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Thành phố Hồ Chí Minh, ngày 07 tháng 01 năm 2026

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Mr. Pham Duc Muc, President of the Vietnam Nurses Association (middle), in a commemorative photo with delegates at the event.

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SHINING ETHICS, RESILIENT METTLE: THE IMPRINT OF MILITARY NURSES IN THE NEW ERA

Ngoc Linh, Bich Huyen, Trung Kien

In early 2026, the Military Medical Department (under the General Department of Logistics and Engineering), in collaboration with the Vietnam Nurses Association, organized the 2026 Military Hospital Nursing Excellence Competition in Ho Chi Minh City. This meaningful professional event honors the military nursing force - the silent "soldiers in white" who play a vital role in caring for and protecting the health of both the armed forces and the public.

The competition brought together 90 outstanding nurses selected from military hospitals nationwide. These representatives embody solid professional expertise, impeccable conduct, a strong sense of responsibility, and pure medical ethics - qualities that define the modern military nurse.

Asserting the Core Role of Nursing Care

Speaking at the opening ceremony, Major General Prof. Dr. Nguyen Truong Giang, Director of the Military Medical Department, affirmed that nursing care holds a position of paramount importance in the noble mission of health protection. Nurses are frontline personnel in direct contact with patients; they perform technical procedures, provide comprehensive physical and mental care, and serve as a pillar of emotional support for patients and their families throughout treatment.

With professional competence, dedication, and compassion, military nurses have made significant contributions to improving treatment efficiency, shortening recovery times, and building patient trust. In doing so, they enhance the humane image of both the medical sector and the People's Army of Vietnam in the hearts of the people.

Honoring "Comprehensively Skilled" Military Nurses

At the event, Mr. Pham Duc Muc, President of the Vietnam Nurses Association, emphasized that the competition is more than just a professional assessment - it is an opportunity to honor exemplary military nurses who are not only theoretically proficient and clinically skilled but also exemplify medical ethics and professional communication.

According to Mr. Pham Duc Muc, military nurses bear a unique mission: caring for the troops, serving the people, and remaining combat-ready to defend the Fatherland under any circumstances. This represents a vivid continuation of the glorious traditions of the Vietnam People's Army, manifested through every quiet shift in military hospitals.

A Professional Arena with a Humanistic Touch

The 2026 competition featured diverse and practical categories closely aligned with the realities of military medicine. Contestants participated in medical uniform showcases, assessments of communication and behavior in hospital settings, and exchange activities during the Gala program.

Through these categories, the Organizing Committee conducted a comprehensive evaluation of each nurse's professional knowledge, conduct, soft skills, situational problem-solving abilities, and sense of responsibility. Beyond being a professional contest, the event served as a forum for nurses to share experiences and promote humanistic values in patient care.

The atmosphere was both serious and vibrant.

The medical uniform showcases were meticulously prepared, projecting a professional yet friendly image. The communication segment presented realistic scenarios, reaffirming the importance of soft skills in enhancing healthcare quality and patient satisfaction.

Spreading "Uncle Ho's Soldiers" Qualities in the New Era

The 2026 Military Hospital Nursing Excellence Competition is an activity of profound political and professional significance. It contributes to building a military nursing force that is professionally strong and ethically exemplary, capable of meeting the healthcare demands of the modern era.

The image of military nurses - dedicated, responsible, and compassionate "soldiers in white"- continues to be reaffirmed. This further enriches the noble tradition of "Uncle Ho's Soldiers" in an era of integration and development, ushering in a new year filled with hope, confidence, and the aspiration to serve.

Photo Captions:

1.Caption 1: Delegations attend the opening ceremony of the 2026 Military Hospital Nursing Excellence Competition.

Photo: *Nguyen Trung Truc / Department of Propaganda and Training.*

2.Caption 2: Major General Prof. Dr. Nguyen Truong Giang, Director of the Military Medical Department, delivers the keynote address at the opening ceremony.

3.Caption 3: Mr. Pham Duc Muc, President of the Vietnam Nurses Association, delivers a speech at the competition.

4.Caption 4: A military nurse demonstrates clinical technical skills during the 2026 Military Hospital-Nursing Excellence Competition.

Photo: *Nguyen Trung Truc / Department of Propaganda and Training*

5.Caption 5: Contestants showcase medical uniforms, embodying the professionalism and standardized image of military nursing personnel.

6.Caption 6: Military nurses shine at the 2026 Nursing Excellence Competition.
Photo: *Nguyen Trung Truc / Department of Propaganda and Training*


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7.Caption 7: Mr. Pham Duc Muc, President of the Vietnam Nurses Association, in a commemorative photo with delegates at the event. ■

CAREGIVER BURDEN AMONG PRIMARY CAREGIVERS OF PATIENTS WITH SCHIZOPHRENIA: A STUDY AT NGHE AN PSYCHIATRIC HOSPITAL IN 2025

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ABSTRACT

Results: The findings revealed that a substantial majority of primary caregivers experienced moderate to severe levels of burden. Predominant manifestations included chronic fatigue, psychological distress, significant social isolation, and exacerbated financial strain. Statistical analysis identified key correlates of caregiver burden, including the socio-demographic characteristics of caregivers, the clinical severity of the patients' symptoms (e.g., PANSS scores), and the chronicity of the illness.

Conclusion: Caregiver burden among this population is a critical public health issue that necessitates urgent attention. Systematic assessment of these burdens serves as a fundamental evidence base for designing targeted psychosocial interventions and multidisciplinary support strategies to enhance the well-being of both caregivers and patients.

Keywords: Caregiver burden; primary caregivers; schizophrenia; Nghe An Psychiatric Hospital.

1.INTRODUCTION

Schizophrenia is a chronic, progressive, and highly recurrent psychiatric disorder that renders patients significantly dependent on family care, particularly within the context of Vietnam's limited community-based mental health support systems. Long-term caregiving for individuals with schizophrenia imposes a substantial psychological, physical, financial, and social burden on primary caregivers. In Vietnam, the prevalence of severe caregiver burden has been recorded at high levels (75–85%), which is markedly higher than findings in some international studies, such as the research by Zahid & Ohaeri (2010); furthermore, a caregiving duration exceeding 10 years has been identified as a risk factor that escalates psychological stress and diminishes the quality of life of caregivers [4]. This situation is frequently associated with adverse factors such as female gender, lower educational attainment, limited income, unstable employment, and prolonged caregiving duration.

Against this background, the study titled **"Current Status of Caregiver Burden among Primary Caregivers of Patients with Schizophrenia Treated at Nghe An Psychiatric Hospital in 2025"** was conducted with the primary objective: to describe the levels of caregiving burden among primary caregivers of psychiatric patients undergoing treatment at Nghe An Psychiatric Hospital in 2025. The research findings provide a scientific evidence base for developing appropriate,

feasible, and sustainable support interventions aimed at mitigating the burden on caregivers of psychiatric patients in the future.

2. MATERIALS AND METHODS

2.1. Study Participants: The study participants consisted of primary caregivers of patients with schizophrenia undergoing inpatient treatment at Nghe An Psychiatric Hospital. Eligible caregivers were direct relatives who had provided care for a minimum of 12 months, were aged 18 years or older, possessed adequate cognitive and communication abilities, were literate in Vietnamese, and provided informed consent to participate. Exclusion criteria included cases where the patient was in an acute agitation phase or the caregiver was unable to complete the interview.

2.2. Study Setting and Duration: The study was conducted from March to July 2025 at Nghe An Psychiatric Hospital. Data collection took place between March and June 2025.

2.3. Study Design: The research employed a cross-sectional descriptive study design.

2.4. Sample Size and Sampling Method: A total population sampling method was applied, inviting all primary caregivers of inpatients with schizophrenia who met the inclusion criteria during the study period. The final sample size consisted of 52 primary caregivers.

2.5. Data Collection Instruments and Evaluation Criteria

2.5.1. Study instruments: Caregiver burden was assessed using the Zarit Burden Interview (ZBI), which consists of 22 items rated on a 5-point Likert scale (0–4), with total scores ranging from 0 to 88. The ZBI scale has been validated in Vietnam, demonstrating high reliability and validity [2]. The instrument comprises two sections: socio-demographic information for both patients and caregivers, and the assessment of caregiving burden.

2.5.2. Evaluation Criteria: The severity of caregiver burden was classified based on total ZBI scores:

- 0–20 points: Little to no or mild burden.
- 21–40 points: Moderate burden.
- 41–60 points: Severe burden.
- 61–88 points: Very severe burden.

2.6. Data Collection Procedure: Data were collected through structured face-to-face interviews conducted by trained investigators who are Bachelors of Nursing. Interviews were performed in private consultation rooms to ensure privacy and confidentiality.

2.7. Data Management and Analysis: Data were audited, cleaned, and analyzed using SPSS version 20.0 software. Descriptive statistics were utilized; quantitative variables were presented as mean and standard deviation (SD), while qualitative variables were expressed as frequencies and percentages.

2.8. Bias and Bias Control: The study may be subject to sampling bias and information bias due to self-reporting. Control measures included investigator training, standardization of the data collection process, cross-checking, and data cleaning prior to analysis.

2.9. Ethical Considerations: The study received approval from the Board of Directors of Nghe An Psychiatric Hospital under Decision No. 178/QD-BVTT dated February 26, 2025. Participants were fully informed of the study objectives and participated voluntarily. All information was coded and kept confidential, utilized strictly for research purposes.

3.RESULTS

3.1. General Characteristics of Primary Caregivers and Patients

Table 3.1. Socio-demographic Characteristics of Primary Caregivers (n=52)

Characteristics		Number	Rate (%)
Age group	18 – 40	12	23,1
	41 - 60	22	42,3
	> 60	18	34,6
	$\bar{X} \pm SD$	51,62± 13,45	
Sex	Male	17	32,7
	Female	35	67,3
Marital status	Single	5	9,6
	Married	47	90,4
Religion	None	49	94,2
	Buddish	3	5,8
Education level	Primary	17	32,7
	Junior secondary	18	34,6
	High school	8	15,4
	College/University	9	17,3

Comments: The results indicate that a majority of primary caregivers were female (67.3%) and fell within the 41–60 age group (42.3%). Most were married (90.4%) and did not follow any religion (94.2%). Regarding educational attainment, the participants primarily had a lower secondary education (34.6%) or a primary education (32.7%).

Table 3.2. Personal Income Characteristics of Primary Caregivers (n=52)

Income per month (VND)	Number	Rate (%)
< 1,5 million	17	32,7
1,5 - < 3 million	08	15,4
3 - < 4,5 million	18	34,6
≥ 4,5 million	09	17,3

Comments: The results show that monthly income levels ranging from 0 to less than 1.5 million VND and from 3 to less than 4.5 million VND accounted for the highest proportions, at 32.7% and 34.6%, respectively. The lowest proportion belonged to the income group ranging from 1.5 million to less than 3 million VND per month, at 15.4%.

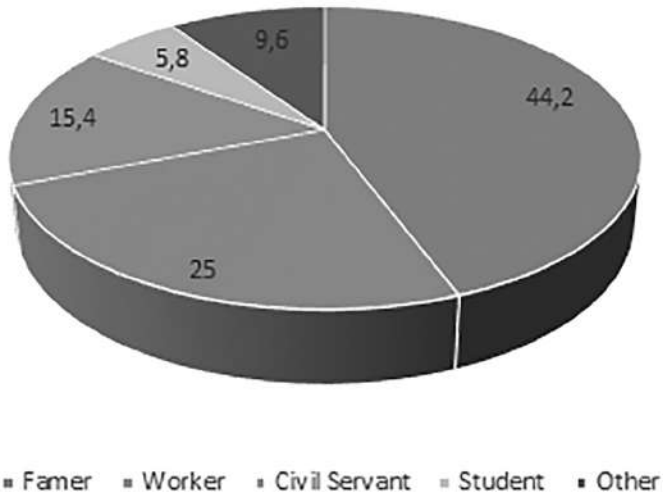

Chart 3.1: Occupations of Primary Caregivers (n=52)

Comments: The chart 3.1 illustrates that the majority of primary caregivers are farmers (44.2%), followed by workers (25%). The lowest proportion belongs to pupils and students, accounting for 5.8%.

Table 3.3. Relationship of Primary Caregivers with patient (n=52)

Variables		Number	Rate (%)
Relationship	Father/mother	20	38,5
	Wife/husband	11	21,2
	Brother/sister	10	19,2
	Children	9	17,3
	Relatives	2	3,8
Time of care (year)	$\bar{X} \pm SD$	15,11 ± 8,27	

Comments: Table 3.3 showed that the majority of primary caregivers were the patients' spouses (38.5%), followed by parents (21.2%). Only 3.8% of primary caregivers were other relatives. The mean duration of caregiving was 15.11 years (Standard Deviation: 8.27).

3.2. Current status of burden of primary care givers

Table 3.4. Primary Caregivers' Perception of Burden in Caring for Patients with Schizophrenia According to the ZBI Scale

Varibales	Rate (%)				
	Never	Rare	Sometimes	Often	Always
Patient asks for more help than they actually need.	3,8	11,5	49,9	25,0	9,8
Do not have enough time for yourself because of the time spent with the patient,	4,0	6,2	48,1	29,6	12,1
Feeling stressed about balancing caregiving for the patient with other responsibilities to family or work.	0,0	3,6	45,0	44,3	7,1
Feeling embarrassed or troubled by the patient's behavior.	2,7	8,4	61,2	20,0	7,7
Feeling angry or resentful when you are around the patient.	9,0	10,2	48,0	25,4	7,4
Feeling that the patient currently affects your relationships with other family members or friends in a negative way.	4,2	9,7	18,1	31,6	36,4
Feeling afraid of what the future holds for the patient.	0,0	1,0	13,2	28,5	57,3
Feeling that the patient is dependent on you.	3,4	2,1	54,0	24,1	16,4
Feeling strained or stressed when you are around the patient.	1,7	6,5	46,2	33,8	11,8
Feeling that your health has suffered because of your involvement with the patient.	1,0	5,1	42,3	39,5	12,1
Feeling that you do not have as much privacy as you would like because of the patient.	3,0	4,6	50,3	34,2	7,9

Comments: The results indicate that primary caregivers frequently experience significant psychological and health-related pressure during the caregiving process for patients with schizophrenia. Factors such as anxiety regarding the patient's condition (85.8%), the feeling of being depended upon (40.5%), and a decline in physical health (51.6%) were recorded at high rates in the "quite frequently" and "frequently" categories. Notably, no participants selected the "never" option for feelings of anxiety and stress in their caregiving role, reflecting the pervasive nature of the psychological burden.

Table 3.5. Primary Caregivers' Perception of Burden in Caring for Patients with Schizophrenia According to the ZBI Scale (cont)

Varibales	Rate (%)				
	Never	Rare	Sometimes	Often	Always
Feeling that social life has suffered because of caring for the patient.	5,8	10,6	43,3	29,8	10,5
Feeling uncomfortable about having friends over because of the patient.	25,0	40,3	20,1	10,2	4,4
Feeling that the patient seems to expect you to take care of him/her, as if you were the only person he/she could depend on.	7,2	6,5	21,6	38,0	26,7
Feeling that you do not have enough money to care for the patient, in addition to your other expenses.	4,5	5,6	13,4	31,2	45,3
Feeling that you will be unable to take care of the patient much longer.	5,6	8,1	26,5	36,5	23,3
Feeling a loss of control of your life since the patient's illness.	4,4	12,0	47,2	29,3	7,1
Wishing you could just leave the care of the patient to someone else.	13,0	11,2	25,4	32,6	17,8
Feeling uncertain about what to do about the patient.	8,3	11,7	36,1	35,2	8,7
Feeling you should be doing more for the patient.	6,5	2,8	35,4	46,0	9,3
Feeling you could do a better job in caring for the patient.	6,9	7,1	32,4	45,0	8,6
Overall, feeling burdened in caring for the patient.	0,0	4,7	30,0	42,0	23,3

Comments: The results indicate that primary caregivers experience various levels of burden, most notably financial pressure (76.5% selecting "quite frequently" or "always") and a sense of being trapped in their caregiving role (64.7%). Simultaneously, 65.3% of caregivers felt they should be doing more for the patient, suggesting an internal sense of guilt or self-reproach. Notably, no participants selected the "never" option for the overall perception of burden, with the highest proportion (42%) falling into the "quite frequently" category.

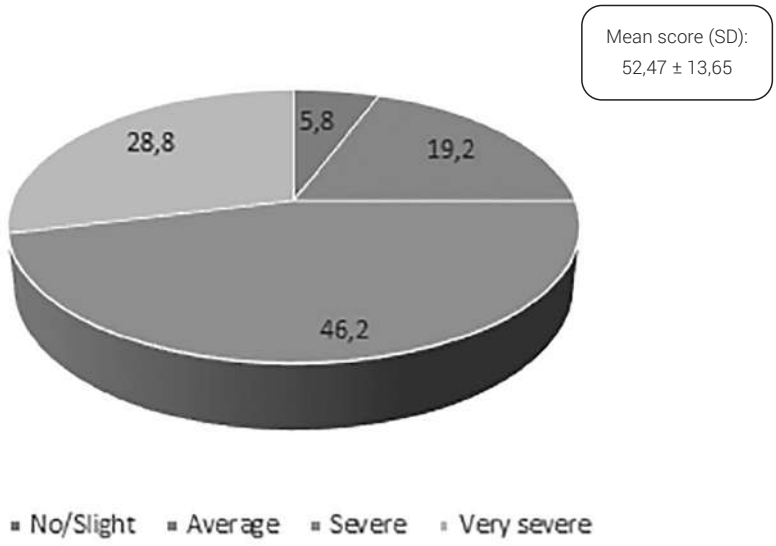

Chart 3.2. Classification of burden levels among primary caregivers according to the ZBI Scale (n = 52)

Comments: The results indicate that the majority of primary caregivers experience a burden level of "severe" or higher (75%), with the "severe burden" group accounting for the highest proportion (46.2%). Only 5.8% of caregivers reported little to no or mild caregiver burden. The mean ZBI score was 52.47 ± 13.65.

4.DISCUSSION

4.1. Study participants' characteristics

The primary caregivers (PCGs) in this study were predominantly female, middle-aged or elderly, with low educational attainment, limited income, and occupations primarily in farming or manual labor. The mean age of PCGs was higher than that reported in several domestic studies, suggesting an increased risk of physical and mental health issues, which subsequently exacerbates the caregiving burden. The proportion of married PCGs in Nghe An accounted for 90.4%, which is comparable to findings in Thai Nguyen (90.8%), reflecting the strong link between familial obligations and the caregiving role within marriage [1]. Furthermore, the fact that the majority of PCGs reported no religious affiliation may limit their access to spiritual support resources from the community.

