

The influencing factors of work alienation among emergency nurses in Guangzhou, China: A fuzzy-set qualitative comparative analysis

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Abstract

Objective: To explore the configurational effect of the factors influencing the work alienation among emergency nurses.

Background: In recent years, work alienation of emergency nurses has become increasingly prominent. This issue not only affects nurses' professional burnout and mental health, but also may compromise the quality of nursing care and even increased the risk of medical errors. Existing studies on work alienation among emergency nurses primarily focus on examining the independent effects of individual factors. However, the formation mechanism of work alienation typically involves complex interactions among multiple factors, and the underlying configurational effects and developmental pathways have not yet received sufficient attention.

Method: A cross-sectional study design was employed. From December 2025 to March 2026, 274 emergency nurses were recruited from 8 tertiary Grade-A hospitals through online surveys in Guangzhou, China. Univariate analysis, correlation analysis and linear regression analysis were used to explore the influencing factors of work alienation among emergency nurses. In addition, the configurational effect of the factors affecting work alienation was explored through fuzzy-set qualitative comparative analysis (fsQCA).

Results: The score of work alienation among emergency nurses was 25.00 (17.00, 34.25). Linear regression analysis showed that sex, experience of workplace violence, work stress, overall perceived humanistic care and psychological resilience were significant factors influencing work alienation of emergency nurses. The fsQCA results identified seven configurational pathways leading to work alienation, which could be categorized into three types: (C1) high work stress, experience of workplace violence, lack of perceived humanistic care; (C2) experience of workplace violence, lack of perceived humanistic care, low psychological resilience; and (C3) high work stress, lack of perceived humanistic care, poor health status.

Conclusion: The development of work alienation among emergency nurses arises from the interactive and synergistic effects of multiple factors, with humanistic care plays a central and universal role. Nursing managers should formulate multidimensional and multi-path intervention strategies to reduce work alienation among emergency nurses based on varying contextual combinations, thereby promoting team stability and development.

1.Introduction

Work alienation is a subjective psychological experience in which employees' material and emotional needs are not met in the workplace. This leads to reduced engagement at work and a negative psychological state characterized by detachment from one's work^[1]. It is a widespread phenomenon among employees in various industries^[2, 3]. Research indicates that nursing professionals are particularly vulnerable to work alienation due to factors such as shift work, frequent exposure to medical disputes and intense work pressures^[4, 5]. Turkish scholars Pinar Ertekin and her colleagues found that 87.3% of nurses exhibit varying degrees of work alienation^[6]. This negative psychological state undermines nurses' work motivation and

professional identity, increases turnover intention and may lead to higher rates of nursing errors and lower patient satisfaction^[7]. This affects the quality and safety of healthcare services^[8].

The emergency department is the first point of contact for patients with acute, critical and severe conditions. It is characterized by a wide range of diseases, unpredictable patient conditions, and heavy workload^[9]. Consequently, emergency nurses frequently faced multiple challenges due to the nature of their work, including intense stress, irregular work schedules, and emotional exhaustion^[10, 11]. As a result, increasing attention has been directed toward the occupational mental health of emergency nurses in recent^[12–14].

In recent years, many studies have confirmed the high prevalence of work alienation among emergency nurses^[8, 15]. The study by Chen Fengming et al. found that the sense of work alienation among emergency nurses (28.77 points) was higher than the average level among clinical nurses (26.45 points)^[16]. Emergency department patients often present with critical and rapidly changing conditions, requiring nurses to be highly alert at all times in order to quickly identify changes in patients' conditions and accurately perform life-saving interventions^[4]. If nurses become indifferent or perfunctory due to work alienation, they may fail to closely monitor patients' conditions or perform procedures in accordance with standard protocols. This may increase the risk of complications and even mortality among patients^[17].

