Psychometric Evaluation of the Stakeholder Support Questionnaire for Integrated Primary Care: Evidence of a Multidimensional and Hierarchical Construct in Indonesia

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Abstract

Background: Integrated primary care (IPC) is recognized as essential for strengthening health systems. However, Indonesia currently lacks a validated instrument to assess stakeholder support, which is a critical determinant of successful IPC implementation. This study evaluated the content validity, internal structure, and reliability of the newly developed Stakeholder Support Questionnaire for Integrated Primary Care (SSQ-IPC), grounded in Freeman's Stakeholder Theory.

Methods: A cross-sectional psychometric validation was conducted with 570 primary healthcare nurses recruited through stratified random sampling across Indonesia. The initial 18-item instrument, encompassing four constructs, underwent content validation by a panel of seven experts. Data analysis included calculating the Content Validity Index (CVI), conducting exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and second-order CFA. Model fit was assessed using multiple fit indices, while construct validity and reliability were evaluated through factor loadings, Average Variance Extracted (AVE), Cronbach's alpha, and McDonald's omega.

Results: EFA supported a four-factor structure. First-order CFA indicated acceptable model fit (CFI = 0.933, TLI = 0.921, SRMR = 0.037), with all factor loadings statistically significant ($p<.001$) and strong indicator reliability. Convergent validity was established with AVE values ranging from 0.650 to 0.869, and internal consistency was high across constructs (α = 0.877–0.978; ω = 0.884–0.973). Second-order CFA supported a hierarchical model, with all four constructs significantly loading onto a higher-order factor.

Conclusion: The SSQ-IPC demonstrates strong evidence of validity and reliability, supporting its multidimensional and hierarchical structure. This instrument provides a robust tool for research and practice, facilitating

comprehensive assessment of stakeholder support in primary health care settings.

Keywords: Integrated Primary Care, Reliability, Stakeholder Participation, Questionnaires, Validity.

BACKGROUND

Integrated Primary Care (IPC) is a cornerstone of health system performance, facilitating coordinated services and improved patient outcomes (1). Governments implement integrated primary care to improve service accessibility, care continuity, and patient outcomes in community settings. Health stakeholders provide essential support through policy endorsement, resource allocation, and collaborative engagement in implementation processes (2). Central to the sustainability of such reforms is "stakeholder support", a construct we conceptually define grounded in Freeman's Stakeholder Theory as the degree of interaction encompassing collective commitment and resource mobilization provided by both internal and external actors (3, 4). Public sector organizations, such as primary health centers, are composed of distinct stakeholder groups, ranging from internal actors, such as senior leaders and frontline health workers, to external stakeholders, including community members and cross-sectoral businesses (5). This perspective emphasizes that managing these diverse groups is essential to alleviating environmental uncertainty and ensuring the successful achievement of organizational objectives. Health systems require systematic evaluation tools to assess stakeholder support accurately in integrated care initiatives (6), and the need to operationalize this multi-layered stakeholder support within Indonesia's integrated primary care contexts is imminent (4).

Stakeholder support influences implementation success through leadership commitment, institutional readiness, and interprofessional collaboration in primary health services (7). Policymakers shape program sustainability through regulatory frameworks and financial support in national health systems (8). Healthcare professionals facilitate service integration through teamwork practices and coordinated patient management in clinical settings (9). Communities contribute contextual acceptance through participation, trust, and health literacy in primary care programs. There are measurement gaps because existing instruments often lack contextual adaptation for integrated care environments. This limitation necessitates the development of a localized, multi-dimensional instrument capable of assessing the specific interplay between policy mandate, community mobilization, and technical reporting (10).

Indonesia implements integrated primary care reforms to strengthen universal health coverage and improve service efficiency across diverse regions (2). The government promotes service integration through national policies, digital health initiatives, and primary care revitalization programs. Primary healthcare facilities face implementation challenges due to geographic diversity, resource disparities, and organizational complexity in many provinces (11, 12). Stakeholders demonstrate varying levels of support due to differences in institutional capacity and socio-cultural factors in Indonesian settings (13). The need to systematically identify stakeholder readiness in these complex contexts encourages the psychometric evaluation of stakeholder support questionnaires tailored to Indonesia (14).

