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The Influence of Digital Service Innovation, Human Resource Quality, and the Effectiveness of Health Promotion on Community Satisfaction and Participation at Babatan Community Health Center

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Keywords

Digital service innovation; quality of human resources; health promotion

Abstract

This study aims to analyze the influence of digital service innovation, the quality of human resources, and the effectiveness of health promotion on community satisfaction and participation in health programs at the Batanan Health Center. This study uses a quantitative approach with a survey method on people who are users of Batanan Health Center services. Data were collected through a Likert scale questionnaire and analyzed using Structural Equation Modeling based on Partial Least Squares (PLS-SEM) to test the relationships between variables. The results of the study are expected to provide an empirical picture of the extent to which digital service innovation, health worker competence, and the effectiveness of health promotion are able to increase satisfaction and encourage community participation in health programs. The findings of this study are expected to be a consideration for Puskesmas managers and the government in improving the quality of technology-based health services, strengthening human resources, and optimizing health promotion to achieve more effective and sustainable public health services.

INTRODUCTION

Health services are one of the main elements in the development of people's quality of life (Abdulmalek et al., 2022; Janto et al., 2022; Verdugo et al., 2024; Wang et al., 2024). Good health services not only focus on curing diseases but also include promotive, preventive, curative, and rehabilitative aspects (Marsha, Hidayati, and Saroh 2021). This is in accordance with public health principles that prioritize efforts to improve health and prevent disease. In the context of health services in Indonesia, Puskesmas (Community Health Centers) play a role as the spearhead of first-level healthcare providers (Fasilitas Kesehatan Tingkat Pertama [FKTP]). As institutions that prioritize promotive and preventive approaches, Puskesmas have the responsibility to provide quality services to the community (Ilyas et al. 2024).

The Babatan Community Health Center, located in the city of Bandung, is one of the healthcare facilities that faces challenges similar to those in other urban areas, namely the high demand for health services, the diversity of population characteristics, and the need for fast and high-quality services. Therefore, research on the influence of digital service innovation, human resource quality, and the effectiveness of health promotion on community satisfaction and participation at the Babatan Community Health Center is important to provide an empirical picture of the extent to which these factors can improve service quality and support the achievement of local public health targets (Ginting and Wau 2019). The urgency of this research is underscored by the Indonesian government's primary healthcare transformation agenda (Ministry of Health, 2023), which mandates the acceleration of digitalization, human

resource strengthening, and community-based health promotion (Adebiyi & Ilesanmi, 2026; Chirawurah et al., 2026; Gashu, 2024; Komi et al., 2022). Without empirical evidence on how these factors interact at the community health center level, policy implementation may fail to address local constraints and may not achieve the desired outcomes of increased community satisfaction and participation.

The performance of health services includes various aspects, ranging from the speed and accuracy of services, friendliness and competence of healthcare personnel, and the availability of facilities and infrastructure to the effectiveness of promotive, preventive, curative, and rehabilitative measures. Based on the vision of the Babatan Community Health Center, which is to realize high-quality, equitable, and promotive- and preventive-oriented healthcare services through community participation, there is a commitment to providing sustainable services focused on community needs. The mission of the Babatan Community Health Center, which emphasizes improving service quality, community empowerment, and strengthening the professionalism of healthcare workers, further highlights that service performance is an important benchmark in the success of the Puskesmas as a primary healthcare institution in the city of Bandung (Ramadhani and Hermana 2023).

However, the challenges in implementing health services cannot be ignored (Filip et al., 2022; Janto et al., 2022; Ugwu et al., 2025). Various factors, such as the limited number and uneven distribution of human resources, incomplete facilities, and the unequal adoption of digital technology, often affect the quality of services provided by community health centers. In addition, the increasingly complex needs of society, especially in urban areas such as the city of Bandung, demand improvements in healthcare performance that are more responsive, effective, and oriented toward patient satisfaction. This condition is in line with the direction of the Ministry of Health through the transformation of primary healthcare services, which emphasizes the use of information technology, strengthening human resources, and improving service quality based on national standards so that people can obtain fast, accurate, and affordable access to healthcare services (Wulandari, Rakhmawati, and Budiasih 2021). Therefore, it is important to evaluate how effectively health service performance has been implemented, as well as its impact on the level of public satisfaction (Ministry of Health of the Republic of Indonesia, 2023). The level of community satisfaction is one of the important indicators in measuring the quality of health services. Patient satisfaction reflects how well healthcare services meet patients' needs and expectations. In this study, the level of community satisfaction includes various aspects, such as ease of access to services, waiting time, the quality of interaction between healthcare workers and patients, and the outcomes of the services received (Marlindawaty 2018).

The Babatan Community Health Center, as one of the community health centers with a broad range of services in the city of Bandung, faces challenges in meeting the diverse health needs of the community. The working area of the Babatan Community Health Center includes several Rukun Warga (RW) and sub-districts with a sufficiently large population; therefore, success in providing satisfactory services is very important. Community satisfaction is one of the main indicators of the success of healthcare services because if people feel satisfied with the services provided, trust in the community health center will increase and participation in health programs will become higher.