Work alienation results from the interaction of multiple factors^[18, 19]. Studies indicate that the emergency department is one of the high-risk departments for workplace violence^[20]. Frequent exposure to workplace violence directly harms nurses' physical and mental health^[21]. They also further diminishes nurses' sense of security and job satisfaction, serving as a significant risk factor for work alienation^[22]. Furthermore, work alienation among nurses has also been found to be closely linked to factors such as excessive work stress^[23], insufficient perceived humanistic care, differences in psychological resilience^[24]. However, existing research on work alienation among emergency nurses has largely focused on the independent effects of single factors, employing quantitative methods such as linear regression to analyze direct associations between variables^[1]. This approach struggles to reveal the complex mechanisms underlying the development of work alienation when multiple factors interact.

Fuzzy-set qualitative comparative analysis (fsQCA)^[25], as an emerging configurational analysis method, integrates the strengths of qualitative and quantitative research to identify multiple concurrent causal pathways leading to outcomes. It offers a new perspective for a deeper understanding of the logic underlying the development of work alienation. Therefore, this study employed a combined approach of linear regression and fsQCA to investigate the influencing factors and configurational paths of work alienation among emergency nurses, providing a theoretical foundation for nursing managers to develop more targeted preventive strategies.

2.Methods

2.1 Study design

A cross-sectional design was used.

2.2 Participants

This study employed a convenience sampling method. Between December 2025 and March 2026, an electronic questionnaire was distributed via the online data collection software Wenjuanxing to WeChat groups of the emergency departments of 8 tertiary Grade-A hospitals in Guangzhou, China. Study participants were included if they met the following criteria: (1) working in the emergency department; (2) having at least one year of work experience; and (3) voluntarily participating. The exclusion criteria were: (1) nursing interns; (2) nurses with psychological disorders or mental illnesses; and (3) nurses who had been away from their positions in the emergency department for more than one month due to illness, maternity leave or other leave. A total of 290 questionnaires were collected for this study. After excluding 16 invalid questionnaires, 274 valid questionnaires remained, resulting in a response rate of 94.48%.

2.3 Ethical considerations

This study was approved by the Ethics Review Committee of the First Affiliated Hospital of Guangzhou University of Chinese Medicine in July 2025 (No. K-2025-119). Before completing the electronic questionnaire, participants reviewed an informed consent form, and all participants voluntarily agreed to participate in the study.

2.4 Measurements

2.4.1 General information questionnaire

The researchers designed the general information questionnaire, which included items on sex, educational background, marital status, professional title, job position, health status, and experience of workplace violence, etc.

2.4.2 Holistic Human Caring Perception Questionnaire for Nurses, HHCPQN

Developed by Chen Yuqin in 2023^[26], this scale comprises six dimensions: self-care (7 items), care from hospital management (4 items), care from the department (14 items), care from patients and their families (3 items), care from relatives (7 items), and care from classmates and friends (5 items). The scale uses a 5-point Likert scale, where 1 indicates “never” and 5 indicates “always”. Total scores range from 40 to 200, with higher scores indicating a higher level of perceived overall humanistic care among nurses. The Cronbach’s α coefficient for this scale was 0.98 in both the original and present studies.

2.4.3 The Connor-Davidson Resilience Scale, CD-RISC

The scale was jointly developed by Connor and Davidson^[27] and revised by Ye Zengjie^[28]. It is a unidimensional scale consisting of 10 items. It uses a 5-point Likert scale, where 1 means “strongly disagree” and 5 means “strongly agree”. Total scores range from 10 to 50, with higher scores indicating greater psychological resilience. The Cronbach’s α coefficient for this scale was 0.85 in the original study and 0.92 in the present study.

2.4.4 Nurse Work Alienation Questionnaire, NWAQ

Developed by Li Xiaoyu in 2012, this scale comprises three dimensions: sense of helplessness (4 items), sense of powerlessness (4 items), and sense of meaninglessness (4 items)^[29]. It uses a 5-point Likert scale, where 1 indicates “strongly disagree” and 5 indicates “strongly agree”. Total scores range from 12 to 60, with higher scores indicating a higher level of work alienation among nurses. In the original study, the Cronbach's α coefficient for this scale was 0.89, whereas in this study, it was 0.94.

2.5 Data collection

Before starting the study, the researchers contacted the nursing administrators at each hospital to inform them of the purpose and significance of the study. After obtaining their informed consent and support, the administrators distributed the survey link to the WeChat group of emergency nurses. The questionnaire was configured to prevent duplicate responses from the same IP address, and every item was marked as mandatory. The survey adhered to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines^[30].