Low income and unstable employment emerged as prominent socio-economic factors, which have been consistently proven to be closely associated with high levels of caregiver burden in various domestic and international studies. For instance, in the study by Vu Thi Quy et al. (2020) conducted in Hung Yen, over 60% of PCGs had a below-average income (less than 3 million VND/month), and low income was significantly correlated with the severity of caregiver burden ($p < 0.01$) [4]. The prolonged duration of care, averaging over 15 years, reflects the chronic nature of schizophrenia and serves as a critical risk factor for physical exhaustion, psychological stress, and a decline in the caregivers' quality of life. Additionally, nearly one-third of the PCGs suffered from comorbid medical conditions, further intensifying the overall burden of care.

Regarding the patients, most were within the working-age population, with a male predominance;

the majority remained unmarried, and their capacity for labor or education was severely impaired. A significant portion of patients had previously worked in agriculture, indicating that the disease burden is concentrated in rural areas. Severe clinical subtypes, such as Paranoid and Undifferentiated schizophrenia, were highly prevalent, often accompanied by delusions and behavioral disturbances, which increased the degree of dependency and the pressure of long-term care.

4.2. Current Status of Caregiving Burden

The findings indicate that the caregiving burden is at high and very high levels, spanning psychological, financial, physical health, and social relationship dimensions. Caregivers frequently experience prolonged anxiety regarding the patient's condition, severe financial pressure, and a decline in their own health. Restrictions on private and social life, combined with the perception of excessive patient dependency, reflect internal conflict and the risk of burnout due to long-term caregiving.

The mean ZBI score reached 52.47 ± 13.65, with 75% of caregivers experiencing a burden level of severe or higher, far exceeding the warning threshold. Compared to an international study of 215 family caregivers of patients with schizophrenia, which reported that 38.2% of caregivers experienced a severe burden [5], it is evident that caregiver burden in schizophrenia is a universal issue; however, there is a higher trend in Vietnam, particularly in rural areas, due to economic hardships and limited community support systems.

Research Conclusions and Implications

Primary caregivers of patients with schizophrenia represent a vulnerable group, enduring a heavy and prolonged caregiving burden. The research results emphasize the necessity of comprehensive and sustainable interventions, including psychological support, caregiving skills training, financial assistance, and the development of community-based care networks, to mitigate the burden on caregivers and enhance

5.CONCLUSION AND RECOMMENDATION

The study conducted at Nghe An Psychiatric Hospital in 2025 among 52 primary caregivers of patients with schizophrenia revealed an exceptionally high caregiver burden. This burden was predominantly observed in middle-aged women with low educational attainment and prolonged caregiving durations. Notably, 75% of caregivers experienced severe to very severe burden, primarily concentrated in psychological, financial, and personal life dimensions.

Based on these findings, the study proposes several interventions, including caregiving skills training, psychosocial counseling, and the integration of caregiver support into nursing care protocols. Furthermore, the establishment of peer support groups and the provision of financial assistance for patients' families are recommended to achieve a sustainable reduction in caregiver burden.

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EMOTIONAL LABOR AND IT'S A SSOCIATED FACTORS AMONG NURSES: A CROSS- SECTIONAL AT THE NATIONAL HOSPITAL OF ENDOCRINOLOGY IN 2025

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ABSTRACT

Objective: To describe the status of emotional labor among nurses and analyze related factors at the National Endocrinology Hospital in 2025.

Methods: A cross-sectional descriptive study was conducted on 356 clinical nurses from April 2025 to June 2025. The Emotional labor Scale for Nurses (ELS-N) was used to assess nurses' emotional labor. Data were analyzed using SPSS 26.0 software.

Results: The overall mean score of emotional labor was 4.39 ± 0.62, indicating a high and stable level of implementation among nurses. The dimension "Surface Acting" scored the highest at 4.41 ± 0.64, while "Deep Acting, focusing on patients" scored slightly lower at 4.36 ± 0.66. Age, professional qualifications, income, work seniority, work position, and job title were significantly associated with the level of emotional labor ($p < 0.05$). Gender, marital status, and type of employment were not statistically significant ($p > 0.05$).

Conclusion: It is necessary to enhance psychological support, stress management, and training in emotional regulation skills for nurses, while improving the working environment and incentive policies. Nurses should actively develop communication skills, emotion control, and professional competence. Researchers are encouraged to expand studies and develop intervention models to improve emotional labor effectiveness in hospitals.

Keywords: emotional labor; nurses; emotional regulation; surface acting; occupational factors; nursing practice.

I. INTRODUCTION

Emotional labor (EL) refers to the process by which nurses regulate and express emotions in accordance with professional expectations during patient care (Grandey, 2019). It is a core component of interpersonal communication in healthcare and has a direct impact on the quality of nursing services and patient satisfaction [1], [9]. In the context of increasing workload and occupational pressure in tertiary hospitals, particularly at the National Hospital of Endocrinology

—where many patients with chronic conditions experience prolonged anxiety and psychological stress—nurses are required to simultaneously ensure clinical competence and provide emotional support. This dual demand necessitates continuous emotional regulation to maintain professional attitudes and effective interactions with patients. In Vietnam in general, and at the National Hospital of Endocrinology in particular, research on nurses' emotional labor remains limited, despite its critical role in nursing workforce management and quality improvement of patient care. Therefore, this study was conducted to describe the status of emotional labor among nurses and to analyze associated factors at the National Hospital of Endocrinology in 2025.

II. METHODS

2.1. Study Design

This study employed a cross-sectional descriptive design.

2.2. Study Setting and Period

The study was conducted from March 2025 to June 2025 at the National Hospital of Endocrinology, Vietnam.

2.3. Study Participants

Inclusion criteria: Registered nurses who were either permanently employed or working under labor contracts and had been directly involved in clinical care at the hospital for at least one year were eligible for inclusion. Participants were required to be present during the data collection period and to voluntarily agree to participate in the study.

Exclusion criteria: Nurses who were absent during the data collection period due to reasons such as annual leave, maternity leave, sick leave, full-time training, or those in the process of resignation or retirement were excluded from the study.

2.4. Sample Size and Sampling Method

Sample size calculation

The sample size was calculated using the following formula:

$$n = \frac{Z^2_{1-\alpha/2} \times p\ 1 - p}{d}$$

Where: n is the required sample size; $Z_{1-\alpha/2}$ is the standard normal value corresponding to a 95% confidence level (Z = 1.96); α is the level of statistical significance; d is the margin of error, set at 5% (d = 0.05); p is the estimated proportion of nurses with a high level of emotional labor.

Based on the findings of a previous study conducted in China by Li Zhou and colleagues (2025), which reported that 70.3% of clinical nurses exhibited a high level of emotional labor [3], the value of p was set at 0.70. Applying the formula yielded a minimum required sample size of 323 nurses.

Sampling method: The hospital had a total of 370 clinical nurses. Given the relatively small population size, a census sampling approach was applied to enhance representativeness and reliability. All eligible nurses were invited to participate in the survey. A total of 356 valid questionnaires were collected and included in the final analysis.

2.5. Research Instruments

The questionnaire consisted of two main parts:

Part 1, Sociodemographic and occupational characteristics: This section collected information on participants' age, gender, marital status, type of employment, educational level, years of professional experience, monthly income, job position, and managerial role.

Part 2, Emotional labor measurement: Emotional labor was assessed using the Emotional Labor Scale for Nurses (ELS-N) developed by J. Hong and O. Kim in 2019 in South Korea [8]. The scale consists of 16 items across three dimensions: Professional emotional regulation effort (5 items), Emotional suppression focused on patients (6 items), and Surface acting according to professional norms (5

Cronbach's alpha coefficient of 0.81. All items were rated on a 5-point Likert scale ranging from 1 = strongly disagree 5 = strongly agree. Mean scores of emotional labor were interpreted using the following categories: very low (1.00–1.80), low (1.81–2.60), moderate (2.61–3.40), high (3.41–4.20), and very high (4.21–5.00).

2.6. Data Collection and Statistical Analysis

Collected data were checked for completeness and validity, coded, and entered SPSS version 26.0 for analysis. Invalid or incomplete questionnaires were excluded. Categorical variables were summarized using frequencies and percentages, while continuous variables were presented as means and standard deviations. The internal consistency of the scale was assessed using Cronbach's alpha. Associations between emotional labor and related factors were analyzed using independent t-tests and one-way analysis of variance (ANOVA). A p-value of less than 0.05 was considered statistically significant.

2.7. Ethical Considerations

The study was conducted in accordance with ethical principles for research involving human participants. Informed consent was obtained from all participants prior to data collection, confidentiality and anonymity were strictly maintained. The study protocol was reviewed and approved by the Decision No1500/QĐ-BVNTTW dated December 24, 2025 of the Ethics Committee of the National Hospital of Endocrinology.

III. RESULTS

3.1. Characteristics of study participants

Table 3.1. Socio-economic characteristics of the study participants (n = 356)

Sociodemographic characteristics		Frequency (n)	Percentage (%)	Occupational characteristics		Frequency (n)	Percentage (%)
Gender	Male	76	21,3	Educational level	College	218	61,3
	Female	280	78,7		Bachelor's degree	109	30,6
Age	21 -30 years	51	14,3		Postgraduate	29	8,1
	31 -40 years	237	66,6	Work experience	≤ 5 years	35	9,8
	41 -50 years	59	16,6		5 - 10 years	100	28,1
	51 -55 years	9	2,5		>10 years	221	62,1
Marital status	Single	295	82,9	Type of employment	Contract - based	322	90,4
	Married	58	16,3		Permanent staff	34	9,6

	Other (divorced /widowed)	3	0,8	Work unit	Medical wards	225	63,2
Monthly income	≤ 10 million VND	34	9,6		Surgical wards	94	26,4
	11 – 20 million VND	276	77,5		Emergency & ICU	37	10,4
	>20 million VND	46	12,9	Position	Head nurse	23	6,5
					Staff nurse	333	93,5

Comments: Among the 356 nurses included in the study, the majority were female (78.7%) and aged between 31 and 40 years (66.6%). Most participants held a college-level nursing qualification (61.3%), followed by a bachelor's degree (30.6%). More than half of the nurses had over 10 years of work experience (62.1%), and the predominant monthly income ranged from 11 to 20 million VND (77.5%). Most participants were contract-based employees (90.4%) and worked in medical wards (63.2%). Staff nurses accounted for the largest proportion of the sample (93.5%).

3.2. Status of emotional labor among study participants

Table 3.2. Descriptive results of emotional labor among nurses

No.	Item	Mean score	Standard deviation
A1	**Professional Emotional Regulation Effort**	4,39	0,65
1	I make an effort to show genuine kindness toward patients.	4,37	0,71
2	I attempt to transform my emotions into positive expressions that patients expect.	4,40	0,67
3	I adjust my emotions and attitudes according to changes in patients' emotional states.	4,39	0,69
4	I express appropriate emotions to maintain an ongoing therapeutic relationship with patients.	4,38	0,68
5	I regulate my facial expressions, tone of voice, and manner of speaking to uphold a professional image and maintain patients' trust.	4,43	0,66

A2	**Emotion Regulation Focused on Patient Care**	**4,36**	**0,66**
6	I suppress feelings of anger when patients behave or speak unfairly toward me.	4,41	0,67
7	Even when I feel afraid, I endure patients' verbal or nonverbal aggressive behaviors.	4,40	0,67
8	I tolerate patients' negative emotional expressions about medical staff or other departments.	4,29	0,74
9	I consciously control my thoughts by reminding myself that patience is an essential professional virtue.	4,30	0,76
10	I accept unfair treatment in order to maintain a positive and harmonious work environment in the ward.	4,35	0,73
11	I try to understand the different circumstances and perspectives between healthcare providers and patients.	4,40	0,67
A3	**Surface Acting**	**4,41**	**0,64**
12	I deliberately exaggerate my expressions of interest when interacting with patients.	4,40	0,67
13	I display emotions such as empathy, friendliness, or enthusiasm even when I do not genuinely feel them.	4,39	0,70
14	I consciously manage my facial expressions, attitudes, and speech during patient interactions.	4,41	0,65
15	Even when patients make me feel emotionally uncomfortable, I immediately present a positive facial expression and professional attitude.	4,42	0,60
16	I cope with emotionally challenging situations by relying on my sense of professional responsibility as a nurse.	4,43	0,67
Overall mean score		**4,39**	**0,62**

Comments: The overall mean score of emotional labor was 4.39 ± 0.62, indicating a high and consistent level of emotional labor performance among nurses. The surface acting dimension showed the highest mean score (4.41 ± 0.64), reflecting a high degree of professionalism in emotional expression. In contrast, emotion regulation focused on patient care demonstrated a slightly lower mean score (4.36 ± 0.66), suggesting that personal emotions may still be affected in high-pressure situations.

Table 3.3. Associations between participants' general characteristics and nurses' emotional labor

Variable	Mean Emotional Labor Score (Mean ± SD)	Test Statistic	p-value	Conclusion
Gender				
Male	4,3 ± 0,65	t= 0,24	0,624	No significant association
Female	4,3 ± 0,61			
Age group (years)				
≤ 30	3,67 ± 0,75	F=35, 97	0,000	Significant association
31 – 40	4,46 ± 0,51			
41 – 50	4,63 ± 0,48			
> 50	4,86 ± 0,33			
Educational level				
Postgraduate	4,66 ± 0,52	F= 6,208	0,002	Significant association
Bachelor's degree	4,48 ± 0,55			
College diploma	4,30 ± 0,65			
Marital status				
Married	4,36 ± 0,59	F= 1,726	0,179	No significant association
Unmarried	4,52 ± 0,76			
Other (divorced/widowed)	4,55 ± 0,50			
Monthly income				
≤ 10 million VND	3,64 ± 0,70	F=33,58	0,000	Significant association
11 –20 million VND	4,44 ± 0,55			
20 million VND	4,63 ± 0,56			
Years of work experience				
≤ 5 years	3,50 ± 0,80	F= 70,25	0,000	Significant association
5–10 years	4,23 ± 0,53			
10 years	4,60 ± 0,47			
Work unit				
Medical departments	4,39 ± 0,60	F= 2,92	0,000	Significant association
Surgical departments	4,46 ± 0,58			
Intensive Care Unit	4,17 ± 0,79			
Employment type				
Permanent staff	4,47 ± 0,53	F= 77,92	0,550	No significant association
Contract -based staff	3,57 ± 0,82			
Position				
Head nurse	4,5 ± 0,57	t=2,33	0,000	Significant association
Staff nurse	4,37 ± 0,62			

Comments: The study results indicate that nurses' emotional labor was significantly associated with age, educational level, income, years of work experience, work unit, and job position ($p < 0.05$). Nurses who were older had higher educational attainment, higher income, longer work experience, and held managerial positions demonstrated higher levels of emotional labor. In contrast, gender, marital status, and employment type showed no statistically significant differences in emotional labor ($p > 0.05$).

IV. DISCUSSION

The findings of this study indicate that the overall level of emotional labor (EL) among nurses at the National Hospital of Endocrinology was high, with a mean score of 4.39 ± 0.62. This result reflects a relatively stable and effective practice of emotional labor strategies during daily nursing care. In the context of a specialized endocrine hospital, where patients predominantly suffer from chronic conditions requiring long-term treatment and frequent interactions with healthcare professionals, the ability to regulate emotional expressions in accordance with professional norms plays a critical role. Effective emotional labor contributes to the establishment of positive nurse–patient relationships, enhances patients' sense of security, and ultimately improves patient satisfaction and quality of care.

These findings are consistent with previous studies by Grandey (2019), Xu and Fan (2023), and Lee et al. (2020), which emphasized emotional labor as a core component of nursing practice that supports professional image, strengthens patient trust, and ensures high-quality care delivery[1] [9] [7]. The high EL score observed in this study suggests that nurses have developed emotional labor practices that meet professional demands, particularly in high-pressure environments characterized by heavy workloads, time constraints, and continuous emotional interactions with patients.

When examining specific dimensions of emotional labor, surface acting demonstrated the highest mean score (4.41 ± 0.66). This finding indicates that nurses frequently modify their outward emotional expressions to conform to professional display rules, even when their genuine emotions may not fully align with expected behaviors. This result aligns with the findings of Zhou and Xiong (2025), who identified surface acting as a commonly adopted emotional labor strategy in healthcare settings, enabling healthcare workers to maintain a calm, friendly, and trustworthy demeanor in front of patients [4]. In nursing practice, particularly in chronic care settings, controlling emotional expressions is promote patient reassurance and cooperation during treatment.

However, international literature has consistently reported that prolonged reliance on surface acting, when not accompanied by adequate organizational and psychological support, may increase emotional strain and elevate the risk of occupational burnout. Therefore, the high level of surface acting observed in this study reflects not only nurses' professionalism but also highlights the need for hospital managers to implement supportive strategies that mitigate the potential negative consequences associated with sustained surface acting.

The dimensional emotion regulation focused on patient care showed a slightly lower mean score (4.36 ± 0.64) compared to surface acting, suggesting that although nurses consciously suppress personal emotions to prioritize patients' needs, they may still experience emotional challenges in highly stressful or demanding situations. This finding is consistent with Yalçın et al. (2025), who reported that inadequately managed negative emotions could adversely affect nurses' job performance, quality of care, and mental well-being [2]. The relatively lower score of this dimension underscores the importance of targeted training and psychological support programs aimed at strengthening nurses' emotion regulation capacities, particularly in complex communication scenarios and during periods of increased workload.

Importantly, this study identified several factors that were significantly associated with emotional labor. Age, educational level, income, years of work experience, working unit, and job position were all significantly related to EL ($p < 0.05$), whereas gender, marital status, and employment type were not associated with statistically significant differences ($p > 0.05$). These findings are consistent with previous studies by Lee et al. (2021) and Kim et al. (2020), which highlighted the central role of professional characteristics and work experience in shaping nurses' emotional labor practices [7] [5].

Nurses with longer work experience and higher

educational attainment tended to demonstrate higher levels of emotional labor, possibly due to their accumulated exposure to complex interpersonal situations and sustained occupational pressures over time. Similarly, Zhang et al. (2025) reported that years of experience and job position were key determinants of emotional labor, as they are closely linked to professional autonomy, decision-making capacity, and perceived control over work processes [10]. These findings suggest that emotional labor should be understood not merely as an individual capability, but as a phenomenon strongly influenced by organizational context and working conditions.