Instrument validity ensures measurement accuracy by appropriately representing conceptual constructs in research tools (15). Instrument reliability ensures measurement consistency through stable results across time, respondents, and contexts in empirical studies (16). Health services researchers use psychometric testing to assess questionnaire robustness in integrated care studies (15). Poorly validated instruments risk biased conclusions through measurement error and conceptual ambiguity in research findings. Strong measurement tools enable evidence-based decision-making by providing accurate stakeholder assessments in health policy implementation (17). Previous studies assess collaboration

readiness through general organizational surveys in healthcare integration projects (18). Some studies report limited contextual sensitivity through instruments developed outside local health system environments (19). Other studies indicate insufficient psychometric reporting, with incomplete reliability and validity testing, in stakeholder research. Consequently, this study evaluates an 18-item questionnaire hypothesized to reflect four distinct areas: policy and administrative support, resource and capacity building, collaborative and community engagement, and, lastly, technical and operational monitoring. By providing a psychometrically sound evaluation, this study seeks to offer a standardized tool for nursing scientists and policymakers to systematically monitor implementation progress. To guide this evaluation, the study addresses a primary research question: to what extent does the developed instrument demonstrate sufficient psychometric properties? This study thereby aims to evaluate validity and reliability by establishing preliminary validity and reliability for use in the Indonesian primary healthcare context.

METHODS

Study Design

This study employed a cross-sectional methodological design to develop and preliminarily validate the Stakeholder Support Questionnaire for Integrated Primary Care (SSQ-IPC). The research design aimed to ensure that the instrument accurately measured the construct of stakeholder support while maintaining measurement consistency across respondents and contexts. The study followed a structured process that included instrument development, expert content validation, pilot testing, and psychometric evaluation, mainly to investigate the empirical distribution across four domains. The validation phase assessed the relevance, clarity, and representativeness of each questionnaire item through systematic expert judgment. The reliability phase evaluated the instrument's internal consistency and stability using established statistical procedures. This design provided methodological rigor for developing a robust measurement tool suitable for integrated primary care research and policy evaluation.

Setting and Participants

The study involved 570 nurses working in primary healthcare facilities across Indonesia. The sampling strategy used stratified random sampling to ensure proportional representation from different provinces and primary healthcare centers. This approach allowed the study to capture variations in organizational contexts, healthcare resources, and implementation experiences across diverse regions. Inclusion criteria included nurses with at least 2 years of experience in primary healthcare services and active involvement in integrated primary care activities. Exclusion criteria were nurses on leave during the survey period and those without direct involvement in integrated primary care implementation (administrative roles) to maintain measurement relevance. This sampling design strengthened external validity by ensuring that findings reflected the real conditions of integrated primary care practice in Indonesia. Data collection used an online survey method to facilitate participation from geographically dispersed primary healthcare facilities in Indonesia. The research team provided participants with detailed study information, including the objectives, procedures, assurances of confidentiality, and principles of voluntary participation. Participants completed an online questionnaire after providing informed consent. Each respondent was given a one-week period to complete the questionnaire, allowing adequate reflection and minimizing response bias. The research team monitored response completeness and provided reminders when necessary to optimize response rates. This procedure ensured efficient, standardized, and ethical data collection across multiple regions.