The Babatan Community Health Center organizes various types of health services, including Upaya Kesehatan Masyarakat (UKM) and Upaya Kesehatan Perseorangan (UKP). UKM focuses on population health in general through health promotion programs, disease surveillance, environmental health, and the prevention and control of communicable and non-communicable diseases. Meanwhile, UKP focuses on meeting individual healthcare needs such as maternal and child healthcare services, immunization, elderly healthcare services, infectious disease control (tuberculosis [TB], Infeksi Saluran Pernapasan Akut [ISPA], and HIV/AIDS), and basic medical services. With this broad and complex service coverage, the Babatan Community Health Center is required to continue innovating to improve service quality, including through the use of digital technology and improvements in human resource quality, in order to respond to the increasingly high expectations of urban communities (Bandung City Health Office, 2023).

The diversification of these services demonstrates that Puskesmas not only function as providers of treatment services but also as centers for promotive and preventive activities. With such a wide variety of services provided, it is important to ensure that all of them operate optimally. Good healthcare service performance in each type of service will have an impact on the satisfaction of community members who receive the services (Anggie Annisa Permatasari, Etika Mandasari, and Febri Setyawati 2024).

In addition to service quality factors, innovation in healthcare services is also an important aspect in increasing community satisfaction and participation. One of the innovations that has developed in recent years is the application of digital services in the healthcare system. Digital services, such as online registration, telemedicine-based health consultations, and electronic medical record systems, can improve service efficiency and reduce patient waiting times (Rahmadeny 2014). The use of technology in healthcare services also enables people to obtain health information more easily and accurately.

However, the implementation of digital services at the Babatan Community Health Center still faces obstacles, such as limited technological infrastructure, a lack of public outreach, and varying levels of digital literacy. Therefore, further studies are needed to examine the extent to which digital service innovation can contribute to public satisfaction and participation in healthcare services.

In addition to digital service innovation, the quality of human resources (HR) is also an influential factor in healthcare services. Healthcare workers who possess high competence, professional attitudes, and strong communication skills can provide more effective services to patients. However, based on data from the Babatan Community Health Center, there is still inequality in the distribution of healthcare workers, especially in the field of health promotion. There is only one health promotion worker at this community health center who is responsible for conducting health education for thousands of people. This inequality indicates that the available human resources are not yet optimal in supporting the effectiveness of health promotion (Green and Kreuter 2005).

Although the Babatan Community Health Center has a vision, mission, and various types of services, the effectiveness of implementing health promotion programs still faces challenges. Based on available data, the Babatan Community Health Center has 22 healthcare workers with diverse professional backgrounds, but only one staff member is specifically responsible for health promotion, namely a public health extension worker. This imbalance indicates that the

number of health promotion personnel is still very limited and not proportional to the workload, which includes counseling, community empowerment, and health program assistance throughout the community health center's service area. This condition is one of the causes of the low level of public participation in promotional programs, which has only reached 50%. Green and Kreuter (2005) stated that the success of health promotion is greatly influenced by the availability of adequate resources, both in quantity and competence. In addition, the limited use of digital technology by community health centers exacerbates the situation, as most of the Indonesian population now relies on internet-based health information (APJII 2023). These data indicate the need to optimize health promotion personnel and innovate technology-based services to increase program effectiveness (Rahmadeny 2014).

Health promotion has an important role in increasing public awareness of the importance of maintaining health and preventing disease. Effectively designed health promotion programs can encourage people to become more active in implementing clean and healthy living behaviors, participating in immunization programs, and utilizing healthcare services available at community health centers. However, in the working area of the Babatan Community Health Center, community participation in health promotion programs still faces various obstacles, such as the lack of involvement of health cadres, limited attractive communication media, and low public interest in attending counseling activities. This demonstrates the need for a more innovative, digital-based, and participatory health promotion strategy so that health messages can be received and implemented optimally by the public (Ministry of Health of the Republic of Indonesia, 2023; Bandung City Health Office, 2023).

Taking into account the various aspects above, this study aims to analyze the influence of digital service innovation, human resource quality, and the effectiveness of health promotion on community satisfaction and participation at the Babatan Community Health Center. The results of this study are expected to provide recommendations for Puskesmas in improving healthcare services so that they are of higher quality and more aligned with community needs.

Overall, increasing community satisfaction and participation in healthcare services at the Babatan Community Health Center can be achieved through optimizing digital service innovations, improving the quality of human resources, and enhancing the effectiveness of health promotion. Therefore, this research has high relevance in supporting improvements in the healthcare service system at the Puskesmas level and improving the overall degree of public health.

From the explanation above, the author chose the title "The Influence of Digital Service Innovation, Human Resource Quality, and the Effectiveness of Health Promotion on Community Satisfaction and Participation at Babatan Community Health Center" because of the importance of service quality as the main factor determining the level of community satisfaction in receiving healthcare services. By analyzing these variables, the research is expected to provide concrete recommendations to improve the quality and reach of services at the Babatan Community Health Center. Optimizing healthcare services will not only improve people's welfare but also strengthen trust in primary healthcare services as the spearhead of the national healthcare system.

