

# User Satisfaction and Challenges in Telemedicine Services during the COVID-19 Pandemic in Indonesia: A Population-Based Analysis

Havivi Rizky Adinda<sup>1)</sup>, Rizma Adlia Syakurah<sup>2)</sup>, Pariyana<sup>3)</sup>

<sup>1)</sup>Medical Education Study Program, Faculty of Medicine, Universitas Sriwijaya, Indonesia

<sup>2)</sup>Public Health Science Study Program, Faculty of Public Health, Universitas Sriwijaya, Indonesia

<sup>3)</sup>Department of Public Health Science, Faculty of Medicine, Universitas Sriwijaya, Indonesia

*Received: September 23, 2023; Accepted: April 03, 2024; Available online: May 16, 2024*

## ABSTRACT

**Background:** COVID-19 pandemic has led to a surge in telemedicine utilization in Indonesia, necessitating increased attention toward user satisfaction and encountering obstacles in telemedicine services. This study aims to analyze the satisfaction and barriers faced by users of telemedicine applications, considering population characteristics during the COVID-19 pandemic in Indonesia.

**Subjects and Method:** Using a descriptive observational design with a cross-sectional approach, the study encompassed the entire population of telemedicine users during the COVID-19 pandemic, with samples adhering to predetermined inclusion and exclusion criteria. Data were collected through Google Forms questionnaires from August 2020 to November 2020. Subsequently, data were subjected to chi-square tests (alternative: Kruskal-Wallis) and logistic regression analyses, with  $p$ -value  $< 0.05$  and 95% confidence interval. User satisfaction with telemedicine was associated with factors such as domicile, settlement, provider, health insurance, and utilized internet network ( $p < 0.05$ ).

**Results:** User satisfaction with telemedicine was associated with factors such as domicile, settlement, provider, health insurance, and utilized internet network ( $p < 0.05$ ). Conversely, barriers encountered in telemedicine exhibited associations with gender, marital status, age, regional origin, residence, education, occupation, health insurance, income, provider type, internet network, and internet quota ( $p < 0.05$ ). A significant correlation was observed between barriers and user satisfaction with telemedicine ( $p < 0.001$ ). The most influential factor affecting satisfaction was income less than Rp 1,500,000 per month (OR 30.818; 95% CI: 1.75 to 542.39), while pay ranging from Rp 3,500,000 to 5,500,000 per month exhibited the most substantial impact on barriers (OR 5.266; 95% CI: 2.326-11.920)

**Conclusion:** The majority of respondents expressed satisfaction and encountered no obstacles when employing telemedicine. Respondents suggested enhancing telemedicine usage by emphasizing the importance of diagnostic accuracy, simplifying processes, maintaining confidentiality, optimizing application features, and improving network speed.

**Keywords:** COVID-19, barriers, satisfaction, telemedicine

### Correspondence:

Rizma Adlia Syakurah. Public Health Sciences, Faculty of Public Health Universitas Sriwijaya. Jl. Raya Palembang-Prabumulih KM. 32 Indralaya, Ogan Ilir, Sumatera Selatan, 30662, Indonesia. Mobile: 0819-4863-001. Email: rizma.syakurah@gmail.com.

### Cite this as:

Adinda HR, Syakurah RA, Pariyana (2024). User Satisfaction and Challenges in Telemedicine Services during the COVID-19 Pandemic in Indonesia: A Population-Based Analysis. Health Policy Manage. 09(02): 237-249. <https://doi.org/10.26911/thejhpm.2024.09.02.09>.



©Havivi Rizky Adinda. Published by Master's Program of Public Health, Universitas Sebelas Maret, Surakarta. This open-access article is distributed under the terms of the [Creative Commons Attribution 4.0 International \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/). Re-use is permitted for any purpose, provided attribution is given to the author and the source is cited.

## BACKGROUND

Since its declaration as a pandemic by the World Health Organization (WHO) in March 2020, telemedicine has gained increasing popularity as a viable solution for addressing the spread of COVID-19 (Ohannessian, Duong, and Odone, 2020). In collaboration with the Ministry of Health and the Indonesian Telemedicine Association (ATENSI), the Indonesian government is actively working towards containing the outbreak and disseminating accurate information regarding COVID-19 to the general public (Aliansi Telemedik Indonesia, 2020). Alongside social restriction policies, the public is encouraged to adhere to preventive measures and minimize non-essential visits to healthcare facilities (Gugus Tugas Percepatan Penanganan COVID-19, 2020) (Aliansi Telemedik Indonesia, 2020).

The utilization of telemedicine in healthcare services is not without limitations when compared to face-to-face consultations. A survey conducted by the Kaiser Family Foundation revealed that elderly individuals aged 65 and above encounter difficulties in accessing electronic devices with internet capabilities. Moreover, elderly patients express concerns regarding data security, struggle with sensitive medical discussions, and generally prefer in-person interactions (Cubanski, 2020). Nonetheless, a considerable number of respondents expressed satisfaction with telemedicine. Approximately 82% of the participants reported being content with the treatment they received through telemedicine and expressed willingness to recommend this service to their family and relatives. Furthermore, respondents expressed comfort and a desire

to use telemedicine again (R Acharya and Rai, 2016; Welch et al., 2017).