2.6 Statistical analysis

Data were statistically analyzed using SPSS 26.0 software. Categorical data were presented as frequencies and percentages, data that followed a normal distribution were expressed as the mean $\pm$ standard deviation, and data that did not follow a normal distribution were presented as the median and interquartile range. Intergroup comparisons were performed using the Mann-Whitney U test and the Kruskal–Wallis H test. Spearman's correlation analysis examined the relationships among overall perceived humanistic care, psychological resilience, and work alienation. Linear regression analysis explored the factors influencing work alienation. The significance level was set at $\alpha = 0.05$.

The fsQCA is a research method based on a configurational perspective. In this study, statistically significant variables were treated as condition variables and work alienation was treated as the outcome variable. These variables were then entered into the fsQCA 4.1 software for analysis. The fsQCA analysis consisted of three main steps: **Calibration**: Prior to analysis, fsQCA requires that the variables be normalized to fuzzy membership values in the range of [0, 1]. The closer the value is to 1, the higher the variable's membership to the target variable. In this study, we used the direct assignment method for categorical variables. For continuous variables, this study selected the 25th, 50th, and 75th percentile as the anchors of fully out, crossover and fully, respectively^[31]. The calibrate (x, n1, n2, n3) function in the fsQCA 4.1 software was then used to convert the fuzzy membership values^[32]. **Necessary conditions analysis**: The consistency and coverage of each predictor variable for the outcome variable (high work alienation) were calculated. The consistency threshold was set at 0.9. A given condition was considered a necessary condition for high work alienation if its consistency was ≥ 0.9 ^[33]. **Configuration Analysis**: A truth table was generated by set the consistency threshold to 0.8 and the case frequency threshold to 3. The complex, parsimonious, and intermediate solutions were then obtained using fsQCA 4.1 software. The intermediate solution was prioritized for result interpretation. A variable that appears in both the parsimonious and intermediate solutions is defined as a core condition, while a variable that appears only in the intermediate solution is defined as a marginal condition^[25].

3.Results

3.1 Descriptive and univariate analysis

A total of 274 emergency nurses were included, of whom 219 were female (79.93%) and 229 had a bachelor's degree or higher (83.58%). The NWAQ scale score was 25.00 (17.00, 34.25), and the sense of powerlessness score was 11.00 (7.00, 13.00), the sense of helplessness score was 7.00 (4.00, 10.00), and the sense of meaninglessness score was 7.00 (4.00, 11.00). The results demonstrated that sex, professional title, health status, experience of workplace violence, work stress were considered influential variables for work alienation among emergency nurses ($p < 0.05$), as seen in Table 1.

Table 1
Comparison of work alienation among emergency nurses with different demographic characteristics (N = 274)

Variable		n(%)	work alienation	Statistical value	P
Sex	Male	55 (20.07)	30.00 (18.00, 36.00)	-2.133 ^a	0.033
	Female	219 (79.93)	25.00 (16.00, 33.00)		
Educational background	Below bachelor's degree	45 (16.42)	24.00 (14.50, 32.50)	1.068 ^a	0.285
	Bachelor's degree or above	229 (83.58)	25.00 (17.00, 35.00)		
Marital status	Married	171 (62.41)	24.00 (16.00, 33.00)	1.961 ^a	0.051
	Unmarried	103 (37.59)	28.00 (17.00, 36.00)		
Presence or absence of children	Yes	155 (56.57)	24.00 (16.00, 33.00)	1.746 ^a	0.081
	No	119 (43.43)	17.00 (28.00, 36.00)		
Professional title	Junior	144 (52.55)	25.50 (17.00, 35.00)	6.494 ^b	0.039
	Intermediate	110 (40.15)	27.00 (19.00, 35.00)		
	Senior	20 (7.30)	18.50 (14.00, 18.50)		
Position	Nurse	234 (85.40)	26.00 (16.00, 35.00)	0.134 ^b	0.935
	Team Leader	24 (8.76)	23.50 (21.00, 28.00)		
	Head nurse	16 (5.84)	24.00 (14.25, 38.50)		
Month income	3000–10 000RMB	167 (60.95)	25.00 (17.00, 36.00)	0.180 ^a	0.857
	10 000RMB and above	107 (39.05)	26.00 (17.00, 33.00)		
Character	Extroverted	67 (24.45)	23.00 (14.00, 32.00)	5.853 ^b	0.054
a = Z value, b = H value					

