemedicine services. These services helped minimize visits to healthcare facilities, thus making self-isolation and physical distancing more effective (4). There are twelve digital companies involved, including DokterSehat, Alodokter, Halodoc, SehatQ, KlikDokter, Good Doctor Technology Indonesia, ProSehat, Link Medis Sehat, Klinikgo, Perawatku.id, Aveecena, and Docquity. The Ministry has also partnered with Gojek and Halodoc, as well as Grab and Good Doctor Indonesia, to provide telemedicine services. These collaborations allow the public to consult on health symptoms and conduct self-assessments for COVID-19 (4).

According to the Ministry of Health Regulation No. 20 of 2019 on the Provision of Telemedicine Services Between Healthcare Facilities, there are several types of telemedicine: teleradiology, tele-electrocardiography, tele-ultrasonography, and teleconsultation (4). In Indonesia, there are numerous teleconsultation platforms such as Alodokter, Halodoc, SehatPedia, JKN Mobile, SehatQ, KlikDokter, Good Doctor, ProSehat, Link Medis Sehat, and services provided directly by hospitals or clinics. According to a survey by Deloitte Indonesia, 10% of Indonesians use health applications (5). Digital health technology is expected to improve healthcare access across Indonesia's 17,504 islands (3).

Halodoc CEO Jonathan Sudharta stated that active users of the Halodoc app increased fourfold after the first COVID-19 case was announced in Indonesia (4). A Deloitte Indonesia survey reported that Alodokter users increased by 1.5 times during the pandemic (4). A study by The Conversation Indonesia involving 22 general practitioners and specialists from various regions revealed that 20 doctors had practiced teleconsultation (7). The JKN Mobile app has also added a consultation feature, enabling users to consult doctors at primary healthcare facilities in accordance with their JKN membership (8).

Research by Kearney compared the performance of top health apps such as Alodokter, Halodoc, and Good Doctor. The study focused on key factors in app usage, finding that all users agreed ease of use, service costs, and diagnostic quality were most relevant. There were significant gaps in four key areas: service cost, diagnostic quality, trusted doctors, and specialized

consultations. Halodoc led in most areas except for specialist consultations, a key feature of Good Doctor (9).

Teleconsultation platforms offer many benefits to users. Reviews on the Play Store indicate that Halodoc consultations help address health complaints, with prompt, friendly, and easy-to-understand responses from doctors—especially valuable for people in remote areas. Alodokter users report helpful and satisfying consultations with complete explanations and responsive service. JKN Mobile users suggested increasing the number of available consulting doctors, especially from hospitals and specialists.

However, some users have raised concerns about the quality of service. Reviews on the Play Store indicate that some Halodoc doctors gave irrelevant or delayed responses and were unfriendly, leading users to become inactive. Alodokter users were annoyed by telemarketing calls offering subscription packages. JKN Mobile users complained about frequent system updates and unstable app performance.

A study by Protásio Lemos da Luz (2019) concluded that a key limitation of teleconsultation is the lack of direct physical examination by doctors, as diagnosis is a layered process that sometimes requires supporting tests. However, the study emphasized that teleconsultation is a complementary service that aids in monitoring patients' health (12). Research by Aashima et al. (2021) highlighted several key patient-perceived benefits of teleconsultation, including saving time and money, comfort, accessibility, and addressing patient concerns and questions. Patients preferred virtual visits over in-person appointments due to fear of COVID-19 infection (11). A study by Alex Fung et al. (2020) in British Columbia stated that telephone and virtual visits were rated highly beneficial, with 72% of participants interested in using telehealth in the future (13).

This sudden transition and increased use of teleconsultation services provide an opportunity to explore its role, user characteristics, platform selection, and user engagement. When a patient selects a platform for consultation, they may leave reviews describing their experiences with care, communication, and follow-up. Research by Power Reviews found that 95% of buyers read ratings and reviews while shopping, and 86% consider reviews critical in making purchase decisions.