The utilization of telemedicine has witnessed a significant surge, with a 600% increase in users by 2020. Telemedicine providers need to anticipate this growth to enhance the quality of their services (Litbangkes Baturaja, no date). Although telemedicine offers comparable service quality, perceived satisfaction and barriers can differ due to the socio-demographic characteristics of service users (Schoenfelder, Klewer and Kugler, 2010; Christasani and Satibi, 2016; Nihayati and Laksmi, 2020; Pratama and Bernarto, 2022). Other factors, such as age, gender, and education, are also identified as obstacles to adopting telemedicine services (Aulia, Budinuryanto and Wismandanu, 2021). Age can influence the lodging of complaints regarding services or products, while gender can affect rights, responsibilities, and social participation. Education plays a significant role in shaping the mindset and behavior of consumers when selecting services (Gusmawan, Haryadi and Sutrisna, 2019), (Wade and Tavis, 2007), (Sumarwan, 2002; Gusmawan, Haryadi and Sutrisna, 2019). Given the substantial increase in telemedicine usage during the COVID-19 pandemic in Indonesia, it is imperative to comprehend the satisfaction levels and constraints users face. Therefore, this study aims to analyze user satisfaction and barriers associated with telemedicine services during the COVID-19 pandemic in Indonesia.

## SUBJECTS AND METHOD

### 1. Study Design

This was an analytic observational study with a cross-sectional design. Data collection was carried out using a questionnaire which was

distributed online via Google Form between August-October 2020.

## 2. Population and Sample

The research population is all users of telemedicine application services during the COVID-19 pandemic in Indonesia, namely 300,000 users. The sample is telemedicine users who meet the inclusion criteria, namely Indonesian citizens at least 18 years old, have used telemedicine during the COVID-19 pandemic, able to operate a telephone/-gadget/ smartphone, and willing to be a respondent. Meanwhile, respondents who used telemedicine applications other than for doctor consultation services and drug collection, did not answer questions clearly and completely, and were not included in this study. Sampling was carried out using consecutive sampling technique with a minimum sample size of 400 which was calculated using the Slovin formula.

## 3. Study Variables

**Dependent variables** consist of satisfaction and barriers of telemedicine users. Satisfaction was assessed from general satisfaction, the telemedicine system, the doctor-patient relationship in telemedicine, and the use of telemedicine applications. Meanwhile, user barriers are measured based on technical, administrative, and interaction barriers with doctors.

**Independent variables** of study were characteristics respondent (age, gender, origin, place of residence, last education, marital status, employment, insurance, income, provider, internet network, and internet quota).

## 4. Operational Definition of Variables

**Telemedicine:** Remote healthcare delivery by professionals through technology, information, and communication, including diagnosis, treatment, disease prevention, injury prevention, evaluation, research, and ongoing education for healthcare providers, to enhancing individual and community health.

**General Satisfaction:** Respondents' subjective evaluation of telemedicine application usage experience.

**Telemedicine System:** all activities or services in telemedicine

**Age:** The numeric representation signifies the respondent's age at the time of research, calculated from their date of birth.

**Gender:** Respondents' identities are distinguished by their physical and biological characteristics since birth.

**Origin:** The respondent's region of residence corresponds to their place of origin as indicated on their Identity Card (KTP).

**Place of Residence:** The location where the respondent resides or has settled.

**Last Education:** Respondents' educational level is determined by their highest completed level of schooling, as evidenced by their most recent diploma.

**Marital Status:** The legal and religious union between a man and a woman is recognized as the lawful relationship of husband and wife.

**Employment:** Respondents' main activities are to meet their life needs and livelihood.

**Insurance:** Third-party assurance or protection against health risks, including medical expense coverage, is provided to clients or customers.

**Income:** individual's monetary compensation for their labour or work performed.

**Provider:** The operator services utilized by respondents when accessing application services.

**Internet Network:** Internet network for accessing application services.

**Internet Quota:** Respondents' monthly average internet quota usage.

## 5. Study Instruments

User satisfaction was assessed using a Likert scale (1 for strongly disagree, and 5 for strongly agree), while barriers were evaluated using a binary scale (yes=1, no=0). Respondents were considered dissatisfied if their

cumulative score was below 50% and satisfied if it reached or exceeded 50% for both satisfaction and barriers. The questionnaire was tested for validity using Pearson product-moment and reliability using Cronbach alpha. The questionnaire was declared valid and reliable with a value of 0.410 – 0.864 for validity and a reliability value of 0.944 for satisfaction and 0.832 for barriers.

**6. Data Analysis**

Data were analyzed by univariate analysis, bivariate analysis by chi-square test and Kruskal Wallis test, and multivariate by logistic regression with a significance of  $p < 0.05$  OR 95% CI.

**7. Research Ethics**

This study was approved by the Ethics Committee Medical and Health Research (KEPKK) Faculty of Medicine, University of Sriwijaya Number: 024-2020.

