

Core Competencies, Challenges, and Predictive Factors in Health Service Management: A Study of Transferred Sub-District Health Promoting Hospitals in Phitsanulok

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Abstract

The transfer of Subdistrict Health Promoting Hospitals to the Provincial Administrative Organization aims to improve primary care but faces management and workforce challenges, particularly in core competencies. This study assessed core competencies among staff of SHPHs transferred to the Phitsanulok PAO, identified related factors and challenges, and proposed policy recommendations. A mixed-method approach was conducted across 47 decentralized SHPHs, including qualitative interviews with 16 executives and staff and a quantitative survey ($n = 141$). Results showed high competency levels across all eight domains, with mean scores (M) ranging from 3.82 to 4.06 and standard deviations (SD) ranging from 0.609 to 0.764 on a 5-point scale. Personal factors, including job position, age, and work experience, were significantly associated with specific domains. Organizational factors, such as workforce development support, participation support, internal communication, resource management, and PAO support, were positively and significantly correlated with all domains. Predictive analysis indicated that these factors ($\beta = 0.034\text{--}0.123$) significantly enhanced competencies, with participation support identified as the most significant predictor, followed by internal communication. This suggests that policy-makers should prioritize inclusive governance and effective communication to enhance workforce readiness. Qualitative findings highlighted challenges of limited access, staff shortages, and outdated systems, whereas enablers included community engagement, leadership, integrated data, and professional development. While high competencies reflect strong workforce resilience, overcoming the resilience–infrastructure paradox through systemic and technological upgrades is essential for sustainable decentralized health management.

Keywords

Core competencies; health service challenges; Subdistrict Health Promoting Hospitals; workforce

Introduction

Subdistrict Health Promoting Hospitals (SHPHs) function as fundamental units within Thailand's primary healthcare network, serving as the closest point of contact between residents and the formal health system. Their roles extend beyond basic clinical services to include community outreach, health promotion, and coordination with local partners to address area-specific health needs (Suphanchaimat et al., 2024). Over the past two decades, national health reforms have increasingly emphasized administrative decentralization as a strategy to enhance local responsiveness and efficiency in health service delivery. A major component of this reform has been the gradual transfer of SHPHs from centralized oversight under the Ministry of Public Health to Local Administrative Organizations (LAOs) and, in many provinces, Provincial Administrative Organizations (PAOs). This governance shift not only reallocates administrative authority but also reshapes accountability structures, organizational responsibilities, and workforce roles within primary healthcare systems.

The decentralization agenda is firmly grounded in Thailand's constitutional and legal frameworks, particularly the 1997 and 2007 Constitutions and the Decentralization Plan and Procedures Act of 1999, which mandate the transfer of authority over financial management, human resources, infrastructure, and public service delivery to local governments (Office of the Decentralization to the Local Government Organization Committee, 2021). In practice, however, decentralization requires complex coordination across multiple administrative levels and sustained capacity-building efforts to ensure that LAOs and PAOs can effectively manage primary healthcare services (Aphisamacharayothin et al., 2026). By 2024, a total of 4,537 SHPHs, approximately 45.9% of all primary care units nationwide, had been transferred to local authorities. In Phitsanulok province, 47 SHPHs were operating under the jurisdiction of the PAO (Phitsanulok PAO Health Division, 2025). Despite this progress, decentralization remains an uneven and ongoing process, with variability in institutional readiness and local management capacity.

Although the transfer of SHPHs was intended to strengthen frontline service delivery and improve responsiveness to local health needs, several persistent challenges continue to limit their effectiveness. These include fragmented support from central agencies, administrative complexity arising from multi-layered governance arrangements, and unclear coordination mechanisms among relevant institutions (Uansri et al., 2024). Human resource constraints further exacerbate these challenges, as many local governments face shortages of qualified health personnel, difficulties in recruitment and retention, and limited incentive structures. As a result, workforce readiness has emerged as a critical determinant of whether decentralization reforms translate into sustained improvements in service quality. Gaps in core competencies are particularly evident in managing expanding workloads, using data for decision-making and service improvement, and integrating professional roles within local administrative and community contexts.

Core competencies represent a foundational dimension of workforce capacity, influencing both individual performance and organizational adaptability in changing health system environments (Manley & Garbett, 2000). In primary healthcare settings, these competencies enable personnel to deliver high-quality services, respond effectively to community needs, and support sustainable health system development (Aphisamacharayothin, 2021). As SHPHs transition to local administrative oversight, strengthening core competencies becomes increasingly important, as frontline staff must perform expanded roles encompassing clinical

care, health promotion, community engagement, and administrative coordination. Misalignment between evolving role expectations and existing workforce competencies may undermine the intended benefits of decentralization, even when governance reforms are formally implemented.

Despite the recognized importance of workforce competencies, significant gaps remain in empirical evidence and measurement approaches. Existing competency frameworks have largely been developed for centralized or hospital-based health systems and do not fully capture the organizational, managerial, and contextual demands associated with decentralized primary healthcare delivery. Moreover, no validated assessment instrument currently exists to evaluate the core competencies of SHPH personnel in the specific context of organizational transfer, thereby limiting policymakers' and local authorities' ability to design evidence-based workforce development strategies (Prasitanarapun & Kitreerawutiwong, 2023). This lack of systematic evidence also constrains theoretical understanding of how decentralization reforms reshape workforce competency requirements.

While this study focuses on Phitsanulok province, the findings provide a critical case study for understanding competency-governance alignment in low- and middle-income countries (LMICs) undergoing health decentralization. The transition from centralized oversight to local administrative control is not merely a structural shift but a sociological phenomenon that reshapes professional identities and workforce dynamics. In response to this gap, the present study examines core health service management competencies among SHPH staff who were transferred to the Phitsanulok PAO to inform both policy implementation and theoretical perspectives on decentralization and workforce development. Phitsanulok province was selected as the study site because it is a pioneer and representative case of health decentralization in Northern Thailand. It was among the first provinces to undergo a large-scale transfer of SHPHs to PAO. Furthermore, its diverse geographical and administrative landscape, encompassing both urban centers and remote rural areas, offers a comprehensive microcosm of the challenges faced by the national transfer process. This makes the findings from Phitsanulok highly relevant and potentially generalizable to other provinces under similar administrative transitions.