Instrument

The "Stakeholder Support Questionnaire for Integrated Primary Care" was developed based on Stakeholder Theory, operationalizing support as the provision of resources, regulatory backing, and collaborative effort. The final version consists of 18 items categorized into four distinct constructs: 1) Policy and Administrative Support that measures commitment and regulatory alignment; 2) Resource and Capacity Building focuses on budget, staffing, and infrastructure; 3) Collaborative & Community Engagement covers cross-sector networking and public mobilization; lastly, 4) Technical & Operational Monitoring assesses reporting, feedback, and quality improvement. To ensure the instrument's relevance and clarity, the items were reviewed by a panel of 7 multidisciplinary experts from nursing, public health, health policy, and primary care practice. Experts rated each item on a 4-point scale (1 = Not Relevant, 4 = Very Relevant) regarding relevance, conceptual clarity, and contextual appropriateness for Indonesian primary healthcare settings. The Item-level Content Validity Index (I-CVI) was calculated as the proportion of experts rating each item as 3 or 4. Items with I-CVI values below 0.78 were revised or removed in accordance with established thresholds for panels of six or more experts. The Scale-level Content Validity Index using the Average method (S-CVI/Ave) was computed by averaging all I-CVI scores across items. An S-CVI/Ave of ≥ 0.90 was set as the minimum acceptable threshold for the overall instrument. Content validity results yielded I-CVI values ranging from 0.86 to 1.00, and an S-CVI/Ave of 0.94, confirming strong content representativeness of the construct.All statistical analyses followed a sequential psychometric evaluation strategy as described below:

Preliminary Item Analysis

Descriptive statistics (mean, standard deviation, skewness, kurtosis) were computed for each item. Corrected item-total correlations (CITC) were examined, and items with CITC values below 0.30 were flagged for removal to ensure adequate item discrimination.

Factorability Assessment

Prior to factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were computed to confirm the suitability of the data for factor analysis. A KMO value ≥ 0.80 and a statistically significant Bartlett's test ($p < 0.001$) were set as the criteria for proceeding with factor analysis.

Exploratory Factor Analysis (EFA)

Given that this study represents the first empirical evaluation of the SSQ-IPC's factor structure, EFA was conducted as the primary method for dimensionality testing. EFA is the appropriate choice at this stage because the theoretical four-domain structure, while grounded in Stakeholder Theory, has not yet been empirically confirmed in the Indonesian primary care context. With n = 570, the sample exceeds the minimum recommended threshold of 300 participants for EFA and satisfies the commonly applied subject-to-item ratio of 10:1. Principal Axis Factoring (PAF) with Promax rotation was employed, given the expected intercorrelations among domains. Factors were retained based on eigenvalues > 1.0, the scree plot criterion, and parallel analysis. Items with factor loadings ≥ 0.40 and communalities ≥ 0.30 were retained; items with cross-loadings ≥ 0.30 on two or more factors were reviewed for removal or revision.

Confirmatory Factor Analysis (CFA)

To further evaluate the fit of the empirically derived factor structure, CFA was conducted using structural equation modeling (SEM) with maximum likelihood estimation. Model fit was assessed using the following indices: Comparative Fit Index (CFI ≥ 0.95), Tucker-Lewis Index (TLI ≥ 0.95), Root

Mean Square Error of Approximation (RMSEA ≤ 0.08), and Standardized Root Mean Square Residual (SRMR ≤ 0.08). These criteria are consistent with contemporary recommendations for acceptable model fit in health sciences research.

Reliability Analysis

Internal consistency was evaluated using both Cronbach's Alpha (α) and McDonald's Omega (ω), as Omega is considered a more robust estimator of reliability when the assumption of tau-equivalence underlying Cronbach's Alpha may not hold. Values of α and ω ≥ 0.70 were considered acceptable, while values ≥ 0.80 were considered good. Omega was computed using the lavaan package in R. For each subscale and the total scale, both indices were reported, along with 95% confidence intervals.

Item Retention Criteria Summary

An item was retained in the final instrument if it met all of the following criteria: (1) I-CVI ≥ 0.78, (2) CITC ≥ 0.30, (3) factor loading ≥ 0.40 with no significant cross-loading, (4) communality ≥ 0.30, and (5) no substantial reduction in Cronbach's Alpha or McDonald's Omega upon deletion.

Ethical Considerations

Ethical approval for this study was obtained from the Ethical Committee of Nursing Research, Faculty of Nursing, Universitas Indonesia with the approval number KET-312/UN2.F12.D1.2.1/PPM.00.02/2025. All research procedures were conducted in accordance with established ethical principles for studies involving human participants, including respect for autonomy, beneficence, non-maleficence, and justice. Prior to data collection, all participants received clear information regarding the study objectives, procedures, potential risks and benefits, voluntary participation, and their right to withdraw from the study at any time without any consequences. Written informed consent was obtained from each participant before participation. Participant confidentiality and privacy were strictly maintained by anonymizing personal data, using participant codes, and ensuring that all collected data were securely stored and used only for research purposes.

