

Health service quality of human immunodeficiency virus voluntaries' counselling and testing

Sudirman Sudirman¹, Sri Purwiningsih¹, Darmin Darmin², Desak Eka Susianawati¹,
Fitri Arni¹, Sitti Fajrah¹

¹Study Program of Public Health, Faculty of Health Science, Indonesia Jaya Institute of Health Science, Palu, Indonesia

²Study Program of Public Health, Faculty of Health Science, Graha Medika Institute of Health and Technology, Kotamobagu, Indonesia

Article Info

Article history:

Received Oct 30, 2022

Revised Jul 27, 2023

Accepted Aug 29, 2023

Keywords:

Health

Health counseling and test

HIV

Service quality

Voluntary

ABSTRACT

United Nations & AIDS (UNAIDS) in 2019 stated that 38 million individuals in the world were suffering from human immunodeficiency virus or HIV. Since it was discovered in 1987, the number of HIV cases in Indonesia until mid-2020 was 436,948 cases, of which 64,990 people have died. This study aims to assess the quality of health services with the service quality (SERVQUAL) analysis model on voluntary HIV counseling and testing. A quantitative study was conducted with a descriptive observational analytic approach and a cross-sectional design on 120 respondents. The variables were measured using a service quality questionnaire and Likert scale. The results showed a difference between the expectations and perceptions of respondents on the service quality of voluntary HIV counseling and testing. The statistical analysis ($p=0.000$) shows that the health services for voluntary HIV counseling and testing have poor quality. However, the respondents gave good scores on responsiveness and assurance of the services. Managers and relevant authorities need to plan and pay special attention to other yet optimal variables.

This is an open access article under the [CC BY-SA](#) license.



Corresponding Author:

Sudirman Sudirman

Study Program of Public Health, Faculty of Health Science, Jaya Indonesia Institute of Health Science
Palu, Indonesia

Email: sudirmandirman549@gmail.com

1. INTRODUCTION

In 2019, United Nations & AIDS or UNAIDS stated that up to 38 million people worldwide are infected with human immunodeficiency virus (HIV), consisting of 36.2 million adults and 1.8 million below-15-years children. Moreover, new HIV cases in 2018-2019 reached 2.25 million people. This figure has not yet reached the planned reduction target of 500 thousand people. It is estimated that 4,500 infections of HIV in children and adults happen every day [1].

The number of HIV cases in Indonesia was increased. It was recorded that from 2005 to March 2021 were 427,201 cases of HIV [2]. The estimations and projections of HIV indicate that more than one million Indonesians will be infected with HIV by 2025. The estimated figure may increase if means to accelerate the prevention of HIV and acquired immunodeficiency syndrome (AIDS) are not implemented immediately [3]. In 2020, East Java Province recorded 64,333 HIV cases and was noted as the highest HIV cases in Indonesia. Therefore, concrete actions are needed to deal with and reduce the number of new infections that can be taken to prevent HIV infection by conducting voluntary health counseling and testing services. This program is crucial to know the appropriate preventive measures, care, and support services that should be provided to people infected with HIV. It is also expected to help infected people to have mental preparation and self-motivation to undergo therapy [4]–[6].

The Indonesian government has established a policy of voluntary HIV testing and counseling program to reduce the new cases of HIV transmission. This service can be provided in primary health care facilities. This program provides information about HIV and AIDS to increase the ability to make decisions regarding decisions HIV testing and consultation [3]. However, the service quality in this program is considered ineffective to detects new HIV infections. In the process, most of the patients suggested that the place for HIV counseling and testing should be separate and service times should be provided every day [7], [8].

However, the main factor causing the ineffectiveness of this program is the low quality of providing voluntary HIV counseling and testing services. Thus, the patients are unmotivated and less interested to participate. This condition will be a formidable challenge to achieve the targets set by the World Health Organization, that is 90; 90; 90. Changes must be made immediately to improve the quality of services to meet patient expectations. These changes can be by improving skills and environmental facilities, providing cognitive attention, self-efficacy, and norms to motivate people to carry out voluntary HIV counseling and testing, especially for those with risky sexual behavior [9], [10].

