



PERCEPTION AND USAGE OF TELEMEDICINE AMONG NATIONAL HEALTH INSURANCE PARTICIPANTS IN PADANG CITY

Shelvy Haria Roza^{1*}, Ayulia Fardila Sari²

^{1,2}Program Studi Kesehatan Masyarakat, Fakultas Kesehatan Masyarakat, Universitas Andalas, Kota Padang, Sumatera Barat, Indonesia

* Correspondence Author: shelvyhariaroa@ph.unand.ac.id

ARTICLE INFO

Article History:

Received : September 19, 2023

Accepted : November 09, 2023

Published: December 12, 2023

DOI:

<https://doi.org/10.26553/jikm.2023.14.3.281-292>

Available online at

<http://ejournal.fkm.unsri.ac.id/index.php/jikm>

ABSTRACT

The existence of a policy on the use of telemedicine in health facilities is applied almost all over the world. In Indonesia, Padang is one city of the achievements in that the use of telemedicine services remains low, even after the implementation of regulations on telemedicine services. This study aimed to determine the perceived convenience and benefits of using telemedicine services among National Health Insurance participants through the Technology Acceptance Model (TAM). This study was a cross-sectional survey. The sample of this study consisted of 100 National Health Insurance respondents registered at a first-level healthcare facility. The samples were collected using consecutive sampling and online questionnaire sheets carried out for three months in 2021. The analysis includes univariate, bivariate, and multivariate analysis. The results showed that 55% of respondents had a high level of accessibility in getting health services by using telemedicine, 54% of respondents had a good experience related to telemedicine officer services, 94% of respondents had perceptions of illness exist positive, 89% of respondents said that they had a perception of ease in using telemedicine services, and 80% of respondents had a perceived the benefits of telemedicine services. The utilization of telemedicine was affected by accessibility ($p=0.000$), staff service ($p=0.000$), perceived ease of use ($p=0.022$), and perceived benefit ($p=0.001$). The multivariate analysis indicated that the officer service was the most influencing the use of telemedicine services ($OR=3.669$). Healthcare facilities should improve their service quality and apply a more accessible and more valuable service for patients as end users.

Keywords: perception, acceptance, usage, telemedicine, TAM

Introduction

The rapid development of health information technology has led to changes in health services worldwide.¹ The role of technology in the health sector is very important for increasing service accessibility and the quality of health services.^{2,3} Health services usually involve direct contact between health workers and patients; however, this interaction must be limited.⁴ With the rapid emergence of electronic medical information, the popularity of mobile health services, such as mHealth, telemedicine, and telehealth, has continued to increase; as a result, health systems worldwide require high-quality reorganization.⁵

Telemedicine has been proven to increase access to health services and help with healthcare problems during the COVID-19 pandemic. Telemedicine services have increased by 44% over the last five years, with various applications in healthcare. Southeast Asian countries have the potential to increase telemedicine use.⁶ However, countries in Southeast Asia have shown that the implementation of telemedicine is slow because it involves clinical governance.⁷ This is in line with the advances in information technology in the health service sector in Indonesia; however, the utilization of telemedicine services is still low.

Since the outbreak of COVID-19 in Indonesia, hospitals have been developing telehealth services to improve the reach of healthcare services and prevent further outbreaks of COVID-19.⁸ The government also instructs healthcare officers to use *telemedicine* to minimize the COVID-19 outbreak.⁸ BPJS Kesehatan is also compliant with the government's regulations (Ministry of Health Regulation number 20 year 2019 on telemedicine healthcare service in a healthcare facility) using telemedicine with members of the National Health Insurance.⁹ They receive healthcare services at a first-level healthcare facility (*Fasilitas Kesehatan Tingkat Pertama* or FKTP).

