Factors Associated With Burnout Syndrome Among Healthcare Workers at Sub-District Health Promoting Hospitals in Khon Kaen Province, Thailand

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Abstract

The recent transfer of sub-district Health Promoting Hospitals (SHPHs) from the Ministry of Public Health (MOPH) to a Provincial Administrative Organization (PAO) in Thailand has created new organizational challenges and role adaptations for healthcare workers, potentially increasing their risk of burnout. Understanding factors associated with burnout in this transitional context is crucial for developing effective support systems and ensuring sustainable local health service delivery. This cross-sectional analytical study aimed to investigate factors associated with burnout syndrome among healthcare workers in SHPHs under the Khon Kaen PAO. Data were collected from 315 healthcare workers between November and December 2024, using self-administered questionnaires that measured socioeconomic status, social support, stress, quality of work life, and burnout. The study found that 29.21% of participants experienced high levels of burnout. Multiple logistic regression analysis revealed that healthcare workers with limited opportunities for personal skill development had 7.73 times higher odds of burnout compared to those with high skill development opportunities. Workers experiencing moderate to very high stress levels had 3.68 times higher odds of burnout compared to those with low-stress levels. A low work-life balance was associated with 2.89 times higher odds of burnout compared to a high work-life balance. The model demonstrated high discriminative ability, with an ROC-AUC of 0.8276. The findings suggest the need for establishing provincial-level training institutes for continuous professional development, implementing stress management systems, and developing flexible work arrangements. Additionally, national policies supporting the transfer of health services to local administration should emphasize systematic workforce capacity building through structured training programs, career advancement pathways, and competency-based skill enhancement that facilitate professional growth. These interventions could help prevent burnout and sustainably strengthen local health systems.

Keywords

Burnout syndrome; healthcare workers; provincial administration organization; sub-district Health Promoting Hospitals

Introduction

Burnout syndrome among healthcare workers represents a critical global health challenge with cascading implications for workforce demographics, healthcare system sustainability, and population health outcomes. The social ramifications extend beyond healthcare settings and compromise community health security when understaffed facilities cannot maintain adequate service coverage. Burnout-induced workforce shortages directly compromise access to essential services, delay preventive care, and disproportionately impact vulnerable populations dependent on public healthcare systems. Beyond individual suffering, burnout contributes to workforce attrition, reduced service quality, and compromised population health coverage, particularly in rural and underserved areas where sub-district Health Promoting Hospitals (SHPHs) serve as primary healthcare access points for entire communities. The economic burden is substantial, with healthcare worker burnout costing health systems billions annually through turnover expenses, reduced efficiency, and medical errors. In developing countries like Thailand, where healthcare infrastructure continues to evolve and human resources remain limited, the impact of burnout becomes more pronounced, potentially undermining progress in strengthening the health system and achieving universal health coverage.

The demographic impact is particularly pronounced as burnout disproportionately affects younger healthcare professionals, potentially creating long-term workforce shortages that could undermine population health security. The 20-Year Thailand National Health Strategic Plan (2017–2036) focuses on developing medical technology systems and enhancing human resources capacity to elevate medical service standards to international levels (Office of the National Economic and Social Development Council [NESDC], 2022). The Ministry of Public Health (MOPH) (2018) established key objectives: "Healthy People, Happy Staff, Sustainable Health System." However, the COVID-19 pandemic has compelled healthcare personnel to work under high-risk conditions and intense pressure, leading to anxiety, stress, and fatigue from heavy workloads, ultimately resulting in burnout syndrome.

The World Health Organization (WHO) (2019) recognized burnout as a medical condition characterized by three key components: (1) emotional exhaustion - feelings of fatigue, physical and mental depletion, and social withdrawal; (2) depersonalization - negative attitudes, indifference, and lack of empathy, and (3) reduced personal accomplishment - feelings of inefficiency and lack of pride in achievements. This burnout syndrome has widespread impacts on personnel, organizations, and healthcare systems, manifesting as decreased work efficiency, service errors, frequent absenteeism, interpersonal relationship issues, and potentially leading to resignation and staff shortages (Worawasuwat, 2020). Consequently, the Department of Mental Health (2024) developed a 5-year Action Plan (2023-2027) that focuses on evolving into a happy organization with continuous monitoring of staff well-being.

The understanding of burnout syndrome has evolved through several theoretical frameworks, each offering unique perspectives on its development and manifestation. The Maslach Burnout Theory (Maslach & Jackson, 1981) conceptualizes burnout as a three-dimensional syndrome comprising emotional exhaustion, depersonalization, and reduced personal accomplishment. This model emphasizes the sequential development of burnout, beginning with emotional exhaustion from prolonged exposure to stressful interpersonal situations, followed by depersonalization as a coping mechanism, and culminating in reduced feelings of personal accomplishment. The Job Demands-Resources (JD-R) Model (Bakker &

Demerouti, 2007; Demerouti et al., 2001) offers a comprehensive framework for understanding the development of burnout through the interaction between job demands and job resources. According to this model, burnout results from an imbalance where job demands exceed available job resources. Job demands include physical, psychological, social, or organizational aspects that require sustained effort, while job resources encompass aspects that help achieve work goals, reduce demands, or stimulate personal growth. This model is particularly relevant for healthcare settings where high emotional and physical demands must be balanced with adequate organizational support, professional development opportunities, and social resources.

Multiple factors contribute to work-related burnout. Socioeconomic conditions fundamentally affect personnel's quality of life and work performance. According to Maslow's Hierarchy of Needs Theory (1954), individuals must have their basic physical and security needs met before achieving work efficiency. This aligns with Herzberg's Two-Factor Theory (1959), which identifies hygiene factors such as salary, working conditions, job security, and interpersonal relationships as crucial in preventing job dissatisfaction. House's Social Support Theory (1981) emphasizes the importance of receiving emotional, informational, and resource assistance from supervisors and colleagues in managing stress effectively. This is further supported by empirical findings highlighting the critical buffering role of social support in occupational stress (Estevez Cores et al., 2021).