Following the case above, the objective of this study is to evaluate the standard of healthcare services for voluntary HIV counseling and testing using the SERVQUAL analysis model. This research is expected to meet expectations and increase the motivation of society in general, especially for people who have risky sexual behavior, to do an HIV test and undergo antiretroviral (ARV) therapy. This study used the service quality (SERVQUAL) assessment. The SERVQUAL analysis model is a suitable tool to evaluate the gap between perceptions and expectations of voluntary HIV counseling and testing [11]. Quality is a concept that stands out in real life, and it can inform the suitable measures to develop effective strategies to improve service systems [12]. The SERVQUAL method makes it possible to study patient expectations so the providers can improve their quality of services and, in turn, will increase patient satisfaction and compliance [13]. Gap model analysis was used to assess the difference between public expectations and perceptions, which consisted of tangible, reliability, responsiveness, assurance, and empathy aspects in HIV counseling and testing services. The results obtained can be used as a reference to improve the service quality related to HIV that prioritizes human rights so the patients can feel more secure, comfortable, and satisfied.

2. RESEARCH METHOD

This study was ethically approved by the Faculty of Public Health Airlangga University with number 73-KPK. The service quality gap model is a model to assess user satisfaction with provided services, consisting of i) Gap 1 (customer expectation – management perceptions); ii) Gap 2 (management perceptions – service standards); iii) Gap 3 (service standards – service delivery); iv) Gap 4 (service delivery – customer perception); and v) Gap 5 (customer perception – customer expectation). This study focuses on assessing Gap 5, which is the final essence that determines customer satisfaction. Customer satisfaction is highly dependent on the minimization of gap 1 to gap 4 related to service delivery.

2.1. Research design

This descriptive-quantitative research used an observational analytic approach with a cross-sectional design, conducted in March-August, 2018 in Surabaya, Indonesia. The research variables consisted of public expectations and perceptions of the service quality of voluntary HIV counseling and testing. The variables were measured based on the service quality questionnaire that had been tested for validation and reliability according to the topic and character of the research location. Each question item is on the Likert scale with a score range of 1 to 5.

2.2. Data collection and analysis

The population in the study was expected to be 1,070. Through the stratified random sampling method, 120 patients were chosen as respondents. This method was used because the population cannot be known with certainty. Data were collected through questionnaires with interview techniques. The data were then analyzed descriptively, while the specific data were tested inferentially using the paired T-test ($\alpha=0.05$).

3. RESULTS AND DISCUSSION

3.1. Result

3.1.1. Service quality of HIV counseling and testing

Respondents included in this study were patients who accessed voluntary HIV counseling and testing services. Characteristics of respondents and test results are presented in Table 1. The gap model service quality yielded a gap value of 0.27 and a p-value of 0.000. More details can be seen in Figure 1 and Table 2. Next, the quality of voluntary counseling and testing (VCT) services is depicted in a 2-dimensional

differencing plane diagram as shown in Figure 1 to determine the dimensions that need to be developed to improve client satisfaction.

Table 1. Characteristics of respondents

Characteristics of respondents		Frequency (n:120)	Percentage (%)
Gender	Male	61	50.83
	Female	59	49.17
Age (years)	20-35	40	33.33
	36-45	46	38.33
	46-55	25	20.83
	56-65	9	7.6

