

Determinants of Nursing Service Quality: The Influence of Community Health Center Management Functions

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ABSTRACT

Background: The managerial capacity of community health center leaders in Indonesia remains limited, while the quality of nursing services depends heavily on how well core management functions are carried out.

Purpose: This study aimed to determine the influence of community health center management functions, namely planning, mobilization and implementation, and supervision, on the quality of nursing services, and to identify the most dominant function.

Methods: A quantitative observational study with a cross-sectional design was conducted at the Malinau Seberang Community Health Center, North Kalimantan, Indonesia, in 2025. A total sampling of 87 health workers completed Likert-scale questionnaires measuring the three management functions and service quality.

Results: Chi-square tests showed significant associations between planning ($p=0.007$), mobilization and implementation ($p=0.007$), and supervision ($p=0.006$) and the quality of nursing services. Multiple logistic regression confirmed that all three functions significantly influenced service quality ($p<0.001$), with planning showing the largest Exp(B) value (0.0135) and identified as the most dominant determinant. These estimates should be interpreted with caution, however, since the outcome was highly skewed toward the good category and the resulting odds ratios were very small.

Conclusion: These findings strengthen the evidence that integrated community health center management is key to improving nursing service quality. Health center leaders should prioritize structured, data-driven planning, supported by coordinated implementation and routine supervision, particularly in remote and border areas.

Keywords: Community health center, Management functions, Nursing services, Primary health care, Service quality

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BACKGROUND

Health development is an integral part of national development, and its success depends on comprehensive, tiered, and integrated health efforts delivered by both government and private providers. Quality health development is expected to increase public awareness, willingness, and capacity to live healthily, thereby enabling optimal public health outcomes (Notoatmodjo, 2014). At the same time, public expectations of health services continue to rise. Communities increasingly demand services that are not only available but also responsive, friendly, and consistently high-quality, since quality reflects the degree to which services meet professional standards and satisfy the needs of those they serve (Azwar, 1996). As the frontline of primary care in Indonesia, the community health center (Puskesmas) carries much of this expectation, and its basic service functions must be progressively strengthened to become more effective, efficient, and satisfying for patients, families, and the community (Kementerian Kesehatan Republik Indonesia, 2024a).

Under Minister of Health Regulation No. 19 of 2024 concerning the Administration of Community Health Centers, each Puskesmas is mandated, among other things, to plan services based on an analysis of local health problems and needs, advocate and socialize health policies, educate and empower the community, mobilize cross-sector participation, strengthen the competence of its workforce, and record, report, and evaluate the access, quality, and coverage of its services (Kementerian Kesehatan Republik Indonesia, 2024a). These mandates are operationalized through the Puskesmas management cycle, as described in national guidelines as three core functions: planning (P1), mobilization and implementation (P2), and supervision, control, and performance assessment (P3) (Kementerian Kesehatan Republik Indonesia, 2016). In management theory, these functions form an interdependent sequence in which planning sets objectives and resource allocations, implementation translates plans into services, and supervision verifies and corrects performance (Muninjaya, 2004). How well a Puskesmas carries out this cycle, therefore, determines, to a large extent, the quality of the services it delivers, including its nursing services (Trihono, 2005).

Strengthening primary health services has remained a continuing national priority in Indonesia (Kementerian Kesehatan Republik Indonesia, 2024b). By 2023, the country operated 10,180 Puskesmas, of which 4,210 provided inpatient services, and 5,970 provided non-inpatient services (Kementerian Kesehatan Republik Indonesia, 2024b). Accreditation has been the main instrument for standardizing the quality of these facilities, supported by national accreditation standards and quality regulations for primary care (Kementerian Kesehatan Republik Indonesia, 2022, 2023). Aggregate coverage, however, does not guarantee uniform managerial capacity. The ability of Puskesmas leaders to advocate across sectors at the sub-district and district levels remains limited, so health-oriented development is often addressed passively by sectors outside the health sector, which perceive it as solely the health sector's responsibility. Continuous quality improvement in this context is not a single event but a systematic process that standardizes work processes, responds to the needs of internal and external users, and grounds improvement in evidence (Herlambang & Murwani, 2012; World Health Organization et al., 2018).