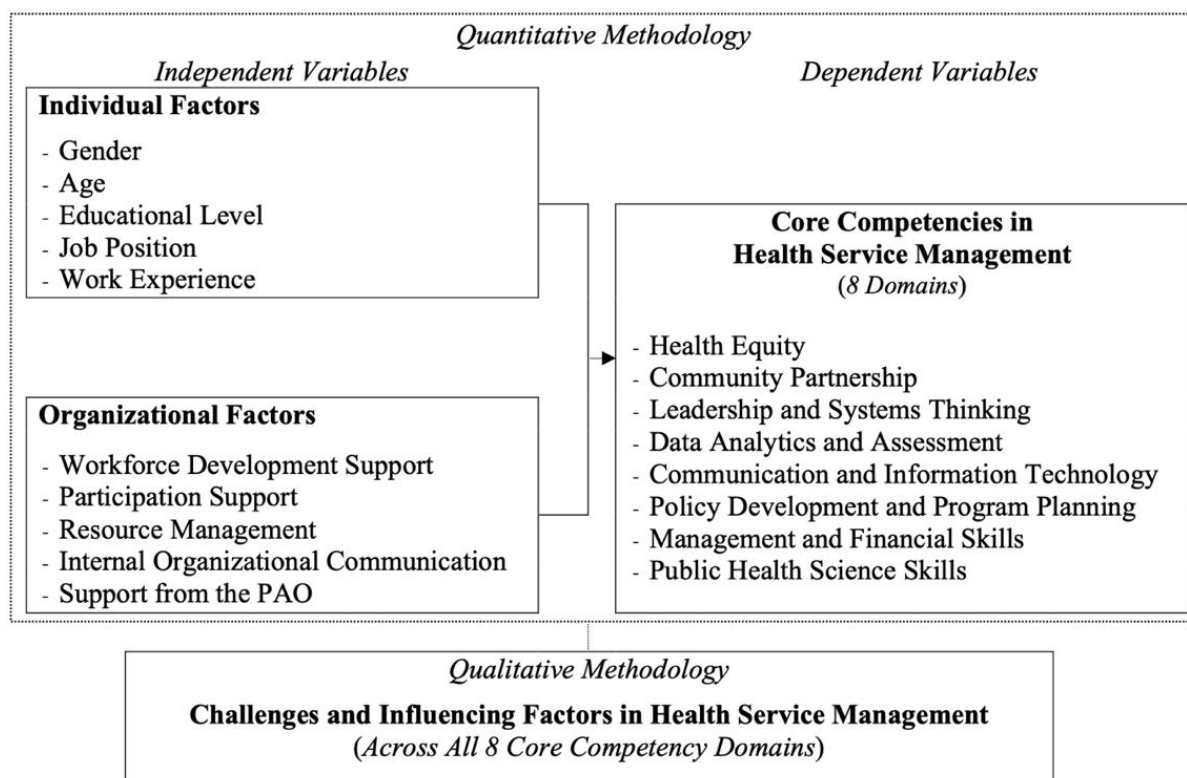
This study aims to examine the core competencies in health service management among the workforce of SHPHs transferred to the Phitsanulok PAO and to identify individual- and organizational-level factors associated with and predictive of these competencies. Using a mixed-methods approach, the study explores management challenges following decentralization and elucidates how governance and organizational conditions shape workforce competency in practice. The findings aim to inform evidence-based workforce development strategies aligned with Sustainable Development Goal 3, while contributing to broader debates on decentralization, health governance, and workforce development.

To understand the dynamics of this transfer, this study employs Bossert's Decision Space Theory, which conceptualizes decentralization as the degree of discretionary authority granted to local decision-makers across health functions (Bossert & Mitchell, 2011). Bossert's Decision Space Theory conceptualizes decentralization as the interaction among decision space (discretionary authority), institutional capacity (resources and skills), and accountability in determining health system performance (Bossert, 1998). In the context of the Phitsanulok PAO, "Decision Space" is reflected in the local authority's capacity to manage workforce competencies and resource priorities. This lens helps explain why 'participation support' and 'internal communication' are vital: they expand the functional decision space of

frontline health workers, enabling them to translate individual competencies into improved service delivery despite structural constraints.

This study's conceptual framework is based on the core competencies for public health professionals proposed by the Council on Linkages between Academia and Public Health Practice (2021), comprising eight domains that integrate technical, managerial, and systems-level competencies relevant to decentralized primary healthcare. The framework conceptualizes decentralization as a governance context that shapes workforce competencies through both individual characteristics (gender, age, educational level, job position, and work experience) and organizational factors (workforce development support, participation support, resource management, internal organizational communication, and support from the PAO). Quantitative analysis examines the predictive relationships among these factors and core competencies, while in-depth qualitative interviews explore the challenges and factors influencing the application of competencies in practice. By integrating quantitative and qualitative approaches, the framework addresses key gaps in understanding workforce competency development under decentralized health governance as illustrated in Figure 1.

Figure 1: Conceptual Framework of the Predictive Factors of Core Competencies



Based on the conceptual framework, this study tests two primary hypotheses (*H*):

H1: Personal factors, including age, work experience, and job position, are significantly associated with the core competency levels of SHPH personnel.

H2: Organizational factors, particularly participation support, internal communication, and PAO administrative support, have a significant positive influence on core competencies.

These hypotheses aim to test the competency-governance alignment by determining whether structural organizational enablers can overcome individual limitations in a transitional administrative environment. By examining these relationships, the study moves beyond descriptive reporting to provide a predictive model of workforce readiness under decentralized governance.