Ratings and reviews are essential tools for providers to drive sales, understand customer preferences and dissatisfaction, improve purchasing processes, and ensure user satisfaction (14).

Telemedicine is a rapidly evolving field that supports remote healthcare services. The World Health Organization defines telemedicine as the use of electronic communications to prevent, diagnose, and treat diseases; conduct research and evaluation; and provide education by healthcare providers to improve health outcomes.

It has been proven to increase access to healthcare at all levels, support patient-centered care at lower costs, enhance decision-making efficiency, improve chronic disease management, and promote healthy lifestyles and self-care. Patient outcomes and eligibility for telehealth engagement, as well as provider involvement using telehealth modalities for inpatient and/or outpatient care, are key factors.

However, in the post-pandemic era, as restrictions are lifted and healthcare facilities return to normal operations, important questions arise about the sustainability of

telemedicine. Will patients maintain these habits? Students, as agents of change in health services—especially those in the Faculty of Public Health—are expected to utilize telemedicine to access healthcare in today's digital age.

A survey on the willingness to use telemedicine among pharmacy students in the Yogyakarta Special Region found that knowledge and perception of telemedicine were related to willingness to use it. Therefore, it is recommended that telemedicine education be incorporated into both curricular and extracurricular activities to better prepare students for its use (23).

In light of this, we aim to investigate whether gender, menstrual status, and academic program influence the utilization of this digital health service among undergraduate students at the Faculty of Public Health, Universitas Andalas Padang. The answer to this question is important for policymakers, service providers, and technology developers to optimize future healthcare services.

METHODS

Study Design

This study employed a cross-sectional design. Data were collected at a single point in time from the target population to obtain an overview of telemedicine utilization among students.

Study Location and Time

The study was conducted among students of the Faculty of Public Health, Universitas Andalas in 2025, and was carried out between April and May 2025.

Population and Sample

The study population comprised undergraduate students at the Faculty of Public Health, Universitas Andalas in 2025. Sampling was conducted using the proportionate random sampling technique to obtain a representative sample from each department according to the number of students.

Instruments and Data Collection

Data were collected using a structured questionnaire consisting of three parts:

a. Part 1: Demographic data (age, gender, academic program, menstrual status)
b. Part 2: Patterns of telemedicine utilization
c. Part 3: Types of telemedicine services used

The questionnaire was administered both in person and online, with an estimated completion time of 15–20 minutes. The questionnaire had undergone validity and reliability testing. Prior to filling out the questionnaire, participants gave their consent by completing an informed consent form.

Data Analysis

Data were analyzed using descriptive statistics (frequencies, percentages) and the chi-square test to examine the relationship between variables and the level of telemedicine utilization. The analysis was conducted using R Studio software.

RESULTS

Respondent Characteristics

Out of the 105 students who completed the questionnaire on telemedicine usage, the following demographic data were obtained:

Table 1. Respondent Characteristics

Characteristic	f	%
Age		
16	1	1
17	1	1,9
18	4	3,8
19	26	24,8
20	26	24,8
21	28	26,7
22	15	14,3
23	4	3,8
Gender		
Male	24	22,9
Female	81	77,1
Menstrual Status		
Menstruating	27	33
Not menstruating	54	67
Academic Program		
Nutrition	38	36,2
Public Health	67	63,8

From Table 1, most respondents were between 19 and 21 years old, with the highest number being 21 years old (26.7%). The majority of respondents were female (77.1%) and came from the Public Health program (63.8%).

Table 2. Students Using Telemedicine.

Telemedicine Usage	f	%
Yes	16	15.2
No	89	84.8
Total	105	100.0

From Table 2, it can be seen that 15.2% of students used telemedicine applications to access health services when they were ill.