Based on the research background, the problem formulation in this study focuses on how digital service innovation, human resource quality, and the effectiveness of health promotion influence community satisfaction and participation in health programs at the Babatan

Community Health Center, as well as the extent to which community satisfaction affects participation. In line with this, the purpose of this study is to comprehensively analyze the influence of these three factors on community satisfaction and participation, as well as to measure the influence of community satisfaction on participation levels in health programs. This research is expected to provide benefits for Puskesmas managers as evaluation material for improving service quality and human resource management, for the government as a basis for policymaking to strengthen the competence of healthcare workers, and for the community in increasing awareness, support, and active involvement in improving the quality of healthcare services at the Babatan Community Health Center.

METHOD

The subjects of this study were people who used healthcare services at the Babatan Community Health Center and were domiciled within the health center's service area. Respondents were selected from patients or patients' family members who had direct experience using digital services, receiving healthcare services from health workers, and participating in health promotion activities. The selection of these subjects was based on the consideration that they were able to provide relevant and objective assessments of digital service innovation, the quality of human resources, and the effectiveness of health promotion implemented at the Babatan Community Health Center. The research objects included the implementation of digital service innovations, the quality of human resources, and the effectiveness of health promotion, as well as their effects on community satisfaction and participation in health programs.

The population of this study consisted of all people within the service area of the Babatan Community Health Center who were recorded as healthcare service users, totaling 20,627 individuals. The sampling technique used purposive sampling with inclusion criteria consisting of individuals who had used the Puskesmas digital services, had received health promotion services, and were willing to become respondents, while those who did not meet these criteria were excluded. The sample size was determined using the Slovin formula with a 5% margin of error, resulting in 393 respondents who were considered representative of the population and relevant to the research objectives in obtaining accurate and representative data.

This study used several variables consisting of digital service innovation, human resource quality, the effectiveness of health promotion, community satisfaction, and community participation. Data were collected through a survey using a Likert-scale questionnaire and were analyzed using the Structural Equation Modeling method based on Partial Least Squares (PLS-SEM) with the assistance of the SmartPLS 4 software application. The analysis was carried out through the evaluation of the measurement model to ensure the validity and reliability of the instrument, as well as the evaluation of the structural model to examine the relationships among variables, the significance of these relationships, and the ability of the model to predict dependent variables. Through this series of analyses, the research was expected to produce comprehensive, accurate, and scientifically accountable findings.

RESULT AND DISCUSSION

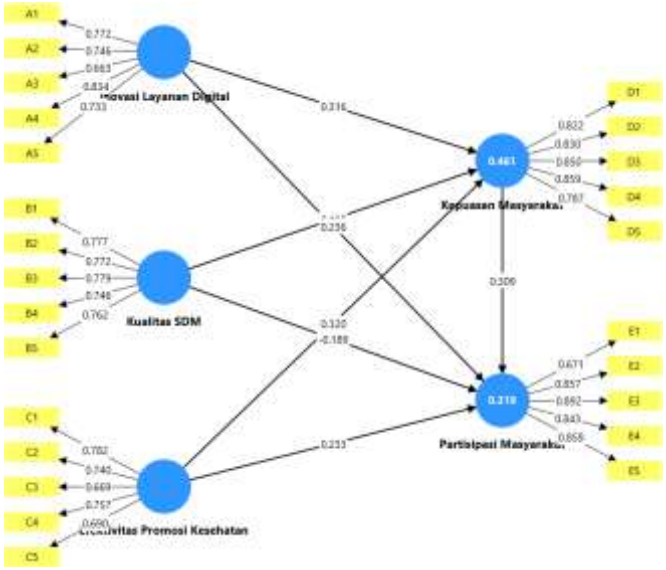

Figure 1 Evaluation of Measurement Models (Outer Model)

Convergent Validity

Table 1 Convergent Validity

	Health Promotion Effectiveness	Digital Service Innovation	Community Satisfaction	Quality of HR	Community Participation
A1		0.772			
A2		0.746			
A3		0.663			
A4		0.834			
A5		0.733			
B1				0.777	
B2				0.772	
B3				0.779	
B4				0.746	
B5				0.762	
C1	0.782				
C2	0.740				
C3	0.669				
C4	0.757				
C5	0.690				
D1			0.822		
D2			0.830		
D3			0.850		
D4			0.859		
D5			0.787		
E1					0.671
E2					0.857
E3					0.892
E4					0.843
E5					0.858

Based on the results of the outer model analysis using SmartPLS, all indicators in each construct show a loading factor value above 0.60 so that it is declared valid in measuring the intended variable. In the Health Promotion Effectiveness variable, indicators C1 to C5 have a

loading value between 0.669 to 0.782. The highest value is indicated by C1 (0.782), which illustrates that the delivery of clear and easy-to-understand health information is the most dominant element, while the lowest value is found in C3 (0.669), but still meets the minimum criteria of validity.