This aligns with Homans' Social Exchange Theory (1958) and Senge's Learning Organization Theory (1990), which emphasize the importance of interaction and collaborative learning. Recent research has underlined the importance of adopting a multidimensional perspective when examining healthcare workers' burnout, as recommended by Nagle et al. (2024). This holistic approach considers the complex interplay between socio-demographic factors, individual characteristics, and work environment conditions, contributing to more comprehensive prevention and control strategies at both personal and organizational levels. However, most existing studies focus primarily on identifying significant factors without exploring how these factors interact or work together to influence burnout development.

Lazarus and Folkman's Stress and Coping Theory (1984) contributes to the understanding of burnout by explaining how individuals appraise and cope with stressful situations. When healthcare workers perceive their work environment as threatening and their coping resources as inadequate, chronic stress develops, potentially leading to burnout. This cognitive appraisal process helps explain individual variations in susceptibility to burnout. Karasek's Job Stress Model (1979) further explained that high job demands coupled with low control lead to chronic stress and eventual burnout. Regarding the quality of work life, Walton's Theory (1974) identified eight essential components: fair compensation, safe environment, development opportunities, career advancement and security, social integration, work rights, work-life balance, and socially beneficial work characteristics. These factors, when properly addressed, effectively prevent work-related burnout.

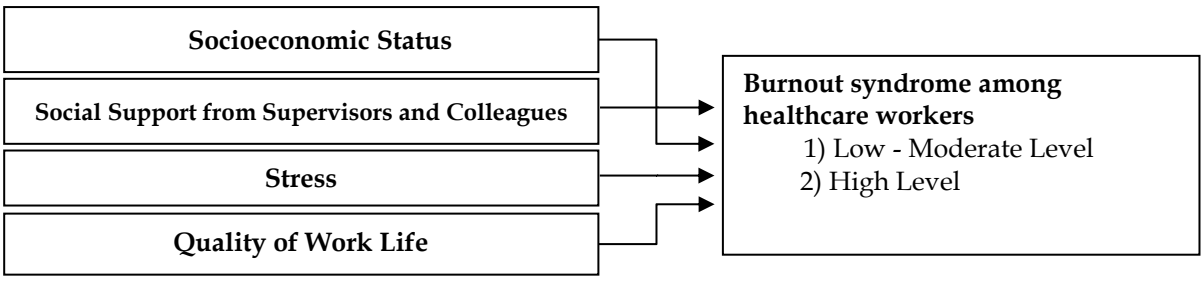
Khon Kaen Province comprises 26 districts, 199 subdistricts, 2,331 villages, and 248 SHPHs, with 1,826 healthcare personnel (Khon Kaen PAO, 2024). This study focuses on the critical transition following Thailand's decentralization policy, transferring SHPHs from the MOPH to a Provincial Administrative Organization (PAO). Khon Kaen Province, as the first province to pilot this transfer, represents a unique case study for examining the impacts of this unprecedented administrative restructuring. This change fundamentally altered administrative frameworks, reporting structures, and operational protocols for healthcare workers. As the pioneering province, Khon Kaen's healthcare workers experienced initial

challenges transitioning from traditional public health officers under ministerial oversight to local government employees with expanded community development responsibilities, potentially creating heightened stress due to uncertainty and the learning curve of navigating this systemic change. A significant change in the local health system involves transferring health promotion hospitals to provincial administrative organizations, requiring healthcare staff to adapt their roles and integrate various functions, including health promotion, disease prevention and control, treatment, rehabilitation, consumer protection, and local development coordination.

Studies in Health Region 7 revealed moderate to high levels of burnout among healthcare staff, with 47% experiencing emotional exhaustion, 64% exhibiting depersonalization, 79% reporting reduced work capacity, and 18.21% reporting severe stress levels (Worawasuwat, 2020). Similar findings have been observed in Health Region 4 among dental nurses in SHPHs (Intaphalan et al., 2024). The specific context of primary healthcare settings, particularly SHPHs, presents unique challenges. These facilities serve as frontline healthcare providers for rural populations, often operating with limited resources, small staff numbers, and broad service responsibilities. The recent transfer of these facilities from the MOPH to a PAO represents a significant organizational change that may exacerbate existing stressors while introducing new challenges related to administrative adaptation and role clarity. However, limited research exists on burnout among healthcare personnel in local administrative organizations despite their distinct management context, the scope of authority, responsibilities, and impacts.

More importantly, there is a significant gap in understanding how various personal and environmental factors interact within the specific context of health system transformation, particularly during the transfer of SHPHs to provincial administrative organizations. This study aims to investigate factors associated with burnout among healthcare workers in SHPHs under the Khon Kaen PAO, with the goal of informing burnout prevention strategies and enhancing personnel management systems within local administrative organizations. The conceptual framework based on the Job Demands-Resources Model and organizational transition context, this study selected four independent variables capturing essential burnout factors during administrative restructuring: (1) socioeconomic status as fundamental personal resources for coping with change (Herzberg, 1959; Maslow, 1954), (2) social support providing crucial assistance when traditional networks are disrupted (House, 1981), (3) stress level operationalizing job demands exceeding resources (Lazarus & Folkman, 1984), and (4) quality of work life encompassing job resources at risk during ministerial-to-provincial transition (Walton, 1974). These variables address personal, social, psychological, and organizational dimensions critical for burnout in healthcare organizational change, which can be used to write the conceptual framework as shown in Figure 1.

Figure 1: Conceptual Framework of Burnout in SHPH Healthcare Workers



Research methodology

This study employed a cross-sectional analytical research design using quantitative data collection through questionnaires. The study population consisted of 1,826 healthcare workers working in SHPHs under the Khon Kaen PAO. The study focused exclusively on workers under regulations because they underwent a complete administrative transition, resulting in homogeneous exposure to organizational change and eliminating confounding variables from mixed administrative systems. Data collection took place from November 10 to December 10, 2024.