**Table 1. Sample characteristics**

Characteristics	Category	Frequency (n)	Percentage (%)
Respondents' Utilization of Telemedicine	Before pandemic	528	26.4
	After pandemic	1472	73.6
Respondents' Telemedicine apps used	Alodokter	297	14.85
	Good doctor	101	5.05
	Halodoc	775	38.75
	Klik dokter	319	15.95
	Mobile JKN	294	14.7
	Sehatpedia	120	6
	SehatQ	40	2
	Yes Dok	52	2.6
	Others	2	0.1
	Respondents' Telemedicine utilization	Counselling	28
Complaint consultation		110	5.5
Health monitoring		19	1.0
Purchase and information on medical equipment		14	0.7
Medicine redemption		29	1.5
Lab reservation/home-service/hospital consultation		7	0.4
Not related to health services		14	0.7
Multi-service		1779	89.0
Reasons for Using Telemedicine	User-friendly	58	2.9
	Time-saving	25	1.3

**RESULTS**

**1. Sample Characteristics**

The majority of respondents used telemedicine services after the pandemic. Meanwhile, more than a quarter had used telemedicine before the pandemic (26%). The most widely used telemedicine service application is Halodoc, as much as 39%. While the other 61% use similar applications such as Alodokter, Klik Dokter, and others. Multi-services and multi-reasons are the choice of the majority of respondents in using telemedicine services. The majority of patients (88.9%) choose telemedicine applications for various services and 93.5% of patients choose multi-reasons to have telemedicine application services. Respondents considered the security and confidentiality of patient data to be the most important factors in telemedicine services (34%) (table 1).

Characteristics	Category	Frequency (n)	Percentage (%)
Respondents' perspectives of the most important factors in telemedicine services	Attractive service features	4	0.2
	Wide and comprehensive selection of specialist doctors, lower service costs	10	0.5
	Praktical	34	1.7
	Collaborates with insurance/company	0	0.0
	Multi-reason	1869	93.5
	Service Features offered by the application	87	4.4
	Accuracy of information and diagnosis of medical complaints	335	16.8
	Security and confidentiality of patient data	678	33.9
	Service response speed	330	16.5
	User-friendly the application system	361	18.1
	Quality of doctor-patient interaction	209	10.5

**2. Respondent Characteristics and Their Relation to Satisfaction and Barriers to Telemedicine Use**

More than a quarter of respondents are aged 26-35 years (38.3%). The majority of respondents were women (54.1%) and the majority of respondents came from Sumatra (41.8%). Most respondents live in urban areas (91.6%) with the majority being married (70.1%). More than three quarters of the respondents have a job (79.7%). The majority of respondents choose BPJS insurance (including KIS) (77.3%). The average monthly income of respondents is IDR 2,500,000 – IDR 3,500,000 (35.9%). More than a quarter of respondents use Telkomsel providers (59%). Meanwhile, more than three-quarters of respondents access telemedicine services using cellular

data internet networks (81.8%). Respondents spend <10 gb quota for one month to access the internet (41.9%) (Table 2).

Bivariate test results show that there is a relationship between regional origin  $p=0.005$ , residential area  $p=0.004$ , insurance  $p<0.001$ , and internet network  $p<0.001$  on satisfaction patients in utilizing telemedicine services during the COVID-19 pandemic in Indonesia. While, the barriers to using telemedicine services during the COVID-19 pandemic are related to variables such as age, gender, regional origin, residential area, marital status, employment status, insurance, average income, provider, internet network, and internet quota used affect patient's barriers to telemedicine services (Table 2).

**Table 2. Relationship between Respondents' Characteristics, Satisfaction, and Barriers to Users of Telemedicine Services**

Characteristics	n	%	Satisfaction		P	Obstacle		P
			Dissatisfied (n=25; 1.2%)	Satisfied (n=1975; 98.8%)		No (n= 1215; 60.8%)	Yes (n=785; 39.2%)	
<b>Age</b>								
18-25 years	388	19.4	3 (0.1)	385 (19.2)		200 (10)	188(9.3)	