Research methodology

This study employed a mixed-methods design, integrating quantitative and qualitative approaches to examine core competencies, predictive factors, and challenges in health service management among SHPHs transferred to the Phitsanulok PAO. Specifically, a convergent parallel design was used, in which quantitative and qualitative data were collected simultaneously but analyzed independently. The findings were integrated during the discussion stage through triangulation, where quantitative results identified the predictive influence of organizational factors on competencies. At the same time, qualitative insights provided a deeper understanding of the management challenges and situational factors that hinder or facilitate the application of those competencies in practice.

The study was conducted in Phitsanulok province across 47 transferred SHPHs and the PAO Public Health Division, with data collected between November 2025 and January 2026. The quantitative component involved 141 SHPH personnel, selected through stratified random sampling, with each SHPH treated as a stratum. This involved selecting three staff members from each SHPH to ensure representation of key functional roles within each facility and comparability across decentralized units. The qualitative component comprised in-depth semi-structured interviews with 16 key informants, including PAO executives, Public Health Division administrators, seven directors of transferred SHPHs, and seven frontline personnel purposively selected from all seven decentralized districts to capture variation in managerial perspectives and frontline experiences. These interviews explored management challenges and contextual factors shaping health service delivery under decentralization.

Participant size

The quantitative sample size was determined using G*Power software for linear multiple regression based on Cohen's (1988) effect size criteria. A medium effect size ($f^2 = 0.15$) was specified, with a significance level of .05 and statistical power of 0.95, which is appropriate for public health and social science research (Faul et al., 2007). Assuming 10 predictors, with five tested, the required minimum sample size was 138 participants. Given that the study covered 47 transferred SHPHs, participants were proportionally allocated, with approximately three personnel per SHPH. Accordingly, the final quantitative sample comprised 141 SHPH personnel selected using stratified random sampling. Each of the 47 transferred SHPHs was treated as a stratum, from which three staff members were randomly selected to ensure proportional representation across all decentralized units. Eligible participants were SHPH staff aged 20 years or older, with at least one year of experience in health service management within transferred SHPHs, and willing to participate. Individuals unable to complete the questionnaire or who withdrew before completing the questionnaire were excluded.

For the qualitative component, purposive sampling was employed to recruit key informants directly involved in or affected by the decentralization of SHPHs. The qualitative sample

consisted of 16 informants, including one PAO executive, one Public Health Division administrator, seven directors of transferred SHPHs, and seven frontline SHPH personnel, representing all seven districts in Phitsanulok province. Inclusion criteria required a current appointment in relevant leadership or operational roles and relevant managerial or service experience in transferred SHPHs. Informants were excluded if they were unable to complete the interview or withdrew from participation.

Research instrument

This study employed a mixed-methods design integrating quantitative and qualitative methodologies.

Quantitative methodology

The quantitative data were collected using a researcher-developed, theory-driven questionnaire operationalized around clearly defined latent constructs. The questionnaire consisted of three sections.

Section 1 addressed individual factors using both open- and closed-ended questions in the form of a checklist, including five items covering gender, age, educational level, job position, and work experience.

Section 2, focused on organizational factors as multidimensional constructs, divided into five theoretically grounded dimensions, including workforce development support, participation support, resource management, internal organizational communication, and support from the PAO, comprising 25 items measured using a five-point Likert-type rating scale (1 = very low, 2 = low, 3 = moderate, 4 = high, and 5 = very high).

Section 3, assessed core competencies in health service management and was organized into eight domains, including data analytics and assessment, policy development and program planning, communication and information technology, health equity, community partnership, Public Health Science skills, management and financial skills, and leadership and systems thinking, comprising a total of 56 items measured using the same five-point Likert-type rating scale (1 = very low, 2 = low, 3 = moderate, 4 = high, and 5 = very high).

Qualitative methodology

Qualitative data were collected through semi-structured in-depth interviews with key informants to provide contextual validation and explanatory depth for the quantitative findings. The interview guide was developed based on the eight core competency domains and comprised predefined main questions with flexible probing to explore challenges systematically and influencing factors in health service management among SHPH personnel following decentralization to the Phitsanulok PAO. This approach enabled an in-depth examination of real-world managerial and operational conditions across all competency domains within decentralized primary healthcare settings.

Instrument quality assessment

The quantitative and qualitative instruments were developed based on an extensive review of relevant theories, concepts, policy documents, textbooks, and prior empirical studies to ensure alignment with the study objectives and adequate content coverage.

To ensure instrument quality, the questionnaire and interview guidelines were submitted to a panel of five experts for content review and consensus assessment. Consensus ratings were assigned using a three-point relevance scale (3 = relevant, 2 = partially relevant/needs revision, and 1 = not relevant), with an a priori overall consensus threshold of at least 70% of ratings at the 2- or 3-point levels, in accordance with the criteria proposed by Schifano and Niederberger (2025). Content validity was further evaluated using a four-point rating scale (1 = not appropriate, 2 = somewhat appropriate, 3 = appropriate, and 4 = highly appropriate). The item-level content validity index (I-CVI), calculated as the proportion of experts rating each item as either appropriate or highly appropriate, ranged from 0.88 to 1.00, while the scale-level content validity index, calculated using the average method (S-CVI/Ave), was 0.97, exceeding the acceptable criterion recommended by Polit et al. (2007).

The quantitative instrument was pilot-tested with 30 individuals who were not included in the main study to evaluate its psychometric properties. Item discrimination analysis was conducted using item-total correlation coefficients to ensure the quality and validity of each item. The threshold for item selection was strictly determined based on the critical value of the Pearson product-moment correlation coefficient (one-tailed) at a significance level of .05. With 28 degrees of freedom ($df = 30 - 2$), only items with a correlation coefficient (r) of 0.306 or higher were retained in the final instrument. The item-total correlation coefficients for the retained items ranged from 0.352 to 0.814, all exceeding the required critical value.

Following the item selection process, internal consistency reliability was assessed using Cronbach's alpha. The organizational factors scale demonstrated excellent reliability ($\alpha = 0.944$), the core competencies scale showed high reliability ($\alpha = 0.890$), and the overall questionnaire achieved strong internal consistency ($\alpha = 0.895$). This rigorous validation process ensured that the research instrument possessed both high construct validity and reliability for the decentralized health management context.