Sample size

The sample consisted of healthcare workers working in SHPHs under the Khon Kaen PAO. The inclusion criteria were: 1) employment at SHPHs under the Khon Kaen PAO; 2) minimum one year of work experience; 3) physical and mental capability to provide information; and 4) voluntary consent to participate in the study. Exclusion criteria included: 1) non-professional healthcare workers such as nursing assistants, health officer assistants, and service staff, and 2) non-civil servants, non-MOPH employees, or non-monthly permanent employees.

The sample size was calculated using Hsieh et al.'s (1998) formula for Multiple Logistic Regression Analysis, aligning with the study by Udho and Kabunga (2022). The initial calculation yielded 63.52 subjects. After adjusting for the Variance Inflation Factor (VIF) of 5.0 to control for confounding factors, the final sample size was determined to be 315 participants from a total population of 1,826. To ensure representative sampling, systematic random sampling was employed to distribute the questionnaires. For participants who are not ready or unwilling, a random replacement sample will be used using the same systematic interval from the remaining population list.

Research instrument

The questionnaire comprised five sections:

Section 1, the Socioeconomic Status Questionnaire, consisted of 12 items that collected demographic data, including gender, age, marital status, underlying diseases, income, education level, professional position, academic position, work duration, sleep adequacy, family responsibilities, and working hours.

Section 2 consisted of the Social Support Questionnaire, which comprised 15 items adapted from Jacobson's concept (1986). This instrument was selected for its comprehensive measurement of three critical job resource dimensions: emotional support, intellectual support, and resource support, which directly align. It measured three dimensions: emotional support, intellectual support, and resource support, using a 5-point Likert scale (1 = least to 5 = most). The scores were interpreted as low support (1.00–2.33), moderate support (2.34–3.67), and high support (3.68–5.00).

Section 3 utilized the Department of Mental Health's (2017) Stress Assessment (STQ-5) tool, consisting of 5 items on a 4-point scale (0–3 points). This instrument was selected for its

validation in Thai healthcare settings. The interpretation ranges were low stress (0–4 points), moderate stress (5–7 points), high stress (8–9 points), and severe stress (10–15 points).

Section 4 featured the Quality of Work Life Questionnaire, which consisted of 40 items based on Walton's concept (1994), measuring eight dimensions using a 5-point Likert scale (1–5 points). This comprehensive instrument captures multiple job resources, including fair compensation, a safe working environment, job security, skill development opportunities, social integration, employee rights, work-life balance, and socially beneficial work. The scores were categorized as low (1.00–2.33), moderate (2.34–3.67), and high quality of work life (3.68–5.00).

Section 5 contained the Burnout Inventory, adapted from the Maslach Burnout Inventory (1986), which comprised 22 items measuring three dimensions on a 5-point scale (ranging from 0 to 4 points). This gold-standard instrument directly operationalizes Maslach Burnout Theory's three-dimensional model. The scores were interpreted as low burnout (0–29.33), moderate burnout (29.34–58.66), and high burnout (58.67–88.00).

Instrument quality assessment

The selection of research instruments was guided by the conceptual framework and established psychometric properties in healthcare settings. Each instrument was chosen based on its theoretical alignment and validated use in similar populations. Content validity was established through expert review by three specialists. Reliability testing was conducted through a pilot study with 30 healthcare workers. The tryout was conducted from October 28 to November 3, 2024, at SHPHs under the Nong Bua Lamphu PAO. The SHPHs in Nong Bua Lamphu province operate under the administration of the PAO, similar to those in Khon Kaen province. They were chosen for their similar work characteristics and proximity to each other. The Item-Objective Congruence (IOC) index was calculated to assess content validity, and Cronbach's alpha coefficient was used to evaluate reliability. All questionnaire sections demonstrated high reliability, with Cronbach's alpha coefficients exceeding 0.7, meeting the standard criteria for research instruments. Cronbach's alpha reliability for this instrument in the current study was for Social Support from Supervisors and Colleagues (0.96), Stress (0.83), Quality of Work Life (0.97), and burnout syndrome (0.91).

Data collection

Data collection was conducted through structured self-administered questionnaires after obtaining approval from the Khon Kaen University Ethics Committee in Human Research. The process began with authorization from the Dean of the Faculty of Public Health at Khon Kaen University, followed by coordination with the Chief Executive of the Khon Kaen PAO. After gaining access to the list of healthcare workers, the researcher coordinated with the directors of SHPHs across all 26 districts through monthly meetings. All confidential information was securely stored on password-protected devices, and participant privacy and confidentiality were strictly maintained throughout the data collection process. All research-related data, in both paper and electronic formats, were scheduled for proper disposal upon completion of the study.

Statistical analysis

Statistical analysis was performed using STATA version 17 (StataCorp, 2021). Data analysis was performed using statistical software and divided into two parts. The first part involved descriptive statistical analysis. For qualitative data, frequency distribution, percentages, and 95% confidence intervals were calculated. For quantitative data with a normal distribution, means and standard deviations were used; for non-normally distributed data, median, minimum, and maximum values were employed. Before conducting the logistic regression analysis, several key assumptions were systematically tested to ensure the validity and reliability of the statistical model. Cross-tabulation tables were constructed between all categorical independent variables and the dependent variable to examine cell frequencies. The analysis confirmed that each cell contained a minimum of five cases, with less than 20% of cells having frequencies below this threshold. No empty cells were observed, ensuring adequate statistical power for coefficient estimation.

The second part consisted of inferential statistical analysis, accompanied by thorough verification of assumptions. Before logistic regression analysis, the following assumptions were tested: (1) Multicollinearity assessment using Variance Inflation Factor (VIF < 5.0) and tolerance values (> 0.2), (2) Linearity of the logit assessed through the Box-Tidwell test, and (3) Independence of observations verified through study design. Initially, Simple Logistic Regression was performed to examine the relationship between each independent variable and the dependent variable, reporting Crude Odds Ratios (COR) with 95% confidence intervals. Variables with p values less than .25 were then included in Multiple Logistic Regression analysis using the Backward Elimination method. Model fitness was assessed using the Hosmer-Lemeshow test ($p > .05$), and discriminative ability was evaluated using the area under the ROC curve (AUC). The final model was presented with Adjusted Odds Ratios (AOR) and 95% confidence intervals (CI) at a significance level of .05 (Hosmer et al., 2000).