Characteristics	n	%	Satisfaction		P	Obstacle		P
			Dissatisfied (n=25; 1.2%)	Satisfied (n=1975; 98.8%)		No (n= 1215; 60.8%)	Yes (n=785; 39.2%)	
26-35 years	768	38.3	13 (0.7)	755 (37.7)	0.539	514 (25.7)	254(12.7)	<0.001
36-45 years	511	25.6	4 (0.2)	507 (25.4)		328 (16.4)	183 (9.2)	
46-55 years	253	12.7	3 (0.2)	250 (12.5)		146 (7.3)	107 (5.3)	
56-65 years	76	3.8	2 (0.1)	74 (3.7)		26 (1.3)	50 (2.5)	
>65 years	4	0.2	0 (0)	4 (0.2)		1 (0.1)	3 (0.2)	
<b>Gender</b>								
Man	918	45.9	13 (0.7)	905 (45.3)		581 (29)	337(16.9)	
Woman	1082	54.1	12 (0.6)	1070(53.5)	0.538	634 (31.7)	448(22.4)	0.032
<b>Origin</b>								
Sumatra	836	41.8	7 (0.4)	829 (41.4)		553 (27.7)	283(14.1)	
Java	483	24.2	5 (0.3)	478 (23.9)	0.005	318 (15.9)	165 (8.3)	<0.001
Borneo	173	8.6	8 (0.4)	165 (8.2)		80 (4)	93 (4.7)	
Sulawesi	264	13.2	2 (0.1)	262 (13)		134 (6.7)	130 (6.4)	
Nusa Tenggara	126	6.3	2 (0.1)	124 (6.1)		58 (2.9)	68 (3.4)	
Maluku Islands	78	3.9	1 (0.1)	77 (3.9)		49 (2.5)	29 (1.4)	
Papuan	40	2	0 (0)	40 (2)		23 (1.1)	17 (0.9)	
<b>Residential area</b>								
Urban	1833	91.6	19 (1)	1814 (90.7)		1188(59.3)	645(32.3)	
Rural	167	8.4	6 (0.3)	161 (8)	0.004	27 (1.4)	140 (7)	<0.001
<b>last education</b>								
Not in school/didn't finish elementary school	1	0.1	0 (0)	1 (0.1)		0 (0)	1 (0.1)	
Basic	11	0.5	0 (0)	11 (0.5)	0.662	8 (0.3)	3 (0.1)	<0.001
Intermediate	727	36.4	12 (0.5)	715 (35.8)		495 (24.8)	232(11.6)	
Advanced	1261	63	13 (0.7)	1248(62.4)		712 (35.6)	549(27.5)	
<b>Marital status</b>								
Not married yet	551	27.6	5 (0.3)	546 (27.3)	0.610	323 (16.2)	228 (11.4)	
Marry	1404	70.1	19 (1)	1385 (69.2)		874 (43.6)	530 (26.5)	0.005
Divorce	45	2.3	1 (0.1)	44 (2.1)		18 (0.9)	27 (1.4)	
<b>Job status</b>								
Doesn't work	406	20.3	8 (0.4)	398 (19.9)	0.143	212 (10.6)	194 (9.7)	
Work	1594	79.7	17 (0.9)	1577 (78.8)		1003(50.1)	591 (29.6)	<0.001
<b>Insurance</b>								
BPJS (including KIS)	1546	77.3	12 (0.6)	1534 (76.7)	<0.001	1048(52.4)	498 (24.9)	
Others (private etc.)	326	16.3	4 (0.2)	322 (16.2)		118 (5.9)	208 (10.4)	<0.001
There isn't any	128	6.4	9 (0.4)	119 (5.9)		49 (2.4)	79 (4)	
<b>Average income (per month)</b>								
<IDR 1,500,000	222	11	4 (0.2)	218 (10.9)	0.133	89 (4.5)	133 (6.7)	
IDR 1,500,000 – IDR 2,500,000	609	30.5	8 (0.4)	601 (30)		494 (24.7)	115 (5.8)	<0.001
IDR 2,500,000 – IDR 3,500,000	719	35.9	6 (0.3)	713 (35.6)		492 (24.4)	227(11.2)	
IDR 3,500,000 – IDR 5,500,000	332	16.6	5 (0.3)	327 (16.3)		93 (4.7)	239 (12)	
IDR 5,500,000 – IDR 10,000,000	83	4.2	0 (0)	83 (4.2)		28 (1.4)	55 (2.8)	
>IDR 10,000,000	35	1.8	2 (0.1)	33 (1.7)		19 (1)	16 (0.8)	
<b>Provider</b>								
Telkomsel	1180	59	9 (0.4)	1171 (58.6)	0.019	730 (36.5)	450 (22.5)	
Smartfren	136	6.8	6 (0.3)	130 (6.5)		50 (2.4)	86 (4.3)	<0.001
XL	229	11.5	5 (0.3)	224 (11.2)		115 (5.7)	114 (5.7)	
Indosat	340	17	4 (0.2)	336 (16.8)		233 (11.7)	107 (5.3)	
Axis	98	4.9	1 (0.1)	97 (4.9)		75 (3.7)	23 (1.2)	
By.U	6	0.3	0 (0)	6 (0.3)		5 (0.3)	1 (0.1)	
Other	11	0.5	0 (0)	11 (0.5)		7 (0.4)	4 (0.2)	

Characteristics	n	%	Satisfaction		P	Obstacle		P
			Dissatisfied (n=25; 1.2%)	Satisfied (n=1975; 98.8%)		No (n= 1215; 60.8%)	Yes (n=785; 39.2%)	
<b>Internet Network</b>								
Wi-Fi	365	18.2	13 (0.7)	1622(81.1)	<0.001	1093(54.6)	542 (27.1)	
Quota (Cellular data)	1635	81.8	12 (0.6)	353 (17.6)		122 (6.1)	243 (12.2)	<0.001
<b>Internet Quota (per month)</b>								
<10GB	837	41.9	12 (0.6)	825 (41.3)	0.963	613 (30.7)	224 (11.2)	
10-20GB	595	29.8	6 (0.3)	589 (29.4)		376 (18.8)	219 (11)	<0.001
20-30GB	426	21.2	5 (0.2)	421 (21)		175 (8.7)	251(12.5)	
30-40GB	80	4	1 (0.1)	79 (4)		26 (1.3)	54 (2.7)	
>40GB	62	3.1	1 (0.1)	61 (3)		25 (1.3)	37 (1.8)	