Based on data from the Social Security Implementation Agency or (*Badan Penyelenggara Jaminan Sosial Kesehatan* or BPJS-K), the Social Insurance Management Agency in Indonesia, the total National Health Insurance (*Jaminan Kesehatan Nasional* or JKN) in 2020 was 222.5 million.¹⁰ This accounts for 81.3% of Indonesia's population.⁴ The BPJS-K did not use physical contact service capitalization. BPJS-K has been working with 20,000 employees in a first-level healthcare facility (FKTP) consisting of 9,841 primary health centers, 4,586 general doctors, 5,495 first-level clinics, 13 type D hospitals and 1,160 private dentists.⁹

According to the BPJS-K data for 2021, some prefectures or cities have not yet reached the target contact number, one of which is Padang. This city has 79 FKTP working with BPJS-K, comprising 22 public healthcare facilities and 57 clinics, and it evaluates public healthcare clinics. The average number of contacts is expected to reach 121 by 2021. The number of visits to healthcare facilities has also decreased since the pandemic COVID-19 of 2020.⁹ Attempts have been made to improve the work-based-contact number of capitation, focusing on implementing indirect services by using telemedicine in FKTP's healthcare services. A contact number of 150

permits must be met as one of the capitation indicators. Indirect contact will be implemented in 2020. The communication media of indirect contact includes mobile JKN applications, telephones, short message services, other messaging applications, and social media.¹¹

The implementation of indirect contact with JKN members to increase the number of contacts at healthcare facilities such as FKTP has not yet shown a maximum result.⁹ The average effect of indirect contact was 781 members per month. This number is only 4% of the total number of contacts at FKTP per month. Another problem is that although Padang is one of the largest areas populated by a considerable number of people, and those people frequently use cellular phones in their daily lives in West Sumatra, the results of telemedicine use remain low.

In Technology Acceptance Model (TAM) theories, perceived benefits and ease of use are the major factors determining user acceptance.^{12,13} This theory has been proven in subsequent research on health technology. There are several challenges in the implementation of mobile health; namely, mobile health applications must be integrated into the clinical flow of performance and assessment results of patient care, using easy administration, and can facilitate communication between patients and between health workers¹⁴ Therefore, this study aimed to identify the factors that influence JKN participants in utilizing telemedicine services from the perspective of convenience and benefits.

Methods

This research was an analytical study using a cross-sectional survey to explore the relationship between perceived benefits and ease of use with the utilization of telemedicine services by National Health Insurance (JKN) members at the first-level healthcare facility in Padang. This study was conducted at community health centers and clinics that collaborated with BPJS-K from June to August 2022, at the first level of healthcare in Padang. The population consisted of JKN members registered at FKTP Padang who met the inclusion and exclusion criteria. The study sample included 100 JKN members with a minimum age of 18 years, selected using convenience sampling with inclusion criteria of at least 18 years, who had used telemedicine.

The type of collection used in this study was primary data obtained through an online questionnaire. The research questionnaire was adapted from a subsequent research questionnaire. After adoption, questionnaire items were formulated according to the research context. Formulating these items involved creating a list of questions for the questionnaire. Following item formulation, an expert assessment was conducted. This expert assessment involved the compilation and evaluation of items by specialists. After expert assessment, data analysis was conducted, measured with validity and reliability tests, and the results showed that all questions had an above-threshold value (0.196), thus confirming the usability of this questionnaire.

We developed an online questionnaire using Google Forms. This process was maximized by using other social media platforms such as WhatsApp, Instagram, and online forums. These media were selected because they quickly and easily supported the wide distribution of questionnaires. The questionnaires were related to users' perceptions of telemedicine use based on the perception and benefits of telemedicine. For perception, ease of use was measured using four questionnaire indicators, the benefit perception variable was measured using four indicators and questionnaires, and the use of telemedicine was measured using five indicators. The measurement scale in this study was based on an ordinal scale in which the respondents classified the answers into different categories. The ordinal scale used in this research was the degree of statement agreement or a Likert scale: from one (strongly disagree) to five (strongly agree). Data processing obtained from the results of an online questionnaire was conducted in the following stages: 1) All data obtained from the respondents were gathered through an online questionnaire using Google Forms; 2) Compile online questionnaire data categorized using a Likert scale; 3) Categorizing the values into "low" category (if the value \leq mean / median) and "high" category (if the value $>$ mean / median), then a percentage is calculated to analyze the difference in proportions between the high or low categories.

Data were analyzed using univariate and bivariate analyses with the chi-square test. Univariate analysis was used to determine the distribution and frequency of data. Bivariate analysis was used to determine the mean difference between the two independent groups. The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Research Ethics Commission of the Faculty of Public Health, Andalas University, Indonesia (No:3/UN16.12/KEP-FKM/2023).