Table 3. Types of Telemedicine Services Used

Type of Service	Yes	%	No	%
Service Registration	13	81.25	3	18.75
Counseling/Information/Edu.	12	75.00	4	25.00
Clinical Consultation	2	12.50	14	87.50
Telepharmacy/Lab/Radiology	2	12.50	14	87.50

In Table 3, the average student used telemedicine services primarily for registration (81.25%), followed by counseling services (75%).

Relationship Between Gender and Telemedicine Usage

Table 4. Gender and Telemedicine Usage

Telemedicine Usage	Male	Female	p-value
Yes	1	15	
No	23	66	
Total	24	81	0.163

Based on the analysis, there was no statistically significant relationship between gender and telemedicine utilization ($p = 0.163$). This indicates that male and female students did not significantly differ in their use of telemedicine services.

Table 5. Academic Program and Telemedicine Usage

Telemedicine Usage	Nutrition	Public Health	p-value
Yes	3	13	
No	35	54	
Total	38	67	0.195

The analysis revealed no statistically significant relationship between academic

program and telemedicine utilization (p = 0.195). This suggests that students from different programs were equally likely to use telemedicine.

Table 6. Menstrual Status and Telemedicine Usage

Telemedicine Usage	Menstruating	Not menstruating	p-value
Yes	5	0	
No	22	54	
Total	27	54	0.001069

There was a statistically significant relationship between menstrual status and telemedicine usage (p = 0.001). Female students who had already menstruated were more likely to utilize telemedicine services compared to those who had not.

DISCUSION

Telemedicine Utilization

Existing health services greatly influence the degree of quality health (25). The findings of this study indicate that telemedicine remains a selected option for accessing healthcare services. This suggests that telemedicine is not merely a temporary solution but is gradually becoming part of a new behavioral pattern in healthcare access. However, the proportion of students using telemedicine remains relatively low.

Many students still prefer direct, face-to-face consultations with doctors rather than using telemedicine. After the pandemic, hospitals became crowded again, indicating a return to conventional healthcare-seeking behavior.

Relationship Between User Characteristics and Level of Service Utilization

The observed respondent characteristics include gender and academic program. The results show that neither gender nor academic program is significantly associated with telemedicine utilization.

This finding aligns with a study by Bambang (2018), which states that gender may influence treatment-seeking behavior. According to the data, most users of health applications were female. However, other studies suggest that gender does not significantly affect a person's decision to utilize healthcare services, as both men and women have equal rights to access care (17).

However, when viewed from the perspective of menstrual status, biological maturity (indicated by menstruation) appears to influence health service-seeking behavior, including telemedicine use. Female students who have already menstruated are likely to be more aware of reproductive and personal health issues, more active or comfortable seeking health solutions (including digitally), and may have specific needs such as consultations regarding irregular periods or menstrual pain—conditions that can be more easily expressed via remote consultation (24).

The results also show that academic program is not significantly associated with telemedicine usage. This aligns with a study among medical students in the United States, which found that students who had clinical exposure to telemedicine were nearly twice as likely to be interested in using telemedicine in the future, increasing from 17.1% to 32%. However, about two-thirds of surveyed students had not yet decided on their telemedicine plans, and 86.5% of those students had never been exposed to

telemedicine—suggesting that it is difficult to form opinions on topics they have never studied (22).

These results suggest that the more clinical experience medical students have with telemedicine, the more favorable their opinions and the greater their likelihood of future use. This may be due to increased exposure and improved comfort with this advanced technology.

This is also consistent with Bambang's (2018) research, which concluded that education does not necessarily influence healthcare utilization (19). Therefore, there is a need for educational and mentoring approaches to improve digital literacy, especially in groups with low exposure.

CONCLUTION

Telemedicine is still mainly used for registration purposes. This presents a challenge for service providers to develop supporting technologies such as remote monitoring devices and to improve the overall quality of services. These results suggest that the more clinical experience medical students have with telemedicine, the more favorable their opinions and the greater their likelihood of future use. This may be due to increased exposure and improved comfort with this advanced technology.

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