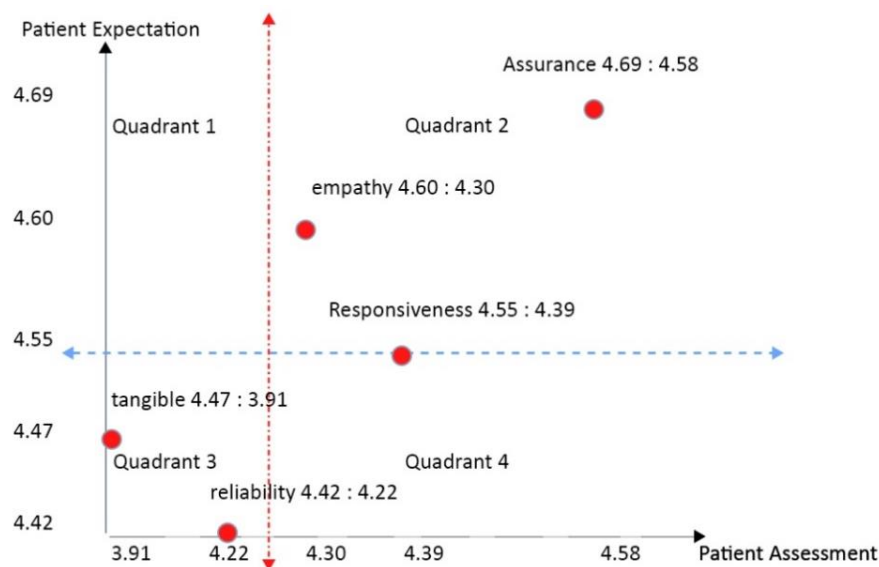


Figure 1. The 2-dimensional differencing plane diagram of VCT

Based on Table 2, it can be seen that the total value of expectation was 4.55, which was then used as a benchmark to determine the dimensions that were expected or not expected by the respondents. The dimensions most expected by respondents, marked with a value equal to or greater than the total expectation value, were the dimensions of responsiveness (4.55), assurance (4.69), and empathy (4.60). Meanwhile, the value for VCT services that have been received was 4.27, which was used as a benchmark to determine the dimensions that were as expected or not by the respondents. The dimensions that did not pass the benchmark were tangible (3.91) and reliability (4.22).

The mapping in Figure 1 also confirms that the dimensions that can be improved to support the quality of VCT services are the tangible and reliability dimensions as they are in quadrant 3. Based on the 2-dimensional differencing plane principle, quadrant 1 or focus improvement effort and quadrant 2 or maintain performance are parts that have adequate development process and must be maintained, while quadrant 3 or medium-low priority and quadrant 4 or reduce emphasis are parts that still need to be improved as it is still not prioritized and has decreased in quality. Thus, all dimensions of service must be prioritized and developed properly to provide maximum VCT service quality.

3.1.2. Strategic issues and recommendations

According to the result above, this study arranged the strategic issues and recommendations. It is described more in Table 3. The dimensions in quadrants 1 and 3 in the 2-dimensional differencing plane diagram were used as material for determining strategic issues and recommendations.

Table 2. Service quality of HIV VCT

Variable dimension	Indicator	Indicator value		Dimension value			Variable value			p-value α (0.05)
		Exp.	Perc.	Exp.	Perc.	Gap	Exp.	Perc.	Gap	
Tangible	Availability of the VCT room	4.44	3.94	4.47	3.91	0.56	4.55	4.27	0.27	0.000
	The comfort of the VCT room	4.41	3.86							
	Availability of competent and non-double duty VCT officers	4.51	4.22							
	Availability of communication aids (pictures, leaflets, and short videos) when conducting VCT	4.56	3.33							
	Clear service time	4.51	4.15							
Reliability	The officer provides information on the management of VCT services	4.37	4.16	4.42	4.22	0.20				
	The officer explains the preparation of the VCT process (informed consent, benefits, impact, and follow-up)	4.44	4.15							
	The officers are easy to find and contact	4.47	4.29							
Responsiveness	The officers immediately act to provide services	4.49	4.53	4.55	4.39	0.16				
	The officers provide timely services	4.59	4.22							
	The officers are always ready to help	4.59	4.43							
	The officers direct the client to immediately get services	4.55	4.42							
	The officers maintain the confidentiality of the clients' personal data	4.73	4.51	4.69	4.58	0.11				
Assurance	Clients are not discriminated against during the VCT process	4.75	4.54							
	There is no stigma in the VCT process toward clients	4.71	4.60							
	The officers give a sense of security to the clients	4.63	4.39							
	The officers respect the clients	4.69	4.77							
	The officers listen and respond to client complaints	4.70	4.44	4.60	4.30	0.30				
Empathy	The service time is provided as needed	4.54	4.24							
	The officers make it easy for clients to take advantage of the VCT services	4.55	4.11							
	The officers motivate clients when using VCT services	4.63	4.43							

Notes:

1. Gap 5 (service quality of voluntary HIV counseling and testing (VCT))
 - a. Qualified if not significant
 - b. Not qualified if it is significant
2. Variable dimension
 - a. Good; Dimension gap \geq Gap 5 value
 - b. Poor; Dimension gap $<$ Gap 5 value
3. Exp. (Expectation); Perc. (Perception)