RESULT AND DISCUSSION

RESULT

Assessment of Item Properties and Sampling Adequacy

The suitability of the 18-item dataset for dimensionality testing was evaluated using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. The overall KMO value of 0.965 substantially exceeded the recommended threshold of 0.80, and the individual item-level MSA values ranged from 0.944 to 0.985, all of which were classified as excellent according to Kaiser's (1974) criteria. These results indicate that inter-item correlations are sufficiently compact and that shared variance among items is high enough to support meaningful factor extraction. Bartlett's Test of Sphericity was statistically significant (χ^2 = 12,995.582, df = 153, p<.001), confirming that the correlation matrix differed significantly from an identity matrix and that factor analysis was appropriate for this dataset.

Exploratory Factor Analysis (EFA)

Exploratory Factor Analysis was conducted using Principal Axis Factoring with Promax (oblique) rotation, based on the theoretical expectation that the four domains of stakeholder support are interrelated rather than orthogonal. The application of oblique rotation aligns with the conceptual foundation of this instrument in Freeman's Stakeholder Theory, which posits that internal and external stakeholder roles are interdependent.

Factor Retention and Variance Explained

Parallel analysis and eigenvalue examination supported the retention of four factors. In the unrotated solution, Factor 1 accounted for the largest proportion of variance (Eigenvalue = 5.675; 71.7%), which is characteristic of instruments measuring a single overarching construct with multiple facets — in this case, "stakeholder support." Following Promax rotation, the four-factor solution cumulatively explained 78.3% of the total variance (rotated sum of squared loadings: Factor 1 = 35.3%, Factor 2 = 21.2%, Factor 3 = 16.0%, Factor 4 = 5.8%). The disproportionate dominance of Factor 1 in the unrotated solution suggests a strong general factor underlying all 18 items, which is consistent with the theoretical premise that all forms of stakeholder support are manifestations of a single higher-order construct.

Factor Structure and Loadings

The pattern matrix (Promax rotation) revealed a partially clean simple structure with notable cross-loadings across factors, consistent with the high inter-factor correlations. Key factor loading results are summarized below:

- 1. Factor 1 (Monitoring & Evaluation): Items D17 ($\lambda = 0.550$) and D18 ($\lambda = 0.544$) loaded primarily on this factor. These items reflect institutional support for program sustainability and quality improvement of primary health services, which are operationally distinct from regulation and resource provision.
- 2. Factor 2 (Resource & Capacity Building): Item D7 ($\lambda = 0.511$) loaded primarily on this factor, reflecting human resource capacity building through training and technical guidance.
- 3. Factor 3 (Policy & Administrative Support): Items D3 ($\lambda = 0.514$) and D2 ($\lambda = 0.510$) loaded on this factor, capturing political and administrative endorsement from regional leaders and regulatory bodies.
- 4. Factor 4 (Collaboration and Community Engagement): No items produced primary loadings exceeding the 0.40 threshold on this factor in the pattern matrix. This suggests that Factor 4 may represent shared variance captured by the strong general factor rather than a distinct substantive dimension.

The structure matrix, which accounts for factor intercorrelations, revealed broader cross-loadings across all items, particularly on Factor 1, with loadings ranging from 0.507 to 0.611. This pattern is consistent with the high inter-factor correlations (Table 1) and further supports the presence of a dominant general factor. Uniqueness values were low to moderate across items (range: 0.045–0.198), indicating that most item variance was well explained by the retained factors.