Results

Based on Table 1, the respondents' characteristics show that most of the respondents are female (79%), 82% are under 30 years old, 81% have a college degree, and most are unemployed. Only a few have jobs above the regional minimum wage, which is the Minimum Wage is the City or Country, usually given to workers, and more than half of the respondents were JKN members in Class 1. The third class of social health insurance in Indonesia is managed by the health insurance organizing agency BPJS Kesehatan, including 1st Class, 2nd Class, and 3rd Class. What distinguishes these classes is the size of the monthly dues that must be paid, as well as the inpatient room that will be his right when the participant is hospitalized. The telemedicine platforms used by the respondents in this study were *Halodoc* and *Mobile JKN*. Respondents used this service to obtain information on health and online consultations. They used telemedicine 1-2 times per month.

Table 1. Univariate Analysis

Variable	Frequency (n= 100)	Percentage (%)
Age		
< 30 years old	82	82
30-39 years old	7	7
>40 years old	11	11
Gender		
Male	21	21
Female	79	79
Education		
High School	19	19
College/University	81	81
Occupation		
Unemployment	77	77
Housewife	5	5
Labor	4	4
Employee	3	3
Entrepreneur	11	11
Income (Regional Minimum Wage)		
Lower than RMG	87	87
Higher than RMG	13	13
Social Insurance Class or JKN Class		
1 st Class	59	59
2 nd Class	14	14
3 rd Class	27	27
Telemedicine platforms used		
Halodoc	63	63
Mobile JKN	34	34
ALoDokter	27	27
KlikDokter	3	3
Intensity to use telemedicine (monthly)		
1-2 times	71	71
3-5 times	10	10
More than five times	19	19
Services being used		
Online Consulting	41	41
Health Information	59	59
Getting the Medicines	17	17
Health Monitoring	7	7
Accessibility		
Low	45	45
High	55	55
Officer Services		
Low	46	46
High	54	54
Perception of Illness		
Negatives	7	7
Positives	93	93
Perception of ease of using telemedicine		
Low	11	11
High	89	89
Perception benefits of using telemedicine		
Low	20	20
High	80	80
Utilization of telemedicine		
Low	54	54
High	46	46

Table 1 shows the results of univariate analysis of the independent and dependent variables. More than half of the respondents reported low utilization of telemedicine (54%). Only a few

respondents had low perceptions of the ease and benefits of using telemedicine. Table 1 shows that most respondents had a high level of accessibility or ease in obtaining health services using telemedicine (55%), and most respondents had good experience regarding telemedicine services (54%). Almost all the respondents had a positive perception of pain (93%). Most respondents (80%) highly perceived the benefits of telemedicine services, which means that a higher perception of the benefits of telemedicine services causes a higher utilization of this application.

Table 2 shows the results of the bivariate analysis of the relationship between perceived ease of use and the benefits of telemedicine utilization. The bivariate analysis results in Table 2 show that the variables of accessibility, staff service, perception of illness, and perception of benefits have a p -value < 0.05 ; thus, it can be concluded that these variables are related to the level of telemedicine service utilization. Meanwhile, the pain perception variable had a p -value > 0.05 , which means there was no relationship between the pain perception variable and the respondent's use of telemedicine services. Respondents whose perception of ease was low were less likely to use telemedicine (OR=10.23; 95% CI=1.26-83.29; $p=0.022$). Therefore, the perceived ease of telemedicine use showed a high degree of telemedicine utilization in healthcare, and the increased use of telemedicine was also seen in respondents with high perceived benefits of telemedicine (OR=11.00; 95% CI=2.39-50.59; $p=0.001$).

Table 2. Bivariate Results

Variable	Telemedicine Utilization <i>n</i> (%)			OR (95% CI)	<i>p</i> -value
	Low	High	Total		
Accessibility					
Low	37 (82.20)	8 (17.80)	45 (100)	10.34 (3.98-26.85)	0.000*
High	17 (30.90)	38 (69.1)	55 (100)		
Officer Services					
Low	37 (80.40)	9 (19.6)	46 (100)	8.95 (3.54-22.62)	0.000*
High	17 (31.50)	37 (68.5)	54 (100)		
Perception of Illness					
Low	5 (71.40)	2 (28.6)	7 (100)	2.25 (0.41-12.16)	0.447
High	49 (52.10)	44 (47.9)	93 (100)		
Perceived ease of use					
Low	10 (90.90)	1 (9.10)	11(100)	10.23 (1.26 - 83.29)	0.022*
High	44 (49.40)	45 (50.60)	89 (100)		
Perceived benefit					
Low	18 (90)	2(20)	20 (100)	11.00 (2.39 - 50.59)	0.001*
High	36 (45)	44(80)	80 (100)		

CI: confidence interval; OR: odds ratio

*statistically significant

The final modeling results of the multivariate analysis are presented in Table 3. Multivariate analysis showed that the variables were significantly associated with telemedicine utilization. The final multivariate modeling results also indicated that the officer service variable was the most dominant variable related to or influencing the use of telemedicine services with the largest OR value, namely 3.669.