Income level and job position were also identified as important factors associated with emotional labor. This result is in line with Chen et al. (2025), who demonstrated that an imbalance between effort and reward, combined with high emotional labor demands, could negatively affect nurses' physical and psychological health [3]. Conversely, adequate organizational support, fair compensation, and opportunities for professional development may buffer the adverse effects of emotional labor and help nurses maintain positive emotional states at work. These findings emphasize the critical role of human resource management policies in enhancing effective emotional labor practices within hospital settings.

The absence of significant differences in emotional labor according to gender and marital status is consistent with the findings of Zhang et al. (2019), who suggested that in highly standardized public hospital environments, professional requirements and organizational norms tend to override demographic differences [10]. This observation further supports the notion that emotional labor in nursing is primarily shaped by occupational and organizational factors rather than individual demographic characteristics alone.

Taken together, the results of this study suggest that enhancing nurses' emotional labor capacity requires a comprehensive approach. Such an approach should include emotion regulation training tailored to nurses' age, educational level, and job position, as well as improvements in the working environment, increased psychological support, adequate income, and clear career development pathways. These interventions may not only reduce the risk of occupational burnout but also contribute to improved quality of care and greater patient satisfaction in contemporary healthcare settings.

Several limitations of this study should be acknowledged. First, the study was conducted at a single specialized hospital over a relatively short period, which may limit the generalizability of the findings to other healthcare settings. Second, the use of self-reported measures may have introduced information bias due to social desirability. Finally, other psychosocial factors that may influence emotional labor were not fully examined. Future studies should consider multi-center designs, mixed-method approaches, or longitudinal frameworks to provide a more comprehensive understanding of emotional labor dynamics and their long-term effects on nurses' mental health and professional outcomes.

V. CONCLUSIONS AND RECOMMENDATIONS

This study found that nurses' emotional labor was at a high level, indicating a strong ability to maintain professional conduct in patient care, with surface acting being the most frequently used strategy and emotion regulation focused on patient care relatively lower. Emotional labor was significantly associated with professional factors, including age, education, income, years of experience, working unit, and job position, while demographic characteristics showed no significant differences. These findings underscore the central role of organizational context and professional experience in shaping nurses' emotional labor. Hospitals should prioritize targeted training and psychological support to enhance emotion regulation capacities, particularly for younger and less experienced nurses in high-intensity care settings. Emotional labor competencies should be integrated into continuing education, performance evaluation, and nursing workforce management. Future research

should employ longitudinal designs and multi-site samples to examine the long-term effects of emotional labor on care quality and nurses' professional development.

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KNOWLEDGE AND ATTITUDES TOWARD ANAPHYLAXIS PREVENTION AND MANAGEMENT OF NURSES, MIDWIVES,AND TECHNICIANS AT VINMEC SMART CITY HOSPITAL IN 2025

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ABSTRACT

Objective: (i) To describe the level of knowledge and attitudes regarding anaphylaxis prevention and management among nurses, midwives, and medical technicians at Vinmec Smart City Hospital in 2025. (ii) To identify factors associated with knowledge and attitudes toward anaphylaxis prevention and management among the study participants.

Methods: A descriptive cross-sectional study was conducted among 109 healthcare professionals (nurses, midwives, and medical technicians) working at Vinmec Smart City Hospital in 2025. Data was collected using a structured, self-administered questionnaire that assessed demographic characteristics, knowledge of anaphylaxis recognition and management, and attitudes toward anaphylaxis prevention and response. Descriptive statistics were used to summarize participants' characteristics and outcome measures. Inferential statistical analyses were performed to identify factors associated with knowledge and attitude levels. A p-value of <0.05 was considered statistically significant.

Results: A total of 109 healthcare professionals participated in the study, including nurses, midwives, and medical technicians working at Vinmec Smart City Hospital. The mean overall knowledge score on anaphylaxis prevention and management was 26.7 ± 3.4 out of 37, and only 26.6% of participants achieved the required knowledge level (≥80%). Among knowledge domains, management knowledge showed the highest pass rate (62.4%), whereas knowledge of clinical scenarios was markedly limited, with a pass rate of only 4.6%.

Regarding attitudes, 67.0% of participants met the required attitude threshold toward anaphylaxis prevention and management. Participation in training related to Circular 51/2017/TT-BYT, both within and outside the Vinmec system, was significant-

associated with differences in knowledge levels ($p < 0.05$). In contrast, positive attitudes were significantly associated with postgraduate qualifications (OR = 8.3; 95% CI: 1.05–65.9; $p = 0.019$).

Conclusion: Although healthcare professionals at Vinmec Smart City Hospital showed generally acceptable knowledge and positive attitudes toward anaphylaxis prevention and management, important knowledge gaps remain. Regular refresher training standardized clinical guidelines, and simulation-based education are recommended to enhance competency and ensure safe, effective management of anaphylaxis in clinical practice.

Keywords: Anaphylaxis; knowledge; attitude; nurses; midwives; patient safety technicians, Vinmec Smart City Hospital, Vietnam.

I. INTRODUCTION

Anaphylaxis is a severe, systemic hypersensitivity reaction characterized by a rapid onset and the potential for fatal outcomes if not diagnosed and treated promptly. As a critical medical emergency, it demands immediate clinical recognition and decisive intervention; intramuscular adrenaline remains the first-line and mandatory treatment [3, 4]. Globally, the incidence of anaphylaxis has been rising over the past decades. In the United States, national data show that hospitalizations related to anaphylaxis approximately doubled between 1999 and 2009 [7, 11, 12]. Similarly, a systematic review in Europe indicates that the incidence ranges from 1.5 to 7.9 per 100,000 person-years, with a sustained upward trend [11].

In Vietnam, anaphylaxis is frequently encountered in clinical practice, commonly triggered by medications, food, chemicals, and vaccines. To address this, the Ministry of Health issued Circular 51/2017/TT-BYT, which provides comprehensive guidelines for the prevention, diagnosis, and management of anaphylaxis. This directive aims to standardize clinical protocols and enhance patient safety nationwide [8]. Despite these efforts, the practical application of and adherence to these guidelines continue to face significant challenges and limitations.

Numerous studies demonstrate that the knowledge and attitudes of healthcare professionals are critical to the successful identification. [3] emphasize that delays in adrenaline administration often result from a lack of clinical knowledge or hesitation among medical staff. This gap is further highlighted by González-Díaz et al. [5], whose survey in Mexico found that while a majority of healthcare workers identified adrenaline as the first-line treatment, the rate of correct responses regarding the precise dosage and route of administration remained low. Similarly, research in Saudi Arabia indicated that only approximately 40% of healthcare providers possessed adequate knowledge of anaphylaxis management, though the study noted that simulation-based training significantly enhanced clinical practice [1].

In Vietnam, preliminary research reflects similar challenges regarding clinical preparedness. A study by Nguyen Hai Lam demonstrated that only approximately 30% of nurses possessed satisfactory knowledge concerning the management of anaphylaxis [9]. Furthermore, research conducted by Ta Thi Anh Tho at K Hospital highlighted significant limitations in nurses' ability to recognize symptoms and execute correct adrenaline injection protocols [14]. These findings suggest that, beyond core professional competency, a proactive attitude toward updating knowledge and strictly adhering to clinical guidelines is a critical factor in determining the quality of emergency management [2, 10].

Moreover, the literature indicates that health

workers' knowledge and attitudes toward anaphylaxis are shaped by multiple individual and professional factors, including gender, educational attainment, clinical specialty, years of experience, and participation in relevant training programs [6, 10]. In particular, simulation-based education has increasingly been shown to enhance practical competence and facilitate the transfer of knowledge to real-world emergency decision-making and skills performance [1, 6].

Vinmec Smart City Hospital operates under an international hospital model in Vietnam, where healthcare professionals routinely care for patient groups at heightened risk of anaphylaxis. Assessing the current knowledge and attitudes of nurses, midwives, and medical technicians at this hospital therefore serves not only as an indicator of workforce readiness but also as an empirical foundation for optimizing training strategies to strengthen anaphylaxis response capacity and improve patient safety.

On this basis, we conducted the study entitled "Knowledge and Attitudes about Anaphylaxis Prevention and Treatment Management of Nurses, Midwives, and Technicians at Vinmec Smart City Hospital in 2025" to describe current knowledge and attitudes, identify associated factors, and inform feasible recommendations for improvement.

II. RESEARCH POPULATION AND METHODS

Study population: The study population consisted of nurses, midwives, and medical technicians working at Vinmec Smart City Hospital in 2025. These healthcare professionals are directly involved in patient care, medication administration, and clinical procedures, including the initial recognition and management of patients at risk of anaphylaxis. Therefore, assessing their knowledge and attitudes has important practical implications for improving emergency response capacity and patient safety.

- Inclusion criteria: were healthcare professionals who had been working at the hospital for at least six months and voluntarily agreed to

- Exclusion criteria: including staff who were on long-term leave during the data collection period, those who declined participation, or questionnaires with more than 20% missing responses.

Time and setting: The study was conducted at Vinmec Smart City Hospital, Hanoi, Vietnam, from July to September 2025.

Study design: A descriptive cross-sectional study design was employed to assess the current level of knowledge and attitudes regarding anaphylaxis prevention and management among healthcare professionals at a single point in time. In addition, the study examined the associations between sociodemographic and professional characteristics and knowledge and attitude outcomes.

Sample size and sampling method: The sample size was calculated using the formula for estimating a population proportion, with the following parameters: expected proportion (p) = 0.5, confidence level of 95% (Z = 1.96), and margin of error (d) = 0.1. The minimum required sample size was 96 participants. After adjusting for an anticipated non-response rate of 10%, the final minimum sample size was 106.

A total of 109 valid questionnaires were collected, satisfying the required sample size. Participants were selected using a convenience sampling method, whereby all eligible healthcare professionals from clinical departments with a high risk of anaphylaxis as well as selected subclinical departments were invited to participate during the study period.

Study variables

- Dependent variables:

Knowledge level regarding anaphylaxis prevention and management.

Attitudes toward anaphylaxis prevention and management.

- Independent variables:

Sociodemographic characteristics: gender, age, profession, educational level.

Professional characteristics: department, years of experience in healthcare, duration of employment at Vinmec Smart City Hospital, prior training on anaphylaxis, and exposure to Circular 51/2017/TT-BYT.

Data collection instruments and procedures: Data were collected using a structured, self-administered questionnaire developed based on Circular 51/2017/TT-BYT on the prevention, diagnosis, and management of anaphylaxis, in combination with international guidelines, including the World Allergy Organization Anaphylaxis Guidelines (2020) and the Anaphylaxis Practice Parameter Update (2023), as well as instruments used in previous domestic and international studies.

The questionnaire comprised three sections: (i) Demographic and professional characteristics; (ii) Knowledge assessment, consisting of 37 multiple-choice questions covering causes, recognition, diagnosis, management, prevention, and clinical scenarios of anaphylaxis. Each correct answer was awarded one point, with a maximum score of 37. Knowledge was considered adequate when participants achieved ≥80% of the total score; (iii) Attitude assessment, consisting of 21 items measured on a five-point Likert scale, with a maximum total score of 105. Attitudes were classified as positive when participants achieved ≥80% of the total score. The questionnaire was pilot tested on a small group of healthcare professionals to assess clarity, feasibility, and internal consistency prior to official data collection.

Data collection procedures: Data were collected through both paper-based questionnaires and electronic surveys. All participants were informed about the study objectives, assured of anonymity and confidentiality, and informed that the collected data would be used solely for research purposes. The average time required to complete the questionnaire was approximately 15–20 minutes. Questionnaires with incomplete responses exceeding 20% of the total items were excluded from the analysis.

Data analysis: Data was entered and analyzed using SPSS version 20.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and study variables. Associations between independent variables and knowledge or attitude levels were examined using Chi-square tests. Odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to quantify the strength of associations. Statistical significance was set at $p < 0.05$.

Ethical considerations

The study was approved by the Ethics Committee in Biomedical Research of Vinmec Smart City Hospital. All participants were fully informed about the study objectives, procedures, rights, and obligations prior to participation. Written informed consent was obtained from all participants. Confidentiality of personal information was strictly maintained, and participants were free to withdraw from the study at any time without any impact on their professional rights or interests.

III.RESEARCH RESULTS

3.1. Characteristics of the research object

Table 3.1: General information of the research subjects (n=109)

General characteristics		Quantity (N)	Rate (%)
Departmental	Clinicaldepts(highriskofanaphylaxis)	82	75,2
	Subclinical depts (lower risk of anaphylaxis)	27	24,8
Gender	Male	18	16,5
	Female	91	83,5

Education	Colleges and universities	94	86,2
	Postgraduate	15	13,8
Training Expertise	Nursing	86	78,9
	Midwifery, Technician	23	21,1
Working time at Vinmec	< 3 years	57	52,3
	≥ 3 years	52	47,7
Total years of experience in the medical profession	< 5 years	46	42,2
	≥ 5 years	63	57,8
Participated in training on prevention and management of anaphylaxis at Vinmec	Trained	51	46,8
	Untrained/unremembered	58	53,2
Participated in training on prevention and management of anaphylaxis outside the Vinmec system	Trained	46	42,2
	Untrained/unremembered	63	57,8
Total		109	100

Comments: Among the 109 participants, most were female (83.5%) and worked in clinical departments with a high risk of anaphylaxis (75.2%). The majority were nurses (78.9%) and held a college or university degree (86.2%). More than half had worked at Vinmec for less than three years, while over half reported at least five years of total professional experience. Fewer than half had received training on anaphylaxis prevention and management either within or outside the Vinmec system.

3.2. Knowledge and attitude about anaphylaxis prevention and management

Table 3.2: Knowledge scores for anaphylaxis prevention and management (n=109)

Knowledge of anaphylaxis prevention and management	Mean	SD	Min	Max
Knowledge of causes and mechanisms (7 items: A.1 – A.7)	4,9	1,5	1	7
Knowledge of anaphylaxis diagnosis (4 items: B.1 – B.4)	2,8	0,9	1	4
Knowledge of management (16 items: C.1 – C.16)	12,8	1,8	8	16
Knowledge of contingency (6 items: D.1 – D.6)	3,9	1,1	1	6
Knowledge of assessment situation (4 items: F.1 – F.4)	2,3	0,8	1	4
General Knowledge (37 items: A1 – F4)	26,7	3,4	19	34

Comments: The mean overall knowledge score was 26.7 ± 3.4 out of 37 points. Management-related knowledge had the highest mean score, whereas situational assessment knowledge showed the lowest mean score among all domains.

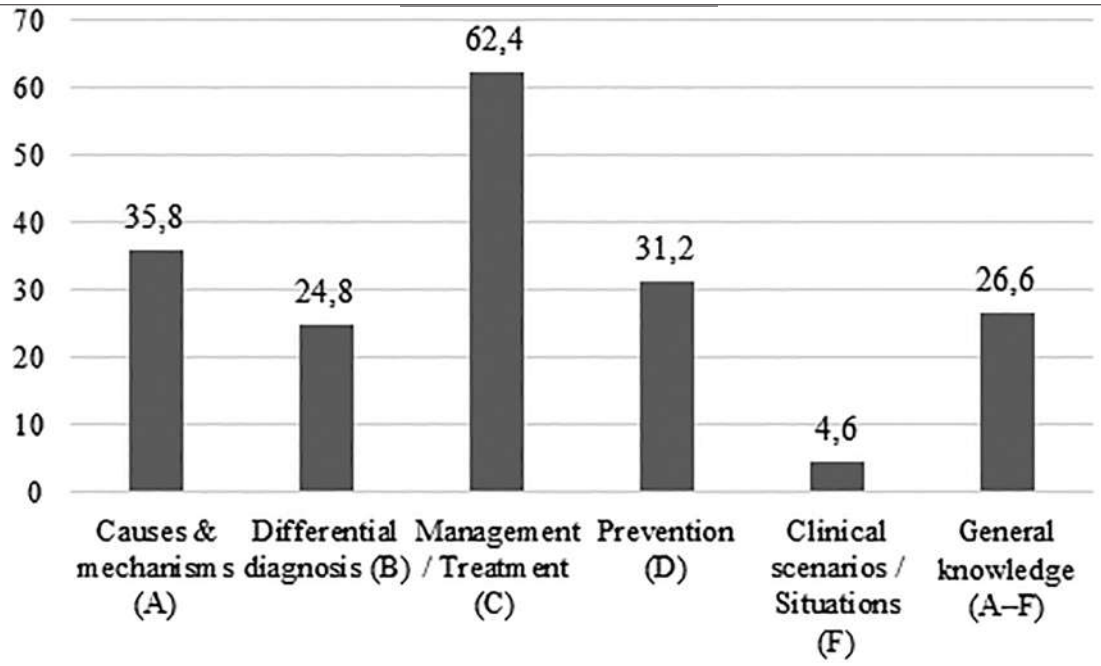

Figure 3.1. Proportion of participants achieving adequate knowledge of anaphylaxis prevention and management by knowledge domain (n = 109)

Comments: Figure 3.1 illustrates the proportion of participants achieving adequate knowledge of anaphylaxis prevention and management across different knowledge domains. The highest proportion of participants meeting the adequacy threshold was observed in the management domain, whereas the lowest proportion was found in the clinical scenario and contingency domain. The remaining domains showed intermediate levels of adequate knowledge.

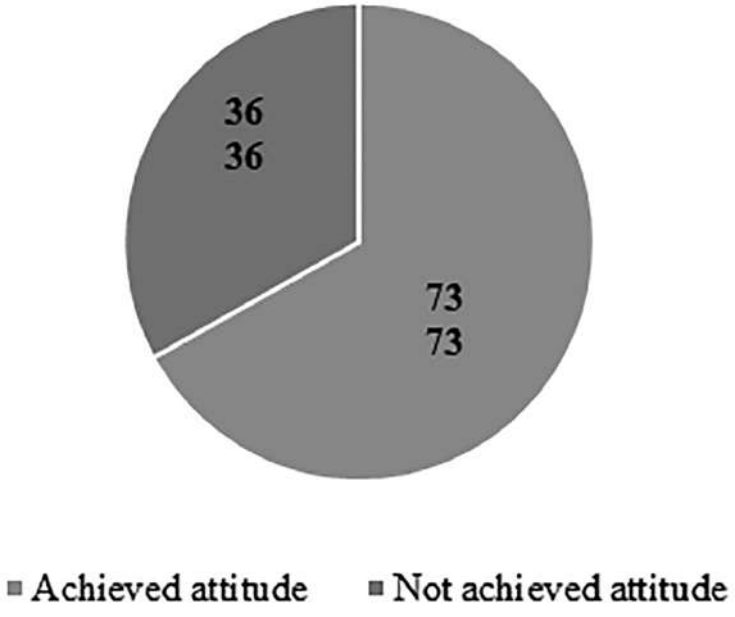

Figure 3.2. Proportion of participants achieving the required attitude toward anaphylaxis prevention and management (n = 109)

Comments: Figure 3.2 indicates that 73/109 participants (67.0%) achieved the required attitude standard regarding anaphylaxis prevention and management, whereas 36/109 (33.0%) did not.