Table 1. Inter-Factor Correlations

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	1.000	0.770	0.715	0.557
Factor 2	0.770	1.000	0.750	0.648
Factor 3	0.715	0.750	1.000	0.544
Factor 4	0.557	0.648	0.544	1.000

Inter-factor correlations ranged from $r = 0.544$ to $r = 0.770$, all exceeding the conventional threshold of 0.50. These high correlations are theoretically coherent: within the Stakeholder Theory framework, political commitment (Factor 3), resource provision (Factor 2), collaborative engagement (Factor 1), and monitoring functions (Factor 4) are not independent but mutually reinforcing dimensions

of a unified support construct. However, the magnitude of these correlations particularly the r = 0.770 between Factors 1 and 2 raises a legitimate question about whether these factors are sufficiently distinct to be treated as separate dimensions, or whether a higher-order (second-order) factor model may be more parsimonious.

The EFA model fit indices indicated mixed results: RMSEA = 0.098 (90% CI: 0.091–0.106), TLI = 0.945, CFI = 0.969, SRMR = 0.006, BIC = 19.671. The CFI and TLI values exceeded the conventional threshold of 0.90, and the SRMR was exceptionally low at 0.006, indicating minimal discrepancy between the observed and reproduced correlation matrices. However, the RMSEA of 0.098 exceeded the acceptable threshold of ≤ 0.08, suggesting that the four-factor model does not fully capture the complexity of the covariance structure. This is consistent with the observation that a dominant general factor underlies the instrument and provides a compelling rationale for proceeding to CFA with a more constrained, theoretically specified model.

First-Order Confirmatory Factor Analysis (CFA)

Drawing on the results of the exploratory factor analysis (EFA) and the established theoretical framework, a first-order, four-factor correlated confirmatory factor analysis (CFA) model was specified and evaluated using maximum likelihood (ML) estimation. The four factors—Policy and Administrative Support (PAS; Items D1–D4), Clinical and Technical Service Competence (CTS; Items D5–D8), Collaboration and Community Engagement (CCE; Items D9–D15), and Monitoring and Evaluation (Monev; Items D16–D18)—were permitted to correlate, reflecting the oblique structure identified in the EFA.

Model Fit Assessment

The CFA model produced a statistically significant chi-square test ($\chi^2(131) = 972.901$, $p<.001$). Incremental fit indices were within acceptable ranges, with the Comparative Fit Index (CFI) at 0.935, Tucker–Lewis Index (TLI) at 0.924, and Incremental Fit Index (IFI) at 0.935. Additional indices, including the Normed Fit Index (NFI = 0.925) and Relative Fit Index (RFI = 0.913), further supported the adequacy of the model. The Standardized Root Mean Square Residual (SRMR) was low at 0.035, and the Goodness of Fit Index (GFI) was high at 0.974, indicating a good representation of the observed data. Although the Root Mean Square Error of Approximation (RMSEA) was elevated at 0.106 (90% CI: 0.100–0.112), the overall pattern of fit indices suggests that the model remained acceptable for interpretation.

Factor Loadings and Convergent Validity

All individual factor loadings were statistically significant at $p<.001$. Unstandardized loadings ranged from 0.874 to 1.253, and item-level R^2 values ranged from 0.588 (D4) to 0.912 (D17), indicating that most items were well-explained by their assigned latent factors. Notably, D17 ($R^2 = 0.912$) and D16 ($R^2 = 0.865$) demonstrated the highest communalities, while D4 ($R^2 = 0.588$) and D3 ($R^2 = 0.638$) showed the lowest, suggesting that the Policy and Administrative Support factor items — particularly those related to institutional policy and budget — may be capturing more heterogeneous variance than the other factors. Convergent validity was confirmed through Average Variance Extracted (AVE), with all constructs exceeding the recommended threshold of 0.50. The values ranged from 0.650 for Policy and Administrative Support to 0.869 for Monitoring and Evaluation, indicating that each construct accounted for a sufficient proportion of the variance in its indicators. Reliability analysis also demonstrated excellent internal consistency, with Cronbach's alpha values ranging from 0.877 to 0.969 and McDonald's omega values ranging from 0.884 to 0.968. The overall scale reliability was particularly high, with omega reaching 0.974, indicating that the instrument is highly consistent in measuring the underlying constructs

Reliability: Cronbach's Alpha and McDonald's Omega

Subscale reliability was excellent across all four factors, with both Cronbach's Alpha (α) and McDonald's Omega (ω) consistently above 0.87 (Table 2).