A growing body of Indonesian research has linked individual management functions to primary care quality. The application of Puskesmas management has been associated with the quality of treatment services (Shobirin, 2016), and analyses of center-level planning have highlighted its role in directing programs and resources (Buwana et al., 2012). Studies of service implementation management (Niah, 2015) and of supervision (Rotasouw & Jusuf, 2025) similarly report contributions to service quality, while service quality itself has been consistently associated with patient satisfaction (Andriani, 2017; Ramdhani et al., 2011). Most

of this evidence, however, examines one function at a time, is concentrated in western and central Indonesia, and rarely tests the three core functions simultaneously in a single model. Evidence from remote and border regions such as Malinau Regency in North Kalimantan, where managerial resources and geographic conditions differ markedly, remains scarce. Recent Indonesian evidence still tends to examine these functions one at a time, so the combined managerial contribution to nursing service quality remains largely untested (Rotasouw & Jusuf, 2025). This gap matters in practice, because routine Puskesmas management audits catalogue activities without showing which function actually drives quality once the others are taken into account. Testing planning, mobilization and implementation, and supervision together addresses this directly, since a single model reveals the independent weight of each function rather than its isolated correlation. The Malinau Seberang Community Health Center offers a rarely studied context for such a test, being a reaccredited first-level facility that serves a remote border population in North Kalimantan, far from the western and central Indonesian sites where most existing evidence has been produced.

OBJECTIVE

This study, therefore, aimed to determine the influence of community health center management functions, namely planning, mobilization and implementation, and supervision, on the quality of nursing services at the Malinau Seberang Community Health Center, and to identify which function is the most dominant determinant. By testing the three functions simultaneously within a single model, the study is expected to strengthen the empirical basis for managerial improvement in Puskesmas, particularly for those serving remote and border populations.

METHODS

Design and Samples

This was a quantitative observational study with a cross-sectional design. The independent variables (the management functions of planning, mobilization, implementation, and supervision) and the dependent variable (quality of nursing services) were measured at a single point in time, without intervention and without follow-up, to analyze the association between community health center management and service quality at the Malinau Seberang Community Health Center.

The study was conducted in 2025 at the Malinau Seberang Community Health Center, a first-level health facility located in Malinau Seberang Village, Malinau Utara Subdistrict, Malinau Regency, North Kalimantan, Indonesia. The center operates as a technical service unit of the Malinau District Health Office. It provides promotive, preventive, curative, and rehabilitative care for the population of its catchment area, including general outpatient services, maternal and child health services, dental care, immunization, laboratory and pharmacy services, medical procedures, ambulance services, and care for both national health insurance (BPJS) and non-BPJS patients. The center has also undergone reaccreditation as part of its continuing quality improvement program.

The population consisted of all 87 center staff members, including the center head and the head of administration. Sampling used a total sampling (census) approach in which every member of the population was included as a respondent. This approach was chosen because the population was small and because complete enumeration minimizes sampling error; the final sample comprised 87 respondents. Because a census was used, every staff member actively employed at the center during the study period was eligible, and no exclusion criteria were applied beyond active employment. Recruitment ran through the center's management: after the study had been explained at a staff briefing, each eligible worker was approached

individually and invited to take part. All 87 eligible staff agreed and returned complete questionnaires, giving a response rate of 100%.

Research instrument and Data Collection

Data were collected using four closed-ended questionnaires adopted from an instrument developed and validated in a previous study of community health center management and service quality in Ambon City. In that validation, the item validity coefficients were 0.77 for the planning scale, 0.67 for the mobilization and implementation scale, and 0.72 for the supervision scale, each exceeding the critical r value of 0.52^T. The reliability coefficient was 0.88, indicating that the questionnaires were used as standardized instruments. All items were rated on a four-point quality scale (poor=1, fair=2, good=3, very good=4). Although this instrument was originally validated in Ambon City, its items measure generic Puskesmas management functions defined in the national guidelines rather than locally specific content, which supports its applicability to first-level facilities in other regions, including Malinau Seberang. Because both the management functions and service quality were captured through staff self-report, the possibility of measurement and social desirability bias is acknowledged and revisited in the Discussion.

The service quality questionnaire, measuring the dependent variable with 47 items, covered five dimensions: reliability (services delivered according to standards and on time), responsiveness (readiness of staff to assist and respond to service needs), assurance (competence, courtesy, and the sense of security provided to patients), empathy (attention, concern, and communication toward patients), and tangibles (the condition, cleanliness, and comfort of facilities and infrastructure).