3.3. Associations between demographic characteristics, knowledge and attitudes toward anaphylaxis prevention and management

Table 3.3: Associations between participant characteristics and knowledge of anaphylaxis prevention and management

Associated factors	Knowledge		OR (95%CI)	p
	Adequate (N/%)	Inadequate (N/%)		
Faculties/Departments				
Clinical	20 (24,4)	62 (75,6)	0,6 (0,3 – 1,7)	0,362
Subclinical	9 (33,3)	18 (66,7)		
Gender				
Male	4 (22,2)	14 (77,8)	0,8 (0,2 – 2,5)	0,645
Female	25 (27,5)	66 (72,5)		
Education				
Colleges and universities	27 (28,7)	67 (71,3)	2,6 (0,6 – 12,4)	0,35
Postgraduate	2 (13,3)	13 (86,7)		
Training Expertise				
Nursing	25 (29,1)	61 (70,9)	1,9 (0,6 – 6,3)	0,302
Midwifery, Technician	4 (17,4)	19 (82,6)		
Working time at Vinmec				
< 3 years	12 (21,1)	45 (78,9)	0,5 (0,2 – 1,3)	0,17
≥ 3 years	17 (32,7)	35 (67,3)		
Total length of professional clinical experience				
< 5 years	11 (23,9)	35 (76,1)	0,8 (0,3 – 1,9)	0,6
≥ 5 years	18 (28,6)	45 (71,4)		
Participated in training on anaphylaxis prevention and management of within Vinmec system				
Untrained/unknown	22 (37,9)	36 (62,1)	3,8 (1,5 – 10,01)	0,004
Trained	7 (13,7)	44 (86,3)		
Participated in training on anaphylaxis prevention and management outside Vinmec system				
Untrained/unknown	23 (36,5)	40 (63,5)	3,8 (1,4 – 10,4)	0,006
Trained	6 (13)	40 (87)		

Comments: Analysis of Table 3.3 shows that most sociodemographic and professional characteristics—including department, gender, educational level, professional specialty, duration of employment at Vinmec, and total clinical experience, were not significantly associated with adequate knowledge of anaphylaxis prevention and management ($p > 0.05$). In contrast, participation in anaphylaxis-related training was significantly associated with knowledge levels. Participants who had not attended or were

unaware of training within the Vinmec system were more likely to have adequate knowledge compared with those who had received training (OR = 3.8; 95% CI: 1.5–10.01; p = 0.004). A similar association was observed for training participation outside the Vinmec system (OR = 3.8; 95% CI: 1.4–10.4; p = 0.006).

Table 3.4: Association between participant characteristics and attitudes toward anaphylaxis prevention and management

Associated factors	Attitude		OR (95%CI)	p
	Adequate / (N/%)	Inadequate (N/%)		
Faculties/Departments				
Clinical	59 (72)	23 (28)	2,4 (0,97 – 5,8)	0,054
Subclinical	14 (51,9)	13 (48,1)		
Gender				
Male	10 (55,6)	8 (44,4)	0,6 (0,2 – 1,6)	0,26
Female	63 (69,2)	28 (30,8)		
Education				
Postgraduate	14 (93,3)	1 (6,7)	8,3 (1,05 – 65,9)	0,019
Colleges and universities	59 (62,8)	35 (37,2)		
Training Expertise				
Nursing	59 (68,6)	27 (31,4)	1,4 (0,5 – 3,6)	0,484
Midwifery, Technician	14 (60,9)	9 (39,1)		
Working time at Vinmec				
< 3 years	38 (66,7)	19 (33,3)	0,97 (0,4 – 2,2)	0,094
≥ 3 years	35 (67,3)	17 (32,7)		
Total length of professional clinical experience				
< 5 years	30 (65,2)	16 (34,8)	0,9 (0,4 – 1,95)	0,739
≥ 5 years	43 (68,3)	20 (31,7)		
Participated in training on prevention and management of anaphylaxis at Vinmec				
Trained	37 (72,5)	14 (27,5)	1,6 (0,7 – 3,6)	0,246
Untrained/unknown	36 (62,1)	22 (37,9)		
Participated in training on prevention and management of anaphylaxis outside Vinmec				
Trained	33 (71,7)	13 (28,3)	1,5 (0,6 – 3,3)	0,366
Untrained/unknown	40 (63,5)	23 (36,5)		

Comment: Most unrelated factors make sense for attitude (p > 0.05). However, the group with a post-graduate degree had a markedly higher achievement attitude than the college/university group (93.3% vs. 62.8%), OR = 8.3 (95% CI: 1.05–65.9; p = 0.019).

IV. DISCUSSION

4.1. Characteristics of the study population

The results indicate that the majority of participants were female (83.5%), held a college or university degree (86.2%), and belonged to the nursing profession (78.9%). This distribution reflects the the structure of the healthcare workforce in Vietnam, where nurses—predominantly women—play a central role in direct patient care. More than half of the participants had worked at Vinmec for less than three years (52.3%), and 42.2% reported fewer than five years of total

professional experience, suggesting a relatively young workforce that may have limited clinical exposure to the recognition and management of anaphylaxis. This finding is consistent with several international studies highlighting practical experience as a key determinant of competence in anaphylaxis identification and treatment [3, 5, 6].

Notably, only 46.8% of participants had received training on Circular 51/2017/TT-BYT within Vinmec system and 42.2% had undergone such training outside the system.Theseproportion underscore the need to strengthen regular training programs and implement post-training competency assessments, in line with the recommendations from international guidelines such as WAO 2020 and AAAAI 2023 [3].

4.2. Knowledge and attitude toward anaphylaxis prevention and management

The participants' mean overall knowledge score was 26.7 ± 3.4 out of 37, and only 26.6% met the predefined adequacy threshold (≥80%). Among the knowledge domains, management knowledge yielded the highest mean score (12.8/16); however, when classified using the adequacy criterion, only 62.4% achieved the required level. Most notably, the pass rate for clinical scenario/contingency knowledge was only 4.6%, indicating substantial limitations in translating theoretical knowledge into practical decision-making and response in real-life anaphylaxis situations.

These findings are consistent with prior evidence. Şimşek et al. reported that, despite awareness of the correct first-line medication, pediatric nurses demonstrated very low competence in adrenaline management in real-world contexts [13]. Similarly, a Vietnamese study by Nguyen Hai Lam found that only about 30% of nurses had adequate knowledge of anaphylaxis management, with particularly weak performance in scenario recognition and application [9]. Collectively, the results suggest that gaps in practical, situation-based anaphylaxis knowledge remain common, even within an inpatient hospital setting.

In contrast to the knowledge findings, the proportion of participants meeting the required attitude standard was relatively high (67%). Most respondents agreed that anaphylaxis is a medical emergency requiring rapid management in accordance with established protocols, reflecting a strong sense of professional responsibility in patient care. However, the coexistence of favorable attitudes and limited knowledge suggests a persistent gap between awareness and practical competence—an issue consistently reported in the international literature [1, 5, 13].

Oluwole et al. reported that higher educational attainmentis associated with more positive professional attitudes and greater receptiveness to clinical guidance and training [10]. Consistent with this evidence, the present study found a substantially higher rate of adequate attitudes among participants with postgraduate qualifications compared with those without (93.3% vs. 62.8%). This pattern suggests that advanced education may strengthen risk perception and reinforce the perceived importance of strict adherence to anaphylaxis management protocols.

4.3. Factors affecting knowledge and attitudes about anaphylaxis prevention and management

In the association analysis, most of demographic and occupational characteristics were not significantly associated withwith knowledge or attitude outcomes. Notably, participation in Circular 51/2017/TT-BYT training showed an unexpected inverse association with knowledge: participants who reported never having attended—or not knowing about—such training demonstrated a higher knowledge pass rate than those who had attended training ($p < 0.05$). This counterintuitive pattern may indicate limitations in the current training approach, which may be overly didactic and insufficiently focused on scenario-based practice and simulation—elements consistently shown to be critical for strengthening anaphylaxis management competence [1, 2,

V. CONCLUSIONS AND RECOMMENDATIONS

This study found that while most nurses, midwives, and technicians at Vinmec reported positive attitudes toward anaphylaxis prevention and management (67%), overall knowledge remained limited, with only 26.6% reaching a satisfactory level. Notably, knowledge related to clinical scenarios and practical application was very low, indicating a substantial gap between awareness and real-world response capacity. Demographic factors such as gender, department, and length of employment were not significantly associated with outcomes; in contrast, higher educational attainment and prior training were more influential.

These findings highlight the need to strengthen and redesign anaphylaxis training programs by prioritizing simulation-based, case-oriented learning and hands-on practice of adrenaline administration, complemented by periodic refresher sessions and post-training competency assessments to ensure retention. Integrating anaphylaxis content into onboarding programs for new staff is also essential to reduce knowledge gaps among those with limited clinical experience. Hospitals should implement routine monitoring and supportive policies that encourage training participation to improve clinical readiness and patient safety. Further multi-center studies are recommended to evaluate the long-term effectiveness of different training models and inform national training and quality-management strategies.

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RESULTS OF COMMUNICATION ACCORDING TO THE AIDET MODEL OF NURSING, MIDWIFERY AND MEDICAL TECHNOLOGY AT VINMEC SMART CITY HOSPITAL IN 2025
RESULTS OF AIDET BASED COMMUNICATION PRACTICE AMONG NURSES, MIDWIVES, AND MEDICAL TECHNICIANS AT VINMEC SMART CITY HOSPITAL IN 2025

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ABSTRACT

Objectives: (i) To describe the level of AIDET-based communication practice among nurses, midwives, and medical technicians; and (ii) to analyze associated factors at Vinmec Smart City Hospital in 2025.

Methods: A descriptive cross-sectional study was conducted across seven departments with 326 observed communication encounters, including 269 encounters involving nurses/midwives and 57 involving medical technicians. Data were collected using a standardized AIDET checklist through structured direct observation. Descriptive statistics were applied; proportions were compared using the Chi-square test and means (where applicable for quantitative variables such as communication duration) were compared using ANOVA. Statistical significance was set at $p < 0.05$.

Results: Overall, 299 of 326 observations (91.7%) completed all five AIDET components. The implementation rates for each component were: Acknowledge 325/326 (99.7%), Introduce 302/326 (92.6%), Duration 318/326 (97.5%), Explanation 324/326 (99.4%), and Thank you 322/326 (98.8%). The rate of full AIDET completion was higher among nurses/midwives than among medical technicians (251/269, 93.3% vs. 48/57, 84.2%; $p < 0.05$). Factors significantly associated with AIDET completion included professional group, department, and work shift. Common reasons for incomplete AIDET implementation were failure to introduce oneself, failure to communicate the expected duration, and omission of a closing thank-you.

Conclusion: The implementation of the AIDET model at Vinmec Smart City Hospital demonstrated a high level of adherence, with 91.7% of observed encounters completing

all five steps; however, the "Introduce" component showed the lowest implementation rate. Differences in AIDET completion across professional groups, departments, and shifts indicate variability in communication practice. Therefore, ongoing refresher training and standardization of AIDET practice, combined with periodic monitoring and feedback, are recommended, with priority support for medical technicians and departments with lower adherence rates. Integration of AIDET criteria into the hospital's quality assessment and professional performance evaluation systems is also advised.

Keywords: AIDET; communication; nursing; midwifery; medical technician; Vinmec Smart City Hospital.

I. INTRODUCTION

Medical communication plays a key role in ensuring the quality of healthcare, directly impacting the patient's experience, satisfaction and trust in the medical facility [9, 14]. An effective communication process not only communicates accurate information, limits professional errors, but also builds a relationship of trust and cooperation between medical staff and patients [15]. In the context of the global shift to a patient-centered care model (Patient-Centered Care), communication skills are considered a key criterion in hospital quality assessment [22].

In Vietnam, the rapid development of the private health system and hospitals has placed a requirement to standardize the communication process between medical staff and patients to ensure uniformity and high quality of services. However, recent surveys show that communication skills are still uneven, affected by work pressures, work environments, and a lack of a systematic approach [11, 16]. This leads to differences in care experience and satisfaction, especially in facilities with large patient populations and diverse needs.

The AIDET model, developed by Studer Group (USA), is a standardized communication tool consisting of 5 steps: Acknowledge, Introducing, Duration, Explanation, and Thank you. [19]. Many recent studies have proven that AIDET significantly improves patient satisfaction, reduces anxiety, and enhances the professional image of healthcare workers [10, 18]. The Press Ganey report indicates that full adoption of AIDET can increase satisfaction scores by 10–20% and reduce communication-related complaints [12].

In Vietnam, a number of studies at the provincial military, obstetrics and pediatrics and general hospitals have documented the positive effects of AIDET on nursing and midwifery [1, 2, 5, 6, 21]. However, the evidence on the application of AIDET in smart hospital environments is limited. This type of hospital, with its high-tech application and personalized care process, requires stricter communication standards to ensure consistent experience.

Vinmec Smart City Hospital is a typical smart hospital in Vietnam, with modern infrastructure and advanced hospital management system. Medical staff include many occupational groups, of which nurses (81.4%) and technicians (18.6%) are the forces that have the most direct contact with patients, working in departments such as Emergency Resuscitation, General Surgery, Pediatrics, Obstetrics, Internal Medicine, Diagnostic Imaging and Rehabilitation.

In this context, the implementation of AIDET at Vinmec Smart City is expected to standardize and improve the quality of communication, but there is currently no systematic study to assess the level of step-by-step compliance and influencing factors in the smart hospital environment in Vietnam.

Therefore, the study "Implementation of the AIDET model in the communication of medical staff at Vinmec Smart City Hospital in 2025" was carried out with two objectives: (i) To describe

the level of AIDET-based communication practice among nurses, midwives, and medical technicians; and (ii) to analyze associated factors at Vinmec Smart City Hospital in 2025.

The results of the study are expected to provide practical evidence, support strategic planning to improve the quality of medical services at hospitals, and contribute to the standardization of communication skills as a mandatory standard in patient health care.

II. RESEARCH SUBJECTS AND METHODS

Research Participants The study population comprised nurses, midwives, and medical technicians (collectively categorized as healthcare staff) currently employed at the clinical and subclinical departments of Vinmec Smart City International General Hospital. Eligible participants were those directly engaged in interpersonal communication with patients or their caregivers throughout the continuum of diagnosis, treatment, and clinical care. The evaluation was conducted through systematic, direct observation of real-time clinical interactions, benchmarked against the standardized AIDET communication framework (Acknowledge, Introduce, Duration, Explanation, and Thank You).

Inclusion and Exclusion Criteria To ensure the integrity of the data, the following criteria were applied for participant selection:

• **Inclusion Criteria:** Healthcare personnel facilitating direct communication with patients or family members during their assigned shifts , and who provided informed consent to participate in the study including acceptance of direct observation.

• **Exclusion Criteria:** Staff members currently on probation or with less than one month of professional tenure at the facility. Additionally, communication encounters not directly related to medical care, clinical treatment, or technical procedures were excluded from the analysis.

Time and place of study

The study was conducted from December 2024 to July 2025 at 07 departments/rooms of Vinmec Smart City Hospital, including: Emergency Resuscitation, General Surgery, Pediatrics, Obstetrics, Medical Examination – Internal Medicine, Diagnostic Imaging and Rehabilitation.

Research Design

The study was designed using an analytical cross-sectional descriptive method, using a structured direct observation method to assess the level of implementation of the AIDET communication model by healthcare workers in real-world communication situations.

Sample size and sampling

The sample size was determined using the standard formula for estimating a population proportion, with the following parameters: a level of significance (Z) of 1.96 (corresponding to a 95% confidence interval), an expected proportion (p) of 0.5, and a margin of error (d) of 0.06[1]. Based on these calculations, a minimum of 267 observations was initially required[2]. After accounting for a 10% attrition reserve, the final minimum target was established at 294 observations[3].

Ultimately, the study successfully gathered 326 valid observations, comprising 269 interactions by nurses/midwives and 57 by medical technicians[4]. This final sample size had exceeded the initial requirements, thereby ensuring the statistical representation of the participating departments and faculties[5].

A purposive convenience sampling method was employed to ensure comprehensive coverage across various departments, work shifts (morning, afternoon, and night), and diverse clinical communication scenarios[6]. These scenarios had included admission, hospitalization, and discharge procedures; diagnostic testing and clinical interventions; as well as treatment administration, medication, and vaccination protocols[7].

Research Variables

The study variables include:

• Characteristics of medical staff: occupational group, faculty/office, working shift.

• Characteristics of communication situations: type of situation, duration of communica-

• Result variables: the level of implementation of each component of the AIDET model (Acknowledge, Introduce, Duration, Explanation, Thank you).

• Results of full implementation of the AIDET model: satisfied or not satisfied.

• The reason for not fully completing the AIDET steps.

Data Collection Tools and Procedures

Research Instruments

The primary data collection tool was a standardized AIDET checklist, which had been developed based on the Studer Group's AIDET model and adapted to the internal implementation guidelines of Vinmec Smart City Hospital1. The instrument comprised two distinct sections:

• **Part A:** Collected demographic and professional data, including department affiliation, occupational group, work shift, type of communication scenario, and duration3.

• **Part B:** Evaluated the performance of the five AIDET components.

Each component was measured on a binary scale (1 point for 'satisfied' and 0 points for 'not satisfied'). A communication encounter was categorized as a "full completion" only if the staff member had successfully performed all five components. Prior to the formal study, the toolkit had been pilot-tested on 30 observations, yielding a Cronbach's alpha of 0.82, which confirmed high internal consistency and reliability[7].

Data Collection Process

The data collection was executed through a systematic four-step process:

1.Investigators were rigorously trained on the AIDET framework and objective observational techniques.

2.Healthcare personnel were directly observed during authentic clinical interactions.

3.Data were recorded in the checklist immediately following the conclusion of each interactionto minimize recall bias.

4.Each entry was audited for completeness and accuracy prior to electronic data entry.