In the Digital Service Innovation construct, indicators A1 to A5 have loading values ranging from 0.663 to 0.834. Indicator A4 (0.834) is the strongest indicator, showing that the quality and ease of innovation in digital services is very influential in shaping the perception of innovation, while A3 (0.663) is the lowest indicator but still worth maintaining.

Furthermore, in the HR Quality variable, all indicators B1 to B5 show a fairly high loading value, which is between 0.746 to 0.779. The indicator with the highest contribution is B3 (0.779) followed by B1 (0.777), indicating that the competence and professionalism of health workers have an important role in reflecting the quality of human resources as a whole.

In the Community Satisfaction construct, indicators D1 to D5 show an excellent loading value, which is between 0.787 to 0.859. The highest scores were found in D4 (0.859) and D3 (0.850), which showed that service quality and service conformity with public expectations were the most decisive factors in shaping satisfaction. In general, all indicators in this construct have a high and stable contribution strength.

Finally, in the Community Participation variable, indicators E1 to E5 show a loading value between 0.671 to 0.892. The E3 indicator (0.892) was the most dominant, indicating that the active involvement of the community in health programs strongly determines the level of participation, while E1 had the lowest value (0.671) but remained within the limits of validity. Overall, these results show that all indicators of the five constructs have good convergent validity and are suitable for use in the research model.

Discriminatory Validity

1. Fornell–Larcker Criteria

Table 2 Fornell Larcker

	Health Promotion Effectiveness	Digital Service Innovation	Community Satisfaction	Quality of HR	Community Participation
Health Promotion Effectiveness	0.729				
Digital Service Innovation	0.572	0.752			
Community Satisfaction	0.604	0.576	0.830		
Quality of HR	0.627	0.467	0.514	0.768	
Community Participation	0.436	0.459	0.489	0.226	0.828

In the Health Promotion Effectiveness construct, the root value of AVE was 0.729, higher than its correlation with Digital Service Innovation (0.572), Community Satisfaction (0.604), Human Resources Quality (0.627), and Community Participation (0.436). This shows that the indicators that make up health promotion reflect more of their own constructs than their relationships with other constructs.

The Digital Service Innovation construct also showed good discriminant validity, where the root value of AVE of 0.752 was higher than its correlation with Health Promotion Effectiveness (0.572), Community Satisfaction (0.576), Human Resources Quality (0.467), and Community Participation (0.459), so that digital service innovation has a clear construct identity.

Furthermore, the Community Satisfaction construct has the highest AVE root value of 0.830, far exceeding its correlation with Health Promotion Effectiveness (0.604), Digital Service Innovation (0.576), HR Quality (0.514), and Community Participation (0.489). Thus, the indicators on the community satisfaction variable are very strong in representing the construct.

For the Human Resources Quality construct, the root value of AVE of 0.768 is greater than its correlation with Health Promotion Effectiveness (0.627), Digital Service Innovation (0.467), Community Satisfaction (0.514), and Community Participation (0.226), showing that HR quality stands strong as an independent construct.

Finally, the Community Participation construct has a root value of AVE of 0.828, which is also higher than all its correlations with other variables, namely Health Promotion Effectiveness (0.436), Digital Service Innovation (0.459), Community Satisfaction (0.489), and Human Resources Quality (0.226). This confirms that community participation has excellent discriminating capabilities and the indicators consistently reflect this construct. Overall, these results show that the model meets the criteria of discriminant validity and that the constructs in the study have strong conceptual clarity.

2. Cross Loading

Tabel 3 *Cross Loading*

	Health Promotion Effectiveness	Digital Service Innovation	Community Satisfaction	Quality of HR	Community Participation
A1	0.478	0.772	0.475	0.376	0.311
A2	0.429	0.746	0.403	0.319	0.330
A3	0.391	0.663	0.277	0.381	0.240
A4	0.444	0.834	0.555	0.298	0.437
A5	0.412	0.733	0.390	0.427	0.367
B1	0.499	0.406	0.471	0.777	0.285
B2	0.475	0.354	0.380	0.772	0.158
B3	0.420	0.388	0.416	0.779	0.107
B4	0.472	0.305	0.323	0.746	0.113
B5	0.544	0.312	0.343	0.762	0.159
C1	0.782	0.434	0.468	0.472	0.322
C2	0.740	0.448	0.430	0.505	0.319
C3	0.669	0.377	0.466	0.352	0.243
C4	0.757	0.468	0.418	0.462	0.425
C5	0.690	0.346	0.421	0.494	0.265
D1	0.493	0.472	0.822	0.409	0.382
D2	0.470	0.437	0.830	0.430	0.351
D3	0.549	0.487	0.850	0.457	0.420
D4	0.507	0.502	0.859	0.457	0.406
D5	0.484	0.488	0.787	0.377	0.463
E1	0.480	0.421	0.364	0.325	0.671
E2	0.368	0.354	0.455	0.205	0.857
E3	0.347	0.374	0.436	0.159	0.892
E4	0.271	0.342	0.352	0.087	0.843
E5	0.326	0.401	0.402	0.148	0.858

In the Digital Service Innovation construct, indicators A1 to A5 show the highest loading in the construct, which is 0.772, 0.746, 0.663, 0.834, and 0.733, respectively. The A4 indicator is the most powerful indicator in explaining digital service innovation, while A3 has

the lowest loading value (0.663), but it is still higher than its loading against other constructs, so it still meets the discriminant validity.