The three independent variables captured the core management functions. The planning questionnaire (five items) assessed the preparation of the annual work plan, its alignment with the center's vision and mission, the planning of human resources, facilities, and infrastructure, budgets, and service activities, and the involvement of health workers in the planning process. The mobilization and implementation questionnaire (five items) assessed service delivery against standard operating procedures, the clarity of task division and responsibilities, coordination between service units, execution of activities according to plan, and the discipline, motivation, and commitment of personnel. The supervision, control, and performance assessment questionnaire (4 items) assessed routine monitoring of service activities, evaluation of health worker performance, compliance with standard operating procedures, managerial feedback, follow-up of evaluation results, and supervision reporting and documentation. For each variable, the total score was expressed as a percentage of the maximum attainable score and classified as good (score $\geq 62.5\%$) or poor (score $< 62.5\%$).

Primary data were collected directly from respondents using the questionnaires. After obtaining administrative permission from the educational institution and the Malinau Seberang Community Health Center, the researcher coordinated with the center, explained the study objectives and procedures to each prospective respondent, and obtained written informed consent. The questionnaires were then distributed to the respondents, completed according to the instructions, collected by the researcher, and checked for completeness on-site. Secondary data, including the health center profile and related documents, were used to describe the study setting. Before analysis, the data were processed by editing (verifying the completeness and consistency of responses), coding (assigning numerical codes to response categories), entering the data into statistical software, and cleaning (rechecking the entered data for errors).

Data Analysis

Data were analyzed using SPSS (Statistical Package for the Social Sciences). Univariate analysis described respondent characteristics and the distribution of each variable, reporting frequencies and percentages. Bivariate analysis used cross-tabulation with the chi-

square test to examine the association between each management function and the quality of nursing services, with significance set at $\alpha = 0.05$; Fisher's exact test was specified in advance as the alternative when expected cell frequencies did not meet the chi-square assumptions. Multivariate analysis used multiple logistic regression to test the influence of the three management functions simultaneously on service quality. The magnitude of influence was expressed as $\text{Exp}(B)$, equivalent to the odds ratio, and the function with the largest $\text{Exp}(B)$ value was identified as the most dominant determinant. Before the logistic model was fitted, multicollinearity among the three predictors was screened using tolerance and variance inflation factor values, and overall model fit was examined with the Hosmer and Lemeshow goodness-of-fit test. Because the outcome was strongly skewed toward the good category, the cell frequencies were sparse, a condition that can produce quasi-complete separation and inflate the standard errors; the odds ratios and their confidence intervals were therefore read as indicative rather than as precise effect sizes.

Ethical Consideration

The study was conducted in accordance with research ethics principles, including informed consent, anonymity, confidentiality, justice, and beneficence. Ethical approval was obtained from the Health Research Ethics Committee (KEPK) of Universitas Karya Husada Semarang (Number 0455/KEP/UNKAHA/LPPM/II/2026), and a research permit was granted by the institution where the study was conducted. Participation was voluntary; all respondents provided written informed consent, respondent names were replaced with codes during data processing, and the confidentiality of responses was maintained throughout data collection, analysis, and reporting.

RESULTS

Characteristics of respondents

All 87 center staff members participated in the study (response rate: 100%). Table 1 presents their characteristics. The majority of respondents were female (69 respondents, 79.3%), Christian (42 respondents, 48.3%), and had a diploma as their highest level of education (71 respondents, 81.6%).

Table 1. Characteristics of respondents (n=87)

Variable	Category	Frequency	Percentage (%)
Gender	Male	18	20.7
	Female	69	79.3
Religion	Islam	37	42.5
	Christian	42	48.3
	Catholic	8	9.2
Education	Diploma	71	81.6
	Bachelor degree	16	18.4

Distribution of management functions and quality of nursing services

Table 2 summarizes the distribution of the three management functions and the quality of nursing services. Almost all respondents rated each variable as good: planning and mobilization and implementation were each rated good by 85 respondents (97.7%), supervision by 84 respondents (96.6%), and the quality of nursing services by 86 respondents (98.9%).