Data Analysis

Quantitative data were imported, cleaned in Microsoft Excel, and subsequently analyzed using SPSS software (Version 20.0). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were utilized to summarize the data. To examine the relationships between variables, the Chi-square test was employed, with the calculation of Odds Ratios (OR) and 95% Confidence Intervals (CI). The threshold for statistical significance was pre-defined at $p < 0.05$.

Quality Control and Ethical Considerations

To mitigate observational and subjective bias, the study utilized standardized checklists and ensured uniform training for all investigators. Observations were conducted randomly across different shifts and departments without prior notification to the participants, thereby reducing the Hawthorne effect.

Regarding research ethics, the study protocol received formal approval from the Biomedical Research Ethics Council of Vinmec Smart City International Hospital (Decision No. 128/QD-VMCSC-HDDD, dated November 15, 2024). All collected data were handled with strict confidentiality and utilized exclusively for research purposes. Participants had been fully briefed on the research objectives and methodologies; they maintained the right to decline participation or withdraw at any stage without any adverse impact on their professional standing or interests.

III.RESEARCH RESULTS

3.1. General characteristics of the research populationparticipant

Table 3.1: General information of the research participants (n=326)

General characteristics		Number (N)	Rate (%)
Career Group	Nursing (NHS)	269	82,5
	Technician (KTV)	57	17,5
Faculties/Departments	Emergency resuscitation	55	16,9
	General Surgery	44	13,5
	Pediatrics	59	18,1
	Products	54	16,6
	Medical examination and internal medicine	57	17,5
	Diagnostic Imaging	41	12,6
	Rehabilitation	16	4,9
Observation Time	Morning shift	217	66,6
	Afternoon shift	84	25,8
	Night Shift	25	7,7
Communication Situations	Reception – Admission – Discharge	202	62,0
	Diagnostics – Tests – Procedures	95	29,1
	Treatment – Medication – Vaccination	29	8,9

Comments: Among the 326 total observations conducted across 90 healthcare professionals, the nursing and midwifery group represented the majority at 82.5%, whereas medical technicians accounted for 17.5%.

Regarding the distribution across departments, the highest concentrations of participants were observed in Pediatrics (18.1%), Medical Examination – Internal Medicine (17.5%), and Obstetrics (16.6%). Conversely, the Rehabilitation department recorded the lowest participation rate, at 4.9%.

The observational data were primarily collected during the morning shift, which accounted for 66.6% of the total sessions, followed by the afternoon (25.8%) and night shifts (7.7%).

In terms of clinical communication scenarios, the "Reception – Admission – Discharge" category was the most frequent, representing 62.0% of all observations. This was followed by "Diagnosis – Testing – Procedures" at 29.1%, while "Treatment – Medication – Vaccination" scenarios constituted the smallest proportion at 8.9%.

3.2. Implementation of the AIDET model in communication

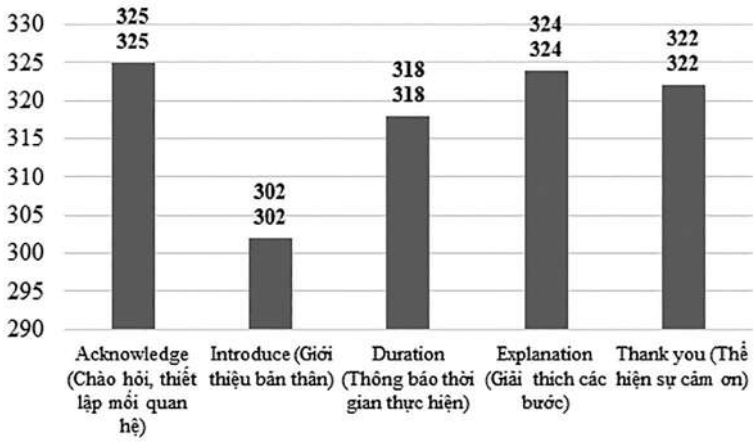

Figure 3.1: Completion rate of each component of the AIDET model (n=326)

Comments: In 326 observations, most of the components of the AIDET model were performed at a very high rate, ranging from 92.6% to 99.7%. The "Acknowledge" component achieved the highest rate (99.7%), followed by "Explanation" with 99.4% and "Thank you" with 98.8%. The "Duration Notification" component reached 97.5%. Meanwhile, "Introduce" had the lowest rate (92.6%). Overall, the full compliance with all 5 components of the AIDET model reached 91.7%.

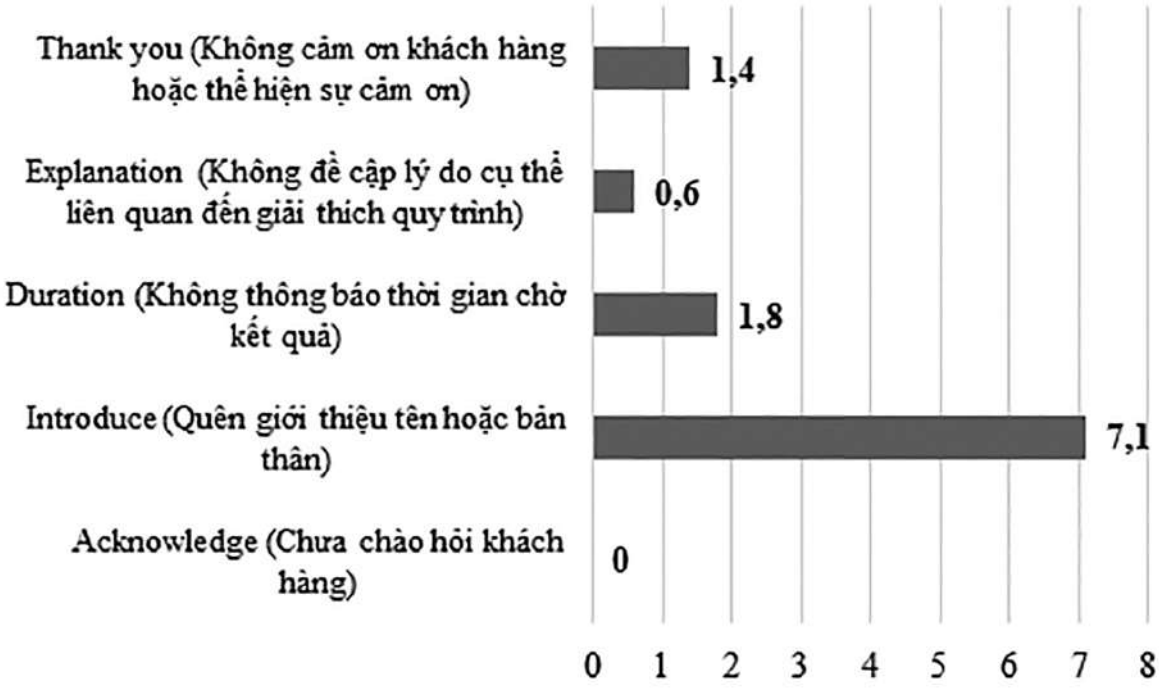

Figure 3.2: Causes of incomplete components of the AIDET model

Comments: In the observations that did not fully complete each component of the AIDET model, the most common cause was "Forgetting or not introducing the name, not introducing yourself" in the Introduction component, accounting for 7.1%. Next, in the Duration component, 1.8% of cases did not notify the waiting time for results or did not specify the specific time. The Thank you component had 1.5% of cases that did not show thanks, while the Explanation component only recorded 0.6% of cases that did not explain the process clearly. Notably, the Acknowledge component is fully implemented in all observations, there is no case of missing a greeting.

3.3. Factors related to the implementation of communication according to the AIDET model

Table 3.2: Relationship between the characteristics of the research object and the implementation of AIDET

Related factors	AIDET Completion (N/%)		OR (95%CI)	p
	Satisfied	Not satisfied		
Career Group				
Nursing (NHS)	251 (93,3)	18 (6,7)	2,6 (1,1 – 6,2)	0,029
Technician (KTV)	48 (84,2)	9 (15,8)		
Faculties/Departments				
Clinical Faculty	251 (93,3)	18 (6,7)	2,6 (1,1 – 6,2)	0,024
Diagnostic Support Department	48 (84,2)	9 (15,8)		

Observation Time				
Afternoon and night shifts	107 (98,2)	2 (1,8)	6,9 (1,6 – 29,9)	0,002
Morning shift	192 (88,5)	25 (11,5)		
Communication Situations				
Reception – Admission – Discharge	189 (93,6)	13 (6,4)	1,9 (0,8 – 4,1)	0,123
Diagnosis – Testing – Procedure – Treatment – Medication – Vaccination	110 (88,7)	14 (11,3)		

Comments: The analysis of factors associated with the full implementation of the AIDET communication model reveals several statistically significant correlations:

Occupational group: The rate of full AIDET completion among nurses and midwives (93.3%) was significantly higher than that of medical technicians (84.2%). Nurses and midwives were more likely to adhere to the complete 5-step model compared to the technician group (OR=2.6; 95%CI: 1.1–6.2; p=0.029).

Departments: Staff in clinical departments demonstrated a higher compliance rate (93.3%) compared to those in diagnostic support departments (84.2%). This difference was statistically significant (OR=2.6; 95%CI: 1.1–6.2; p=0.024).

Working Shifts: There was a prominent difference in performance between shifts5. Healthcare workers on afternoon and night shifts had a much higher completion rate (98.2%) than those on the morning shift (88.5%). The probability of full compliance during afternoon/night shifts was 6.9 times higher than during the morning shift (OR=6.9; 95%CI: 1.6–29.9; p=0.002).

Communication situation: Although the "Reception – Admission – Discharge" group had a higher completion rate (93.6%) compared to the "Diagnosis – Testing – Treatment" group (88.7%), this finding did not reach statistical significance (p=0.123).

IV. DISCUSSION

4.1. Characteristics of the research object

The study recorded 326 observations of communication activities of medical staff, of which nurses and midwives accounted for 82.5%, reflecting the typical human resource characteristics of general hospitals in Vietnam, where the nursing force plays a leading role in care, monitor and communicate regularly with the patient and the patient's family members [7, 16]. The distribution by department/department shows that Pediatrics (18.1%), Medical Examination – Internal Medicine (17.5%) and Obstetrics (16.6%) account for a high proportion. These are specialties with a large frequency of direct contact, requiring continuous, clear and standard communication to ensure patient safety and improve the care experience, in line with the assessment of domestic studies on the characteristics of communication in clinical departments with high interaction intensity [4, 8].

In terms of observation time, the majority of communication was recorded on the morning shift (66.6%), which is the time frame when many medical examination, treatment, procedures and interventions are concentrated. Studies at provincial and central hospitals in Vietnam show that morning shifts are often accompanied by high work pressure, which can easily affect the quality of communication if there is no standardized process [16]. Therefore, it is important to strengthen

and maintain the practice of communication according to the AIDET model in the morning shift to ensure uniformity and service quality in the condition of high workload.

These results are consistent with the Studer Group's report on the implementation of the AIDET model in clinical settings, in which nurses and frontline staff in clinical departments were identified as focus groups that should prioritize the application and monitoring of communication practices [19, 20]. At the same time, Ali and his colleagues' research also noted that nurses account for more than 80% of the workforce that communicates directly with patients, playing a key role in shaping patient experience and satisfaction [9].

4.2. Implementation level of components of the AIDET model

The research results show that the level of compliance with the components of the AIDET model is very high, especially at the steps of Acknowledge (99.7%), Explanation (99.4%) and Thank you (98.8%). These are the components associated with basic communication behaviors such as greeting, explaining processes and showing respect, which are regularly integrated into nursing training and standards of conduct in healthcare facilities in Vietnam [7, 16]. Many domestic studies also confirm that clear explanations and friendly communication attitudes of medical staff are closely related to patient satisfaction and sense of security [4, 7].

However, the Introduce step only reached 92.6% and was the component with the highest non-compliance rate (7.1%). This result shows that although health workers are well aware of the AIDET model, there are still certain limitations to the full and consistent implementation of each step. Some studies in Vietnam show that medical staff often tend to skip the step of introducing themselves in familiar contexts, especially for patients undergoing long-term treatment, or when the workload is high [3, 6].

This is also consistent with the findings of Shaw and colleagues in the UK, where the Introduce step is often overlooked in clinical practice, although it is a key factor in establishing professional roles and responsibilities and building trusting relationships between healthcare workers and patients [18]. According to the Studer Group, failure to clearly introduce identities and roles can cause patients to feel out of control, reduce trust levels, and affect the assessment of the care experience, even when other communication steps are adequately implemented [19, 20].

4.3. Factors related to the implementation of AIDET

Analysis of relevant factors showed that the nursing group was more likely to complete the AIDET model fully than the technician group (OR = 2.6; p = 0.029). This result can be explained by the characteristics of the professional role of nurses, when they are the force directly involved in comprehensive care, continuous monitoring and maintaining regular communication relationships with patients and family members. Meanwhile, technicians mainly perform subclinical technical activities, short contact times, and are procedural, resulting in a greater emphasis on the technical aspect rather than communication [11, 16]. The results are consistent with research by Chen et al. in China, in which occupation was identified as one of the strongest predictors of compliance with communication standards, especially standardized communication models such as AIDET [11]. In Vietnam, studies by Han Thi Thanh and Phan Thi Hong Tuyen also recorded a significantly higher rate of adequate implementation of AIDET by nurses compared to other groups of healthcare workers, showing the consistency of the current research results [5, 6].

In addition, the faculty/office is also a significant factor influencing the implementation of AIDET. Staff working in clinical departments had higher rates of full AIDET completion than support and subclinical departments (93.3% vs. 84.2%), with statistically significant differences (OR = 2.6; p = 0.024). This reflects the difference in the intensity and nature of communication, as clinical staff often have to build and maintain long-term interactive relationships with patients, thereby forming a habit of fully practicing standard communication steps [8, 17]. In contrast, in support and diagnostic imaging departments, the pressures of the number of shifts, the need for rapid rotations, and short

contact times can cause staff to prioritize the completion of professional tasks, leading to the abbreviation or omission of some components of AIDET. This phenomenon has also been documented in Hwang et al.'s study, where time pressure and high workload reduce the ability to fully perform normative communication behaviors [13].

Shift work time was a prominent relevant factor in this study. Employees working the afternoon and night shifts were more likely to complete the full AIDET than the morning shift (98.2% vs. 88.5%), with statistically significant differences (OR = 6.9; 95%CI: 1.6–29.9; p = 0.002). This result shows that the morning shift – the time when many medical examinations, procedures, hospital admissions and interdisciplinary coordination activities are concentrated – is the period with the highest work pressure, thereby negatively affecting the quality of communication. This is consistent with previous studies, in which time pressure and workload were seen as major barriers to maintaining patient-centered communication [13, 16].

In contrast, the study did not record a statistically significant difference between types of communication situations (reception – hospitalization – discharge versus diagnosis – testing – procedures – treatment – medication – vaccination) with full implementation of AIDET (p = 0.123). This shows that when the AIDET model has been implemented and standardized throughout the hospital, healthcare workers tend to maintain relatively stable communication behavior, regardless of the context or type of interaction. These results reinforce the view that AIDET is a flexible communication framework that can be effectively applied in a variety of clinical situations [19, 20].

4.4. Significance of the study

The results of this study confirm the feasibility and effectiveness of the application of the AIDET communication model in hospital settings, especially in private healthcare facilities and smart hospitals. The high level of compliance in most components of the model indicates that healthcare workers have adopted and applied the principles of standardized communication relatively well in their daily practice. This is in line with the general trend of modern hospitals, in which communication is considered an important indicator reflecting the quality of service and patient experience [22].

Firstly, self-introduction should be emphasized as a mandatory standard, regardless of whether the employee and patient are familiar or not. Several studies indicate that referrals increase feelings of safety, trust, and enhance the overall assessment of service quality [14, 18].

Secondly, it is necessary to consider adjusting the allocation of human resources and work processes in the morning shift, when work pressure is high, in order to create conditions for employees to fully carry out communication steps. Solutions may include increasing support staffing, reallocating appointments, or adopting concise but effective communication tools.

Thirdly, for departments with low completion rates such as Medical Examination – Internal Medicine, it is necessary to strengthen training and direct supervision mechanisms. The study by Ali et al. showed that immediate feedback after observation significantly improved compliance with the communication model within 3 months [9].

Finally, the integration of AIDET into the periodic training program, which combines regular monitoring and two-way feedback between staff, patient feedback, and management, will help maintain and improve the quality of communication in the long term. In the context of smart hospitals moving towards a uniform and personalized experience, standardized communication is not only a skill but also a strategic component in health service quality management.

4.5. Limitations of the study

This study has some limitations that need to be considered when interpreting the results. First of all, the cross-sectional descriptive design only reflects the current situation at a time, and does not allow to assess the trend of change or the causal relationship between related factors. In particular, the study used direct observation to evaluate the implementation of the AIDET model,

so it is difficult to avoid the Hawthorne effect, where healthcare workers are able to adjust their communication behavior in a more positive direction due to the perception that they are being monitored.

Although the team tried to mitigate this effect by not announcing the observation time in advance and performing observations on various shifts, the ability to fully control the Hawthorne effect was still limited. In addition, the study was conducted in one hospital, with a given sample size, so the ability to generalize the results to other medical facilities should be carefully considered.

V. CONCLUSIONS AND RECOMMENDATIONS

The study results demonstrate a high level of adherence to the AIDET communication model at Vinmec Smart City Hospital, with 91.7% of total observations successfully fulfilling all five stages. Notably, the components of Acknowledge, Explanation, and Thank You exhibited exceptional compliance rates of 99.7%, 99.4%, and 98.8%, respectively. In contrast, the Introduce step was identified as the least performed component, with a rate of 92.6%.

Statistical analysis reveals that AIDET completion rates varied significantly across occupational groups, departments, and working shifts. Specifically, the nursing and midwifery group demonstrated a significantly higher compliance rate compared to medical technicians (93.3% vs. 84.2%; $p < 0.05$). Primary areas for improvement include consistent self-introduction, clear notification of expected duration, and the formal expression of gratitude, underscoring the necessity for standardized communication reinforcement within specific units.

Consequently, it is recommended that the hospital sustains and enhances the efficacy of AIDET implementation through periodic, scenario-based training and intensified monitoring with real-time feedback tailored to each department and shift[7]. Priority should be given to medical technical teams and units exhibiting lower compliance[8]. Furthermore, integrating AIDET criteria into the hospital's quality management and professional performance evaluations will be crucial to ensuring the uniformity and long-term sustainability of communication standards throughout the institution[9].