### 3. Respondent Characteristics that Influence Satisfaction and Barriers to Telemedicine Services

Based on the results of the multivariate analysis presented in Table 3, it is known that the variables that have a significant effect on the satisfaction of users of telemedicine services include using BPJS Insurance (OR= 6.49), Other Insurance (Private) (OR=12.11), Average Income <Rp 1,500,000/month (OR= 30.82), average income IDR 2,500,000 – IDR 3,500,000/month (OR= 11.51), average income IDR 3,500,000 – IDR. 5,500,000/month (OR=11.82), and Wifi Internet Network (OR=0.24).

While the variables that have a significant effect on barriers to users of telemedicine services include age 26-35 years (OR=0.08), male sex (OR=0.78), origin from Sumatra (OR=0.40), origin from Java

(OR=0.44), secondary education (OR=0.72), married status (OR=0.47), uses BPJS insurance (OR=0.49), uses a wifi network (OR=2.05), lives in urban areas (OR=0.16), average income <IDR 1,500,000/month (OR=2,86), average income IDR 3,500,000- IDR 5,500,000/month (OR=5,27), average income IDR 5,500,000 IDR 10,000.000/- Month (OR=3.02), Using internet quota <10 Gb/Month (OR=0.41), and using internet quota of 10-20 Gb/Month (0.42).

Multivariate analysis showed that the types of barriers to satisfaction levels that most influenced the use of telemedicine services in this study were technical barriers with an OR of 0.17. This means that technical constraints are the factors that most influence the level of patient satisfaction and barriers to using telemedicine services (table 4).

**Table 3. Multivariate Logistic Regression Analysis between Variables with Levels of Satisfaction and Barriers to Users of Telemedicine Services**

Independent Variable	OR	95% CI		P
		Upper limit	Lower limit	
<b>Satisfaction</b>				
Using BPJS Insurance	6.49	1.72	2.45	0.006
Other Insurance (Private)	12.11	2.08	7.06	0.006
Average Revenue <Rp 1,500,000/ Month	30.81	1.75	5.42	0.019
Average income IDR 2,500,000 – IDR 3,500,000/month	11.51	1.28	1.03	0.029
Average Income IDR 3,500,000 – IDR 5,500,000/month	11.81	1.32	1.06	0.027
Wifi internet network	0.23	0.08	0.69	0.009
<b>Barrier</b>				
Age 26-35 years	0.076	<0.01	0.89	0.040
Man	0.779	0.61	0.99	0.038
From Sumatra	0.405	0.19	0.87	0.021

Independent Variable	OR	95% CI		P
		Upper limit	Lower limit	
Javanese origin	0.442	0.20	0.97	0.041
Middle education	0.723	0.55	0.95	0.022
Marry	0.466	0.22	0.98	0.044
Using BPJS Insurance	0.495	0.31	0.79	0.003
Wifi internet network	2050	1.51	2.78	<0.001
Living in an Urban Area	0.163	0.10	0.27	<0.001
Average income < IDR 1,500,000/month	2.86	1.14	7.14	0.024
Average Income IDR 3,500,000 - 5,500,000/ Month	5,266	2.33	1.20	<0.001
Average income IDR 5,500,000 - 10,000,000	3027	1.22	7.50	0.017
Quota < 10 GB/Month	0.412	0.22	0.78	0.007
Quota 10-20 GB/Month	0.420	0.22	0.80	0.007

**Table 4. Multivariate Logistic Regression Analysis of Variable Types of Barriers to Telemedicine Service User Satisfaction Level**

Variables	OR	95% CI		P
		Upper limit	Lower limit	
Technical Constraints	0.17	0.05	0.62	0.007
Administrative Constraints	0.09	0.03	0.29	<0.001

## DISCUSSION

The primary finding of the study reveals that income factors play a significant role in influencing both user satisfaction and barriers to telemedicine adoption. Specifically, low-income individuals exhibit lower satisfaction thresholds and are easily contented, impacting telemedicine user satisfaction. Conversely, respondents with high and very high incomes report higher satisfaction levels due to their familiarity with technologies such as video calling and their ability to afford telemedicine services. Telemedicine significantly reduces the financial burden and waiting time associated with clinic visits, resulting in higher satisfaction (Le et al., 2019).

However, income factors can also contribute to barriers to telemedicine utilization. These barriers include limited cooperation with BPJS Kesehatan (Indonesia's national health insurance program) and implementing JKN mobile applications. Furthermore, reimbursement policies pose challenges, particularly concerning payments by private insurance providers who exhibit

reluctance to cover telemedicine services (Chang, 2015). Additionally, a considerable portion of the Indonesian population relies on self-medication without health insurance coverage, resulting in obstacles for respondents with certain income levels who have to bear their healthcare costs (Syarifain et al., 2017).