Variable		n(%)	work alienation	Statistical value	P
	Intermediate	157 (57.30)	26.00 (17.00, 35.00)		
	Introverted	50 (18.25)	30.00 (21.00, 36.00)		
Years of work	1 ~ 5	62 (22.63)	27.50 (17.00, 32.25)	1.521 ^b	0.467
	5 ~ 10	84 (30.66)	26.50 (16.25, 33.00)		
	10 and above	128 (46.72)	24.00 (16.25, 33.00)		
Employment Type	contract-based	212 (77.37)	25.00 (16.00, 34.75)	0.687 ^a	0.492
	public institution staffing	62 (22.63)	25.00 (18.75, 34.25)		
Number of nightshifts	0 ~ 4/month	62 (22.63)	26.50 (16.00, 34.25)	0.526 ^b	0.769
	4 ~ 8/month	125 (45.62)	25.00 (17.00, 34.50)		
	9 or above /month	87 (31.75)	25.00 (19.00, 36.00)		
Health status	Good	154 (56.20)	24.00 (17.00, 31.00)	2.426 ^a	0.015
	Poor	120 (43.80)	28.00 (17.00, 36.00)		
Experience of workplace violence	Yes	67 (24.45)	33.00 (25.00, 38.00)	-4.896 ^a	<0.001
	No	207 (75.55)	24.00 (15.00, 32.00)		
Work stress	Low	208 (75.91)	24.00 (15.25, 32.75)	4.071 ^a	<0.001
	High	66 (24.09)	31.00 (22.00, 40.00)		
a = Z value, b = H value					

3.2 Correlation Analysis

The results showed that the HHCPQN score of emergency nurses was 145.50 (123.75, 170.25), which was negatively correlated with work alienation ($r = -0.582, p < 0.01$). The CD-RISC score was 39.00 (30.00, 46.00), which was also negatively correlated with work alienation ($r = -0.488, p < 0.01$).

3.3 linear regression analysis

Linear regression analysis was performed to evaluate the common effect of the variables found to be associated with work alienation, based on the univariate analysis. The variable assignment method is shown in Table 2. The results of multiple linear regression analysis indicated that sex ($\beta = -0.120$, $p = 0.024$), experience of workplace violence ($\beta = 0.170$, $p = 0.002$), work stress ($\beta = 0.112$, $p = 0.040$), HHCPQN ($\beta = -0.408$, $p < 0.001$), and CD-RISC ($\beta = -0.413$, $p < 0.001$) were significant predictors of work alienation among emergency nurses, accounting for 28.1% of the total variance (Table 3).

Table 2 Assignment of values to variables	
Variables	Assignment of values
Sex	Male=0; Female=1
Professional title	Junior (1, 0, 0), Intermediate (0, 1, 0), Senior (0, 0, 0)
Health status	Good=0, Poor=1
Experience of workplace violence	No=0; Yes=1
Work stress	Low=0, High=1
HHCPQN	substitute original value
CD-RISC	substitute original value

Table 3 Linear regression analysis of factors affecting work alienation among emergency nurses (N=274)					
Variable	Non-standardized		Standardized	<i>t</i>	<i>P</i>
	β	<i>S.E.</i>	β		
Constant	49.627	5.936	-	8.36	0.001
Sex	-3.256	1.431	-0.120	-2.275	0.024
Professional title (Junior vs Senior)	3.605	2.251	0.166	1.602	0.110
Professional title (Intermediate vs Senior)	3.797	2.285	0.172	1.662	0.098
Health status	1.594	1.151	0.073	1.385	0.167
Experience of workplace violence	-4.283	1.344	-0.170	-3.187	0.002
Work stress	2.837	1.373	0.112	2.067	0.040
HHCPQN	-0.141	0.033	-0.408	-4.284	0.001
CD-RISC	-0.350	0.080	-0.413	-4.369	0.001

3.4 Configuration Analysis Based on fsQCA

Based on the results of univariate analysis and linear regression analysis, this study identified seven influencing factors for work alienation among emergency nurses: sex, professional title, health status, experience of workplace violence, work stress, HHCPQN score and CD-RISC score. Although some factors didn't demonstrated statistical significance in linear regression analysis, these variables were still included in the fsQCA analysis based on relevant literature and their clinical significance.