Data collection

Data were collected in accordance with research ethics principles, ensuring participants' rights, confidentiality, and anonymity. A validated questionnaire and a semi-structured interview guide were used. Formal approval to conduct the study was obtained through official permission from the Phitsanulok PAO and all participating SHPHs.

Quantitative data were collected using a cross-sectional survey design between November 2025 and January 2026. Data collection was conducted on-site at 47 SHPHs transferred to the PAO. Eligible personnel lists were obtained from each SHPH, and three staff members per facility were selected using simple random sampling, resulting in a total of 141 participants. Prior to participation, the study objectives, procedures, and participants' rights, including voluntary participation and the right to withdraw without penalty, were clearly explained. Written informed consent was obtained from all respondents. Completed questionnaires were

reviewed for completeness, coded, and included in the analysis only when all required items were fully completed.

Qualitative data were collected through in-depth, semi-structured interviews with 16 purposively selected key informants representing policy, managerial, and frontline levels. The interview guide was developed in advance and aligned with the eight core competency domains. Interviews were conducted in person, each lasting approximately 45–60 minutes. All participants provided written informed consent, and interviews were audio-recorded with permission, transcribed verbatim, and anonymized. To enhance credibility and trustworthiness, data source triangulation was employed by comparing perspectives across participant groups and organizational contexts, supporting a comprehensive understanding of health service management challenges within the decentralized healthcare system.

Data analysis

In this study, data were analyzed using both qualitative and quantitative approaches. Quantitative data were analyzed using descriptive and inferential statistics. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize individual characteristics, organizational factors, and levels of core competencies in health service management. Inferential analyses included chi-square tests to examine associations between categorical variables, Pearson's product-moment correlation coefficients to assess relationships between continuous variables, and multiple linear regression analysis to identify significant predictors of core competencies and to develop a predictive model for SHPH personnel.

Prior to performing the multiple linear regression analysis, key statistical assumptions were rigorously assessed to ensure the model's validity. The assumption of residual normality was validated through a visual inspection of the Normal Q-Q plots and residual histograms, which confirmed that the errors were normally distributed. Multicollinearity was evaluated using Variance Inflation Factors (VIF), with all values below 5 (ranging from 1.342 to 3.568), indicating no significant redundancy among predictors. Linearity and homoscedasticity were assessed using standardized residual plots, which showed no systematic violations. Finally, standardized regression coefficients (β) and coefficients of determination (R^2) were reported to facilitate the interpretation of predictor effects and explained variance.

Qualitative data from in-depth interviews were analyzed using content analysis. Transcripts were systematically coded, categorized, and synthesized into themes reflecting challenges and influencing factors in health service management under decentralized administration. To enhance trustworthiness, credibility was supported through data source triangulation across policy-level administrators, SHPH directors, and frontline personnel. Dependability and confirmability were strengthened through an iterative coding process, the maintenance of an audit trail, and the grounding of interpretations in verbatim quotations. Data saturation was achieved after the fourteenth interview due to the homogeneity of experiences within each participant group. The final two interviews were retained to ensure representation across all districts and organizational levels. Detailed contextual descriptions were provided to support transferability to other decentralized primary healthcare settings.

Ethical approval

This study was reviewed and approved by the Graduate-Level Human Research Ethics Committee of Sirindhorn College of Public Health, Faculty of Public Health and Allied Health Sciences, Praboromarajchanok Institute, Ministry of Public Health (Protocol No. COA.68-02-0013; approved on November 5, 2025). The research was conducted in full compliance with the three fundamental principles of human research ethics: respect for persons, beneficence and non-maleficence, and justice.

Respect for persons was ensured by safeguarding participants' dignity, autonomy, and the right to voluntary participation. All participants received comprehensive information regarding the study objectives and procedures, provided written informed consent, and were free to withdraw at any time without coercion or incentives. Privacy and confidentiality were strictly maintained: no personally identifiable information was collected, data were reported in aggregate, and all research materials were securely stored for 3 years prior to destruction. The principles of beneficence and non-maleficence were upheld, as the study involved questionnaire-based surveys and interviews only and posed no physical or psychological risks to participants. All instruments were used exclusively for research purposes, and participation contributed to improved understanding of core competencies in health service management.

Justice was ensured through clearly defined inclusion and exclusion criteria, equitable participant selection, and procedures designed to minimize selection bias, thereby ensuring a fair distribution of the benefits and burdens associated with the research.

Results

Analysis of individual characteristics among the 141 participants showed that the majority were female (87.2%), while males accounted for 12.8%. Participants were distributed across a wide age range, with the largest proportion aged 31–40 years (29.1%), followed by those aged 41–50 years (26.2%), those aged 51 years and older (23.4%), and those aged 30 years or younger (21.3%). Participant ages ranged from 22 to 60 years.

In terms of educational attainment, most participants held a bachelor's degree (73.1%), while 16.3% had less than a bachelor's degree and 10.6% held a master's degree. Regarding job position, public health scholars and public health technical officers constituted the largest group (40.4%), followed by nurses and advanced practice nurses (31.9%), and other health personnel, including traditional Thai medicine practitioners, dental public health officers, patient assistants, and support staff (27.7%).

With respect to work experience, the largest proportion of participants had less than 5 years (34.7%), followed by those with 11–20 years (27%) and 21–30 years (19.9%). Smaller proportions reported 5–10 years (11.3%) and more than 30 years of experience (7.1%). Overall, participants' work experience ranged from 1 to 40 years.