For the HR Quality construct, indicators B1 to B5 also showed strong consistency, with the highest main loading ranging from 0.746 to 0.779. Indicators B3 (0.779) and B1 (0.777) are the most dominant indicators, and all indicators still have lower loading values on other constructs than on the main construct.

The Health Promotion Effectiveness Construct also shows good discriminant validity. Indicators C1 to C5 have the highest main loading in this construct, with values ranging from 0.669 to 0.782. Indicators C1 (0.782) and C4 (0.757) are the most dominant indicators in describing the effectiveness of health promotion, while C3 has the lowest value (0.669) but remains valid because it is lower in other constructs.

In the Community Satisfaction construct, indicators D1 to D5 show a very high loading value in the construct, which is between 0.787 to 0.859. Indicators D4 (0.859) and D3 (0.850) are the most powerful, and although some indicators have correlations with other constructs, their main loading values are much higher, so there is no violation of discriminant validity.

Finally, the construct of Community Participation also meets the criteria for discriminatory validity. Indicators E1 to E5 show the highest main loading values between 0.671 to 0.892, with the E3 indicator being the most dominant (0.892). All indicators in this construct have a lower load than other constructs, indicating that they accurately represent community participation. Overall, the results of this cross loading ensured that all constructs in the research model met the discriminant validity and could be used in advanced analysis.

3. HTMT (*Heterotrait-Monotrait Ratio*)

Table 4 HTMT

	Health Promotion Effectiveness	Digital Service Innovation	Community Satisfaction	Quality of HR	Community Participation
Health Promotion Effectiveness					
Digital Service Innovation	0.719				
Community Satisfaction	0.728	0.658			
Quality of HR	0.782	0.576	0.586		
Community Participation	0.520	0.530	0.549	0.248	

Based on the results of the *Heterotrait-Monotrait Ratio* (HTMT) test, all HTMT values between constructs are below the recommended threshold, which is <0.90, and even most of them are below the conservative criterion <0.85. The HTMT value in this study ranges from 0.248 to 0.782, so it can be ensured that all variables have excellent discriminant validity. This shows that each construct is clearly distinguishable from the others, and there is no *construct overlap* problem in the model being tested.

The HTMT value between Health Promotion Effectiveness and Digital Service Innovation is 0.719, which is still within the safe range and suggests that the two are empirically different constructs despite having a moderate relationship. Similarly, the relationship between Health Promotion Effectiveness and Community Satisfaction (0.728) and HR Quality (0.782) remained below the critical limit, indicating that this construct did not overlap with other variables.

Furthermore, the relationship between Digital Service Innovation and Community Satisfaction of 0.658, as well as with HR Quality of 0.576, also shows a good level of construct separation, so that digital service innovation really stands as a unique variable in the model.

The relationship between Community Satisfaction and HR Quality had an HTMT value of 0.586, indicating that although the two constructs are related, they remain conceptually and empirically separate. The Community Participation construct has the lowest HTMT value compared to other variables, namely 0.520 (with Health Promotion Effectiveness), 0.530 (with Digital Service Innovation), 0.549 (with Community Satisfaction), and 0.248 (with Human Resources Quality). These very low values confirm that Community Participation is a construct that is truly independent, has unique characteristics, and does not overlap with other variables. Thus, all constructs in the model have met discriminant validity based on HTMT criteria.

Reliability Test

Table 5 Reliability Test

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Health Promotion Effectiveness	0.778	0.781	0.849	0.531
Digital Service Innovation	0.809	0.832	0.866	0.565
Community Satisfaction	0.887	0.888	0.917	0.689
Quality of HR	0.828	0.841	0.878	0.589
Community Participation	0.882	0.884	0.915	0.686

Based on the results of the construct reliability analysis, all variables in this study showed excellent reliability quality in all test parameters, namely Cronbach's Alpha, rho_A, and Composite Reliability. In the Health Promotion Effectiveness construct, Cronbach's Alpha value is 0.778, rho_A is 0.781, and Composite Reliability is 0.849, all above the minimum limit of 0.70. This confirms that the indicators in this construct are consistent and reliable in measuring the variables in question. An AVE value of 0.531 also indicates that more than 53% of the variance of the indicator is able to be explained by the construct, thus meeting the criteria of convergent validity.

Digital Services has a Cronbach's Alpha value of 0.809, rho_A of 0.832, and Composite Reliability of 0.866. These three values are in the high category, indicating that digital service innovation indicators are consistent internally. The AVE value of 0.565 has also exceeded the minimum limit of 0.50, indicating that the indicator is able to represent digital innovation variables well and are valid in a convergent manner.

Furthermore, the Community Satisfaction construct shows the highest reliability compared to other constructs. Cronbach's Alpha value of 0.887, rho_A of 0.888, and Composite Reliability of 0.917 confirm the strength of excellent internal consistency. An AVE value of 0.689 indicates that almost 70% of the variance of the indicator can be explained by the community satisfaction construct, so that this variable has a very strong measurement quality and optimal convergent validity.