The study also identifies two types of barriers affecting patient satisfaction in telemedicine services: technical and administrative obstacles. Technical obstacles can arise from application difficulties, unclear and slow networks, and technological developments that do not align with the patient's physical condition (Acharya and Rai, 2016; Istifada, Sukihananto and Laagu, 2017). A reliable technological infrastructure is crucial for the success of a telemedicine system, and technical issues, including poor connections and inadequate transmission of video, audio, and images, are perceived barriers for telemedicine users (Litvak et al., 2021). Additionally, administrative barriers are experienced by users, including difficulties in understanding information due to low levels



of health literacy (Chowdhury, Sunna and Ahmed, 2021).

In efforts to advance telemedicine in Indonesia, users of telemedicine services provide recommendations to enhance various aspects. These recommendations include improving diagnostic accuracy, streamlining processes, accelerating response times, safeguarding patient confidentiality, optimizing application features such as audio and image quality and explanations, enhancing access speed, and facilitating medication retrieval. Schwamm et al. endorse the implementation of telemedicine systems that can broaden access, increase affordability, and reduce disparities, especially those caused by geographical limitations or provider availability (Schwamm et al., 2017).

#### **Factors Related Respondent's Satisfaction and Barrier in Using Telemedicine Services**

Income, regional origin, residential area, health insurance, network provider, internet network type, age, education level, gender, occupation, marital status, and insurance-related administrative processes can be associated with satisfaction and barriers in using telemedicine. In contrast to Martinez et al. (2018), regional origin is related to telemedicine usage due to the common language it creates, avoiding miscommunication between patients and doctors arising from differences in the perception of social objects and events (Juariyah, 2012). The settlement region influences the understanding of technology, with urban communities exhibiting better familiarity with information technology and the impact of diverse economic factors (Bakken et al., 2006; Utomo et al., 2015). User satisfaction is also linked to selecting network providers based on user experience and meeting their needs (PUSKAKOM UI, 2015; Ariansyah, 2017). Health insurance, particularly BPJS, plays a role in telemedicine user satisfaction through

collaborations with service providers, providing convenience and benefits to users. According to previous research, telemedicine treatment must be covered by health insurance according to legal provisions (Schroeder, 2019). Furthermore, good internet access facilitates a smooth online consultation process (Hitayani and Oktamianti, 2022).

Age and education level have been identified in previous research as significant contributors to barriers to telemedicine use (Kruse et al., 2018). Conversely, gender is associated with variations in spatial abilities, which may impact technological proficiency. The underrepresentation of women in STEM fields further affects their familiarity with technical domains like telemedicine (Terry, 2017) (Ceci and Williams, 2007).

The critical challenges in implementing telemedicine in remote areas of Indonesia encompass technological availability, reliable internet access, and information and communication technology advancements. Slow internet connection and limited technology are primary obstacles (Ariyanti and Kautsarina, 2017). Topographical and cultural factors also contribute to the digital divide and the unpreparedness of rural communities to embrace new technologies (Bali, 2018). (Orlando, Beard and Kumar, 2019) (Hadiyat, 2014). Married individuals and those employed may face additional barriers due to familial health responsibilities and limited leisure time (Iskandar, 2017).

Insurance and service providers also present barriers to telemedicine utilization, characterized by intricate administrative processes and the unavailability of national health insurance (Herwando and Sitompul, 2021). Additionally, subpar network services and limited wireless signals hinder the speed and quality of Home Online Health Consultation (HOHC) (Almathami, Than Win and Vlahu-Gjorgievska, 2020)

### AUTHOR CONTRIBUTION

Havivi Rizky Adinda, Rizma Adlia Sya-kurah, and Pariyana are responsible for the conception and design of the study. HRA performed data collection, analysis, and drafting. all authors performed data interpretation. RAS and P did critical revision and final approval of the version to be published.

### CONFLICT OF INTEREST

There was no conflict of interest in the study.

### FUNDING AND SPONSORSHIP

This study is self-funded.

### ACKNOWLEDGEMENT

The authors express their gratitude to the respondents who participated in this study.