Table 1 presents the analysis of organizational factors, which indicates that overall organizational support was perceived at a high level ($M = 4.07$, $SD = 0.552$). Participation Support emerged as the strongest dimension ($M = 4.17$, $SD = 0.614$), characterized by active

community collaboration in health project planning and open expression of opinions among personnel. Resource Management and Internal Communication also received high ratings, particularly for transparent budget planning and constructive exchanges with colleagues. In contrast, although still rated in the high range, Support from the PAO ($M = 3.95$, $SD = 0.675$) had the lowest relative mean score. Specific gaps identified include the need for enhanced technical guidance from the PAO and more frequent training opportunities for health service delivery. This suggests that while participatory systems are robust, there is a relative need for stronger administrative and professional development support to optimize workforce performance.

Table 1: Descriptive Statistics for Organizational Factors ($n = 141$)

No.	Items	Mean (M)	SD	Level
1	Participation Support	4.17	0.614	High
2	Resource Management	4.14	0.648	High
3	Internal Communication	4.13	0.639	High
4	Workforce Development Support	3.97	0.621	High
5	Support from the PAO	3.95	0.675	High
Overall Organizational Factors		4.07	0.552	High

Table 2 presents the levels of core competencies in health service management across eight domains. Overall, respondents demonstrated a high level of competency. When examining specific domains, health equity received the highest mean score, followed by community partnership and leadership and systems thinking. Other domains, including data analytics, communication and information technology, and policy development, were also consistently rated highly. While all competencies remained within the high range, management and financial skills and public health science skills received comparatively lower scores. These findings suggest that while the workforce is particularly strong in fostering community partnerships and promoting equity, there is relatively greater room for development in technical and financial management.

Table 2: Core Competencies in Health Service Management (8 domains) ($n = 141$)

No.	Items	Mean (M)	SD	Level
1	Health Equity	4.06	0.629	High
2	Community Partnership	4.03	0.609	High
3	Leadership and Systems Thinking	3.92	0.658	High
4	Data Analytics and Assessment	3.91	0.642	High
5	Communication and Information Technology	3.87	0.644	High
6	Policy Development and Program Planning	3.86	0.668	High
7	Management and Financial Skills	3.83	0.648	High
8	Public Health Science Skills	3.82	0.764	High
Overall Core Competencies		3.91	0.592	High

Table 3 presents the associations between individual and organizational factors and core competencies in health service management. Among individual factors, gender and educational level were not significantly associated with overall core competencies. Job position showed significant associations with higher competencies in data analytics and assessment ($\chi^2 = 12.870$), policy development and program planning ($\chi^2 = 12.873$), management and financial skills ($\chi^2 = 9.557$), public health science skills ($\chi^2 = 11.335$), and leadership and systems thinking ($\chi^2 = 9.112$), with public health officers and academics demonstrating higher competency levels than nurses and other personnel. Age was

significantly associated with communication and information technology ($\chi^2 = 16.343$), with respondents younger than 40 years exhibiting higher levels of competency. Work experience was significantly related to policy development and program planning ($\chi^2 = 12.873$), management and financial skills ($\chi^2 = 22.941$), and communication and information technology ($\chi^2 = 19.616$), with higher competencies observed among respondents with less than five years or 11–20 years of experience.

Regarding organizational factors, all five variables demonstrated significant positive correlations with core competencies across all domains ($p < .01$). Workforce development support was positively correlated with all eight competency domains ($r = 0.414$ to 0.626). Participation support showed strong positive correlations across domains ($r = 0.562$ – 0.725). Resource management was positively associated with all domains ($r = 0.507$ – 0.689), as was internal organizational communication ($r = 0.523$ – 0.684). Support from the PAO also demonstrated positive correlations across all domains, although with comparatively lower correlation coefficients ($r = 0.386$ – 0.523). Overall, these findings indicate that both individual factors, particularly job position, age, and work experience, and organizational factors play significant roles in shaping core competencies in health service management.

Table 3: Associations of Individual Factors and Organizational Factors with Core Competencies ($n = 141$)

Variable	Test	Interpretation
Personal Factors (Chi-Square: χ^2)		
Gender	Not significant	No association with overall core competencies
Edu. Level	Not significant	No association with overall core competencies
Job Position	$\chi^2 = 9.112$ – 12.873	Higher competencies for public health officers.
Age	$\chi^2 = 16.343$	Higher competencies in Communication & IT.
Work Exp.	$\chi^2 = 12.873$ – 22.941	Higher competencies for <5 yrs or 11–20 yrs.
Organizational Factors (Pearson Correlation: r)		
Workforce Development Support	$r = 0.414$ – 0.626	Positive correlation with overall domains ($r = 0.614$): Data Analytics & Assessment ($r = 0.604$), Policy Development & Program Planning ($r = 0.603$), Communication & IT ($r = 0.588$), Health Equity ($r = 0.626$), Community Partnership ($r = 0.580$), Management & Financial Skills ($r = 0.494$), Public Health Science Skills ($r = 0.415$), Leadership & Systems Thinking ($r = 0.542$).
Participation Support	$r = 0.562$ – 0.725	Positive correlation with overall domains ($r = 0.706$): Data Analytics & Assessment ($r = 0.602$), Policy Development & Program Planning ($r = 0.623$), Communication & IT ($r = 0.615$), Health Equity ($r = 0.725$), Community Partnership ($r = 0.677$), Management & Financial Skills ($r = 0.625$), Public Health Science Skills ($r = 0.562$), Leadership & Systems Thinking ($r = 0.677$).
Resource Management	$r = 0.507$ – 0.689	Positive correlation with overall domains ($r = 0.651$): Data Analytics & Assessment ($r = 0.571$), Policy Development & Program Planning ($r = 0.611$), Communication & IT ($r = 0.613$), Health Equity ($r = 0.689$), Community Partnership ($r = 0.561$), Management & Financial Skills ($r = 0.586$), Public

Variable	Test	Interpretation
		Health Science Skills ($r = 0.507$), Leadership & Systems Thinking ($r = 0.570$).
Internal Organizational Communication	$r = 0.523-0.684$	Positive correlation with overall domains ($r = 0.662$): Data Analytics & Assessment ($r = 0.564$), Policy Development & Program Planning ($r = 0.610$), Communication & IT ($r = 0.617$), Health Equity ($r = 0.684$), Community Partnership ($r = 0.623$), Management & Financial Skills ($r = 0.576$), Public Health Science Skills ($r = 0.523$), Leadership & Systems Thinking ($r = 0.591$).
Support from PAO	$r = 0.386-0.523$	Positive correlation with overall domains ($r = 0.496$): Data Analytics & Assessment ($r = 0.523$), Policy Development & Program Planning ($r = 0.461$), Communication & IT ($r = 0.423$), Health Equity ($r = 0.418$), Community Partnership ($r = 0.498$), Management & Financial Skills ($r = 0.431$), Public Health Science Skills ($r = 0.386$), Leadership & Systems Thinking ($r = 0.445$).