Ethical approval

This study was approved by the Khon Kaen University Ethics Committee in Human Research (Protocol No. HE672175, October 8, 2024). All participants were informed about the study's objectives and procedures, and written informed consent was obtained before their participation. The research protected participant confidentiality by excluding personally identifiable information and using only aggregated data for analysis. The questionnaire responses were voluntary, and participants could withdraw from the study at any time. Research data were securely stored, accessible only to the primary researcher, and will be destroyed one year after study completion.

Results

The study sample consisted of 315 healthcare workers from SHPHs under the Khon Kaen PAO. Table 1 presents a comprehensive demographic profile and key study variables, measured as composite scores rather than individual item percentages, providing a clearer analytical perspective on the population characteristics. The study participants comprised predominantly female healthcare workers in their thirties with bachelor's degree qualifications and extensive work experience exceeding ten years. Most were married public

health academic officers earning moderate incomes while working extended hours with limited sleep patterns and small family units.

Social support levels showed an overall moderate to high distribution, with high, moderate, and low levels of social support, respectively. Specifically, emotional, cognitive, and resource support all demonstrated high levels of support. The quality of work life showed overall moderate levels, with both high and low levels also represented. Individual dimensions showed varying patterns: socially beneficial work was rated high, along with employee rights, social integration, skill development opportunities, and a safe working environment. However, job security and career advancement showed concerning results, with a substantial proportion rating them as low.

Stress levels were categorized into four groups: low stress, moderate stress, high stress, and very high stress. Work-life balance showed mixed results, with participants rating it as high, moderate, and low. Burnout analysis revealed an overall distribution of burnout syndrome at high, moderate, and low levels. The three burnout dimensions exhibited distinct patterns: emotional exhaustion was predominantly high, depersonalization was predominantly low, and personal accomplishment showed a mixed pattern, ranging from moderate to high and low levels (Table 1).

Table 1: Demographics, Psychosocial Factors, and Burnout Levels of SHPH Healthcare Workers (n = 315)

Baseline	*n*	%
Socioeconomic Status		
Gender		
Male	80	25.40
Female	235	74.60
Age group (years old)		
≤ 30 years	89	28.25
31–40 years	122	38.73
41–50 years	62	19.68
51–60years	42	13.33
(Mean = 37.58, SD = 9.41, Minimum = 24, Maximum = 59)		
Marital Status		
Single	133	42.22
Married	155	49.21
Widowed/Divorced/Separated	27	8.57
Educational attainment		
Associate Degree or Below	23	7.30
Bachelor's Degree or Equivalent	254	80.63
Master's Degree or Higher	38	12.06
Monthly Income		
≤ 15,000 THB	13	4.13
15,000–29,999 THB	158	50.16
≥ 30,000 THB	144	45.71
(Mean = 30,743.96, SD = 14,054.86, Minimum = 12,350, Maximum = 70,000)		
Duration of Employment in the Position of Public Health Officer at a Sub-District Health Promoting Hospital (years)		
1–5 years	14	5.49
6–10 years	48	18.82
> 10 years	193	75.69
(Mean = 14.13, SD = 9.69, Median = 13, Minimum = 1, Maximum = 40		

Baseline	*n*	%
Chronic Illness		
Yes	54	17.14
No	261	82.86
Professional Position		
Nurse	82	26.03
Public Health Academic Officer	108	34.29
Public Health Practitioner	6	1.90
Traditional Thai Medicine	21	6.67
Public Health Officer	69	21.90
Dental Public Health Officer	29	9.21
Academic Position		
Operational	134	42.54
Skilled or Professional	178	56.51
Senior or Specialist	3	0.95
Adequacy of Sleep Duration		
Less than 8 Hours	167	53.02
8 Hours	104	33.02
More than 8 Hours	44	13.97
Family Dependents to Take Care of (Persons)		
Less than 5 Persons	301	95.56
6–10 Persons	14	4.44
(Mean = 2.51, SD = 1.63, Median = 2, Minimum = 0, Maximum = 8		
Working Hours		
Less Than or Equal to 8 Hours	94	29.84
More Than 8 Hours	221	70.16
Social Support from Supervisors and Colleagues		
Overall Social Support from Supervisors and Colleagues Level		
Low	40	1.270
Moderate	125	39.70
High	150	47.60
Emotional Aspect		
Low	43	13.65
Moderate	125	39.68
High	147	46.67
Cognitive Aspect		
Low	41	13.02
Moderate	121	38.41
High	153	48.57
Resource Aspect		
Low	34	10.79
Moderate	130	41.27
High	151	47.94
Stress		
Stress Level		
Low Stress	92	29.21
Moderate Stress	96	30.48
High Stress	38	12.06
Very High Stress	89	28.25
Quality of Work Life		
Overall Quality of Work-Life Level		
Low	14	4.40
Moderate	199	63.20
High	102	32.40
Fair and Adequate Compensation for Work		
Low	106	33.65

Baseline	*n*	%
Moderate	153	48.57
High	56	17.78
Safe and Healthy Working Environment		
Low	19	6.03
Moderate	128	40.63
High	168	53.33
Job Security and Career Advancement		
Low	129	40.95
Moderate	148	46.98
High	38	12.06
Opportunities for Personal Skill Development		
Low	30	9.52
Moderate	117	37.14
High	168	53.33
Social Integration or Teamwork		
Low	27	8.57
Moderate	118	37.46
High	170	53.97
Rights at Work		
Low	18	5.71
Moderate	122	38.73
High	175	55.56
Work-Life Balance		
Low	37	11.75
Moderate	153	48.57
High	125	39.68
Socially Beneficial Nature of Work		
Low	5	1.59
Moderate	60	19.05
High	250	79.37
Burnout Syndrome		
Overall Burnout Syndrome Level		
Low	17	5.40
Moderate	206	65.40
High	92	29.20
Emotional Exhaustion		
Low	65	20.63
Moderate	52	16.51
High	198	62.86
Depersonalization		
Low	249	79.05
Moderate	62	19.68
High	4	1.27
Personal Accomplishment		
Low	15	4.70
Moderate	250	79.40
High	50	15.90

Table 2 demonstrates the prevalence of burnout syndrome among the 315 healthcare workers. High-level burnout affected 29.21% (95% CI [0.24, 0.34]) of participants, while 70.79% (95% CI [0.65, 0.75]) reported low to moderate levels of burnout. For this research, the analysis of factors associated with burnout syndrome focused explicitly on the high-level burnout group (29.21%) as the primary study population (Table 2).