### REFERENCE

- Acharya, R and Rai, J (2016). Evaluation of patient and doctor perception toward the use of telemedicine in Apollo Tele Health Services, India, *Journal Family Medicine and Primary Care*, 5(4), p. 798. doi: 10.4103/2249-4863.201174
- Aliansi Telemedik Indonesia (2020) Members, Aliansi Telemedik Indonesia, Jakarta. Available at: <https://aten-si.or.id/#members>. (Accessed: 7 July 2020).
- Almathami HKY, Than Win K, Vlahu-Gjorgievska E (2020). Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients'. homes: Systematic literature review', *Journal of Medical Internet Research*, 22(2). Available at: <https://doi.org/10.2-196-16407>.
- Ariansyah K (2017). Faktor-Faktor yang Memengaruhi Kepuasan Pelanggan terhadap Layanan Pitalebar Berge-rak, *Buletin Pos dan Teleko-munikasi*, 15(1), p. 27. Available at: <https://doi.org/10.17933/bpostel.2017.150103>.
- Ariyanti S, Kautsarina K (2017). Kajian Tekno-Ekonomi pada Telehealth di Indonesia [Techno-Economic Study on Telehealth in Indonesia. *Buletin Pos dan Telekomunikasi*, 15(1): 43–54.
- Aulia MF, Budinuryanto DC, Wismandanu O (2021). Persepsi Dokter Hewan Praktisi Hewan Kecil terhadap Telemedicine di Masa Pandemi Covid-19, *Acta Veterinaria Indonesi-ana*, 9(2), pp. 82–86. DOI: <https://doi.org/10.29244/avi.9-.2.82-86>
- Bakken S, Grullon-Figueroa L, Izquierdo R, Lee NJ, Morin P, Palmas W, Teresi J, et al. (2006). Development, validation, and use of English and Spanish versions of the telemedicine satisfaction and usefulness question-naire. *Journal of the American Medical Informatics Association : JAMIA*, 13(6-), 660–667. <https://-doi.org/10.1197-/jamia.M2146>
- Bali, S. (2018) 'Barriers to Development of Telemedicine in Developing Countries', *Telehealth* [Preprint].
- Ceci SJ, Williams WM (2007) Why aren't more women in science?: Top researchers debate the evidence., Why aren't more women in science?: Top researchers debate the evidence. Washington, DC, US: American Psychological Association. Available at: <https://doi.org/10.1037/11546-000>.
- Chang H (2015). Evaluation framework for telemedicine using the logical framework approach and a fishbone diagram, *Healthcare Informatics Research*, 21(4), pp. 230–238. Available at: <https://doi.org/10.4258/hir.20-15.21-4.230>.
- Chowdhury SR, Sunna TC, Ahmed, S (2021). Telemedicine is an important aspect of healthcare services amid COVID-19

- outbreak: Its barriers in Bangladesh and strategies to over-come, *The International Journal of Health Planning and Management*, 36(1), pp. 4–12. Available at: <https://doi.org/https://doi.org/10.1002/hpm.3064>.
- Christasani PD, Satibi (2016). Kajian Faktor Demografi terhadap Kepuasan Pasien Jaminan Kesehatan Nasional pada Fasilitas Kesehatan Tingkat Pertama', *Jurnal Farmasi Sains dan Komunitas*, 13(1), pp. 28–34. DOI: <https://doi.org/10.24071/-jpsc.00127>
- Cubanski J (2020). Possibilities and Limits of Telehealth for Older Adults During the COVID-19 Emergency, Kaiser Family Foundation. Available at: <https://www.kff.org/corona-vir-us-policywatch/-possibilities-and-limits-of-telehealth-for-older-adults-during-the-covid-19-emergency/> (Accessed: 23 July 2020).
- Gugus Tugas Percepatan Penanganan COVID-19 (2020) Peta Sebaran COVID-19, Gugus Tugas Percepatan Penanganan COVID-19. Available at: <https://covid-19.go.id/peta-sebaran> (Accessed: 10 July 2020).
- Gusmawan F, Haryadi, Sutrisna E (2019). Pengaruh Kualitas Layanan dan Karakteristik Sosiodemografi terhadap Minat Kunjungan Ulang yang Dimoderasi Oleh Kepuasan Pasien pada Pelayanan Rawat Jalan Puskesmas Kedungbanteng Kabupaten Banyumas, *Jurnal Ekonomi, Bisnis dan Akuntansi (JEBA)*, 21(4), pp. 1–15.
- Hadiyat YD (2014) Kesenjangan Digital di Indonesia (Studi Kasus di Kabupaten Wakatobi)', *Pekommas*, 17(2), pp. 81–90.
- Herwando H, Sitompul TH (2021). Evaluasi Manfaat Penerapan Telemedicine di Negara Kepulauan: Systematic Literature Review', *Indonesian of Health Information Management Journal (INOHIM)*, 9(2), pp. 91–101. Available at: <https://doi.org/10.4-7007/inohim.v9i2.261>.
- Hitayani, W. and Oktamianti, P. (2022) 'Penggunaan Telemedicine pada Pasien Kaki Diabetik di Era Pandemi', *Syntax Literate: Jurnal Ilmiah Indonesia*, 7(9), pp. 14626–14638.
- Iskandar IW (2017). Pemanfaatan Waktu Luang Pada Buruh Pabrik Di Pt. Yang Ming International Kota Semarang. Universitas Muhammadiyah Semarang.
- Istifada R, Sukihananto, Laagu MA (2017). Pemanfaatan Teknologi Telehealth pada Perawat di Layanan Homecare', *Nursing Current*, 5(1), pp. 51–61. <https://doi.org/10.19166/nc.v5i1.1102>
- Juariyah (2012). Miskomunikasi Antar budaya Mahasiswa Pendatang di Kabupaten Jember', *Jurnal Ilmu Komunikasi*, 10(3), pp. 251–261. DOI: <https://doi.org/10.31315/jik-.v10i3.45>
- Le LB, Rahal HK, Viramontes MR, Meneses KG, Dong TS, Saab S (2019). Patient Satisfaction and Healthcare Utilization Using Telemedicine in Liver Transplant Recipients. *Digestive diseases and sciences*, 64(5), 1150–1157. <https://doi.org/10.1007/s10620-018-5397-5>
- Litbangkes Baturaja (no date) 'Aplikasi Telemedicine Berpotensi Merevolusi Pelayanan Kesehatan di Indonesia', Balai Penelitian dan Pengembangan Kesehatan Baturaja.
- Litvak M, Miller K, Boyle T, Bedenbaugh R, Smith C, Meguerdichian D, Reisman D, et al. (2022). Telemedicine Use in Disasters: A Scoping Review. *Disaster medicine and public health preparedness*, 16(2), 791–800. <https://doi.org/10.1017/dmp.2020.473>
- Martinez KA, Rood M, Jhangiani N, Kou L, Rose S, Boissy A, Rothberg MB (2018).