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EXPERIENCES OF MEDICATION ERRORS IN CLINICAL PRACTICE AMONG NURSING STUDENTS: A QUALITATIVE STUDY IN HO CHI MINH CITY

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ABSTRACT

Objectives: This study explores the experiences and perceptions of nursing students, nursing lecturers, and clinical nurses regarding the factors and contexts leading to medication errors (MEs) in clinical practice at healthcare facilities.

Methods: A qualitative study using in-depth interviews was conducted with 21 participants, including nursing students and lecturers from Pham Ngoc Thach University of Medicine, and clinical nurses at affiliated practice sites. Data were analyzed using thematic analysis.

Results: Seven groups of factors contributing to MEs during clinical practice were identified: (1) Verbal or unclear medication orders; (2) Work overload and simultaneous multitasking; (3) Similar appearance of medications; (4) The gap between theory and practice; (5) Lack of pharmacological knowledge; (6) Fatigue, sleep deprivation, and lack of concentration; and (7) Subjective attitudes.

Conclusion: Factors associated with MEs involve both system-level and individual-level factors. Coordinated solutions from educational institutions, clinical settings, and students are necessary to minimize these errors.

Keywords: Medication errors, clinical practice, nursing students, qualitative research.

1. INTRODUCTION

Patient safety is a top priority in healthcare, in which medication errors (MEs) are among the most common causes of serious medical incidents [17]. MEs can occur at any stage of the medication administration process and not only affect patients but also create psychological pressure on healthcare professionals [5]. According to the National Guidelines on Pharmacovigilance (2021), an ME is any preventable event related to medication that occurs during the planning or administration process [1].

During clinical practice (CP), nursing students frequently participate in supporting medication distribution to patients; however, due to a lack of experience, skills, and environmental pressures, they are at high risk of committing errors [14]. Numerous studies have recorded relatively high ME rates among nursing students: 38.3% in Turkey, 39.68% in Iran [9], 17.3% in the Philippines [6], and 18.8% in Vietnam [4]. This reality poses a significant challenge to medication safety in nursing education. Investigating the causes of MEs to propose appropriate solutions is a crucial foundation for enhancing the quality of nursing training and ensuring patient safety. Nevertheless, most previous studies have primarily utilized quantitative methods, which have not yet deeply explored the lived experiences and specific clinical contexts leading to these errors. Particularly in Ho Chi Minh City, where nursing students often undergo clinical practice at tertiary referral hospitals, the heavy clinical workload many potential risks for MEs. Conducting an in-depth qualitative study allows for a comprehensive, rich, and diverse understanding of the situations and causes related to MEs during nursing students' clinical practice. This study aims to explore the experiences and perceptions of nursing students, clinical instructors, and clinical nurses regarding the factors and contexts leading to MEs in clinical practice at healthcare facilities.

2. MATERIALS AND METHODS

2.1. Study Design and Participants

A qualitative study using in-depth interviews was conducted from August 2022 to February 2023 at Pham Ngoc Thach University of Medicine. Participants were selected using a purposive sampling method, consisting of:

•15 fourth-year Bachelor of Nursing students (both general and specialized) who had previously reported medication errors in a prior quantitative study (conducted from April 2022 to June 2022) and consented to be interviewed;

•3 clinical instructors with a minimum of 3 years of experience;

•3 clinical nurses currently working at practice sites with direct contact with students.

Individuals who could not be contacted or were unable to schedule an interview time were excluded from the study.

2.2. Instruments and Data Collection

A semi-structured interview guide was utilized to deeply explore the factors contributing to medication errors (MEs) and the specific situations leading to these errors. The questions were tailored to each target group, consisting of core questions and situational follow-up questions during the interview.

• **For Students:** From your experience, what are the causes of MEs during your clinical practice? Which contexts are most likely to lead to a medication error? What factors in the clinical environment make you feel prone to confusion or loss of concentration? Can you describe a specific error situation that you witnessed or directly experienced? In that situation, which factor do you think most influenced the student's decision or action?

• **For Instructors and Nurses:** In your opinion, what are the common causes of MEs during nursing students' clinical practice? What contexts facilitate the occurrence of MEs? Which factors in the clinical practice process easily influence students to commit MEs?

Data collection was conducted through in-depth interviews in a private room, with only the researcher and the participant present. Each interview lasted between 30 and 40 minutes. The entire process was audio-recorded following the informed consent of the participants.

2.3. Data Processing and Analysis

Data from the interviews were transcribed verbatim and saved as Microsoft Word documents. The researcher performed a close reading, coded the information, and categorized the content into themes, which were then summarized into a synthesis table. Thematic analysis was employed to identify recurring and prominent patterns of content. Representative quotes were used to illustrate the themes in the results section. To ensure the reliability of the findings, research team members independently analyzed the data, cross-checked results, and held discussions to reach a consensus on the final contents and themes.

2.4. Ethical Considerations

The study was approved by the Ethics Committee of Pham Ngoc Thach University of Medicine under Decision No. 666/TĐHYKPNT-HĐĐĐ dated April 22, 2022. Participation was entirely voluntary; participants maintained the right to refuse or withdraw at any time without any impact on their studies or employment.

3. RESULTS

Through in-depth interviews, seven primary groups of factors leading to medication errors (MEs) among nursing students were most frequently recorded: (1) Verbal or unclear medication orders; (2) Work overload, with students assigned multiple tasks simultaneously; (3) Medications with similar appearances; (4) The gap between theory and practice; (5) Lack of pharmacological knowledge; (6) Fatigue, sleep deprivation, and lack of concentration; and (7) Subjective attitudes.

3.1. Verbal or Unclear medication orders

Verbal medication orders are a form inherent with many risks, especially in busy clinical environments where information can be misheard or misunderstood. One student shared a night shift situation where a doctor ordered a Glucose infusion, but the nurse communicated it as Saline, leading to incorrect administration until the records were checked: "...I only discovered it after re-checking the records..." (SV3). Another case occurred due to receiving unclear medication orders: "...the student on the night shift did not hear the order clearly from the nurse and prepared a medication for infusion instead of injection..." (SV2).

Furthermore, incomplete medication information also contributes to errors. One lecturer shared a practical situation: "...a nurse handed over a pre-filled syringe and told the student to inject 'that person,' but 'that person' could be anyone in the room, making it impossible to identify according to the '5 Rights' principle" (GV17). Additionally, illegible handwriting in medication orders can lead to incorrect drug information: "...the doctor wrote Paracetamol 500 mg, but because the handwriting was so poor, it was read as 125 mg..." (SV3).

3.2. Work overload and simultaneous multi-tasking

The excessive workload at tertiary hospitals creates significant pressure for nursing students during clinical practice. Students must undertake a large volume of work while supporting nurses under sub-optimal conditions. One student shared a specific experience: "That night, over forty cases were admitted; the patients were so crowded they had to lie in hallways and on folding cots. The nurse gave me 2-3 sets of medications, but those on cots had no bed or room numbers… I ended up distributing the wrong medication..." (SV4).

Time pressure also causes students to form a habit of working quickly to keep up with the schedule, affecting compliance with care procedures. A lecturer remarked: "…students get used to the way the nurses work quickly to keep up, and it becomes a habit" (GV18). Simultaneously, there is a psychological hesitation to ask for clarification in a fast-paced environment; students are managed by medical staff during shifts and worry that asking again might lead to being evaluated as incompetent or lacking focus, affecting their academic results. A nurse shared: "The cause is overcrowding; the staff's speed is faster than the students', but students do not dare to ask again for fear of being scolded..." (ĐD 19).

3.3. Medications with similar appearances

One of the common causes of MEs among nursing students is the similar appearance of certain medications, especially ampules or glass vials. A student shared: "Medication errors occur because the outer packaging is similar, especially glass vials; they look the same and are often stored together in the medicine cabinet; picking them up quickly leads to mistakes" (SV13). Similarities in shape, size, and color—differing only in very small details like the drug name line—increase the risk of error: "…because the two vials were identical, both glass, white, same size, same milliliters, differing only by the text on the vial…" (SV13).

This is particularly true in specialized departments that use many types of small ampule medications. An Anesthesia and Resuscitation nursing student stated: "Two tiny vials, two identical white outer wraps" (SV10). A Midwifery student reflected: "Lidocaine, distilled water in glass ampules, Magnesium Sulfate, and Camic for hemostasis are also easily confused… they are white glass tubes; some have raised red letters, while others have all black letters, making them easy to mistake" (SV14).

3.4. The gap between theory and practice

The gap between theory and clinical reality causes difficulties for nursing students. A lecturer noted: "There is a gap—a hole between theory and practice; for example, there are things I only know because I researched them or had the opportunity to work and interact with facilities that already had those policies" (GV17). Some students believe school content is too idealized compared to reality: "…the school teaches in a way that is too perfect… it hasn't created situations for us to handle, so when we get to the hospital, we don't know how to ensure correct processing..." (SV2). Another student stated: "knowledge at school and in reality is often 30-40% different; some details exist in theory but are greatly shortened in clinical practice" (SV8). Additionally, practice conditions differ significantly: "…lab sessions are only on models, with plenty of equipment and instructor support; the environment is also more relaxed than at the hospital" (SV9). If these differences are not guided in advance, they affect students' confidence and patient safety during clinical practice.

3.5. Lack of pharmacological knowledge

A factor shared by students leading to MEs is a lack of medication knowledge. Students reported lacking confidence in their pharmacological competence when carrying out medication-related orders. One student shared: "I dare not evaluate the pharmacological knowledge of all nursing students, but personally, I am not confident in knowing the information about the medication I give to patients" (SV11).

This deficiency relates not only to remembering drug names but also basic information such as indications, timing of administration, and potential side effects. Another student observed:

"students do not clearly understand the usage of that drug, for example, before or after meals, main effects, side effects; if it's the first time encountering that drug, we won't understand it clearly..." (SV1). Some students also frankly acknowledged that not mastering pharmacology can lead to incorrect execution of medication orders: "...lack of pharmacological knowledge; if you don't know the drug, you might make a medication error in the order" (SV12).

3.6. Fatigue, sleep deprivation, and lack of concentration

Physical fatigue and sleep deprivation, especially during night shifts, are factors that directly affect concentration and increase the risk of errors. Many students shared that rest time during shifts is limited, making them groggy and unalert at the start of work. A student shared: "Night shifts usually allow 2-3 hours of sleep; when just switching shifts, I'm still groggy and very tired" (SV3). Another student once took the wrong medication right after waking up: "At that moment I had just woken up… instead of taking Cefo, I took Cefa" (SV13). Students also shared they try to work quickly because they want to go home early to rest before afternoon classes: "Night shift friends are also sleepy and want to finish quickly to rest, while during the day, they want to leave early for lunch to rest before studying in the afternoon…" (SV4). Lecturer observations also showed fatigue and lack of sleep are latent causes of errors: "It's not just due to sleepiness; lack of concentration or other poor physical conditions also lead to medical errors" (GV17). Echoing this, a nurse shared: "…working too many shifts and lacking sleep is also a cause of medication errors; at my hospital (Children's Hospital), we need to calculate doses, and if you aren't alert at night, it all gets mixed up immediately" (ĐD20).

3.7. Subjective attitudes

Subjectivity is a factor leading to MEs shared by many lecturers and students. One lecturer noted that students do not realize the severity of MEs: "…sometimes they think it's just pumping medicine in and it won't affect anything; meaning they haven't imagined how dangerous the comimportance of injecting medication for the patient" (GV16). Furthermore, a subjective attitude leads to a lack of focus during work, indirectly leading to errors. A lecturer shared: "a common cause is subjectivity and lack of concentration while working. Many times while administering medication, they are thinking about something else and not paying attention to the work they are doing" (GV18).

Failing to carefully check information before and after performing a procedure is a common manifestation of subjectivity. One student shared: "…due to our subjectivity, we don't check before and after the injection" (SV4). Concurring, another student admitted: "when going to the clinic, I just subjectively thought it was correct, so I didn't check again" (SV5). Subjectivity is also shown when students over-rely on memory or become familiar with a patient's face, leading to skipping important identification steps. One case shared: "…subjective because of being familiar with the patient's face, so the friend did not re-check the name and medication. But actually, that patient was named B, not A" (SV8).

The causes of MEs during clinical practice for nursing students are rich and diverse, occurring in many different situations and contexts. Among the above causes, the factor most shared and emphasized as leading to MEs is verbal or unclear medication orders.

4. DISCUSSION

Verbal medication orders are one of the common causes leading to medication errors (MEs), as clearly documented through the sharing of students and lecturers in this study. This method of communication can harbor many risks, especially in busy clinical environments, where information is prone to being misheard, misunderstood, or not re-confirmed. A study in Iran also reported that although verbal orders may be useful in emergencies, they remain a contributing factor to errors and must be controlled. Establishing and adhering to clear order confirmation protocols and limiting verbal communication when not strictly necessary is crucial for ensuring patient safety. Work overload is another factor leading to MEs among nursing

students. A study by Musharyanti et al. in Indonesia noted similar findings, where nursing students in clinical environments with limited human resources often had to perform tasks independently without adequate supervision, leading to related errors. Furthermore, the psychological fear of being criticized or reprimanded for asking for clarification multiple times while clinical nurses are busy makes students hesitant to clarify the tasks to be performed, resulting in errors.

Medications with similar appearances are a common cause of errors that have been reported in many studies. A 2020 study by Selig reported that medications with similar packaging (65.5%) and those with similar appearances (58.8%) were among the causes leading to errors. Reports from the World Health Organization show that drugs with similar names or appearances (Look-Alike, Sound-Alike – LASA) are systemic risk factors arising from product characteristics and drug management processes, which can cause confusion even for experienced healthcare professionals. The World Health Organization and other health agencies recommend that improving packaging design is a critical element in ME reduction strategies.

Additionally, the gap between theory and practice was reported as a factor leading to MEs in this study. The discrepancy between theoretical teaching in pre-clinical settings and the application of knowledge in clinical practice causes confusion for students. Similarly, a study in Indonesia reported that nursing students were not well-prepared to apply patient safety content from theory to practical application during nursing procedures. Patient safety education needs to be integrated with real-world situations in the clinical environment. Accessing practical situations helps students better identify and enhance their ability to respond to risks affecting patient safety. Results from both the qualitative study by Musharyanti and the study by Mohaddeseh show that limitations in drug knowledge are a factor causing MEs in nursing students. This cause is quite common and has been recorded in many previous studies. The lack of pharmacological knowledge in students, combined with the presence of LASA medications, creates a resonance that increases the risk of MEs. Strengthening the teaching and review of basic pharmacology, medication safety, and scientific drug management is considered essential to help students improve their ability to identify and prevent errors when using medications.

The state of fatigue and sleep deprivation leading to a lack of concentration among nursing students, which poses a risk of errors during clinical practice, was also reported. Fatigue from long shifts and lack of rest impairs concentration and reduces the ability to recognize and react to high-risk situations during the medication administration process; this directly impacts clinical quality and safety.

Besides systemic factors such as work overload and unclear medication orders, subjective attitudes on the part of the students themselves are also a cause of MEs. A study by Cebeci et al. showed that a lack of awareness regarding the importance of verifying the "5 Rights" is a common subjective cause among final-year students. Similarly, a study in Turkey found that subjective factors, lack of clinical experience, and limited communication with clinical instructors are common subjective causes of medication errors in nursing students. Therefore, it is very important and necessary to raise the awareness of nursing students in ensuring medication safety for patients.

Some limitations of the study include the risk of recall bias as participants recounted ME experiences that had occurred previously. Additionally, with a qualitative research design and a sample selected from students who had already experienced MEs, the research results may be limited in terms of representativeness and generalizability.

5. CONCLUSION AND RECOMMENDATIONS

Medication errors among nursing students stem from both systemic and individual factors. To minimize the occurrence of these errors, clinical practice facilities should standardize medication order communication protocols while strictly limiting verbal orders to a minimum.

Furthermore, educational institutions and clinical sites must collaborate closely to ensure

that workloads are appropriately matched to student competencies. It is also essential to arrange reasonable study schedules, prioritize the physical and mental well-being of students, and implement solutions aimed at bridging the gap between theory and practice. Establishing a safety culture that encourages error reporting and experience sharing also plays a vital role in preventing medication errors.

Additionally, clinical instructors should strengthen the provision of clinical drug knowledge, with a particular focus on warning students about Look-Alike, Sound-Alike (LASA) medications. On the students' part, it is imperative to enhance personal awareness and responsibility in preventing medication errors throughout their clinical practice.

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THE CURRENT STATUS OF POSTOPERATIVE CARE FOR HIGH-RISK WOMEN AFTER CESAREAN SECTION AT THE OBSTETRICS DEPARTMENT BACH MAI HOSPITAL, VIETNAM, 2024

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ABSTRACT

Background: High-risk women after cesarean section are particularly vulnerable to postoperative complications. However, evidence regarding postoperative care practices for this population in low- and middle-income countries remains limited.

Objective: To describe postoperative complications and nursing care practices among high-risk women following cesarean section at a tertiary referral hospital in Vietnam.

Methods: A cross-sectional descriptive study was conducted among 156 high-risk women who underwent cesarean section at the Obstetrics Department of Bach Mai Hospital between March and September 2024. High-risk status was defined based on maternal, obstetric, and postoperative risk factors. Data were extracted from medical records and nursing care forms, including demographic characteristics, clinical risk factors, postoperative complications, and care activities. Descriptive statistics were used for data analysis.

Results: The mean maternal age was 32.8 ± 4.6 years, with 34.0% of women aged ≥35 years. Common risk factors included previous cesarean section (46.2%), hypertensive disorders of pregnancy (28.8%), and gestational diabetes mellitus (21.2%). Postpartum anemia (23.7%), surgical site infection (12.8%), and postpartum hemorrhage (9.6%) were the most frequent postoperative complications. Most women received adequate vital sign monitoring (94.2%) and surgical wound care (89.1%). However, psychological support was less consistently provided, with only 76.9% of women receiving counseling.

Conclusions: High-risk women after cesarean section experience substantial

postoperative morbidity. Although adherence to essential postoperative care practices was generally high, gaps remain in psychological support and comprehensive care. Strengthening holistic postoperative care may improve maternal outcomes in tertiary hospital settings.

Keywords: High-risk women; cesarean section; postpartum care; nursing care; Vietnam.

1. INTRODUCTION

Cesarean section is one of the most frequently performed obstetric procedures worldwide, particularly in tertiary referral hospitals. Although cesarean delivery is often a life-saving intervention, it is associated with a higher risk of maternal morbidity compared with vaginal delivery, especially among women with underlying medical conditions, pregnancy-related complications, or complex obstetric histories.