Table 2: Prevalence of Burnout Among SHPH Healthcare Workers in Khon Kaen PAO (n = 315)

Level of Burnout Syndrome	*n*	%	95% CI
High	92	29.21	[0.24, 0.34]
Low & Moderate	223	70.79	[0.65, 0.75]

Table 3 presents the results of a simple (univariate) logistic regression analysis examining the relationship between potential risk factors and high-level burnout. The crude odds ratio (COR) was calculated to demonstrate preliminary associations between each independent variable and high-level burnout without controlling for confounding variables, serving as an initial screening step to identify variables with p values < .25 for inclusion in the subsequent multivariable model. The analysis revealed several variables with p < .25, qualifying them for inclusion in the multivariable model. Among demographic factors, none showed statistically significant associations with burnout (all p > .05), suggesting that individual characteristics alone do not predict burnout risk in this population. However, several jobs demands and resources showed strong associations social support showed significant associations across all dimensions - emotional support (COR = 3.22, 95% CI [1.55, 6.65], p = .013), cognitive support (COR = 2.98, 95% CI [1.40, 6.33], p = .001), and resource support (COR = 3.05, 95% CI [1.39, 6.69], p = .030). Quality of work-life dimensions also showed strong associations, particularly opportunities for personal skill development (COR = 43.99, 95% CI [15.41, 125.56], p < .001), work-life balance (COR = 94.87, 95% CI [27.94, 322.13], p < .001), and social integration (COR = 7.93, 95% CI [3.30, 19.03], p < .001). Stress levels showed a clear dose-response relationship with burnout risk. Compared to low stress, moderate stress increased odds by 2.59 times (95% CI [1.19, 5.64]), high stress by 6.62 times (95% CI [2.70, 16.22]), and very high stress by 5.48 times (95% CI [2.57, 11.69]) (p < .001) (Table 3).

Table 3: Simple Logistic Regression of Factors Associated With Burnout in SHPH Healthcare Workers (n = 315)

Factor	Burnout Syndrome		COR	95% CI	*p* value
	n	%			
Gender					.3331
Male	20	5.00	1	1	
Female	72	30.64	1.32	[0.74, 2.35]	
Age group (years old)					.9446
≤ 30 years	25	28.09	1	1	
31–40 years	38	31.15	1.15	[0.63, 2.11]	
41–50 years	17	27.42	0.96	[0.46, 1.99]	
51–60years	12	28.57	1.02	[0.45, 2.31]	
Marital Status					.4843
Widowed/Divorced/Separated	6	22.22	1	1	
Single	43	32.33	1.67	[0.62, 4.44]	
Married	43	27.74	1.34	[0.50, 3.55]	
Educational attainment					.3439
Associate Degree or Below	6	26.09	1	1	
Bachelor's Degree or Equivalent	71	27.95	1.09	[0.41, 2.90]	
Master's Degree or Higher	15	39.47	1.84	[0.59, 5.75]	
Monthly Income					.6269
≥ 30,000 THB	39	27.08	1	1	
≤ 15,000 THB	5	38.46	1.68	[0.51, 5.45]	
15,000–29,999 THB	48	30.38	1.17	[0.71, 1.93]	

Factor	Burnout Syndrome		COR	95% CI	*p* value
	n	%			
Duration of Employment in the Position of Public Health Officer at a Sub-District Health Promoting Hospital (years)					.3296
> 10 years	51	26.42	1	1	
1–5 years	4	28.57	1.11	[0.33, 3.70]	
6–10 years	18	37.50	1.67	[0.85, 3.25]	
Chronic Illness					.1720
No	72	27.59	1	1	
Yes	20	37.04	1.54	[0.83, 2.85]	
Professional Position					.6095
Nurse	24	29.27	1	1	
Public Health Academic Officer	32	29.63	1.01	[0.54, 1.91]	
Traditional Thai Medicine	3	50.00	2.41	[0.45, 12.83]	
Public Health Officer	7	33.33	1.20	[0.43, 3.36]	
Dental Public Health Officer	21	30.43	1.05	[0.52, 2.12]	
Public Health Practitioner	5	17.24	0.50	[0.17, 1.47]	
Academic Position					.8797
Operational	41	30.60	1	1	
Skilled or Professional	50	28.09	0.88	[0.54, 1.44]	
Senior or Specialist	1	33.33	1.13	[0.10, 12.86]	
Adequacy of Sleep Duration					.6614
Less than 8 Hours	51	30.54	1	1	
8 Hours	27	25.96	0.79	[0.46, 1.37]	
More than 8 Hours	14	31.82	1.06	[0.51, 2.16]	
Family Dependents to Take Care of (Persons)					.1798
6, 10 Persons	2	14.29	1	1	
Less than 5 Persons	90	29.90	2.55	[0.56, 11.66]	
Working Hours					.6764
More Than 8 Hours	63	28.51	1	1	
Less Than or Equal to 8 Hours	29	30.85	1.11	[0.66, 1.89]	
Social Support from Supervisors and Colleagues					
Emotional Aspect					.0013
High	29	19.73	1	1	
Moderate	44	35.20	2.21	[1.27, 3.82]	
Low	19	44.19	3.22	[1.55, 6.65]	
Cognitive Aspect					.0001
High	27	17.65	1	1	
Moderate	49	40.50	3.17	[1.82, 5.51]	
Low	16	39.02	2.98	[1.40, 6.33]	
Resource Aspect					.0030
High	31	20.53	1	1	
Moderate	46	35.38	2.11	[1.24, 3.61]	
Low	15	44.12	3.05	[1.39, 6.69]	
Stress Level					< .001
Low Stress	11	11.96	1	1	
Moderate Stress	25	26.04	2.59	[1.19, 5.64]	
High Stress	18	47.37	6.62	[2.70, 16.22]	
Very High Stress	38	42.70	5.48	[2.57, 11.69]	
Quality of Work Life					