Table 4 demonstrates the predictors of core competencies in health service management ($p < .01$). The analysis of predictive factors revealed consistent patterns across eight competency domains. Overall, job position negatively influenced competencies, indicating that changes from public health officers to practical nurses or other personnel were associated with reduced performance ($\beta = -0.090$ to -0.157). Interpretations were made relative to the reference group (public health officers), indicating that public health officers had significantly higher competency levels. Positive organizational predictors were consistent across domains. Workforce development support, participation support, internal organizational communication, resource management, and support from PAO were all positively associated with core competencies ($\beta = 0.032-0.123$), highlighting the importance of organizational support and personnel engagement. Educational level positively predicted competencies in communication and information technology, health equity, and community partnership ($\beta = 0.108-0.121$), while work experience positively influenced leadership and systems thinking ($\beta = 0.060$).

Based on the adjusted R^2 (Adjusted R-squared), the explained variance ranged from 43.3% (public health sciences) to 62.8% (health equity), indicating that a combination of organizational factors, education, experience, and job position effectively predicts core competencies in health service management. These findings underscore the critical role of organizational support and targeted personnel development in enhancing competencies across technical, managerial, and leadership domains.

Table 4: Predictive Factors of Core Competencies ($n = 141$)

Domains	Predictors	Influence (β) & Predictive Equation (R^2)
Overall Core Competencies	Job Position (X_POS), Workforce Development Support (X_WDS), Participation Support (X_PSS), Internal Organizational Communication (X_ICC), Support from the PAO (X_PAO)	POS (-), WDS (+), PSS (+), ICC (+), PAO (+) $\hat{Y} = 0.635 - 0.092(X_POS) + 0.036(X_WDS) + 0.062(X_PSS) + 0.038(X_ICC) + 0.035(X_PAO)$ Adjusted $R^2 = 0.619$ (61.9%)

Domains	Predictors	Influence (β) & Predictive Equation (R^2)
Health Equity	Educational Level (X_EDU), Workforce Development Support (X_WDS), Participation Support (X_PSS), Resource Management (X_RMG), Internal Organizational Communication (X_ICC)	EDU (+), WDS (+), PSS (+), RMG (+), ICC (+) $\hat{Y} = 0.492 + 0.108(X_EDU) + 0.042(X_WDS) + 0.052(X_PSS) + 0.044(X_RMG) + 0.044(X_ICC)$ Adjusted $R^2 = 0.628$ (62.8%)
Community Partnership	Educational Level (X_EDU), Participation Support (X_PSS), Internal Organizational Communication (X_ICC), Support from the PAO (X_PAO)	EDU (+), PSS (+), ICC (+), PAO (+) $\hat{Y} = 0.779 + 0.109(X_EDU) + 0.074(X_PSS) + 0.041(X_ICC) + 0.052(X_PAO)$ Adjusted $R^2 = 0.539$ (53.9%)
Leadership and Systems Thinking	Job Position (X_POS), Work Experience (X_EXP), Participation Support (X_PSS), Support from the PAO (X_PAO)	POS (-), EXP (+), PSS (+), PAO (+) $\hat{Y} = 0.916 - 0.113(X_POS) + 0.060(X_EXP) + 0.123(X_PSS) + 0.044(X_PAO)$ Adjusted $R^2 = 0.547$ (54.7%)
Data Analytics and Assessment	Job Position (X_POS), Workforce Development Support (X_WDS), Resource Management (X_RMG), Support from the PAO (X_PAO)	POS (-), WDS (+), RMG (+), PAO (+) $\hat{Y} = 0.727 - 0.110(X_POS) + 0.077(X_WDS) + 0.041(X_RMG) + 0.055(X_PAO)$ Adjusted $R^2 = 0.535$ (53.5%)
Communication and Information Technology	Educational Level (X_EDU), Workforce Development Support (X_WDS), Internal Organizational Communication (X_ICC)	EDU (+), WDS (+), ICC (+) $\hat{Y} = 0.791 + 0.121(X_EDU) + 0.069(X_WDS) + 0.092(X_ICC)$ Adjusted $R^2 = 0.500$ (50%)
Policy Development and Program Planning	Job Position (X_POS), Workforce Development Support (X_WDS), Participation Support (X_PSS), Resource Management (X_RMG), Support from the PAO (X_PAO)	POS (-), WDS (+), PSS (+), RMG (+), PAO (+) $\hat{Y} = 0.449 - 0.101(X_POS) + 0.064(X_WDS) + 0.035(X_PSS) + 0.050(X_RMG) + 0.032(X_PAO)$ Adjusted $R^2 = 0.533$ (53.3%)
Management and Financial Skills	Job Position (X_POS), Participation Support (X_PSS), Resource Management (X_RMG), Support from the PAO (X_PAO)	POS (-), PSS (+), RMG (+), PAO (+) $\hat{Y} = 0.822 - 0.090(X_POS) + 0.079(X_PSS) + 0.044(X_RMG) + 0.034(X_PAO)$ Adjusted $R^2 = 0.470$ (47%)
Public Health Science Skills	Job Position (X_POS), Participation Support (X_PSS), Support from the PAO (X_PAO)	POS (-), PSS (+), PAO (+) $\hat{Y} = 0.833 - 0.157(X_POS) + 0.108(X_PSS) + 0.056(X_PAO)$ Adjusted $R^2 = 0.433$ (43.3%)

Note: Categorical variables were dummy-coded to enhance statistical rigor. The designated reference groups for comparison include Public Health Officers (for Job Position), Below Bachelor's Degree (for Educational Level), and less than 5 years (for Work Experience). Adjusted R^2 is reported to provide an unbiased estimate of the explained variance in core competencies.