3.4.1 Calibration of fsQCA

For binary variables, complete non-membership and complete membership were assigned values of 0 and 1. For multinomial variables (professional titles), fully out, crossover and fully in were assigned values of 0, 0.5, and 1, respectively. For continuous variables (HHCPQN, CD-RISC), calibration and value assignment are performed through anchor point setting, with calibration thresholds for complete non-membership, crossover points, and complete membership set at the P_5 , P_{50} , and P_{95} . The variables' calibration values are presented in Table 4.

Table 4
The calibrations anchors of antecedent and outcome variables.

Variables	Fully out	Crossover	Fully out
Sex	0	/	1
Professional title	0	0.5	1
Health status	0	/	1
Work stress	0	/	1
Experience of workplace violence	0	/	1
HHCPQN	100.55	146	200
CD-RISC	28	39	50
NWAQ	12	25	45

3.4.2 Necessary conditions analysis of fsQCA

The necessary conditions analysis aimed to determine whether a particular condition is necessary for an outcome variable to occur. The results showed that the consistency coefficients for all seven variables were below 0.9 (Table 5), indicating that no single factor can independently cause work alienation among emergency nurses. This finding further highlights the multifactorial and interactive nature of work alienation among this population. Therefore, the sufficient conditions analysis was needed to explore the paths through which different combinations of factors influence work alienation.

Table 5
Necessary conditions analysis of fsQCA

Variable	Work alienation		~Work alienation	
	Consistency	Coverage	Consistency	Coverage
Sex	0.766	0.465	0.831	0.535
~Sex	0.234	0.566	0.169	0.434
Professional title	0.350	0.620	0.374	0.704
~Professional title	0.833	0.556	0.798	0.565
Health status	0.485	0.538	0.393	0.462
~Health status	0.515	0.444	0.607	0.557
Work stress	0.309	0.622	0.166	0.349
~Work stress	0.691	0.442	0.834	0.569
Experience of workplace violence	0.328	0.651	0.177	0.378
~Experience of workplace violence	0.672	0.431	0.823	0.558
HHCPQN	0.507	0.485	0.793	0.821
~HHCPQN	0.817	0.788	0.512	0.524
CD-RISC	0.471	0.486	0.723	0.792
~CD-RISC	0.798	0.731	0.531	0.516

3.4.3 Sufficient conditions analysis of fsQCA

The configurational path of work alienation in emergency nurses was analyzed based on seven condition variables. As shown in Table 6, there were seven paths of high-level work alienation among emergency nurses, with an overall coverage rate of 0.345 and overall consistency of 0.932. This indicates that these seven paths collectively accounted for 34.5% of the study subjects, with a probability of 93.2% for experiencing high-level work alienation. Based on the core conditions and variable types of each pathway, the seven configurations were further classified into three categories: C1, high work stress, experience of workplace violence, lack of perceived humanistic care; C2, experience of workplace violence, lack of perceived humanistic care, low psychological resilience; C3, high work stress, lack of perceived humanistic care, poor health status.