Factor	Burnout Syndrome		COR	95% CI	*p* value
	n	%			
Fair and Adequate Compensation for Work					< .001
High	1	1.79	1	1	
Moderate	45	30.07	23.64	[3.17, 176.05]	
Low	46	42.45	40.57	[5.41, 304.28]	
Safe and Healthy Working Environment					.0016
High					
Moderate	35	20.83	1	1	
Low	48	37.50	2.28	[1.36, 3.82	
	9	47.37	3.42	[1.29, 9.06	
Job Security and Career Advancement					.0011
High					
Moderate	3	7.89	1	1	
Low	36	35.81	6.50	[1.91, 22.17]	
	53	27.91	4.51	[1.30, 15.61]	
Opportunities for Personal Skill Development					< .001
High	14	8.33	1	1	
Moderate	54	46.15	9.42	[4.88, 18.18]	
Low	24	80.00	43.99	[15.41, 125.56]	
Social Integration or Teamwork					< .001
High	30	17.65	1	1	
Moderate	45	38.14	2.87	[1.67, 4.94]	
Low	17	62.96	7.93	[3.30, 19.03]	
Rights at Work					.0001
High	36	20.57	1	1	
Moderate	45	36.89	2.25	[1.34, 3.79]	
Low	11	61.11	6.06	[2.19, 16.75]	
Work, Life Balance					< .001
High	10	8.00	1	1	
Moderate	49	32.03	5.41	[2.61, 11.24]	
Low	33	89.19	94.87	[27.94, 322.13]	
Socially Beneficial Nature of Work					.1764
High	68	27.20	1	1	
Moderate	21	35.00	1.44	[0.79, 2.62]	
Low	3	60.00	4.01	[0.65, 24.54]	

The multivariable analysis presented in Table 4 identified three significant factors associated with burnout syndrome among healthcare workers in SHPHs under the Khon Kaen PAO. Personal skill development opportunities emerged as the most significant predictor, with officers reporting low to moderate levels of development opportunities experiencing 7.73 times higher odds of burnout compared to those with high levels (95% CI [3.82, 15.63], p < .001). The stress level was the second most influential factor, where individuals experiencing moderate to very high stress levels were 3.68 times more likely to develop burnout compared to those with low stress levels (95% CI [1.72, 7.89], p = .001). Work-life balance was also significantly associated with burnout, as officers reporting low to moderate work-life balance demonstrated 2.89 times higher odds of experiencing burnout compared to those with high work-life balance (95% CI [1.27, 6.53], p = .011). The predictive capability of the model was assessed using the Receiver Operating Characteristic (ROC) curve analysis, yielding an area under the curve of 0.8276, indicating good discriminative ability between individuals with and without burnout syndrome.

Table 4: Multivariable Analysis of Factors Associated With Burnout in SHPH Healthcare Workers (n = 315)

Factor	Burnout Syndrome		AOR	95% CI	p value
	n	%			
Stress Level					.001
Low Stress	11	11.96	1	1	
Moderate – Very High Stress	81	36.32	3.68	[1.72, 7.89]	
Quality of Work Life					
Opportunities for Personal Skill Development					< .001
High	14	8.33	1	1	
Moderate & Low	82	53.06	7.73	[3.82, 15.63]	
Work-Life Balance					.011
High	10	8.00	1	1	
Moderate & Low	82	43.16	2.89	[1.27, 6.53]	

Discussion

The findings of this study provide strong empirical support for the Model in the specific context of sub-district Health Promoting Hospitals (SHPHs). The identification of three primary predictors—limited skill development opportunities, high stress levels, and poor work-life balance—directly aligns with the theoretical framework, which posits that burnout results from an imbalance between job demands and available resources.

The 29.21% prevalence of high-level burnout represents a significant demographic phenomenon with far-reaching social implications. This rate exceeds previous findings among healthcare professionals, where burnout rates were 18.1% for nurses and 17.3% for physicians (Izdebski et al., 2023). However, it remains lower than rates reported during the coronavirus pandemic, where 49.9% of healthcare workers experienced burnout, with nurses showing the highest rate (56.0%), followed by other clinical staff (54.1%) and physicians (47.3%) (Ibrahim et al., 2022; Rotenstein et al., 2023).

The Centers for Disease Control and Prevention (CDC) (2023) reported a rise in burnout among healthcare workers, from 32% in 2018 to 46% in 2022. However, direct comparisons should be interpreted with caution as these studies were conducted at different periods, in various healthcare administration systems, and across different geographical contexts with varying work environments, organizational cultures, and healthcare delivery models, which may significantly influence burnout prevalence rates. This phenomenon reflects feelings of inefficacy and reduced pride in work accomplishments, primarily stemming from routine, repetitive tasks, particularly in outpatient services dealing with common ailments. Healthcare workers may feel that their potential is underutilized and face limited professional challenges compared to their counterparts in larger hospitals, which manage more complex cases. The small organizational structure and limited staffing of SHPHs restrict opportunities for career advancement and higher-responsibility roles. This lack of clear career progression may contribute to diminished perceptions of professional development and achievement.