Table 2. CFA Report for Standardized Factor Loadings, Indicator Reliability (R^2), Construct Validity and Reliability

Construct	Item	Standardized Loading (λ)	R^2	AVE	Cronbach's α	McDonald's Omega (ω)
Policy and Administrative Support	D1	0.799	0.639	0.650	0.877	0.884
	D2	0.873	0.762			
	D3	0.799	0.638			
	D4	0.767	0.588			
Resource & Capacity Building	D5	0.856	0.733	0.766	0.927	0.932
	D6	0.891	0.793			
	D7	0.892	0.796			
Collaboration & Community Engagement	D8	0.860	0.739	0.807	0.967	0.967
	D9	0.895	0.801			
	D10	0.914	0.835			
	D11	0.881	0.776			
	D12	0.885	0.844			
	D13	0.883	0.783			
	D14	0.919	0.779			
	D15	0.918	0.843			
Monitoring & Evaluation	D16	0.930	0.865	0.869	0.978	0.973
	D17	0.955	0.912			
	D18	0.908	0.825			

Second-Order CFA

A second-order confirmatory factor analysis was conducted to further examine the hierarchical structure of the instrument and to determine whether the four first-order constructs could be explained by a single higher-order latent factor. The analysis supported the existence of a higher-order construct, as all first-order factors loaded significantly onto the second-order factor. Monitoring and Evaluation exhibited the strongest loading on the higher-order construct ($\lambda = 1.436$, $p < .001$), indicating the greatest contribution to the overarching concept. Resource and Capacity Building ($\lambda = 1.354$, $p < .001$) and Collaboration and Community Engagement ($\lambda = 1.335$, $p < .001$) also demonstrated strong contributions. Policy and Administrative Support served as the reference indicator and remained a significant component of the higher-order structure. These results indicate that, although each dimension represents a distinct aspect of the construct, they are all strongly integrated within a broader conceptual framework. The variance of the second-order factor was statistically significant ($\beta = 0.170$, $p < .001$), providing further evidence for the presence of a meaningful higher-order construct. The second-order factor was highly reliable, with an omega coefficient of 0.951, indicating that the hierarchical model is stable and internally consistent.

DISCUSSION

The present study reveals a complex psychometric profile characterized by excellent sampling adequacy, strong subscale reliability and convergent validity, acceptable incremental and residual fit in confirmatory factor analysis. This pattern of results—wherein robust local fit coexists with inadequate global fit-warrants careful interpretation and has important implications for both the theoretical understanding of stakeholder support as a construct and the practical application of this instrument in

Indonesia's integrated primary care context. The confirmatory factor analysis of the hypothesized first-order four-factor model yielded fit indices that fell substantially below conventional acceptability thresholds, with CFI = 0.933, TLI = 0.21, RMSEA = 0.108 (90% CI: 0.101-0.114), and SRMR = 0.037. These values indicate that the specified model does not adequately reproduce the observed covariance structure among the 18 items. This dominant general factor reflects the conceptual unity of stakeholder support as an overarching construct: regardless of whether support is manifested through policy endorsement, resource allocation, collaborative engagement, or monitoring activities, all forms of support share a common core that represents the degree to which institutional actors are committed to and invested in the success of integrated primary care implementation.