Table 6
Conditions configuration of high-level work alienation among emergency nurses

Variable	H1	H2		H3			
	Pathway 1	Pathway 2	Pathway 3	Pathway 4	Pathway 5	Pathway 6	Pathway 7
Sex		☒	☒	■	■	■	
Professional title	☒	☒	☒		☒	☒	●
Health status		●	☒	●	☒	■	●
Work stress	●	●		☒	☒	■	●
Experience of workplace violence	●	●	●	●	●	☒	☒
HHCPQN	☒	☒	☒	☒	☒	☒	☒
CD-RISC	☒		☒	☒	☒		☒
Unique Coverage	0.076	0.028	0.034	0.069	0.025	0.057	0.032
Original Coverage	0.100	0.026	0.041	0.069	0.025	0.057	0.028
Consistency	0.950	0.959	0.993	0.900	0.942	0.915	0.907
Overall solution coverage	0.345						
Overall solution consistency	0.932						
Notes: ☒, ■, ☒, ☒, indicate the presence of core conditions, the presence of peripheral conditions, the absence of core conditions, and the absence of peripheral conditions. Blank space indicates “don’t care”							

3.4.4 Robustness test

To verify the robustness of the results, we adjusted the consistency threshold from 0.8 to 0.75 and 0.85, observing changes in the consistency and coverage of the configurational paths and results. The results showed no significant changes in the number of configurations, core conditions or edge conditions, indicating that the results of this study are robust.

4. Discussions

This study showed that the work alienation score for emergency nurses was 25.00 (range 17.00–34.25) points. This indicates a moderate level of work alienation, which is lower than the scores reported by Li Na (40.00 ± 7.15)^[8], Zhang Lingling (29.56 ± 11.10)^[22] and Jia Yanan (34.92 ± 10.18)^[34]. This may be related to differences in the survey regions. Guangdong Province is one of China’s most economically developed provinces, with well-established medical infrastructure, favorable work environments, and professional

support systems^[35]. The regression model indicates that sex, experience of workplace violence, work stress, perceived humanistic care and psychological resilience influence work alienation among emergency nurses, which is consistent with existing study conclusions^[8, 34].

Linear regression studies focus solely on the independent effects of individual factors and are unable to reveal their synergistic interactions^[36]. Therefore, we used the fsQCA analysis to identify the multifactorial structural paths underlying work alienation among emergency nurses. The results showed that neither individual factors nor work-related factors can independently cause work alienation among emergency nurses. This further confirms that work alienation is formed through the interaction and synergistic effects of multiple factors.

The results of the fsQCA analysis indicated that work alienation among emergency nurses could be categorized into seven distinct paths. Based on the core conditions within the combinations of these paths and the types of variables associated with each condition, we classified the paths into three categories. Each category provides a precise entry point for identifying work alienation among emergency nurses.

The C1 category refers to nurses characterized by high work stress, exposure to workplace violence, and lack of perceived humanistic care. This category indicates that when emergency nurses simultaneously face high work stress and workplace violence, and lack adequate humanistic care support, they are highly susceptible to developing work alienation. High work stress and workplace violence, as core sources of stress, continuously deplete nurses' psychological and emotional resources^[37, 38]. If humanistic care is insufficiently perceived at this stage, it will sever their critical emotional buffer mechanisms. Existing research has confirmed that workplace violence significantly increases nurses' occupational burnout^[39], and the lack of humanistic care in high-pressure environments further weakens their sense of belonging to their work^[40], ultimately leading to feelings of alienation. This suggests that nursing managers should proactively assess nurses' work-related stress during routine management, conduct timely stress evaluations and interventions^[38], and particularly activate psychological support mechanisms immediately following violent incidents to ensure effective replenishment of nurses' emotional resources.

The C2 category refers to nurses characterized by experience of workplace violence, lack of perceived humanistic care, and low psychological resilience. This category indicates that when nurses lack sufficient psychological resilience, the combination of workplace violence and a lack of humanistic care is more likely to trigger work alienation. As a core psychological resource for coping with adversity, low psychological resilience weakens nurses' ability to buffer against incidents of workplace violence^[41]. At the same time, if they frequently encounter violence in a workplace environment that lacks humanistic care, that environment cannot provide them with effective emotional support or coping guidance^[42]. This results in the accumulation of negative emotions, which eventually leads to doubts about the meaning of work and emotional alienation. Therefore, for nurses with low psychological resilience, their psychological resilience level can be enhanced through mindfulness training, cognitive behavioral interventions and peer support groups^[43].