Furthermore, limited medical resources and equipment may prevent officers from delivering care at their full trained capacity. The performance evaluation system, which often emphasizes short-term quantitative metrics over long-term qualitative outcomes in health promotion and disease prevention, may fail to adequately recognize its efforts. Additionally, the requirement to manage multiple responsibilities simultaneously without achieving excellence in all areas may lead to a decreased sense of self-efficacy and a reduced sense of professional accomplishment.

Opportunities for personal skill development (AOR = 7.73) have a significant influence on burnout among healthcare workers in SHPHs through multiple interconnected pathways. Skill development not only enhances professional knowledge and capabilities but also contributes to employees' sense of self-worth and confidence. When officers receive opportunities for self-development, they perceive organizational investment in their professional growth, which in turn fosters stronger organizational commitment and work motivation. Conversely, limited development opportunities may create feelings of professional stagnation and provide crucial insights into the motivation and retention of healthcare workers in primary care settings. This finding aligns with the Self-Determination Theory, which emphasizes the development of competence as a fundamental human need (Deci & Ryan, 2000). In the context of SHPHs, healthcare workers face the challenge of providing comprehensive care across multiple domains—treatment, prevention, promotion, and rehabilitation—often with limited opportunities for specialized training or career advancement. Research has demonstrated that opportunities for skill development directly affect burnout levels among healthcare personnel, particularly in primary care settings such as SHPHs. Studies have found that personnel often face constraints in skill development opportunities, such as training or further education, due to small organizational structures and staffing limitations (Supapvanich et al., 2022).

Additionally, staff lacking development opportunities showed a 2.48 times higher risk of stress and burnout compared to those with access to skill development opportunities (Wichaidit et al., 2022). This phenomenon is particularly relevant in the current context of health service transfer to provincial administrative organizations, where officers must adapt to expanded roles encompassing health promotion, disease prevention, treatment, rehabilitation, consumer protection, and local development coordination. Without necessary skill development, officers may lack confidence in handling new challenges, which can lead to increased stress and eventual burnout. Recent research has confirmed that organizational restructuring and role changes create significant stress and pressure on personnel, especially in healthcare systems undergoing administrative policy changes (Nagle et al., 2024).

Moreover, professional development opportunities at SHPHs are more limited compared to those at larger healthcare facilities, such as community hospitals, due to structural and network constraints. The small organizational structure and limited professional staffing create practical barriers to skill development, whether through self-directed learning or pursuit of higher education, as staff absence for development activities would strain already limited service delivery capacity. These constraints further exacerbate the risk of burnout among healthcare workers in these facilities. The transfer of these facilities to a PAO has created additional complexity, requiring workers to adapt to new administrative systems while maintaining clinical competencies. Without systematic professional development programs, workers may feel professionally stagnant despite the increasing complexity of their roles.

This resource gap intensifies when staff observe colleagues in large hospitals receiving opportunities for further study, specialized training, and clearly defined career-advancement pathways, prompting them to weigh whether to stay within or leave the MOPH while considering external factors such as the fact that performance-appraisal and career-development mechanisms in PAO facilities are still at a pilot stage—leaving many procedures ill-defined—and that professional recognition remains tied mainly to the MOPH structure. Previous research has consistently identified professional development as a key factor in enhancing the satisfaction and retention of healthcare workers (Lu et al., 2020). However, this study quantifies the specific risk magnitude, demonstrating that inadequate development opportunities increase burnout risk by nearly 8-fold. This finding has direct policy implications for a PAO, suggesting that investing in structured training programs and career development pathways may be among the most effective strategies for preventing burnout.

The 3.68-fold increased odds of burnout associated with elevated stress levels confirm the central role of job demands in the development of burnout. However, the specific context of SHPHs presents unique stressors beyond typical healthcare demands. These include (1) Role ambiguity during administrative transition, (2) Broad service responsibilities with limited specialist support, (3) 24-hour community accessibility expectations, and (4) Resource constraints typical in rural healthcare settings. Stress is identified as a critical factor contributing to burnout among healthcare workers in primary care services. Research indicates that stress increases the risk of burnout by 2.08 times among healthcare personnel (Marković et al., 2024). Studies have further revealed that high stress levels can increase the risk of burnout by 3.9 times, particularly among nurses (Izdebski et al., 2023). Healthcare workers report high work-related stress, leading to both physical and mental exhaustion, which perpetuates workplace stress and ultimately contributes to burnout (Grochowska et al., 2022).

Inadequate stress management and insufficient organizational support have been identified as key factors accelerating burnout development (Kowalczuk et al., 2020). This phenomenon is particularly relevant in the current context of administrative transitions to provincial administrative organizations, where officers must adapt to new work systems and organizational cultures. Accumulated stress from this adaptation process, when left unmanaged, can lead to physical and mental exhaustion, ultimately resulting in burnout. Recent studies have demonstrated a significant positive correlation between work-related stress and burnout among primary healthcare personnel, especially during organizational management changes (Nagle et al., 2024). The nature of healthcare workers' work in SHPHs presents multiple stress-inducing challenges.

As frontline healthcare providers, they must manage high patient expectations while dealing with resource and staffing limitations. They work under constant pressure from evolving healthcare policies while juggling multiple responsibilities across treatment, promotion, prevention, and rehabilitation services, each requiring meticulous attention to detail. Stress is further amplified by the small organizational structure and limited staffing, forcing officers to handle excessive workloads and often perform duties beyond their primary roles, such as administrative, financial, and management tasks. This work diversity not only increases workload but also creates anxiety about potential errors. Studies have shown that excessive workload significantly increases stress and burnout tendencies (Zhang et al., 2020), particularly in roles involving regulatory and financial responsibilities. When combined with insufficient support systems, this high-responsibility stress can lead to discouragement and eventual burnout (Montero-Marin et al., 2016).