Table 3. Recommended results of 2-dimensional differencing plane

No	Gap 5 strategic issue	Brainstorming result	Study	Recommendation
1	The quality of VCT services (gap 5) was not optimal. All quality dimensions had not met the criteria. In the 2-dimensional differencing plan diagram, tangible and reliability dimensions had the lowest assessment value by the respondents.	The unfulfilled quality of VCT services was due to several obstacles in service standards and performance, and in turn, affects service quality. The different character of each client also affects the assessment and makes it difficult for officers to adjust the services provided.	The inadequate quality of VCT services was influenced by the lack of assistance by the officers and the differences in the character of the clients. Therefore, the clients were less satisfied, especially in the tangible and reliability dimensions.	<ol style="list-style-type: none"> a. Carry out a need-assessment method to a client group to adjust the VCT service needed. b. Conduct job description analysis for all officers to maximize available resources c. Establish an Educational Information Communication (EIC) team between officers and managers for those with higher risk for HIV. d. Structuring the VCT room to be suitable for privacy matters and maximizing supporting facilities. e. Counseling and testing are accompanied by updated media to educate VCT clients.

3.2. Discussion

Service quality can be defined as an assessment made by users toward the service provided. The smaller the difference between expectations and perceptions felt by service users, the better the service quality. This study observed that respondents who used VCT services have negative perceptions of all dimensions (tangible, reliability, responsiveness, assurance, and empathy). It indicates that the health services received by respondents were not optimal [12].

The lack of optimal service observed in this study was due to the incompleteness of all the dimensions that can be provided. Respondent expectations in a health service will tend to be higher on the dimensions of reliability, responsiveness, assurance, and empathy. Overall, respondents will give a quality assessment if the service received can meet their expectations in general. Health care provider organizations, especially those related to facilities and competent human resources, must always carry out regular assessments to improve their services [14]–[16].

The reliability dimension in VCT services is considered imperfect. The availability of communication aids in giving informed consent, such as leaflets, brochures, and media, is not sufficient, so respondents do not understand the information provided. Other studies suggest that health services are considered unsatisfactory if there is a lack of knowledge conveyed, a lack of modern health services, the use of informed consent that is too complicated, and a lack of explanation of the tests to be performed. Specifically for informed consent, communication should be followed the character of each patient to increase patient awareness and interest in carrying out related tests [17], [18].

In the tangible dimension, respondents revealed that the services provided were not neatly arranged, giving the impression that they lacked respect and lowered their confidence to discuss private matters. Furthermore, the service time and waiting time are still unclear, and the incompetence of the counseling staff causes respondents to find it quite difficult to perform VCT. The motivation given by counselor officers (empathy dimension) to patients was still inadequate, while patients needed encouragement and support to undergo the VCT process. The practice of VCT must be carried out based on consent, confidentiality, and consultation to obtain optimal results. The discipline of applying these principles is very helpful for individuals and groups [19]. Previous research stated that the dimensions of tangible and reliability in a health service are considered the most crucial among other dimensions by patients [20]–[22].

The results of this study illustrate that VCT services need serious attention by health service providers because the quality of services provided is closely related to the strategies for controlling HIV transmission, especially in the dimensions of reliability, tangible, and empathy. In addition, the quality of VCT services greatly influences the future and self-esteem of the patients and HIV transmission afterward. Another study explains that the implementation of quality VCT can be the right solution to overcome feelings of depression in sufferers and can reduce HIV transmission. It is because quality services prioritize guarantees, respect human rights, and prioritize consent and confidentiality so that no one feels disadvantaged [19].

The results of the study evaluating the quality of outpatient services in Eastern Saudi Arabia indicate that the proposed model was valid and reliable, and service quality gaps from all dimensions need to be prioritized and focused on improving hospital management [23]. The analysis between perceptions and expectations of Medical-Surgical Patients in General Hospitals in Saudi Arabia showed a negative gap in the five dimensions. This can provide information to nurses about aspects of nursing care that will improve patient outcomes and satisfaction [24].

Research in Saudi Arabia shows that gender, education, income, and occupation have a significant effect on inpatient satisfaction [25]. Single patients perceived physical evidence, reliability, empathy, and loyalty higher than married patients [26]. Improvements are needed to achieve high-quality healthcare services in private hospitals in Yemen to raise loyalty among patients [27]. Patient satisfaction in the aspects of empathy was strongest in the public sector and responsiveness in the private sector [28]. Patient expectations in university hospitals are higher than their perceptions [29]. Currently, the intensity of access for high-risk populations to VCT services is still insignificant. VCT health services are effective for screening cases, preventing, and providing care for people with HIV/AIDS [7], [30].