High-risk women after cesarean section are more susceptible to adverse outcomes such as postpartum hemorrhage, surgical site infection, thromboembolic events, delayed physical recovery, and postpartum psychological disorders. These risks necessitate comprehensive and closely monitored postoperative care. However, in many low- and middle-income countries, including Vietnam, evidence on postoperative care practices for high-risk women remains scarce.

Bach Mai Hospital is a major tertiary referral hospital in northern Vietnam, where an increasing number of high-risk cesarean deliveries are managed each year. Evaluating the current status of postoperative care for this vulnerable population is essential for identifying gaps and improving the quality of maternal health services.

2. METHODS

2.1. Study design and setting

This cross-sectional descriptive study was conducted at the Obstetrics Department of Bach Mai Hospital, a tertiary referral hospital in Hanoi, Vietnam.

2.2. Study population and sample size

cesarean section and were classified as high-risk during the postpartum period. Participants were selected consecutively from March to September 2024.

2.3. Definition of high-risk women after cesarean section

Women were classified as high-risk if they met at least one of the following criteria:

Maternal-related factors:

- Maternal age ≥35 years
- Pre-existing medical conditions (e.g., hypertension, diabetes mellitus, cardiovascular disease)
- History of preeclampsia or eclampsia
- Antenatal anemia

Obstetric-related factors:

- Previous cesarean section (one or more)
- Placenta previa or placenta accreta spectrum
- Macrosomia or multiple pregnancy
- Emergency cesarean section

Postoperative-related factors:

- Postpartum hemorrhage
- Surgical site infection
- Coagulation disorders
- Postpartum anemia

2.4. Data collection

Data were collected retrospectively from medical records and nursing care forms. Variables included demographic characteristics, obstetric and medical risk factors, postoperative complications, and postoperative care activities such as vital sign monitoring, wound care, early mobilization, nutritional counseling, and psychological support.

2.5. Data analysis

Data were analyzed using descriptive statistics. Categorical variables were presented as frequencies and percentages, while continuous

variables were expressed as means and standard deviations.

2.6. Ethical considerations

This study was approved by the Institutional Review Board of Bach Mai Hospital. All data were anonymized prior to analysis. Informed consent was waived due to the retrospective nature of the study.

3.RESEARCH RESULTS

3.1. General characteristics of participants

Table 1. Distribution of participants by age group (n = 156)

Age group (years)	Number	Percentage (%)
<30	38	24.4
30 – 34	65	41.6
≥35	53	34.0
Total	**156**	**100**

The mean maternal age was **32.8 ± 4.6 years.**

3.2. Distribution of risk factors

Table 2. Common risk factors among participants

Risk factor	Number	Percentage (%)
Previous cesarean section	72	46.2
Hypertensive disorders of pregnancy	45	28.8
Gestational diabetes mellitus	33	21.2
Antenatal anemia	29	18.6
Macrosomia / multiple pregnancy	27	17.3

3.3. Postoperative complications

Table 3. Post-cesarean complications

Complication	Number	Percentage (%)
Postpartum anemia	37	23.7
Surgical site infection	20	12.8
Postpartum hemorrhage	15	9.6
Delayed recovery	18	11.5

3.4. Status of postoperative care

Table 4. Postoperative care activities for high-risk women

Care activity	Adequate implementation (%)
Vital sign monitoring during first 24 hours	94.2
Appropriate surgical wound care	89.1
Counseling on early mobilization	85.3
Nutritional counseling	83.3
Psychological support	76.9

4. DISCUSSION

This study provides a comprehensive overview of postoperative care for high-risk women after cesarean section at a tertiary referral hospital in Vietnam. The findings reveal a high prevalence of obstetric and medical risk factors, a considerable burden of postoperative complications, and generally good adherence to essential postoperative care practices, although notable gaps remain.

More than one-third of participants were aged 35 years or older. Advanced maternal age has been widely recognized as a significant risk factor for adverse maternal outcomes following cesarean delivery, including postpartum hemorrhage, infection, and delayed recovery. The age distribution observed in this study is comparable to reports from other tertiary hospitals, where women aged ≥35 years account for approximately 30–40% of high-risk cesarean deliveries.

Nearly half of the women had a history of previous cesarean section, reflecting the increasing trend of repeat cesarean deliveries. Previous cesarean section is associated with a higher risk of abnormal placentation, uterine atony, and

postoperative infection, further emphasizing its role as a key determinant of high-risk status.
Hypertensive disorders of pregnancy and gestational diabetes mellitus were common among participants. These conditions may impair wound healing and increase susceptibility to infection and hemorrhage. Antenatal anemia, present in nearly one-fifth of participants, likely contributed to the high rate of postpartum anemia observed.

Adherence to core postoperative care practices, including vital sign monitoring and wound care, was high, reflecting the standardized protocols and clinical expertise available at a tertiary hospital. However, psychological support was less consistently implemented, highlighting a gap in holistic postpartum care.

5. LIMITATIONS OF THE STUDY

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inference between risk factors, care practices, and outcomes. Second, the single-center setting may limit generalizability to other healthcare levels. Third, retrospective data collection relied on the completeness of medical records, potentially underestimating undocumented care activities. Fourth, psychological outcomes were not assessed using validated instruments. Finally, post-discharge outcomes were not evaluated.

Despite these limitations, the study provides valuable real-world evidence on postoperative care for high-risk women in a tertiary hospital in a low- and middle-income country.

6. CONCLUSIONS

High-risk women after cesarean section at Bach Mai Hospital experience substantial postoperative morbidity. Although essential postoperative care practices were largely implemented, gaps remain in comprehensive and psychological care. Strengthening holistic postoperative care may improve maternal health outcomes.

7. RECOMMENDATIONS

- Develop standardized postoperative care protocols specifically for high-risk women.
- Enhance training for nurses and midwives in psychological assessment and counseling.
- Promote multidisciplinary collaboration to improve comprehensive postpartum care.

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HEALTHCARE STUDENTS' READINESS FOR FRONTLINE RESPONSEDURING HEALTH EMERGENCIES: 1LESSONS FROM THE COVID-19 PANDEMIC IN VIETNAM

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ABSTRACT

Purpose: This study aims to guide nursing education programs on enhancing healthcare students' readiness for frontline support during future health emergencies, using Vietnam's COVID-19 response as a case study.

Methods: A qualitative study utilizing Krippendorff's technique was conducted in July 2021 across field hospitals in Southern Vietnam. Twenty healthcare students were randomly recruited and interviewed until data saturation was achieved.

Findings: Findings indicated that students with strong self-confidence, positive attitudes, and emotional support were more inclined to volunteer during the pandemic. Their confidence stemmed from prior simulation sessions, clinical experiences, and COVID-19-specific training. Emotional support from university administrators and the community played a crucial role in sustaining their motivation and resilience.

Conclusions: Nursing programs should prioritize building self-confidence, resilience, and professional identity to better prepare students for future health crises.

Keywords: health preparedness, COVID-19, volunteerism, clinical competence, simulation training.

1. INTRODUCTION

The COVID-19 pandemic placed unprecedented strain on healthcare systems worldwide and exposed critical gaps in emergency preparedness within the healthcare workforce [1,2]. In many countries such as Denmark [3], the United Kingdom [4], the US [5], and Vietnam [6,7], healthcare students were mobilized to support frontline services, including patient care, screening, contact tracing, and logistical coordination. These experiences highlighted both the potential contribution of healthcare students and the challenges associated with their readiness to

to respond effectively in crisis situations.

While many students demonstrated strong willingness to volunteer, their readiness was influenced by professional confidence, prior training, institutional support, and emotional resilience. One study found that about 27% of nursing students in a university in Singapore [8], or 30 % in another study in Saudi Arabia [9] showed their intention to participate on the frontlines. Although students might express enthusiastic, exceptional, and voluntary attitudes to this emerging assignment, their decision has been influenced by family members, university teachers, school policies, and friends [10]. Understanding these factors is essential, not only to reflect on the COVID-19 response, but also to inform the design of preparedness-oriented nursing and healthcare education.

Beyond the pandemic context, COVID-19 functioned as a stress test for healthcare education systems. Lessons learned from students' frontline experiences provide valuable empirical evidence to guide the development of structured training frameworks that prepare healthcare students for future public health emergencies.

This study aimed to explore factors influencing healthcare students' willingness and readiness to participate in frontline healthcare services during a public health emergency, using the COVID-19 pandemic in Vietnam as a case study.

2. METHOD

Study design

The study was a qualitative approach using Krippendorff's technique.

Settings and participants

Data were collected in July 2021 at COVID-19 field hospitals in Southern Vietnam. Participants were undergraduate healthcare students (nursing, medicine, public health, and preventive medicine) who had volunteered for frontline support. Convenience sampling was applied, and recruitment continued until data saturation was achieved [11].

Data Collection

Semi-structured, in-depth interviews were conducted in private settings, each lasting approximately 30 minutes. All interviews were audio-recorded with participants' consent and anonymized prior to analysis.

Data analysis

Transcripts were analyzed following Krippendorff's analytic steps: unitizing meaning units, condensing key content, forming subcategories, and synthesizing overarching themes (Table 1). Two researchers independently reviewed transcripts to ensure analytic rigor [12].

Table 1. An example of the data analysis process.

Step 1. Decontextualization Identify meaning units	"A call for volunteer of healthcare students during this time is in-time and critically necessary to support our future colleagues in Southern cities/provinces."	"Nursing students can provide invaluable assistance to registered nurses. Several nursing procedures, which I practiced numerous times in the simulation and in hospitals. I am capable of doing these processes perfectly, step by step, exactly like professional nurses do."	"After a long day of collecting samples, my mother shared a post on her Facebok about a project calling for donations to support the difficult situation of COVID-19 in the Southern provinces with a strong belief in me and a cheer. I was inspired a lot and got more motivation to complete my work."
Step 2. Recontextualization Condense the key context	It's time to call for support from healthcare students.	Nursing students have gained enough experience from simulated practice to perform nursing procedures flawlessly.	Nursing students are more motivated by small acts of support from loved ones in the face of the epidemic.
Step 3. Sub-categorization Identify homogeneous themes	Necessity of the healthcare students' response	The information and abilities acquired during students' time in medical school would aid them in their roles as frontline healthcare providers	The small things published on social media might serve as a powerful motivator for them to perform more
Step 4. Compilation Shape sub-categories to key categories.	Willingness attitude	Self-confidence	Perceived emotional support

Ethical implications

The research has undergone the ethical approval of Vinmec Ethics Research Committee (No.28/2021/CN-HĐĐĐ VMEC).

3. RESULTS

The results of this study are distilled into four main themes, highlighting key aspects of healthcare students' readiness to provide frontline support during the COVID-19 pandemic in Vietnam.

3.1. Willing attitudes

Healthcare students exhibited a strong sense of duty and pride in their professional roles during the pandemic. The urgency and necessity of their involvement were evident as they perceived their contributions as crucial to alleviating the burden on the overextended healthcare workforce, who had to be away from their family for weeks or even months serving in COVID-19 field hospitals. Media reports on the exhausting conditions faced by healthcare workers amplified the students' awareness of the significance of their support. Many students felt that their participation was not just a voluntary act but a professional obligation to their future colleagues and the community. One student remarked:

'A call for volunteers of healthcare students during this time is in-time and critically necessary to support our future colleagues in Southern provinces.' This sentiment was echoed across the student body, reflecting a collective recognition of their professional identity and the vital role they could play.

Healthcare students were proud of their professional titles and the education they received at medical schools. They believed that the pandemic made themselves, patients, and society in general aware of the importance of the profession. Healthcare students voluntarily provided COVID-19 frontline support as they considered themselves a part of the healthcare workforce. This was a valuable work that healthcare students from across the nation could support their home country, especially vulnerable people who suffered from COVID-19, to overcome the most challenging period of the pandemic. A group leader of healthcare students said that:

'We understand our participation is essential during this difficult time to support the medical workforces. Medical students should not say 'No'. Although our knowledge in holistic care, especially for COVID-19 patients, is inadequate, we have basic knowledge from our studies at school, and we will try our best.'

3.2. Self-Confidence and Influence of Prior Experience

The willingness to engage in frontline support was closely tied to the students' self-confidence, which was significantly bolstered by their previous experiences in clinical practice, simulation sessions, and supplementary training. These experiences provided a strong foundation for the students, enabling them to adapt quickly to the dynamic and often unpredictable environment of a COVID-19 field hospital.

The nature of clinical practice could vary from one clinical setting to another; however, the underlying principles of patient safety should be the foundation for health professionals to follow when delivering patient care. With the supervision of a senior nurse, a nursing student confidently shared that:

'Several nursing procedures, I practiced numerous times in the simulation and in hospitals. I am able to perform step by step and exactly as professional nurses do.'

Furthermore, supplementary training courses specifically designed to prepare students for the COVID-19 response played a crucial role in enhancing their self-efficacy. These courses offered updated information on COVID-19, including personal protection, contact tracing, and patient care, and provided opportunities for students to engage with experts and discuss their concerns. A group leader reflected on this preparation:

'My university offered some courses about COVID-19 for medical students. These courses provided updated information about personal protection, contact tracing, and initial care for COVID-19 patients. In each class, we had chances to practice and discuss with lecturers, experts, and experienced health workers, which

our self-confidence a lot.'

For many students, it was not their first participation in the COVID-19 frontline support. Experience gained from their involvement during the first wave of COVID-19 in Vietnam also influenced students' decision to retake this voluntary task. The environment and pressure from the frontline were very new and strange for both staff and students; however, the prior experience gave students the confidence to contribute to the establishment of work collaboration in a newly set up COVID-19 field hospital. A student majoring in preventive medicine said:

'This is the third time I voluntarily register to be on the frontline. We do not know everything about COVID-19, but at least I can confidently say that I have experiences in different working positions to properly set up students' teamwork to support the healthcare workforce here.'

3.3. Perceived Necessity and Opportunity for Real-Life Experience

In addition to their willingness and confidence, healthcare students viewed their participation in the COVID-19 response as a valuable opportunity to gain real-life experience that would benefit their future careers. The chance to work alongside experienced healthcare professionals, observe patient care, the progression of COVID-19 patients, and directly contribute to patient recovery was highly motivating for the students.

Despite the inherent challenges and initial hesitation, students recognized the unique learning opportunities presented by the pandemic. They were eager to acquire new knowledge, particularly about a novel infectious disease, and to apply their theoretical learning in a real-world context. One nursing student expressed this motivation, saying:

'The involvement of healthcare students during this time to support health workers is obviously essential. With adequate personal protective equipment and a suitable working schedule, it will be a great chance for us to obtain more medical knowledge, especially about a novel infectious disease.'

For some students, the experience also served as a critical eye-opener, revealing the complexities of healthcare systems and the need for adaptability in crisis situations. A medical student shared:

"Working in a COVID-19 field hospital was an intense and challenging experience. It was a crash course in crisis management, and I learned more in those weeks than I ever could in a classroom. This experience taught me the importance of flexibility and quick decision-making in healthcare."

The opportunity to collaborate with seasoned professionals provided students with insights into interprofessional teamwork and the dynamics of patient care in high-pressure environments. One student, majoring in preventive medicine, highlighted the importance of this exposure:

"Being part of a healthcare team during the pandemic was invaluable. It gave me a firsthand look at how doctors, nurses, and other healthcare workers coordinate and support each other, especially under stressful conditions. This experience has definitely influenced how I see my future role in healthcare."

The students also acknowledged the emotional and psychological growth that came from facing the realities of a global health crisis. As one student put it:

"The pandemic pushed us beyond our comfort zones, but it also made us stronger and more resilient. We were not just learning technical skills; we were learning how to cope with stress, how to support our colleagues, and how to maintain our own well-being in the face of overwhelming challenges."

3.4. Perceived Emotional Support

The emotional and psychological well-being of healthcare students played a critical role in sustaining their motivation and resilience on the frontline. Emotional support from university administrators, faculty members, and the broad-

cope with the stress and demands of their roles.

Students frequently mentioned the importance of timely encouragement and empathetic attitudes from their faculty, which reinforced their sense of worth and capability. One nursing student recalled a particularly challenging moment:

'I still remember that upsetting and stressful day when I was classified as at high risk of exposure. Everything seemed to be falling. One of my favorite teachers knew that, and she called me to calm me down and encourage me a lot. My mood was boosted after that, and I was able to get back to work normally. I really appreciated that in-time emotional support.'

In addition to institutional support, the recognition and appreciation from the community also served as a significant source of emotional sustenance. Social media, virtual projects, and public acknowledgments of healthcare workers' efforts were powerful motivators for students, reinforcing their sense of belonging and commitment to the cause. One student reflected on how a small gesture from her mother lifted her spirits:

'After a long day, really tired, my mother shared a post on her Facebook about a project calling for donations to support the difficult situation of COVID-19 in the Southern provinces. She was proud of me, and it inspired me a lot.'

4. DISCUSSION

Although grounded in the COVID-19 context, the findings reflect fundamental components of healthcare emergency preparedness. Willingness to serve, professional self-confidence, and emotional support are essential attributes for healthcare students responding to crisis situations. Evidence showed that 80% of healthcare students in an Indian medical school had a positive attitude[13], or more than three-four individuals in another study in New Delhi expressed their readiness to participate in frontline care in COVID-19 outbreaks [14]. Healthcare students were flexible and could perform effectively with different tasks such as assisting call-based information centers [13,15], screening COVID-19 patients, serving for database management of COVID-19 information, and caring for homeless and older patients [13]. As healthcare students, they were confident with the knowledge gained from their courses at medical schools. They also highlighted the importance of training courses, specifically about COVID-19, in preparing them confidence with new tasks at the frontline. Studies showed that 80% of Jordanian healthcare students and 91% of Ugandan healthcare students demonstrated proper or adequate knowledge about COVID-19 before participating in the frontline workforce [13]. Although the healthcare students will keep volunteering in social works, lessons learned from the COVID-19 pandemic revealed expanding opportunities for clinical practice, simulation-based education, and crisis-based learning experiences will better prepare students for the complexities of healthcare work.

To ensure that future healthcare students are equally prepared, nursing education programs must prioritize the development of specific attributes. Building self-confidence is crucial, and this can be achieved by providing students with ample opportunities for simulation and clinical experiences. Such experiences are essential for helping students develop the skills and confidence needed to manage the challenges of frontline support, as well as for building resilience and emotional fortitude, which are vital for coping with the stress and uncertainty inherent in emergency situations.