- Patterns of Use and Cor-relates of Patient Satisfaction with a Large Nationwide Direct to Consu-mer Telemedicine Service. *Journal of general internal medicine*, 33(10), 1768–1773. <https://doi.org/10.1007-/s11606-018-4621-5>.
- Nihayati and Laksmi (2020). Perilaku pencarian informasi pekerjaan oleh sarjana fresh graduate dengan analisis Model Wilson. *Berkala Ilmu Perpustakaan dan Informasi*, 16(1), pp. 55–67.
- Ohannessian R, Duong TA, Odone A (2020). Global Telemedicine Imple-mentation and Integration Within Health Systems to Fight the COVID-19 Pandemic: A Call to Action. *JMIR public health and surveillance*, 6(2), e18810. <https://doi.-org/10.2196/18-810>
- Orlando JF, Beard M, Kumar S (2019). Systematic review of patient and caregivers' satisfaction with tele-health videoconferencing as a mode of service delivery in managing patients' health. *PloS one*, 14(8), e0221848. <https://do-i.org/10.1371/-journal.pone.0221848>.
- Pratama V, Bernarto I (2022). The Relationship between Health Service Quality, Servicescape, and Socio-demo-graphic Factors on Outpatient Satis-faction Levels at Clinic X. *Budapest International Research and Critics Institute (BIRCI-Jour-nal)*, 5(1), pp. 3337–3349. DOI: <https://doi.org/10.-33258/birci.v5i1.4001>
- PUSKAKOM UI (2015) FIXED BROA-DBAND SATISFACTION SURVEY: A Study on Residential and Business Broadband Users in Indonesian Cities. Depok.
- Schoenfelder T, Klewer J, Kugler J (2010). Factors associated with patient satis-faction in surgery: the role of patients' perceptions of received care, visit characteristics, and demo-graphic vari-ables. *The Journal of surgical research*, 164(1), e53–e59. <https://doi.org/1-0.1016/j.jss.2010.08.001>.
- Schroeder C (2019). Pilot study of telem-edicine for the initial evaluation of general surgery patients in the clinic and hospitalized settings. *Surgery Open Science*, 1(2). Available at: <https://do-i.org/10.1-016/j. sopen.2019.06.005>.
- Schwamm LH, Chumbler N, Brown E, Fonarow GC, Berube D, Nystrom K, Suter R, et al. (2017). Recom-menda-tions for the Implementation of Tele-health in Cardiovascular and Stroke Care: A Policy Statement From the American Heart Asso-ciation. *Circulation*, 135(7), e24–e44. <https://doi.org/10.1161/CIR.0000000000000475>.
- Scott Kruse C, Karem P, Shifflett K, Vegi L, Rav K, Brooks M (2018). Evaluating barriers to adopting telemedicine worldwide: A systematic review. *J Tele-med Telecar*, 24(1), 4–12. <doi.org/10-.1177/1357633X16674087>
- Sumarwan, U. (2002) *Perilaku Konsu-men*. Penerbit Ghalia Indonesia.
- Syarifain A, Rumayar AA, Mandagi CKF (2017). Hubungan Antara Pendi-dikan Dan Pendapatan Dengan Pemanfaatan Pelayanan Kesehatan Oleh Pasien Bpjs Di Wilayah Kerja Puskesmas Sario Kota Manado. *Kesmas: Jurnal Kesehatan Masyarakat Universitas Sam Ratulangi*
- Terry, W.S. (2017) *Learning and Memory: Basic Principles, Proce-sses, and Procedures*. 5th Editio. New York: Routledge. Available at: <https://doi.-org/https://doi.org/10.4324/9781315622781>.
- Utomo IC, Rokhmah S, Widodo DAP (2015). Analisis dan Perbandingan Tingkat

Pemahaman Teknologi Informasi pada Anak di Desa Tertinggal dengan Perkotaan Sebagai Upaya Peningkatan Pemahaman Teknologi Informasi di Desa Tertinggal', *Jurnal Ekonomi dan Teknik Informatika*, 3(5), pp. 48–54.

Wade, C. and Tavris, C. (2007) *Psikologi* Edisi Kesembilan Jilid 2. Erlangga.

Welch BM, Harvey J, O'Connell NS, McElligott JT (2017). Patient preferences for direct-to-consumer telemedicine services: a nationwide survey. *BMC health services research*, 17(1), 784. <https://doi.org/10.1186/s12913-017-2744-8>.