Table 3. Final Multivariate Modelling Results

Variable	OR (Exp.β)	95% CI		P-Value
		Lower	Upper	
Accessibility	3.520	1.107	11.191	0.033
Officer service	3.669	1.216	11.070	0.021
Perception of Convenience	2.653	0.218	32.274	0.444
Perception of Benefits	3.190	0.559	18.212	0.192

Discussion

Telemedicine was initially intended as a solution for remote monitoring and consultation with health workers for communities in hard-to-reach areas and was supported by presidential instruction No. 9 of 2017 concerning accelerated development in the use of telemedicine as an effort to increase access and quality of health services.¹⁵ Since the pandemic, telemedicine services have increased since the pandemic. This is reinforced by the government's circular to health facilities to use telemedicine services to minimize the transmission of Covid 19, namely Circular Letter Number Hk.02.01/Menkes/303/2020 and Letter Number YR.03.03/III/III8/2020. However, based on the research results, it was found that utilization of telemedicine services was still low, at 54% for JKN participants in Padang City. This can be influenced by several factors because the decreasing pandemic situation causes services with long-distance contact to become increasingly low. The research results show that the applications that most respondents in this study used were *Halodoc* and *Mobile JKN*. The respondents generally used services to access health information and online consultations. Respondents generally used telemedicine services 1-2 times.

In 2022, the results of the Indonesia Survey Center showed that health services are utilized online, which is a public service that is frequently visited, and the use of telemedicine is increasing during the pandemic until the end of 2020. However, based on the research results, it was found that the utilization of *telemedicine* by JKN participants in Padang City remains low. This is not in line with the results of Ellen *etal.* showing that access to nursing services in the community has increased after accessing telehealth applications such as Medicare and *Medicaid*; the average user of this application is the young age group and 65% of the group.¹⁶

The results showed that accessibility was high when utilizing *telemedicine*. Accessibility in telemedicine services can be interpreted not from the reach of health services from the patient's distance, but from the ease of accessing health services online for participants as telemedicine users. Accessibility is included in enabling factors include the infrastructure and facilities that are in place to enable or facilitate health behaviour or health actions taken by respondents^{17,18}. *E-health applications* can increase the service accessibility for both customers and health professionals. Staff service also showed a significant relationship with the use of telemedicine and the most dominant variable related to or influencing the use of telemedicine services. Health worker actions are associated with health service utilisation^{4,19}.

The results showed that more than half of the respondents reported low utilization of telemedicine (54%). Only a few respondents had low perceptions of the ease and benefits of using telemedicine. Perceived ease of use includes: 1) improving access to healthcare services, 2) no physical and mental efforts, 3) being time-efficient, and 4) providing the need for healthcare. Handayani's research showed that some respondents found no problem using the mobile JKN information. However, the user does not seem to have updated the application for a long time.²⁰ Telemedicine services for patients and users are expected to periodically update information on healthcare services, which should improve their telemedicine services, such as consultation and information, by using mobile health services; however, it is easy for patients or users to access and understand²¹.

The perceived benefits include: 1) telemedicine improves the productivity and effectiveness of healthcare, 2) coping with many health problems, 3) meeting expectations, and 4) no additional medical consultation required. In the Health Belief Model theory, perceived benefits improve an individual's belief in decision-making,^{22,23} meaning that a higher perception of the benefits of using telemedicine services causes higher utilization of this application. Therefore, there is a relationship between perceived ease of use and the benefits of telemedicine utilization, and between perceived ease of use and perceived benefits and the frequency of telemedicine utilization which is quite successful because it provides an accessible service for users, is easy to read, makes it easy to access health information and its use, and makes it easy to monitor health as an effective factor for a quality system in telemedicine services and becomes the key to users' satisfaction.^{24,25}