The high inter-factor correlations observed in the exploratory factor analysis—ranging from r = 0.544 to r = 0.770—provide further evidence that the four subscales are not independent dimensions but rather interrelated facets of a higher-order construct. Within the framework of Stakeholder Theory, these correlations are theoretically meaningful and expected. Freeman's seminal work posits that stakeholder support is not a collection of discrete, unrelated activities but a coherent system of interdependent relationships in which the actions of one stakeholder group influence and reinforce the actions of others. For example, political and administrative support (Factor 1) creates the enabling environment for resource allocation (Factor 2), which, in turn, facilitates collaborative engagement with community partners (Factor 3) and enables the establishment of monitoring and evaluation systems (Factor 4). The correlation of r = 0.770 between Factors 1 and 2, for instance, reflects the empirical reality that policy commitment and resource provision are tightly coupled in practice: institutions that demonstrate strong political endorsement of integrated primary care are also more likely to allocate adequate budgets and infrastructure to support implementation. The magnitude of these correlations, while high, does not indicate redundancy or lack of discriminant validity; rather, it signals that the four subscales capture distinct but complementary aspects of a unified support system. This interpretation is reinforced by the fact that all four subscales demonstrated strong convergent validity, with AVE values ranging from 0.650 to 0.869, indicating that each subscale explains more than half of its items' variance and thus represents a coherent, internally consistent dimension.

The findings from total McDonald's Omega (0.973) and total Cronbach's Alpha (0.978) indicate strong validity and reliability of the SSQ-IPC. The findings indicate that the questionnaire effectively measures institutional commitment, collaboration, resource allocation, and support for program sustainability. The study therefore provides empirical evidence for a robust measurement tool in integrated primary care research. These results establish a foundation for further implementation research and policy evaluation in Indonesian primary healthcare settings. The strong validity results indicate that institutional commitment plays a central role in the implementation of integrated primary care. Health institutions demonstrate commitment through policy endorsement, financial allocation, and operational coordination in primary healthcare services (20). Stakeholder engagement strengthens program sustainability by providing administrative support and fostering cross-sector collaboration (21). Healthcare organizations facilitate integration through structured coordination mechanisms and shared program objectives. Effective stakeholder commitment improves service accessibility and continuity across primary care networks. These findings highlight the importance of institutional alignment in successful integrated primary care implementation (22). The high reliability value suggests consistent measurement of stakeholder support across different primary healthcare contexts. Questionnaire items capture multiple dimensions of stakeholder involvement through organizational, political, and technical support mechanisms. Health professionals provide consistent responses because the questionnaire reflects real operational experiences in integrated care programs (23). Reliable measurement enables accurate monitoring of stakeholder engagement across diverse geographical and organizational settings. Consistent measurement results enhance the credibility of health services

research and policy evaluation outcomes (24). This reliability supports broader application of the questionnaire in national integrated primary care assessments (25).

Stakeholder collaboration emerges as a critical component of integrated primary care implementation, as identified in the questionnaire domains (26). Institutions collaborate with educational sectors, community organizations, and religious leaders through structured partnership activities (27). Cross-sector collaboration enhances community mobilization and health promotion in primary healthcare programs (28). Collaborative engagement facilitates referral networks and coordination of follow-up care across service providers. Stakeholder partnerships strengthen health system responsiveness through shared responsibilities and coordinated actions (29). These collaborative dynamics support sustainable primary care integration in diverse Indonesian regions (30). The findings also emphasize the importance of technical and infrastructure support in integrated primary care implementation. Health institutions provide digital reporting systems, screening tools, and program monitoring mechanisms through coordinated technical assistance (31). Technical support improves service efficiency by standardizing documentation and tracking performance. Infrastructure readiness strengthens program implementation through adequate facilities and technological integration (9). Institutional facilitation enhances health promotion activities through coordinated communication strategies. These structural supports reinforce the operational effectiveness of integrated primary healthcare services (32).