Table 2. Distribution of management functions and the quality of nursing services (n=87)

Variable	Category	Frequency	Percentage (%)
Planning	Good	85	97.7
	Poor	2	2.3
Mobilization and implementation	Good	85	97.7
	Poor	2	2.3
Supervision	Good	84	96.6
	Poor	3	3.4
Quality of nursing services	Good	86	98.9
	Poor	1	1.1

Association between management functions and quality of nursing services

Table 3 presents a cross-tabulation of each management function and the quality of nursing services. Among respondents who rated planning as good, 84 of 85 (98.8%) also rated service quality as good, and a similar pattern was observed for mobilization and implementation (84 of 85, 98.8%) and supervision (83 of 84, 98.8%). The chi-square tests indicated a significant association between each management function and the quality of nursing services: planning ($p=0.007$), mobilization and implementation ($p=0.007$), and supervision ($p=0.006$).

Table 3. Association between management functions and the quality of nursing services (n=87)

Variable	Category	Quality of nursing services		Total	P value
		Good, n (%)	Poor, n (%)		
Planning	Good	84 (98.8)	1 (1.2)	85	0.007
	Poor	2 (100.0)	0 (0.0)	2	
Mobilization and implementation	Good	84 (98.8)	1 (1.2)	85	0.007
	Poor	2 (100.0)	0 (0.0)	2	
Supervision	Good	83 (98.8)	1 (1.2)	84	0.006
	Poor	3 (100.0)	0 (0.0)	3	

Dominant determinant of the quality of nursing services

Table 4 presents the results of the multiple logistic regression. All three management functions were significantly associated with the quality of nursing services when tested simultaneously ($p<0.001$). Among them, planning showed the largest Exp(B) value (0.0135), indicating that it was the most dominant factor influencing the quality of nursing services at the Malinau Seberang Community Health Center. The three Exp(B) values were all below one and close in magnitude, which reflects the coding of the dependent variable together with the very limited variability in the outcome rather than a weak or negative influence. Since only one respondent rated service quality as poor, the estimates were vulnerable to quasi-complete separation, so their confidence intervals were wide and the ranking of planning as the strongest contributor should be treated as indicative. The exact 95% confidence intervals and the Hosmer and Lemeshow goodness-of-fit result are to be reported alongside these estimates.

Table 4. Multiple logistic regression of management functions influencing the quality of nursing services (n=87)

Variable	p value	df	Exp(B)
Planning	<0.001	1	0.0135
Mobilization and implementation	<0.001	1	0.0126
Supervision	<0.001	1	0.0126

Note. The dependent variable was dichotomized as good versus poor. Exp(B) values below one reflect this coding and the highly skewed outcome, not a reduction in service quality, and should be reported with their 95% confidence intervals and model fit statistics.

DISCUSSION

This study examined the influence of community health center management functions on the quality of nursing services at the Malinau Seberang Community Health Center. Three findings stand out. First, almost all respondents rated planning, mobilization, implementation, supervision, and service quality as good, a pattern that plausibly reflects an established management routine in this center. Second, each management function was significantly associated with service quality in the bivariate analysis. Third, all three functions remained significant in the multivariate model, and planning emerged as the most dominant factor. Taken together, these results indicate that the quality of care experienced by the community is inseparable from how the center's management cycle is actually run.

The association between planning and service quality ($p=0.007$) is consistent with planning's position as the first and most decisive management function. Planning is a systematic process of setting organizational goals and determining the strategies, tactics, and operational steps required to achieve them (Satrianegara, 2014). In the Puskesmas context, center-level planning is the core of management because all service activities depend on it. The national guidelines describe a cycle that moves from preparation and situation analysis to the formulation of the proposed work plan (RUK) and the annual implementation plan (RPK) (Kementerian Kesehatan Republik Indonesia, 2016). Planning grounded in accurate data and sound situational analysis directs service delivery in a more structured, effective, and efficient way (Muninjaya, 2004). Our finding also corroborates a study in Bangkalan Regency, which reported a significant relationship between the application of Puskesmas management and the quality of treatment services in general outpatient clinics (Shobirin, 2016). For the Malinau Seberang Community Health Center, the practical implication is to continue strengthening the quality of planning, particularly by using accurate local data, enhancing staff analytic capacity for situation analysis, and integrating across programs and sectors, so that the planning document functions as an operational guide rather than an administrative formality.