Easy to use is related to the degree of difficulty in technological services, including how to apply telemedicine, how to use it, and how to learn about it.^{26,27} User satisfaction will increase if the quality of information is well-organized and easy to use;²⁸ therefore, the perceived ease of telemedicine use shows a high degree of telemedicine utilization in healthcare. Based on the technology acceptance model theory, there are factors affecting the use of technology, one of which is the perception of ease of use and benefits. Perceived ease of use is a factor affecting the attraction to telehealth among COVID-19 patients in Daerah Istimewa Yogyakarta.²⁹

Most respondents (87%) wanted to use telemedicine and said that telemedicine was helpful during the pandemic.^{24,30} The factors affecting users' acceptance of telemedicine include perceived benefits, perceived ease of use, social influence, support conditions, internet access, and relevant hardware.^{22,31} The perception of benefits is the result of the telemedicine healthcare service experienced by users. Patients evaluate the benefits of telehealth based on the results of the healthcare they receive and the service they expect.^{32,33} Based on the results of this research, the factors of ease of use and benefits are the keys affecting patients' utilization of telemedicine for obtaining healthcare services at first-level healthcare facilities.

A limitation of this study is that our sample was not too broad; that is, only a few first-level health facilities were included. Therefore, the scope of this study needs to be expanded further. In addition, the survey object was the participants of the National Health Insurance for telemedicine services, but it needs to be considered and integrated into the scope of the research, namely the perceptions of medical personnel at first-level health facilities. The impact of the COVID-19 pandemic on the use and perception of medical personnel was not included, which is an interesting finding worthy of further in-depth exploration.

Conclusion

In summary, this study showed that most of the utilization of telemedicine at the first-level facilities in Padang was high in frequency. The perception of ease of use and apparent benefits of telemedicine utilization was also high. There was an evident relationship between perceived ease of use and perceived benefits during the utilization of telemedicine by JKN members in first-level healthcare facilities. The healthcare facility and BPJS-K can improve their service quality and develop a more accessible and valuable service to meet patients' needs. They should enhance societal education regarding the benefits of telemedicine services. Therefore, the use of health care services through telemedicine can also be improved. Future research should evaluate the effectiveness of telemedicine in other population groups and healthcare providers.

Acknowledgment

We would like to thank the Faculty of Public Health, Andalas University for supporting the implementation of this research through funding from the DIPA FKM University in 2022.

Funding

This study was funded by DIPA FKM Unand Nomor 0022/BPPT/SPK/PNP/FKM/Unand-2022 year 2022.

Conflict of Interest

There is no conflict of interest in the making of this journal.

Reference

1. Yuan B, Jian W, He L, Wang B, Balabanova D. The role of health system governance in strengthening the rural health insurance system in China. *Int J Equity Health*. 2017 May 23;16(1):44. doi: 10.1186/s12939-017-0542-x. PMID: 28532418; PMCID: PMC5440979.
2. Tangcharoensathien V, Thwin AA, Patcharanarumol W. Implementing health insurance for