The analysis of predictive factors revealed consistent patterns across eight competency domains. However, in contrast to the initial bivariate findings, the multiple regression model showed that, after accounting for all variables, Job Position was the only personal factor that remained a significant predictor. This indicates that organizational supports, particularly participation and communication, exert a more dominant influence on workforce readiness

than age or years of experience alone. Consequently, while factors such as age and work experience showed initial correlations, they were no longer statistically significant when robust organizational enablers were present.

While the quantitative analysis identified significant predictors of core competencies, these statistical trends do not fully capture the operational complexities and lived experiences of the workforce post-transfer. To provide deeper context, the following qualitative findings explore how management challenges and enabling factors manifest across specific competency domains, offering a more nuanced perspective on the workforce's operational reality. For the challenges and influencing factors in health service management, qualitative interviews with SHPH personnel and administrators revealed how these factors manifest across competency domains. In the *Health Equity* domain, challenges included limited access to services for marginalized populations. A frontline SHPH worker (female, 29 years) noted: "Access to technology in the community, such as among the elderly or low-income groups, is uneven." Enabling factors included strong community engagement and outreach initiatives that facilitated equitable access.

Community Partnership was strengthened through participatory planning with local stakeholders. A transferred SHPH director (female, 32 years) stated: "Engaging local personnel in planning enables programs to address real community needs," allowing interventions to be adapted to local contexts. *Leadership and Systems Thinking* were critical for navigating operational complexities and coordinating inter-organizational activities. A SHPH director (female, 48 years) emphasized: "Effective management of personnel and budget, along with visionary leadership, is crucial."

Data Analytics and Assessment faced obstacles, including incomplete datasets, delayed data collection, and insufficient personnel. A frontline worker (female, 27 years) explained: "Due to the transfer process and insufficient personnel, the efficiency of data collection may decrease." Workforce expansion and inter-agency collaboration, however, improved the timeliness of decision-making. *Communication and Information Technology* was hindered by outdated systems and a lack of integration. A frontline worker (female, 34 years) reported: "The SHPH system is still outdated and not connected to the PAO, making data reporting difficult." Ongoing IT support and training enhanced workflow efficiency.

Policy Development and Program Planning suffered from misalignment between provincial policies and local needs. A transferred SHPH director (female, 32 years) commented: "Some plans or policies are unclear, causing misunderstandings and affecting operations." Involving local personnel in program design enabled context-sensitive implementation. *Management and Financial Skills* were constrained by limited budgets, personnel allocation, and multiple role demands. A Public Health Division administrator (male, 45 years) noted: "Resource allocation must be optimized across SHPHs to maintain service quality," while a frontline worker (male, 36 years) added: "Budget constraints and insufficient staff mean we must prioritize some services over others, which can affect overall program quality." Strategic planning, leadership, and collaborative resource management mitigated these challenges.

Public Health Science Skills were influenced by gaps in technical knowledge and capacity to implement evidence-based interventions. A frontline nurse (female, 31 years) emphasized: "We need more training on epidemiology and preventive care guidelines to provide quality services." A transferred director (female, 40 years) noted: "Continuous professional development and technical workshops are essential for maintaining service standards," and a Public Health Division administrator (male, 45 years) added: "We support

SHPHs with evidence-based guidance and mentoring to strengthen their technical competencies.”

The integration of quantitative and qualitative data provided a comprehensive understanding of core competencies under decentralization. Quantitative results highlighted organizational factors, particularly participation support, workforce development, and internal communication, as significant predictors of multiple competency domains. Qualitative findings complemented these results by illustrating how these supports operated in practice, including participatory planning, shared decision-making, and experiential learning, thereby enhancing motivation and the application of practical skills. While quantitative findings indicated overall high competency levels, qualitative data revealed persistent structural challenges, including workforce shortages and limitations in health information systems, providing context and explanation.

Discussion

The study indicated that the SHPH workforce transferred to the Phitsanulok PAO demonstrated high core competencies in health service management. However, a critical tension emerges from the findings. While the quantitative results indicate high levels of core competencies, qualitative interviews reveal persistent structural constraints, including outdated IT systems and workforce shortages. This discrepancy suggests a resilience–infrastructure paradox in the context of the Phitsanulok PAO. This paradox can be further understood through Bossert’s (1998) Decision Space Theory, which distinguishes between decision space (authority) and institutional capacity (resources and infrastructure). The transfer to the PAO expanded the decision space by granting more autonomy and fostering participation. However, outdated systems and fragmented governance represent significant gaps in institutional capacity. High scores in domains such as *Community Partnership* and *Health Equity* reflect the strong commitment and adaptive capacity of frontline personnel to respond to community needs despite administrative fragmentation.

The outdated systems identified in the interviews function as a structural ceiling. This constraint limits the translation of workforce competencies into optimal organizational performance. This situation reflects a competency–governance misalignment, in which the workforce’s readiness and capabilities outpace the local government’s technological and administrative infrastructure. In contrast to some prior studies, the findings of this research highlight a shift in determinant factors post-decentralization. Although age and experience showed individual correlations in bivariate analyses, the final multivariate analysis confirmed that Job Position was the primary individual determinant. This suggests a competency–governance alignment in which organizational enablers, such as participation support and internal communication, serve as the ‘bridge’ that enables staff, regardless of age or years of service, to achieve high competency levels. Essentially, robust organizational systems can mitigate the limitations often associated with a lack of experience or age-related barriers.