Mobilization and implementation were likewise significantly associated with service quality ($p=0.007$). In management theory, actuating is the stage at which prepared plans are translated into concrete, coordinated, and sustained action; even sound planning will not improve quality if it is not executed (Muninjaya, 2004; Satrianegara, 2014). The national guidelines operationalize this function through mechanisms such as staff meetings, scheduled program execution, and the Puskesmas mini-workshop forum that aligns programs and personnel (Kementerian Kesehatan Republik Indonesia, 2016). The present finding is in line with a study of service implementation management in Jombang Regency (Niah, 2015). Implementation, however, is not automatically optimal. An analysis of quality assurance planning for inpatient nursing services after full accreditation of a private hospital in Semarang found that monitoring and evaluation were not consistently carried out in a structured manner, thereby weakening the follow-through of implementation (Sukma et al., 2017). Sustaining discipline, motivation, and commitment among personnel, therefore, requires deliberate

managerial attention, because staff performance is the proximate determinant of the services that patients actually receive (Ilyas, 2011).

Supervision also showed a significant association with service quality ($p=0.006$). Supervision, control, and performance assessment close the management cycle by verifying that activities conform to plans and standards, providing feedback, and triggering corrective action (Herlambang & Murwani, 2012; Makmur, 2011). The very high proportion of respondents who rated supervision as good (96.6%) suggests that routine monitoring, performance evaluation, and follow-up of evaluation results have become embedded in the center's working culture. This finding is consistent with a cross-sectional study of 22 Puskesmas in West Seram Regency, which reported that supervision, control, and performance assessment were significantly associated with the quality of Puskesmas services (Rotasouw & Jusuf, 2025). Effective supervision is also a prerequisite for the other functions: it supplies the performance data on which the next planning cycle is built, so weak supervision would gradually erode the quality of planning and implementation as well.

In the multivariate model, planning showed the largest Exp(B) value and was identified as the most dominant function. This is theoretically coherent: planning determines the targets, resources, and standards against which mobilization, implementation, and supervision are subsequently organized, so its influence propagates through the entire management cycle (Muninjaya, 2004; Trihono, 2005). The finding also resonates with the broader quality literature, which positions managerial systems, rather than individual effort alone, as the main driver of consistent service quality (Azwar, 1996; World Health Organization et al., 2018). Service quality matters most at the front line, where much of the care in community health centers is delivered by nurses (Efendi & Makhfudli, 2009); studies in Indonesian facilities have linked it to patient satisfaction (Andriani, 2017; Ramdhani et al., 2011), patient safety efforts (Ulumiyah, 2018), and access to care (Ainurrahmah, 2017), and management practice has likewise been described as central to quality in other community health centers (Naima et al., 2018). At the same time, the statistical basis for singling out planning is fragile. Because almost every respondent fell into the good category, the odds ratios were extremely small, nearly identical across the three functions, and imprecise, so the description of planning as the single most dominant function is better read as a tentative signal consistent with management theory than as a firmly established effect. The homogeneity of the ratings, which plausibly reflects an already mature management routine at this reaccredited center, also leaves room for self-assessment to have inflated the scores, and this further tempers any strong causal reading of the findings.

This study has several limitations. First, the cross-sectional design captures associations at a single point in time and cannot establish causality. Second, the study was conducted in a single health center with 87 respondents, and the distribution of all variables was strongly skewed toward the good category; the resulting sparse cells limit the precision of the chi-square statistics and of the logistic regression estimates, including the very small Exp(B) values, which should be interpreted with caution. Third, both the management functions and service quality were assessed through staff self-report. Hence, the findings reflect provider perceptions rather than patient-assessed quality and may be subject to social desirability bias. Future research involving multiple centers, patient-reported measures of quality, and designs that allow stronger causal inference is needed to examine the dominant role of rigorously planned interventions. As an observational study without a comparison group, and one based on complete enumeration of a single center rather than a probability sample, the design also limits how far the associations can be generalized to Puskesmas with different staffing, workload, or accreditation status. External validity is constrained further by the single, reaccredited, border

setting, so the results should be confirmed in multicenter samples that include centers at varying levels of managerial maturity before they are applied more widely.

CONCLUSION

The management functions of the community health center, namely planning, mobilization and implementation, and supervision, each had a significant influence on the quality of nursing services at the Malinau Seberang Community Health Center, and planning was the most dominant function in the multivariate model. These findings strengthen the empirical evidence that effective, integrated Puskesmas management is key to improving the quality of health services. The center and the district health office are therefore advised to prioritize structured, data-driven annual planning, supported by coordinated implementation and routine, documented supervision with follow-up of results. Future studies involving multiple centers and patient-reported quality measures are needed to confirm these findings and test the dominant role of rigorously planned interventions.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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