- migrants, Thailand. *Bull World Health Organ.* 2017 Feb 1;95(2):146-151. doi: 10.2471/BLT.16.179606. PMID: 28250516; PMCID: PMC5327939.
3. Stoumpos AI, Kitsios F, Talias MA. Digital Transformation in Healthcare: Technology Acceptance and Its Applications. *Int J Environ Res Public Health.* 2023 Feb 15;20(4):3407. doi: 10.3390/ijerph20043407. PMID: 36834105; PMCID: PMC9963556.
 4. Salesika S. The analysis of factors that affect the utilization of telemedicine services in national health insurance participants at first-level facilities. 2021; Thesis. Universitas Sriwijaya
 5. Zaid, Z., Shinta, A., Aufa, M. F., & Pratondo, K. Social Norm and Social Influence on Covid 19 Vaccine Intention. *Perintis's Health Journal).* 2021; 8(2), 91–99. <https://doi.org/10.33653/jkp.v8i2.682>
 6. Kane CK, Gillis K. The Use Of Telemedicine By Physicians: Still The Exception Rather Than The Rule. *Health Aff (Millwood).* 2018 Dec;37(12):1923-1930. doi: 10.1377/hlthaff.2018.05077. PMID: 30633670.
 7. Intan Sabrina M, Defi IR. Telemedicine Guidelines in South East Asia-A Scoping Review. *Front Neurol.* 2021 Jan 13;11:581649. Available from: <https://doi.org/10.3389/fneur.2020.581649>. PMID: 33519669; PMCID: PMC7838484.
 8. Indonesia's Ministry of Health. Blueprint for Health Digital Transformation Strategy 2024. Jakarta: Kementerian Kesehatan RI 2021. Available from: <https://repository.kemkes.go.id/book/710>
 9. Indonesia's Ministry of Health. Ministry of Health Regulation number 20 year 2019 on telemedicine healthcare service in a healthcare facility Available from: <https://peraturan.bpk.go.id/Details/138613/permenkes-no-20-tahun-2019>
 10. BPJS Kesehatan. Number of BPJS Health participants in 2020Tahun 2020. jakarta; 2020. Available From: <https://databoks.katadata.co.id>
 11. BPJS Kesehatan. BPJS Health: Health facilities must maintain contact with participants. Available from: <https://news.republika.co.id/berita>
 12. He Y, Chen Q, Kitkuakul S. Regulatory focus and technology acceptance: Perceived ease of use and usefulness as efficacy. Wright LT, editor. *Cogent Bus Manag [Internet].* 2018 Jan 1;5(1):1459006. Available from: <https://doi.org/10.1080/23311975.2018.1459006>
 13. Al-Adwan AS, Li N, Al-Adwan A, Abbasi GA, Albelbisi NA, Habibi A. "Extending the Technology Acceptance Model (TAM) to Predict University Students' Intentions to Use Metaverse-Based Learning Platforms". *Educ Inf Technol (Dordr).* 2023 Apr 28:1-33. Available from: <https://doi: 10.1007/s10639-023-11816-3>. Epub ahead of print. PMID: 37361794; PMCID: PMC10140721.
 14. Hampshire K, Mwase-Vuma T, Alemu K, Abane A, Munthali A, Awoke T, Mariwah S,

- Chamdimba E, Owusu SA, Robson E, Castelli M, Shkedy Z, Shawa N, Abel J, Kasim A. Informal mhealth at scale in Africa: Opportunities and challenges. *World Dev.* 2021 Apr;140:105257. Available from: <https://doi.org/10.1016/j.worlddev.2020.105257>. PMID: 33814676; PMCID: PMC7903241.
15. Pasaribu, Karl Fritzs et al. The Development of Telemedicine in Tackling Connectivity and Healthcare Accessibility. *Jurnal Berita Kedokteran Masyarakat* Vol 34, No 11 (2018). UGM. Available from: <https://journal.ugm.ac.id/bkm/article/view/40576>
 16. Franciosi EB, Tan AJ, Kassamali B, Leonard N, Zhou G, Krueger S, Rashighi M, LaChance A. The Impact of Telehealth Implementation on Underserved Populations and No-Show Rates by Medical Specialty During the COVID-19 Pandemic. *Telemed J E Health.* 2021 Aug;27(8):874-880. Available from: <https://doi.org/10.1089/tmj.2020.0525>. Epub 2021 Apr 7. PMID: 33826411; PMCID: PMC8420945.
 17. Siboro, M. D., Surjoputro, A., & Budiyaniti, R. T. The factors that influence the utilization of telemedicine services during the covid-19 pandemic on the Java Island. *Jurnal Kesehatan Masyarakat (Undip).* 2021; 9(5), 613–620. <https://doi.org/10.14710/jkm.v9i5.30762>.
 18. Tariverdi M, Nunez-del-Prado M, Leonova N, Rentschler J. Measuring accessibility to public services and infrastructure criticality for disasters risk management. *Sci Rep* [Internet]. 2023;13(1):1–16. Available from: <https://doi.org/10.1038/s41598-023-28460-z>
 19. McCollum R, Gomez W, Theobald S, Taegtmeier M. How equitable are community health worker programmes and which programme features influence equity of community health worker services? A systematic review. *BMC Public Health.* 2016 May 20;16:419. Available from: <https://doi.org/10.1186/s12889-016-3043-8>. PMID: 27207151; PMCID: PMC4875684.
 20. Handayani PW, Meigasari DA, Pinem AA, Hidayanto AN, Ayuningtyas D. Critical success factors for mobile health implementation in Indonesia. *Heliyon* [Internet]. 2018;4(11):e00981. Available from: <https://doi.org/10.1016/j.heliyon.2018.e00981>
 21. Zhang X et al. User acceptance of mobile health services from users' perspectives: The role of self-efficacy and response-efficacy in technology acceptance. *Inf Heal Soc Care* 2017 [Internet].2017;42(2):194–206. <https://doi.org/10.1080/17538157.2016.1200053>. Epub 2016 Aug 26. PMID: 27564428.
 22. Kavandi H, Jaana M. Factors that affect health information technology adoption by seniors: A systematic review. *Health Soc Care Community.* 2020 Nov;28(6):1827-1842. Available from: <https://doi.org/10.1111/hsc.13011>. Epub 2020 May 7. PMID: 32378769.
 23. Snoswell CL, Chelberg G, De Guzman KR, Haydon HH, Thomas EE, Caffery LJ, et al. The clinical effectiveness of telehealth: A systematic review of meta-analyses from 2010 to 2019. *J Telemed Telecare* [Internet]. 2021 Jun 29;29(9):669–84. Available from: <https://doi.org/10.1177/1357633X211022907>