Studies showed that nurses are among those at the highest risk of violence in the workplace, particularly in departments such as emergency, psychiatric and ICU. The primary sources of workplace violence experienced by nurses are patients and their families, and this violence can take the form of verbal abuse, threats, shoving and physical assault^[37]. The consequences of violence extend beyond physical injury to include psychological trauma, occupational burnout, turnover intentions, and diminished nursing quality^[44, 45]. However, after incidents of violence occur, nurses often do not receive sufficient organizational support and are even asked to 'understand the patient', reflecting a severe lack of humanistic care^[46]. This aligns with the pathways of work alienation observed among nurses in both Category 1 and Category 2. At the organizational level, hospitals should establish zero-tolerance policies and clear reporting mechanisms, ensuring that experiences of workplace violence are not perceived as part of nurses' professional duties^[47]. In terms of training, enhanced education on patient safety, crisis behavior identification, and communication skills is essential. Additionally, post-incident support is equally critical. After nurses experience workplace violence, nursing managers should promptly provide compassionate care and psychological counseling to prevent the silent spread of post-traumatic stress disorder (PTSD)^[48].

The C3 category refers to nurses characterized by high work stress, lack of perceived humanistic care, and poor health status. This category indicates that nurses with fragile health were more prone to experiencing a sense of work alienation in environments characterized by high work stress and low perceived humanistic care. Nurses with fragile health typically possessed relatively insufficient physical or psychological resources, and high work pressure further exacerbates their mental and physical burdens^[49]. Meanwhile, low perceived humanistic care means they struggle to receive sufficient emotional support, resource allocation, or health care in the workplace, preventing their health challenges from being effectively alleviated. Research indicates that nurses' health status is significantly negatively correlated with their occupational burnout and work alienation, and that those with health vulnerabilities have weaker coping abilities in high-stress environments^[1]. Nurses with poor health status demonstrate weaker coping abilities under high-pressure environments and exhibit greater vulnerability to the negative impacts of work-related stress, subsequently developing feelings of powerlessness and alienation toward their work^[50].

Notably, lack of perceived humanistic care was prevalent across all three categories leading to work alienation. This indicates that low perceived humanistic care was a core common condition in the development of work alienation among emergency nurses. Regardless of the source of stressors, whether from work pressure, workplace violence, or personal health vulnerabilities, inadequate humanistic care support exacerbates work alienation. These findings underscore the critical role of humanistic care in preventing work alienation among emergency nurses. Nursing leaders should prioritize the establishment of a humanistic care system as the core strategy for addressing work alienation in intervention efforts.

5. Conclusion

This study employed the fsQCA to elucidate the formation mechanism of work alienation among emergency nurses, identifying three categories comprising seven paths. The results confirmed that work alienation is caused by the interaction and synergistic effects of multiple factors. The application of fsQCA addresses the limitation of linear regression, which focuses solely on individual factor effects, providing a new perspective

for understanding the complex causes of work alienation in emergency nurses. Future interventions should adopt multidimensional and multi-path approaches to enhance nurses' work engagement and professional belonging, thereby promoting the stability and development of emergency nursing teams.

6. Limitations

This study has the following limitations. First, the participants were exclusively recruited from Guangdong Province, which may limit the generalizability of the findings. Second, this study employed a cross-sectional survey and thus cannot determine causal relationships between variables. Future research could expand the sample size, conduct longitudinal studies to examine dynamic relationships among variables, and investigate configuration differences in work alienation among emergency nurses across different regions, thereby providing insights for developing more universally applicable intervention models.

Declarations

Data Availability Statement

The data are not publicly available due to privacy or ethical restrictions. The raw data may be obtained from the first author or corresponding author upon reasonable request.

Conflict of interest

All authors declared no conflict of interest.

Author contribution statement

Jinjia Lai: Writing - original draft, formal analysis, data curation, conceptualization.

Peihua Chen: data curation, Formal analysis.

Zhiyin Luo: data curation, Formal analysis.

Yongqi Huang: Writing - original draft, Formal analysis.

Lizhen Chen: Formal analysis.

Haiying Xu: Formal analysis.

Xiangwei Yang: Investigation, Methodology.

Yibing Tan: Resources, Methodology.

Ya Tang: Investigation, Methodology.

Ping Zeng: Writing - review & editing, Supervision, Methodology, Formal analysis.

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