Therefore, strengthening decentralized health services requires not only personnel development but also system-level improvements, including upgrading institutional and technological infrastructure to align with the workforce’s existing competencies. Individual factors such as gender, age, job position, educational level, and work experience influenced specific competency domains, suggesting that accumulated experience and advanced education enhance decision-making, planning, and resource management capabilities

(Shewchuk et al., 2005; Xu et al., 2021). Although provincial in scope, this study provides a vital lens into competency-governance alignment. Such alignment is essential for health systems in LMICs. The findings suggest that decentralization serves as a sociological catalyst, reshaping professional identities through new administrative and community-based accountability structures. These findings align with prior studies emphasizing that interprofessional collaboration and exposure to diverse clinical settings strengthen competencies across leadership, policy development, and program planning (Prasitanarapun & Kitreerawutiwong, 2023; Vikström-Dahl et al., 2024).

Among the examined predictors, organizational factors, including workforce development support, participation support, internal communication, resource management, and support from the PAO, were particularly influential in shaping core competencies. The results indicated that participation support was the strongest predictor of competencies. This finding aligns with the “Decision Space” Theory (Bossert & Mitchell, 2011), as increased participation, support, and communication effectively expand the discretionary authority for SHPH staff. This expansion allows workers to overcome systemic challenges and utilize their high competencies more effectively. Similar patterns have been observed in studies that highlight organizational readiness and support as key determinants of effective multisectoral collaboration. Structured competency frameworks and training programs further enhance workforce adaptability, professional development, and performance (MacKay et al., 2024; Spanakis et al., 2025).

Workforce development support, in particular, provides mechanisms for continuous skill acquisition, knowledge sharing, and mentorship, strengthening individual competencies while fostering organizational resilience (Council on Linkages Between Academia and Public Health Practice, 2021). In decentralized health services, inclusive governance and participatory decision-making promote accountability and empower staff to respond effectively to local health needs (Abdulwehab et al., 2023).

Qualitative findings revealed domain-specific challenges, such as limited access, workforce shortages, outdated systems, fragmented governance, and misaligned policies, while enablers included community engagement, leadership, integrated data systems, and continuous professional development. These insights align with evidence that patient and community engagement improves responsiveness and equity, particularly in decentralized and rural primary care settings (International City/County Management Association, 2023; Rush et al., 2025). Furthermore, preparedness, adaptability, and collaborative problem-solving were critical to workforce readiness and service quality under complex conditions (Al-Jabri et al., 2025).

Enhancing organizational support, participatory governance, and workforce development is crucial. These mechanisms strengthen workforce adaptability, improve service quality, and foster core competencies. Evidence suggests that perceived organizational support, empowerment, and structured professional development programs are directly associated with higher engagement, commitment, and achievement of competencies (Matvijit et al., 2024). Implementing multi-level strategies that integrate targeted competency-based training, participatory governance, efficient resource allocation, digital health technologies, and supportive organizational policies can sustain high-quality primary care. Addressing both individual and organizational factors enables health systems to optimize workforce performance, service quality, and operational efficiency. Continuous monitoring, evaluation, and feedback ensure interventions remain evidence-based, contextually relevant, and capable of promoting equity, sustainability, and resilience.

Theoretically, this study contributes to the literature on health system decentralization and workforce development by extending the Council on Linkages competency framework through an organizational governance lens. Decentralization should not be viewed solely as structural reform. Findings show its effects are mediated by organizational support, including participation, capacity building, and resource management. The proposed concept of competency–governance alignment highlights that core competencies emerge from interactions between individual characteristics and enabling organizational contexts, explaining variations in workforce outcomes across decentralized settings. This perspective advances theory by positioning organizational enablers as a critical link between decentralization policy and human resource performance, offering a transferable conceptual lens for understanding primary healthcare workforce competencies in other low- and middle-income countries.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design captures data at a single point in time, preventing firm conclusions regarding causal relationships between organizational factors and core competencies in health service management. Second, the study was conducted exclusively among SHPHs transferred to the Phitsanulok PAO, which may limit generalizability to SHPHs in other provinces or to health organizations under different administrative structures. Third, quantitative data were collected via self-administered questionnaires, which may be subject to response biases, including social desirability bias and inaccuracies in self-assessments of competencies and organizational conditions. Fourth, although multiple individual and organizational factors were examined, other potentially influential variables – such as leadership styles, organizational culture, and external policy dynamics – were not included and may have affected observed relationships. Finally, the qualitative component involved a limited number of key informants selected through purposive sampling. While providing in-depth contextual insights, this approach may not fully capture the diversity of perspectives among all SHPH personnel, particularly frontline staff with varying roles and experiences.

Conclusion and recommendation

This study demonstrates that both individual and organizational factors shape core competencies in health service management among personnel in decentralized SHPHs. Participants showed high competency across eight domains. Personal factors such as job position, age, and experience influenced specific domains, while organizational support, including workforce development, participatory decision-making, resource management, internal communication, and guidance from the PAO, consistently enhanced performance. Qualitative findings highlighted challenges such as limited access, workforce shortages, outdated systems, and misaligned policies, as well as enablers including community engagement, leadership, integrated data systems, professional development, and collaborative resource allocation.

To strengthen competencies, the study recommends moving beyond traditional training to address the competency–governance misalignment. Specifically, the PAO should prioritize a

hard-system upgrade by modernizing the IT infrastructure and integrating data systems to match the staff's high soft-skill readiness. Policy alignment must focus on removing the structural ceiling identified in this study, ensuring that high individual human agency is supported by robust organizational governance.

At the organizational level, strengthening competencies also requires sustained workforce development efforts. Continuous training, mentoring, and opportunities for practical skill application should be complemented by inclusive planning and decision-making, effective resource allocation, and leadership development. Upgrading IT systems and aligning policies with local contexts will further enable personnel to apply their competencies effectively. In addition, regular monitoring of workforce competencies can help identify gaps and guide targeted interventions to sustain high-quality, equitable, and responsive health services. Together, these findings highlight that integrated organizational support, workforce capacity development, and community engagement are essential for achieving sustainable improvements in decentralized health service management.

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