Things that are recommended to be improved are providing job description analysis, forming an educational information communication or EIC team between HIV case officers and managers, structuring the VCT room, conducting a need-assessment analysis of patients, and counseling and testing using updated media. Massora stated that job descriptions have a close relationship with employee performance [31]. An appropriate, clear, and precise job description can improve the work performance of service personnel. On the other hand, a need-assessment analysis is carried out to ensure that service personnel can provide efficient services to improve patient health.

This approach can describe health problems in a population, identify inequalities in health and access to services, and determine priorities for the most effective use of resources. In practice, need-

assessment analysis requires a practical understanding of what is involved, the time and resources required to conduct the assessment, and the appropriate integration of results into service planning and delivery [32]. The provision of the latest counseling and test media can provide complete information to patients so that patients can understand and carry out treatment steps easily. Furthermore, it is expected that the recommendations given can improve services and reduce the gap between services and patients.

4. CONCLUSION

There are differences in patient expectations of VCT with the quality of services provided. Responsiveness and assurance dimensions in VCT services are considered adequate. However, other dimensions still need improvement to produce quality services. Solutions that can be used for future improvements are providing job description analysis, forming an EIC team between officers and HIV case managers, structuring the VCT room, conducting need-assessment analysis for patients, and using updated counseling and test media.

ACKNOWLEDGEMENTS

The authors thanked to Indonesia Jaya Institute of Health Science, Palu, Indonesia for giving support to accomplished this research.




REFERENCES

- [1] W. Byanyima, "UNAIDS data 2020," 2020. https://www.unaids.org/sites/default/files/media_asset/2020_aids-data-book_en.pdf (accessed on August 15, 2023).
- [2] Indonesian Ministry of Health, "The report of HIV AIDS and sexually transmitted diseases in quarter I of 2021" 2021. https://siha.kemkes.go.id/portal/files_upload/Laporan_TW_I_2021_FINAL.pdf. (accessed on August 15, 2023).
- [3] Indonesian Ministry of Health, *Guidelines for HIV counseling and testing (in Indonesian)*. Indonesia, 2014.
- [4] HIV.gov, "The global HIV/AIDS epidemic," 2023. <https://www.hiv.gov/federal-response/pepfar-global-aids/global-hiv-aids-overview/>
- [5] UNAIDS, "Global HIV & AIDS statistics," 2022. <https://www.unaids.org/en/resources/fact-sheet> (accessed on August 15, 2023).
- [6] World Health Organization, "HIV and AIDS," 2023. <https://www.who.int/news-room/fact-sheets/detail/hiv-aids> (accessed on August 15, 2023).
- [7] Y. Dong *et al.*, "Prediction model for the risk of HIV infection among MSM in China: validation and stability," *International Journal of Environmental Research and Public Health*, vol. 19, no. 2, p. 1010, Jan. 2022, doi: 10.3390/ijerph19021010.
- [8] C. Cheruiyot, D. Magu, P. Mburugu, and D. Sagwe, "Uptake and utilization of institutional voluntary HIV testing and counseling services among students aged 18-24 in Kenya's public Universities," *African Health Sciences*, vol. 19, no. 4, pp. 3190–3199, Jan. 1970, doi: 10.4314/ahs.v19i4.42.
- [9] M. Ebrahimi, F. Jalilian, H. Ashtarian, Z. Heidari, and F. Rajati, "The role of integrative model of behavioral prediction in voluntary counseling of individuals with sexual high-risk behavior," *Journal of Education and Health Promotion*, vol. 8, no. 1, p. 138, 2019, doi: 10.4103/jehp.jehp_364_18.
- [10] A. T. Alem, M. M. Sisay, and A. M. Alemayehu, "Factors affecting voluntary HIV/AIDS counseling and testing service utilization among youth in Gondar City, Northwest Ethiopia," *HIV/AIDS - Research and Palliative Care*, vol. Volume 12, pp. 667–673, Nov. 2020, doi: 10.2147/HIV.S267494.
- [11] S. H. Teshnizi, T. Aghamolaei, K. Kahnouji, S. M. H. Teshnizi, and J. Ghani, "Assessing quality of health services with the SERVQUAL model in Iran. A systematic review and meta-analysis," *International Journal for Quality in Health Care*, vol. 30, no. 2, pp. 82–89, Mar. 2018, doi: 10.1093/intqhc/mzx200.
- [12] S. Rezaei, M. Hajizadeh, H. Zandian, A. Fathi, and B. Nouri, "Service quality in Iranian hospitals: A systematic review and meta-analysis," *Medical Journal of the Islamic Republic of Iran*, vol. 32, no. 1, pp. 249–253, 2018, doi: 10.14196/MJIRI.32.59.
- [13] A. Jonkisz, P. Karniej, and D. Krasowska, "SERVQUAL method as an 'old new' tool for improving the quality of medical services: A literature review," *International Journal of Environmental Research and Public Health*, vol. 18, no. 20, 2021, doi: 10.3390/ijerph182010758.
- [14] A. A'aqoulah, A. B. Kuyini, and S. Albalas, "Exploring the gap between patients' expectations and perceptions of healthcare service quality," *Patient Preference and Adherence*, vol. 16, pp. 1295–1305, 2022, doi: 10.2147/PPA.S360852.
- [15] M. S. Ibrahim, "Validating service quality (SERVQUAL) in healthcare: measuring patient satisfaction using their perceptions in Jordan," *Journal of Information and Knowledge Management*, vol. 19, no. 1, 2020, doi: 10.1142/S0219649220400213.
- [16] M. Ali, "How patients perceive healthcare services: A case of Ayub Teaching Hospital, Abbottabad–Pakistan. SERV Service QUAL Quality," *International Journal of Healthcare Management*, vol. 11, no. 1, pp. 52–59, 2018, doi: 10.1080/20479700.2017.1304324.
- [17] A. Pramanik, "Patients' perception of service quality of health care services in India: A comparative study on urban and rural hospitals," *Journal of Health Management*, vol. 18, no. 2, pp. 205–217, 2016, doi: 10.1177/0972063416637695.
- [18] K. Moodley, C. Staunton, T. Rossouw, M. De Roubaix, Z. Duby, and D. Skinner, "The psychology of 'cure' - Unique challenges to consent processes in HIV cure research in South Africa," *BMC Medical Ethics*, vol. 20, no. 1, 2019, doi: 10.1186/s12910-019-0348-z.
- [19] E. Wekesa, "HIV testing experiences in Nairobi slums: The good, the bad and the ugly," *BMC Public Health*, vol. 19, no. 1, 2019, doi: 10.1186/s12889-019-7975-7.
- [20] P. Węglowski, I. Mazur, J. A. Jończyk, M. Czapla, and P. Karniej, "A new application of the SERVQUAL method for the evaluation of the quality of medical services," *Studies in Logic, Grammar and Rhetoric*, vol. 51, no. 1, pp. 101–111, 2017, doi: 10.1515/slgr-2017-0036.
- [21] A. Riaz and U. Sughra, "Measurement of service quality gaps in dental services using servqual in public hospitals of rawalpindi," *Pakistan Journal of Medical Sciences*, vol. 37, no. 3, pp. 751–756, 2021, doi: 10.12669/pjms.37.3.3436.