HR Quality also shows excellent reliability. Cronbach's Alpha value of 0.828, rho_A of 0.841, and Composite Reliability of 0.878 are well above the standard of 0.70. An AVE value of 0.589 proves that the HR quality indicator is adequately able to reflect these variables. Thus, this construct is reliable and valid.

Finally, the Community Participation construct showed excellent results, with Cronbach's Alpha value of 0.882, rho_A of 0.884, and Composite Reliability of 0.915. An AVE value of 0.686 indicates the indicator's ability to explain construct variance very well, making it one of the most powerful variables in terms of measurement quality. Overall, all constructs in this research model were proven to be reliable and meet convergent validity, making them suitable for use in the analysis of future structural models.

Evaluation of Structural Models (Inner Model)

1. Coefficient of Determination (R^2)

Table 6 Coefficient of Determination

	R-square	Adjusted R-square
Community Satisfaction	0.461	0.456
Community Participation	0.319	0.312

Based on the results of the internal model analysis using SmartPLS, the Community Satisfaction construct has an R-square value of 0.461 with an Adjusted R-square of 0.456. This value shows that the variables of Health Promotion Effectiveness, Digital Service Innovation, and Human Resources Quality are able to explain 46.1% of the variation in changes in Community Satisfaction. This percentage is in the moderate category, according to the criteria of Hair et al., which state that the R-square value between 0.26–0.50 indicates a moderate explanatory ability of the model. This confirms that the model has good enough predictive power so that the three independent variables are relevant in explaining the level of public satisfaction.

Meanwhile, the Community Participation construct has an R-square value of 0.319 and an Adjusted R-square of 0.312. This means that Health Promotion Effectiveness, Digital Service Innovation, Human Resources Quality, and Community Satisfaction together are able to explain 31.9% of the variation in changes in Community Participation. This value belongs to the weak to moderate category, but is still acceptable in social research, where people's behavior is generally influenced by many external factors outside the model.

Overall, these results show that the predictor variables are better able to explain Community Satisfaction than Community Participation, so that the satisfaction construct becomes a more stable and predictable component in this research model.

2. Effect Size (f^2)

Tabel 7 *Effect Size*

	Health Promotion Effectiveness	Digital Service Innovation	Community Satisfaction	Quality of HR	Community Participation
Health Promotion Effectiveness			0.096		0.037
Digital Service Innovation			0.121		0.048
Community Satisfaction					0.076

Quality of HR	0.030	0.030
Community Participation		

Based on the results of the effect size (f^2) calculation in the structural model, all variables showed contribution values that were in the small category according to the criteria of Hair et al. (2019), which were values between 0.02–0.14. In the construct of Community Satisfaction, the variable of Health Promotion Effectiveness gives a value of f^2 of 0.096, which indicates a small but still meaningful influence in increasing community satisfaction. The Digital Services Innovation variable has an f^2 value of 0.121, making it the factor with the strongest relative contribution to satisfaction, although it is still in a small category. Meanwhile, HR Quality only gave an f^2 value of 0.030, indicating that its contribution to improving community satisfaction was minimal.

In the Community Participation construct, the effect size value produced is also in the small category. The effectiveness of Health Promotion has an f^2 value of 0.037, indicating a limited contribution in encouraging community participation. Digital Services Innovation gave an f^2 of 0.048, which was the largest contribution among the variables influencing participation, although its strength remained small. Community satisfaction exerted a small effect with an f^2 value of 0.076, indicating that the increase in satisfaction was not fully able to significantly increase community participation. The HR Quality variable also contributed very little with an f^2 value of 0.030, suggesting that the influence of HR on community participation was relatively low in this model.

3. Uji Signifikansi (Bootstrapping)

Table 8 Significance Test

	Original sample (O)	Sample average (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Effectiveness of Health Promotion -> Community Satisfaction	0.320	0.324	0.077	4.168	0.000
Effectiveness of Health Promotion -> Community Participation	0.233	0.238	0.071	3.277	0.001
Digital Service Innovation -> Community Satisfaction	0.316	0.314	0.066	4.817	0.000
Digital Service Innovation -> Community Participation	0.236	0.235	0.070	3.387	0.001
Community Satisfaction - > Community Participation	0.309	0.310	0.063	4.904	0.000
Quality of Human Resources -> Community Satisfaction	0.165	0.167	0.073	2.280	0.023

Based on the results of bootstrapping analysis on SmartPLS, all structural pathways in the research model were proven to be statistically significant with *a p-value* of < 0.05. In the relationship between Health Promotion Effectiveness and Community Satisfaction, a path coefficient of 0.320 with a *t-statistic* value of 4.168 (p = 0.000) was obtained, indicating that health promotion has a positive and significant influence in increasing community satisfaction. The effect of the effectiveness of health promotion on community participation was also significant with a coefficient of 0.233, *a t-statistical value* of 3.277, and p = 0.001, indicating that the more effective the health promotion, the higher the level of community participation.