24. Gumilang MA, Rifkamurti N, Handayani F, Sandi G, Irbah H. Elderly perceptions of telemedicine services. *Pengmaskemas*. 2021;1(2): 136–43. Available from: <https://journal.fkm.ui.ac.id/pengmas/article/view/5737>
25. Jia X, Pang Y, Liu LS. Online Health Information Seeking Behavior: A Systematic Review. *Healthcare (Basel)*. 2021 Dec 16;9(12):1740. doi: 10.3390/healthcare9121740. PMID: 34946466; PMCID: PMC8701665.
26. Ikram U, Gallani S, Figueroa J and FT. Strategies to Make Telehealth Work for Elderly Patients. *Harv Bus Rev*. 2020. Available from: <https://www.hbs.edu/faculty/Pages/item.aspx?num=59271>
27. Safi S, Thiessen T, Schmailzl KJ. Acceptance and Resistance of New Digital Technologies in Medicine: Qualitative Study. *JMIR Res Protoc*. 2018 Dec 4;7(12):e11072. Available from: <https://doi:10.2196/11072>. PMID: 30514693; PMCID: PMC6299231.
28. Sven Laumer, Christian Maier & Tim Weitzel (2017) Information quality, user satisfaction, and the manifestation of workarounds: a qualitative and quantitative study of enterprise content management system users, *European Journal of Information Systems*, 26:4, 333-360. Available from: <https://DOI:10.1057/s41303-016-0029-7>
29. Pratondo, Katon, Zaid, Shinta A. The Perceived Role of Convenience and Usefulness in Influencing Telehealth Acceptance by Covid 19 Patients. *J Endurance*. 2022;7(1):209–220. Available from: <https://doi.org/10.22216/jen.v7i1.844>
30. Shaverdian N, Gillespie EF, Cha E, Kim SY, Benvengo S, Chino F, Kang JJ, Li Y, Atkinson TM, Lee N, Washington CM, Cahlon O, Gomez DR. Impact of Telemedicine on Patient Satisfaction and Perceptions of Care Quality in Radiation Oncology. *J Natl Compr Canc Netw*. 2021 Jan 4;19(10):1174–1180. Available from: <https://doi:10.6004/jnccn.2020.7687>. PMID: 33395627; PMCID: PMC8254817.
31. Garavand A, Aslani N, Nadri H, Abedini S, Dehghan S. Acceptance of telemedicine technology among physicians: A systematic review. *Informatics Med Unlocked [Internet]*. 2022;30(April):100943. Available from: <https://doi.org/10.1016/j.imu.2022.100943>
32. Zobair K. M. E al. Health Seekers' Acceptance and Adoption Determinants of Telemedicine in Emerging Economies. *Australas J Inf Syst [Internet]*. 2021;25:1–30. Available from: <https://doi.org/10.3127/AJIS.V25I0.307>
33. Gajarawala SN, Pelkowski JN. Telehealth Benefits and Barriers. *J Nurse Pract*. 2021 Feb;17(2):218–221. Available from: <https://doi:10.1016/j.nurpra.2020.09.013>. Epub 2020 Oct 21. PMID: 33106751; PMCID: PMC7577680.