- [22] M. Pekkaya, Ö. Pulat İmamoğlu, and H. Koca, "Evaluation of healthcare service quality via Servqual scale: An application on a hospital," *International Journal of Healthcare Management*, vol. 12, no. 4, pp. 340–347, 2019, doi: 10.1080/20479700.2017.1389474.
- [23] K. J. Al Fraihi and S. A. Latif, "Evaluation of outpatient service quality in Eastern Saudi Arabia: Patient's expectations and perceptions," *Saudi Medical Journal*, vol. 37, no. 4, pp. 420–428, 2016, doi: 10.15537/smj.2016.4.14835.
- [24] M. M. Al-Momani, "Gap analysis between perceptions and expectations of medical-surgical patients in a public hospital in Saudi Arabia," *Medical Principles and Practice*, vol. 25, no. 1, pp. 79–84, 2016, doi: 10.1159/000441000.
- [25] H. M. Al-Borie and A. M. Sheikh Damanhour, "Patients' satisfaction of service quality in Saudi hospitals: a SERVQUAL analysis," *International Journal of Health Care Quality Assurance*, vol. 26, no. 1, pp. 20–30, 2013, doi: 10.1108/09526861311288613.
- [26] S. Ahmed, K. M. Tarique, and I. Arif, "Service quality, patient satisfaction and loyalty in the Bangladesh healthcare sector," *International Journal of Health Care Quality Assurance*, vol. 30, no. 5, pp. 477–488, 2017, doi: 10.1108/IJHCQA-01-2017-0004.
- [27] A. Anbori, S. N. Ghani, H. Yadav, A. M. Daher, and T. T. Su, "Patient satisfaction and loyalty to the private hospitals in Sana'a, Yemen," *International Journal for Quality in Health Care*, vol. 22, no. 4, pp. 310–315, 2010, doi: 10.1093/intqhc/mzq029.
- [28] S. A. Javed and F. Ilyas, "Service quality and satisfaction in healthcare sector of Pakistan— the patients' expectations," *International Journal of Health Care Quality Assurance*, vol. 31, no. 6, pp. 489–501, 2018, doi: 10.1108/IJHCQA-08-2016-0110.
- [29] A. Gilavand and A. Torabipour, "The Quality of Services of Iran University Hospitals Based on SERVQUAL's Evaluation Model: A Systematic Review and Meta-Analysis," *Frontiers in Public Health*, vol. 10, 2022, doi: 10.3389/fpubh.2022.838359.
- [30] L. Liu, D. Wang, X. Qin, Z. Hu, and R. Chen, "The impact of social capital on civil society organizations delivering voluntary counseling and testing HIV/AIDS service: a cross-sectional study in China," *BioScience Trends*, vol. 14, no. 3, pp. 182–191, 2020, doi: 10.5582/bst.2020.03110.
- [31] A. Massora, "The effect of officer guidance in human resources quality performance," *European Research Studies Journal*, vol. 20, no. 4, pp. 253–263, 2017, doi: 10.35808/ersj/832.
- [32] J. Wright, R. Williams, and J. R. Wilkinson, "Development and importance of health needs assessment," *BMJ*, vol. 316, no. 7140, pp. 1310–1313, Apr. 1998, doi: 10.1136/bmj.316.7140.1310.