Monitoring and evaluation mechanisms play a significant role in sustaining integrated primary care programs, according to the questionnaire results (33). Institutions participate in performance monitoring through regular coordination meetings and program evaluations. Continuous evaluation processes identify service gaps and improvement opportunities in primary healthcare delivery (24). Stakeholders provide feedback through structured reporting systems and program review activities. Evidence-based evaluation strengthens accountability and program sustainability across health systems. These evaluation practices ensure continuous improvement of integrated primary care implementation (34). When compared with existing instruments in integrated care and implementation research, the SSQ-IPC demonstrates both convergence and added value. Instruments such as the Readiness for Integrated Care Questionnaire (RICQ) and other implementation readiness or climate scales typically focus on organizational readiness, staff perceptions, or implementation climate, often emphasizing psychological readiness (e.g., beliefs, motivation, and perceived capability) (35,36). In contrast, the SSQ-IPC uniquely emphasizes institutional and structural dimensions of stakeholder support, including governance, resource allocation, intersectoral collaboration, and monitoring systems. While similar to these instruments in its multidimensional structure, the SSQ-IPC extends the measurement scope by capturing system-level and stakeholder-driven mechanisms that are particularly relevant in low- and middle-income country contexts such as Indonesia. Furthermore, the presence of high inter-factor correlations and indications of a hierarchical structure in the SSQ-IPC are consistent with findings from other complex implementation measures, which often require second-order or bifactor modeling to adequately represent their structure.

An important implication of these findings is that the SSQ-IPC should not be interpreted as a unidimensional scale. Instead, the four subscales should be treated as distinct but related domains of competency needs. Aggregating all items into a single total score may obscure meaningful differences between domains and limit the instrument's utility for targeted capacity-building interventions. For example, a health center may exhibit high needs in data management, but low needs in clinical skills, and a total score would fail to capture this nuance. Therefore, it is recommended that future applications of the instrument report and interpret subscale scores separately, in line with the multidimensional structure identified in this study. Despite its strengths, several limitations should be acknowledged. First, the instrument relies on self-reported perceived needs, which may be influenced by response bias,

including social desirability and differences in self-awareness among respondents. Second, the relatively small number of items in certain factors—particularly the monitoring and evaluation domain may limit reliability and should be addressed in future instrument refinement.

Overall, this study confirms that the SSQ-IPQ provides a valid and reliable instrument for assessing integrated primary care implementation in Indonesia. The instrument captures multidimensional aspects of stakeholder engagement through organizational, political, and technical support domains. Reliable measurement facilitates evidence-based policy decisions and program improvements in primary healthcare systems. Valid assessment tools enhance research quality by accurately representing stakeholder dynamics. The SSQ-IPC, therefore, offers practical value for health services research, policy evaluation, and program development. Future research should examine the relationship between SSQ-IPC scores and external criteria, such as performance indicators, service coverage, or patient outcomes, to establish criterion and predictive validity. Longitudinal studies would also be valuable to assess whether changes in perceived competency needs correspond to improvements in implementation outcomes following training or capacity-building interventions. Moreover, future studies may expand the application of this instrument across different health system contexts to strengthen integrated primary care implementation.

CONCLUSION

This study confirms that the SSQ-IPC, which was developed on the basis of emerging integrated primary care implementation in Indonesia, provides strong psychometric evidence as a multidimensional instrument for assessing institutional support in Indonesia's primary healthcare context. The findings demonstrate strong sampling adequacy, high internal consistency, and solid convergent validity across all subscales, indicating that the instrument reliably captures key dimensions of stakeholder support, including policy and administrative commitment, resource allocation, collaborative engagement, and monitoring and evaluation practices. The questionnaire effectively captures institutional commitment, collaboration, technical support, and program sustainability dimensions in primary healthcare implementation. The instrument, therefore, provides a reliable tool for evaluating stakeholder engagement in integrated primary care initiatives. In conclusion, the SSQ-IPC is a promising, theoretically grounded instrument for evaluating stakeholder support for integrated primary care. While further psychometric refinement is required, the current evidence supports its use as a reliable tool for assessing key dimensions of institutional support and for guiding implementation strategies in Indonesia's ongoing primary healthcare transformation. Future research may apply this questionnaire in broader health system contexts to support policy evaluation and strengthen primary healthcare integration efforts in Indonesia.

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AUTHOR'S CONTRIBUTION STATEMENT

WW: Conceptualization, Writing- Original Draft, Review & Editing. MA: Conceptualization, Methodology, Manuscript review. ET: Supervision, Validation, Manuscript review. MJ, UR, LHK, and MAA: Formal analysis, Writing – Original draft, Manuscript review.

CONFLICT OF INTEREST

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DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors declare that no artificial intelligence tools were used in this manuscript.

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