Furthermore, Digital Service Innovation has a significant positive influence on two dependent variables. The effect on Community Satisfaction was shown by a coefficient of 0.316 with a t-statistic of 4.817 (p = 0.000), while the influence on Community Participation had a coefficient of 0.236 with a t-statistic of 3.387 (p = 0.001). This shows that increased digital innovation in healthcare consistently contributes to increased public satisfaction and participation.

The Community Satisfaction variable was also proven to have a significant effect on Community Participation, with a path coefficient of 0.309, t-statistic 4.904, and p = 0.000. These findings show that community satisfaction is one of the important determinants that encourages active participation in health services or programs. In addition, the Human Resources Quality variable showed a positive and significant influence on Community Satisfaction, with a coefficient of 0.165, t-statistic 2.280, and p = 0.023, although the power of influence was relatively small compared to other variables.

The Influence of Digital Service Innovation on Community Satisfaction

The results of the study showed that Digital Service Innovation had a positive and significant effect on Community Satisfaction, with a path coefficient value of 0.316, t-statistic 4.817, and a p value of 0.000. These findings confirm that the higher the quality and application of digital innovations in health services, the greater the level of public satisfaction with health center services.

These results are in line with the development of digital transformation in the health sector. Sutabri et al. (2023) stated that the application of digital technology is able to improve service quality through accelerating administrative processes, improving workflows, and reducing the potential for errors. Innovations such as online queuing systems, application-based self-registration, and teleconsultation have been proven to improve patient comfort and experience while receiving services.

Research by Ilyas et al. (2024) on the implementation of the Satusehat platform also shows that the integration of digital systems in health services can increase efficiency, accelerate data access, and improve service response. This has a direct impact on increasing public satisfaction because the service process becomes faster, easier, and more transparent.

From the perspective of innovation management, Widjaja et al. (2020) emphasized that technological innovation has a strong correlation with improving organizational performance and user satisfaction, because technology provides added value in the form of convenience, speed, and operational efficiency.

The Influence of Human Resources (HR) Quality on Community Satisfaction

The results showed that the quality of human resources had a positive and significant effect on Community Satisfaction, with a path coefficient value of 0.165, t-statistic 2.280, and a p value of 0.023. These findings indicate that although the influence is smaller than other variables such as digital service innovation or the effectiveness of health promotion, human resources still play an important role in shaping public perception of community satisfaction with health center services.

The quality of human resources is a basic aspect in health services because it is in direct contact with the community. Budiman et al. (2021) emphasized that the quality of nursing

services is greatly influenced by the competence of health workers, communication skills, empathic attitudes, and responsiveness in providing services. Good interpersonal interaction can increase people's sense of comfort, trust, and satisfaction.

Research by Maulina et al. (2019) also shows that the quality of health services is determined by the reliability of health workers in providing services precisely, quickly, and according to procedures. The better the competence of health workers, the higher the level of community satisfaction.

In addition, Basruddin et al. (2022) stated that the professionalism of paramedics contributes directly to the perception of the quality of services received by the public. The friendly, clear, and professional service creates a positive experience for patients thereby increasing their satisfaction levels.

The Effect of Health Promotion Effectiveness on Community Satisfaction

The results of the study showed that the Effectiveness of Health Promotion had a positive and significant effect on Community Satisfaction, with a path coefficient value of 0.320, t-statistic of 4.168, and a p value of 0.000. This emphasizes that the more effective the health promotion strategy carried out by the health center both through face-to-face education, group counseling, and digital media, the higher the level of community satisfaction with the services provided.

These findings are in line with the research of Sumampouw et al. (2023) which states that targeted health promotion activities are able to increase public understanding of health issues, build positive perceptions, and increase trust in health workers. When health information is conveyed clearly and easily understood, people feel more confident and satisfied with the services received.

Research by Anggie Annisa Permatasari et al. (2024) also confirms that digital media-based health promotion is increasingly effective in the modern era. Digital media expands access to information, accelerates the delivery of education, and increases public engagement with health service programs. The ease of access to this information has a significant impact on the perception of service quality and the level of public satisfaction.

In addition, Amalia (2022) explained that health promotion is an important component in the quality of health services. Promotion that is carried out consistently and systematically can improve public health behavior while increasing their satisfaction with the services provided.

The Influence of Digital Innovation on Community Participation

The results of the study showed that Digital Service Innovation had a positive and significant effect on Community Participation, with a coefficient value of 0.236, t-statistic 3.387, and a p value of 0.001. These findings indicate that the better the digital service innovations implemented in health centers such as online registration, digital queuing systems, teleconsultations, or access to application-based service information, the higher the level of community involvement in utilizing health services.

These results are in line with research by Sutabri et al. (2023) which confirms that digital transformation in health services encourages people to use services more actively because the service process becomes faster, more efficient, and more accessible. This convenience reduces

the administrative barriers that previously made people reluctant to participate in health programs.