BIOGRAPHIES OF AUTHORS






Sudirman    is a lecturer in Public Health Program at the Institute of Health Science Indonesia Jaya. Actively writing books and actively participating in Research Grant competitions from Research and Technology Higher Education both as team leaders and members. as a member of the public health professional organization, the Association of Indonesian Public Health Scholars (PERSAKMI). He can be concatted at email: sudirmandirman549@gmail.com.






Sri Purwiningsih    is a lecturer at the Institute of health Science Indonesia Jaya in the Bachelor of Public Health Program. The educational background of the Bachelor of Public Health was obtained from the Institute of Health Sciences Indonesia Jaya. Master of Health degree that focuses on public health science obtained from the university of East Indonesia. Her research is focusing on health community services. She can be concatted at email: tabitasri2008@gmail.com.






Darmin    is a lecturer at the Graha Medika Institute of Health and Technology Kotamobagu City. He was Chairman of the Quality Assurance Institute (SPM) of the Graha Medika Institute of Health and Technology in 2020, and He is a Vice Chancellor III for Student Affairs and Alumni, Graha Medika Institute of Health and Technology in the 2021-2025 period. He is actively writing books and actively participating in the Research Grant competition from Ristek Dikti both as team leader and member. He can be concatted at email: dharmyn@gmail.com.






Desak Eka Susianawati    is a lecturer at the Jayapura Indonesian Health Sciences College campus, Palu, the Public Health Study Program. The educational background of the Bachelor of Public Health was obtained from the Institute of Health Sciences Indonesia Jaya. Master of Health degree that focuses on public health science obtained from the University of East Indonesia. Her research is focusing on health community services. She can be concatted at email: desak.susianawati@gmail.com.



Fitri Arni    is a lecturer at the Health Science Indoensia Jaya, the Public Health (S1) study program. Her bachelor's degree was obtained from Public Health Sciencesat the Indonesian Muslim University (UMI). Her master's degree was from Hasanudin University. Her research is focusing on health community services. She can be concatted at email: fitrirsasyidi@gmail.com.



Sitti Fajrah    obtained a bachelor's degree in public health from the Indonesian Muslim University, Makassar in 2011. In 2013, she got the master degree from Hasanuddin University, Makassar. She ia a lecturer at Institute of Health Science Indonesia, Palu City, Central Sulawesi. She is the member of public health professional organizations: Association of Indonesian Public Health Experts (IAKMI) and the Association of Indonesian Public Health Scholars (PERSAKMI). She can be concatted at email: sittifajrah2@gmail.com.