The significant association between poor work-life balance and burnout (AOR = 2.89) reflects the unique challenges of community-based healthcare delivery. Unlike hospital-based colleagues, who can typically leave work at the end of their shifts, SHPH staff often live within the communities they serve, creating permeable boundaries between their professional and personal lives. Work-life balance significantly influences burnout among healthcare workers in SHPHs due to the unique and challenging work characteristics of these settings. These officers must provide continuous healthcare services to the community, both during and outside official hours, as their facilities serve as frontline healthcare units with constant community access. This accessibility requires staff to remain prepared for emergencies at all times. Beyond routine healthcare services, officers must also engage in proactive community work, such as home visits, health promotion activities, and disease control initiatives, often conducted outside regular hours to accommodate local community lifestyles. The transfer of SHPHs to provincial administrative organizations has introduced additional complexities, requiring adaptation to new work environments and coordination with MOPH facilities that operate under different protocols. This transition has increased administrative demands and required additional time allocation for various activities.

The limited staffing in these small organizational structures necessitates that each officer handle multiple responsibilities and participate in after-hours service rotations, reducing personal and rest time. Research has demonstrated significant correlations between work-life imbalance and burnout among healthcare personnel. Studies indicate that healthcare workers with poor work-life balance face a 44.5% higher risk of burnout, while those working extended hours exhibit an elevated risk of burnout of 58.06% (Lu et al., 2020). The lack of work-life balance leads to accumulated physical and mental fatigue, insufficient time for self-care, and inadequate family time (Fenwick et al., 2018). Implementing flexible work schedules and supporting family care have been identified as crucial strategies for preventing and reducing burnout among healthcare professionals (Murray et al., 2016). Organizational leaders must prioritize work-life balance through effective policies and measures to mitigate negative impacts and prevent burnout (Tetrick & Winslow, 2015).

The lack of significant associations between demographic variables and burnout contrasts with some previous studies that have found age, gender, or experience effects. This finding suggests that in the current organizational context, structural and environmental factors override individual characteristics in determining burnout risk. This pattern supports organizational-level intervention approaches rather than focusing on individual resilience training. The absence of experience-related differences in burnout risk is particularly noteworthy, suggesting that both newcomers and veterans face similar burnout risks under current conditions. This pattern may reflect the ongoing organizational transition, which has created new challenges even for experienced workers.

The findings of this study have significant implications for the development of local health systems in the context of transferring SHPHs to provincial administrative organizations. In terms of personnel development, provincial administrative organizations should establish systematic and continuous development plans that emphasize essential skill-building opportunities for healthcare workers to fulfill their multifaceted roles. The establishment of provincial-level personnel development centers with contextualized training programs is crucial. Additionally, implementing mentoring systems and inter-hospital learning networks would facilitate knowledge exchange and collaborative learning among staff. Regarding professional advancement, clear career pathways should be delineated for public health personnel within local administrative organizations. This includes developing specialized positions such as community health promotion specialists, chronic disease management

experts, and local health system developers. Supporting systems for continuing education and context-appropriate academic development should be implemented to enhance learning outcomes.

For effective stress management and work-life balance, human resource management systems should be enhanced to support a work-life equilibrium through appropriate staffing levels, flexible shift management, and supportive work systems, including information technology, thereby reducing administrative burdens. Mental health counseling centers and holistic health promotion activities should be established to support personnel's well-being. Service system development requires structural and operational improvements in SHPHs. This could be achieved by developing hospital network clusters that enable the sharing of resources and personnel, establishing efficient referral systems with local hospitals, and implementing digital technologies such as telemedicine and mobile health applications.

At the national policy level, this study emphasizes the need for comprehensive policies that support the transfer of healthcare services to local authorities, accompanied by systematic personnel development frameworks. A national committee for local public health human resource development should be established to set standards, guidelines, and support systems, including sustained budget allocation for personnel capacity building. These developmental initiatives would strengthen local health systems by ensuring public health personnel maintain optimal quality of life, work satisfaction, and sustainable service delivery capacity. Investment in personnel development and support systems not only prevents burnout but also lays the groundwork for a robust and sustainable local health system.

Limitations

This study faced several significant limitations. The cross-sectional design limited our ability to establish causal relationships between various factors and burnout syndrome, particularly during the transition period from health service to provincial administrative organizations. The current study approach, while valuable for identifying risk factors, does not provide insights into 'how' these factors influence or prevent burnout in the specific context of organizational change. Understanding these mechanisms would significantly contribute to the development of more targeted and effective interventions. The geographical limitation of Khon Kaen Province may constrain the generalizability of findings to other areas. However, several limitations must be acknowledged.

The cross-sectional design prevents causal inference, which is particularly important given the dynamic nature of organizational transition. While we identified factors associated with burnout, the temporal relationships and potential mediating mechanisms require longitudinal investigation. Self-reported questionnaire data collection may be subject to response bias, particularly when addressing sensitive issues such as stress and burnout. Additionally, the data collection period, which coincided with the end-of-year reporting period, may have influenced stress levels and perceptions of burnout among respondents.

Future research should consider a large-scale qualitative study aimed at understanding how the identified factors operate in the local context, providing deeper insights into the mechanisms underlying burnout development during health system transitions. Such qualitative research could explore the lived experiences of healthcare workers, revealing how personal and environmental factors interact in their daily work lives and how the

organizational change from the MOPH to a PAO influences their well-being and job performance. These methodological constraints should be considered when interpreting and applying the study findings to broader healthcare contexts. These methodological constraints should be considered when interpreting and applying the study findings to broader healthcare contexts.

Conclusion

The study found that healthcare workers working in SHPHs under the Khon Kaen PAO experienced a high prevalence of burnout at 29.21%. Significant factors associated with burnout included limited opportunities for personal skill development, high stress levels, and poor work-life balance. The findings indicate the necessity for developing concrete support systems, including the establishment of provincial-level personnel development centers, stress management and counseling systems, and flexible work arrangements.

National policies supporting the transfer of health services to local administration should emphasize human resource development systems that facilitate professional growth. These findings can be applied to planning support systems for public health personnel in other local administrative organizations, particularly in developing comprehensive personnel development plans that address both academic and stress management skills. Implementing flexible work systems through technology adoption and developing mentoring systems for new personnel support are also recommended. These implementations would help prevent burnout and sustainably strengthen local health systems.

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