Research by Ilyas et al. (2024) on the implementation of the Satusehat platform also supports this finding. Digitalization has been proven to increase transparency, accelerate access to information, and improve the user experience. These factors increase people's motivation to be more involved in health services and programs.

The Influence of Human Resources Quality on Community Participation

The results showed that the quality of human resources did not have a significant effect on Community Participation, with a coefficient value of 0.030, t-statistic 0.409, and a p value of 0.683. These findings show that public perception of the quality of health workers does not have a direct contribution to the increase or decrease in their participation in utilizing health services.

This condition shows that even if health workers are considered competent, friendly, or professional, it does not automatically make the community more actively participate in health programs. These findings are in line with the idea that community participation tends to be influenced by other factors beyond the competence of human resources, such as access to services, digital innovation, the effectiveness of health promotion, as well as social and environmental factors.

Some studies support this phenomenon. According to Prayetni et al. (2018), community participation is more influenced by empowerment approaches and direct involvement than the quality of health workers themselves. Meanwhile, Ginting & Wau (2019) explained that people often remain passive even though they are served by competent health workers, especially when the service pattern is still centered on health workers so that the space for active participation is limited. Himawan (2016) also emphasized that services that are too focused on health workers can make the community dependent, not involved.

The Effect of Health Promotion Effectiveness on Community Participation

The results showed that the effectiveness of health promotion had a positive and significant influence on Community Participation (O = 0.338; t = 4.905; p = 0.000). These findings indicate that the more effective health promotion is carried out, the higher the community involvement in health programs. This is in line with the opinion of Sumampouw et al. (2023) who stated that health education and promotion are able to increase public awareness and motivation to behave proactively in disease prevention efforts. When people obtain clear, accurate, and easy-to-understand information, they tend to be more prepared and willing to engage in health activities.

Research by Anggie Annisa Permatasari et al. (2024) also strengthens these findings by showing that the use of digital media in health promotion expands access to information, such as schedules of health activities, immunization programs, and screening services. This ease of access encourages people to participate more actively because they know when, where, and how health programs are implemented.

The Effect of Community Satisfaction on Community Participation

The results showed that Community Satisfaction had a positive influence on Community Participation, with a correlation coefficient of 0.549 and a contribution to R-square Participation of 0.274. These findings indicate that the higher the level of public satisfaction with the services provided by the health center, the greater their motivation to be actively involved in various health programs. Satisfaction is an important factor that shapes people's positive perception of health services, thereby increasing their willingness to participate.

These findings are in line with various previous studies. Amalia (2022) states that people who are satisfied with health services tend to be more cooperative, have a higher level of trust in health institutions, and behave more actively in participating in health programs. Satisfaction creates positive emotional connections and increases trust between the community and the health center, which ultimately encourages them to be more involved in health activities.

Research by Mayawi et al. (2021) also shows that patient satisfaction correlates with willingness to return to using health services in the future. In the context of community participation, this act of returning to visit is a form of active behavior that reflects the support and involvement of the community in health services. Similarly, Najib et al. (2022) emphasized that high levels of satisfaction have a direct impact on patients' readiness to comply with the directives of health professionals and follow the health programs offered.

Theoretically, this relationship is strengthened by Wulandari et al. (2021) who emphasize that customer satisfaction can increase loyalty and engagement. In health services, this involvement is seen in the willingness of the community to participate in counseling, routine health checks, immunizations, and disease prevention programs. From the perspective of public services, Hariyoko et al. (2021) explained that community satisfaction is closely related to trust in service providers. When the service is judged to be fast, friendly, quality, and meets expectations, community participation increases because they feel valued and receive real benefits.

In the context of health centers, Sumantri (2019) also emphasized that people who are satisfied with services will be more active in participating in health programs. Satisfaction creates the perception that the services received are truly beneficial to their health and that of their families, thus strengthening the motivation to participate sustainably. Thus, it can be concluded that community satisfaction is a key factor in building strong and sustainable community participation in the health sector.

CONCLUSION

Based on the results of this study, it can be concluded that digital service innovation, human resource (HR) quality, and the effectiveness of health promotion significantly influenced community satisfaction and participation at the Babatan Community Health Center. Digital innovation had a positive and significant effect on both community satisfaction and participation because the digitalization of healthcare services made services more accessible, efficient, and transparent, while also encouraging the public to become more actively involved in health programs. HR quality also had a positive and significant effect on community satisfaction, indicating that the competence, professionalism, and attitudes of healthcare workers contributed to improving public perceptions of healthcare services. However, HR quality showed a negative but significant effect on community participation, suggesting that

high public trust in healthcare workers may reduce the community's active involvement unless accompanied by empowerment and educational approaches. In addition, the effectiveness of health promotion had a positive and significant influence on both community satisfaction and participation, as effective health education improved public understanding, motivation, and engagement in healthcare programs. Community satisfaction itself was also proven to positively affect community participation by increasing trust, loyalty, and willingness to participate in health-related activities. Future research is recommended to examine additional variables, such as health literacy, organizational culture, leadership, or community empowerment strategies, and to involve a broader research scope across multiple *Puskesmas* or regions in order to obtain more comprehensive and generalizable findings.

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