There is also a need to strengthen professional identity and ethical commitment among healthcare students. Programs should focus on integrating professional values and ethics into the curriculum, emphasizing the role of healthcare providers in times of crisis. An integrative systematic review of professional identity measures for student health professionals underscored the need for university programs to integrate professional values and ethics into the curriculum, promoting safe and effective clinical practice the importance of ethics education in fostering ethical competence, enabling healthcare professionals and students to appropriately navigate ethically challenging situations, especially

during crises [16]. A study on nursing and midwifery students further emphasized the critical role of professional identity in effective practice, advocating for transformative educational approaches that incorporate professional judgment, reasoning, critical self-evaluation, and accountability [17].

Societal norms and cultural values influenced students' desire to volunteer . According to studies, the value of healthcare providers was related not only to professionalism and expertise but also the capacity to build trust and connections with a diverse group of individuals, which healthcare students might acquire and practice through volunteer activities [18]. Volunteering enabled students to develop critical cultural competencies, social skills, communication abilities, and an understanding of the social context [19]. A study in the US provided evidence that students who used to join a voluntary work were more likely to possess leadership abilities, social self-confidence, critical thinking abilities, and conflict resolution skills than non-volunteers [20]. Also, they would become potential candidates for admission or employment who would command higher salaries [21,22]. Healthcare students, therefore, should be more open to social activities and more ready to respond to urgent calls for support not only to join hands to help others but also self-improve personal capacities for a successful career.

CONCLUSION

Healthcare students' willingness to join the COVID-19 frontline highlights the importance of preparing future professionals through enhanced education. Confidence in their roles was supported by their academic training and specific courses on COVID-19, underscoring the need for simulation-based education and crisis-based learning. To ensure readiness for emergencies, nursing programs should integrate clinical experiences and emphasize building resilience, professional identity, and ethical commitment. Additionally, engaging in volunteer activities fosters essential cultural competencies, social skills, and leadership abilities, preparing students for diverse challenges in their careers. Thus, a comprehensive approach that combines academic rigor, practical experiences, and social engagement is crucial for developing well-rounded healthcare providers capable of effectively responding to crises.

DECLARATION

Ethics approval: The research has undergone the ethical approval of VinMec Ethics Research Committee No.28/2021/CN-HĐĐĐ VMEC signed on June 28th, 2021.

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PERIPHERAL INTRAVENOUS CATHETER FRACTURE DUE TO ACCIDENTAL CUTTING WITH SCISSORS: LESSONS FROM TWO CASEREPORTSAND THE IMPORTANCE OF IMMEDIATE CLINICAL RESPONSE

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ABSTRACT

Background: Peripheral intravenous catheter (PIVC) fracture is a rare but potentially catastrophic complication. While traditionally attributed to technical insertion errors—such as needle reinsertion causing cannula shearing—iatrogenic fracture during catheter removal remains undocumented. This report describes an unprecedented mechanism of PIVC fracture caused by accidental severing with scissors and evaluates the impact of the immediate clinical response on patient outcomes.

Case Presentation:

•**Case 1:** An 86-year-old male experienced a PIVC transection during elective removal using scissors. Immediate proximal digital venous compression successfully sequestered the 6-mm fragment, allowing for definitive surgical retrieval via localized venous cutdown. The patient recovered without sequelae.

•**Case 2:** A 40-year-old male suffered a similar iatrogenic transection; however, the absence of immediate compression resulted in fragment displacement. Despite multi-modal imaging (X-ray, ultrasound, and CECT) and exploratory surgery, the 5x2 mm fragment was not retrieved. Follow-up imaging confirmed distal embolization to an unidentified location, leading to a protracted and unresolved clinical course.

Conclusion: These cases underscore the decisive role of immediate proximal manual occlusion in preventing the systemic embolization of fractured catheter fragments. The starkly divergent outcomes demonstrate that clinical hesitation significantly escalates diagnostic complexity and surgical failure. Furthermore, this report highlights a critical latent risk in routine nursing care, mandating the absolute prohibition of sharp instruments during PIVC removal and the institutionalization of standardized emergency response algorithms.

Keywords: Catheter fracture, iatrogenic embolism, venous cutdown, nursing safety protocols, digital compression.

1. INTRODUCTION

Peripheral intravenous catheterization (PIVC) remains the most prevalent invasive procedure in clinical practice, facilitating essential therapeutic delivery for millions of patients worldwide [8]. Despite its clinical ubiquity, PIVC is fraught with high complication rates, with failure occurring in up to 70% of cases [8]. While mechanical issues such as phlebitis, occlusion, and extravasation are frequently encountered, intravascular catheter fracture represents an exceedingly rare but potentially catastrophic adverse event [1, 3–5]. Unlike central venous catheters (CVCs), where fractures are more common due to increased length and central venous pressures, PIVC fractures are typically attributed to technical mishaps during insertion—most notably the reinsertion of the introducer needle into a partially advanced cannula, causing structural shearing [1, 4, 6, 7].

Existing literature focuses predominantly on device-related fatigue or the technical proficiency of the clinician [1, 4, 5]. However, the two cases presented herein expose a previously undocumented iatrogenic mechanism: accidental severing with scissors during dressing removal. This distinction pivots the clinical discourse from technical skill to human factors and procedural non-compliance. These incidents underscore that grave risks can remain latent in routine nursing tasks if fundamental safety principles—specifically the prohibition of sharp instruments at vascular access sites—are compromised [8].

The objective of this report is to describe two contrasting cases of non-technical PIVC fracture. By comparing their disparate clinical trajectories, we aim to provide an evidence-based framework for the prevention, diagnosis, and immediate management of this rare but preventable complication.

2. Case prentation

This is a descriptive case report, an observational study of two rare incidents that occurred at a provincial general hospital in 2025. Data were chronologically, covering the events of the incident and the subsequent treatment processes. Informed consent was obtained from both patients for the development of this report, in full compliance with ethical principles in medicine.

2.1. Case 1: Efficacy of immediate proximal compression

An 86-year-old male with a medical history of chronic obstructive pulmonary disease (COPD) and hypertension was admitted for intravenous antibiotic therapy. A 22-gauge PIVC was placed in the distal third of the left forearm and remained indwelling for 50 hours. During elective catheter removal, the nursing staff utilized scissors to debride the adhesive dressing, resulting in the accidental transection of the catheter cannula. The 6-mm distal fragment subsequently embolized into the venous lumen.

Upon immediate recognition of the fragment displacement, the attending nurse performed a decisive maneuver by applying digital venous compression proximal to the insertion site. This rapid intervention successfully sequestered the fragment, preventing further cephalad migration. Following a surgical consultation, a localized venous cutdown was performed slightly proximal to the original puncture site, leading to the successful retrieval of the fragment. The post-procedural course was uneventful; the patient remained hemodynamically stable and was discharged on day 5. This case underscores how prompt iatrogenic recognition and immediate manual occlusion can avert severe embolic sequelae.

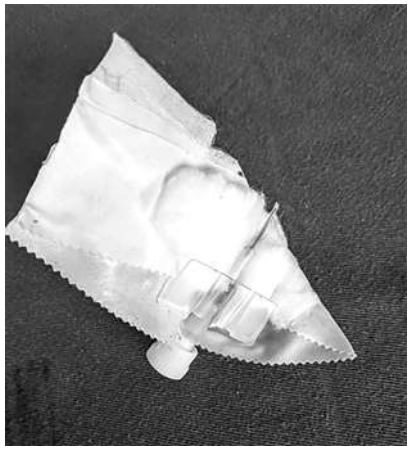

Figure 1: The severed catheter fragment (Case 1)

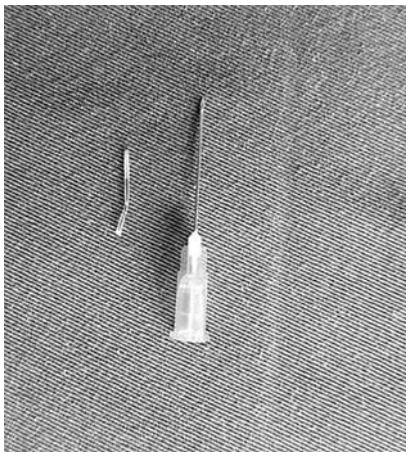

Figure 2: The severed catheter fragment successfully retrieved from the vein (Case 1)

2.2. Case 2: The consequences of delayed intervention and diagnostic complexity

A 40-year-old male with type 2 diabetes mellitus and transaminitis was admitted for fluid resuscitation via a 22-gauge PIVC, placed in the distal third of the right forearm. Following a 53-hour indwelling period, the catheter was accidentally transected with scissors during elective removal. Unlike Case 1, immediate digital compression was not initiated. Although a pressure bandage was subsequently applied to the proximal forearm, the initial window for localized sequestration was missed.

The diagnostic workup proved challenging. Initial radiography was unremarkable, consistent with the radiolucent properties of standard PIVC polymers. Subsequent venous ultrasonography of the right upper limb identified an acute thrombus completely occluding the mid-forearm cephalic vein, but failed to provide definitive sonographic evidence of the foreign body. An emergent surgical thrombectomy was performed; however, the fragment remained elusive.

Following transfer to a tertiary facility, Contrast-Enhanced Computed Tomography (CECT/MSCT) localized a $5 \times 2 \text{ mm}$ hyperdense structure within the cephalic vein lumen. Despite this finding, a repeated ultrasound immediately thereafter and a follow-up scan 12 hours later were negative, suggesting distal embolization to an unidentified anatomical site. Throughout the observation period, the patient remained hemodynamically stable without respiratory or circulatory distress. Due to the failure of retrieval, the patient required prolonged monitoring, illustrating the significant clinical and economic burden of unretrieved intravascular fragments.

Feature	Case 1	Case 2
Patient Information	Male, 86 years old	Male, 40 years old
Diagnosis	COPD, Hypertension	Type 2 Diabetes Mellitus, Elevated liver enzymes
Catheter Indwelling Time	50 hours	53 hours
Mechanism of Fracture	Accidental severing with scissors	Accidental severing with scissors
Immediate Nursing Response	Immediate proximal pressure applied	No immediate pressure applied
Diagnostic Modalities	Venous ultrasound	X-ray, Venous u ltrasound, CT Angiography (MSCT)
Management Strategy	Immediate surgical venous cutdown	Exploratory surgery (failed), CT localization
Outcome	Successful 6mm fragment retrieval. Full recovery.	Fragment not retrieved. Embolization to an unidentified location.

Postincident Hospital Stay	5 days	Prolonged due to hospital transfer

3. DISCUSSION

3.1. An unprecedented mechanism of PIVC fracture

The cases presented herein are etiologically distinct from existing literature. While conventional PIVC fractures are predominantly attributed to technical mishaps—specifically the reinsertion of the introducer needle into a partially advanced cannula [1, 4, 5]—or material fatigue from prolonged indwelling time and joint-related mechanical stress [5], our cases introduce an unprecedented mechanism: accidental iatrogenic severing via scissors.

This finding pivots the clinical discourse from device-related or technical proficiency issues toward human factors and procedural non-compliance. These incidents were not symptomatic of structural device defects or inadequate insertion skills; rather, they represented a fundamental breach of nursing safety protocols—specifically the contraindication of using sharp instruments near vascular access sites [8]. Such occurrences expose a critical vulnerability in clinical training, reinforcing that even routine nursing tasks harbor latent risks for catastrophic complications if performed without rigorous adherence to established safety standards.

3.2. Clinical outcomes and the decisiveness of immediate intervention

The most significant finding of this report lies in the divergent outcomes of the two cases, which are directly attributable to the immediacy of the post-incident clinical response. In Case 1, the instantaneous application of manual compression proximal to the fracture site functioned as a physiological barrier, neutralizing venous hemodynamic forces that would otherwise have facilitated distal migration. This maneuver—occluding the venous return superior to the fragment—effectively sequestered the foreign body, enabling a localized and uncomplicated surgical retrieval. Such an intervention aligns with established emergency protocols for mitigating intravascular embolism [1, 4] and underscores the criticality of the "golden seconds" following a fracture.

Conversely, Case 2 serves as a cautionary paradigm of the sequelae associated with clinical hesitation. The absence of an immediate compressive response allowed the fragment to be swept into the systemic circulation, rendering later attempts at localized pressure ineffective. The subsequent cascade of events—including failed exploratory surgery, the requirement for high-resolution diagnostic imaging, and inter-hospital transfer—exemplifies how a momentary delay can transform a manageable incident into a protracted, costly, and ultimately unresolved clinical dilemma. This comparison reinforces that decisive initial action not only dictates the feasibility of retrieval but also minimizes secondary risks, including unnecessary radiation exposure, extended hospitalization, and the psychological burden on the patient.

3.3. Diagnostic challenges and the efficacy of advanced imaging modalities

The diagnostic trajectory of Case 2 underscores the inherent limitations of conventional screening for intravascular foreign bodies. Since most PIVCs are composed of non-radiopaque polymers, they remain largely occult on routine radiography—a challenge consistently documented in the literature and reaffirmed in our findings [1, 3, 4]. This necessitates a strategic escalation to more sensitive imaging modalities.

While bedside ultrasonography offers a rapid, non-invasive means of visualizing superficial vessels, its diagnostic yield is significantly attenuated by factors such as minimal fragment size, concurrent thrombus formation, or proximal migration, as evidenced in Case 2. In such indeterminate scenarios, Computed Tomography Angiography (CTA/MSCT) emerges as the gold standard, providing the superi-

spatial resolution and contrast enhancement required for definitive anatomical localization and the exclusion of distal embolization [1, 4].

Table 3.2: Comparison of diagnostic imaging modalities for catheter foreign bodies

Modality	Advantages	Disadvantages	Indications
Routine X -ray	Widely available, low cost	Fails to detect non - radiopaque foreign bodies (PIVC) [1], [3], [4].	Virtually useless for PIVC [1], [3], [4].
Vascular Ultrasound	Non -invasive, radiation -free, available at the bedside	May be inconclusive if the foreign body is small or has migrated [1], [4].	First -line choice for superficial foreign bodies suspected to be retained [1], [3], [4].
CT or CT Angiography	Precise localiz ation, unaffected by thrombus formation	Radiation exposure, requires contrast media, high cost	The gold standard for localizing migrated foreign bodies [1], [4].

3.4. Management strategies and potential complications of retained foreign bodies

The clinical management of intravascular foreign bodies remains contentious, particularly regarding small, distal fragments. While current consensus mandates retrieval to mitigate risks of thrombosis, sepsis, or cardiac perforation, the optimal intervention is strictly dictated by the fragment's anatomical location [1, 3–5]. Although endovascular extraction is the gold standard for central embolizations, its feasibility is often limited for small, peripheral segments [1]. In such instances, localized surgical intervention—as demonstrated in Case 1—remains a highly effective and definitive approach, provided the fragment remains stationary.

Conversely, the failure to retrieve the fragment in Case 2 challenges the viability of a conservative 'watchful waiting' strategy. Evidence from Dell'Amore et al. corroborates that even small, peripherally-originated PIVC fragments can embolize to the pulmonary vasculature, manifesting as persistent symptoms such as non-productive cough and low-grade pyrexia [4]. The eventual necessity for an invasive thoracotomy in their report underscores that initially asymptomatic retained fragments can result in significant delayed morbidity [4]. Thus, our findings, aligned with existing literature, emphasize that immediate intervention and definitive retrieval are paramount to forestalling both acute sequelae and chronic complications [1, 3–5]."

Table 3.3: Comparison of peripheral catheter fracture cases in the literature

Feature	This Report (Case 1)	This Report (Case 2)	Report by Adeosun et al [1]	Report by Dell'Amore et al [4]	Report by Kumar et al [5]
Etiology	Severed with scissors	Severed with scissors	Multiple catheter reinsertions	Needle reinsertion	Undetermined, during withdrawal
Immediate Response	Immediate venous compression	No immediate venous compression	Not specified	Not specified	Not specified

Initial Diagnosis	Ultrasound	X-ray (negative), Ultrasound	Ultrasound (negative), X - ray (negative)	Venous ultrasound (negative)	X-ray (inconclusive)
Diagnostic Modality	Venous ultrasound	CT Angiography	CT Angiography	CT Angiography	High - resolution ultrasound
Management	Minor surgical venous cutdown	Failed minor surgery, fragment not found	Venous cutdown under general anesthesia	Wait and watch, then thoracotomy	Surgical retrieval
Outcome	Successful retrieval	Fragment not retrieved	Successful retrieval	Successful retrieval, full recovery	Successful retrieval

4. CONCLUSIONS AND RECOMMENDATIONS

The clinical disparity between the two cases presented underscores a fundamental principle in vascular access safety: the outcome of a peripheral intravenous catheter (PIVC) fracture is dictated less by the complication itself and more by the immediacy of the clinical response. While PIVC fracture is a rare adverse event, these cases highlight an emerging, non-technical risk—accidental mechanical trauma caused by the use of sharp instruments during routine nursing care.

The successful retrieval in Case 1, contrasted with the failed intervention and subsequent embolization in Case 2, provides empirical evidence that immediate proximal digital compression is the most critical maneuver in preventing distal migration and mitigating severe sequelae. Furthermore, these incidents expose a critical gap in procedural compliance, emphasizing that patient safety is contingent upon strict adherence to fundamental protocols—specifically the absolute avoidance of scissors at vascular access sites.

Ultimately, ensuring patient safety requires a dual approach: the rigorous standardization of basic nursing procedures and the implementation of specific emergency algorithms for catheter-related complications. Establishing a "Just Culture" that prioritizes transparent, real-time reporting of such near-misses remains essential for fostering a resilient healthcare environment and preventing the recurrence of similar prevent-

Drawing from the comparative analysis of these cases and the identified systemic gaps, the following evidence-based recommendations are proposed to enhance safety protocols and optimize the clinical management of PIVC-related complications:

* For nursing practice

- Procedural compliance: Strictly adhere to evidence-based protocols, maintaining an absolute contraindication against using scissors or sharp instruments for dressing removal at vascular access sites.
- Post-Removal integrity verification: Systematically perform a visual inspection of every explanted catheter. Any structural compromise or missing segment must be immediately reported as a critical medical incident.
- Immediate hemodynamic maneuver: Upon suspicion of catheter fracture, apply instantaneous proximal digital compression. This priority intervention is vital to arrest fragment migration and facilitate localized retrieval.
- Evidence-Based diagnostic pathway: Utilize bedside ultrasonography as the first-line modality for superficial localization, transitioning to CT Angiography (MSCT) for definitive mapping if migration is suspected.

* For healthcare íntitutions

- Institutional standardization: Enforce competency-based training programs that explicitly prohibit high-risk practices, such as needle reinsertion and the use of unapproved tools during PIVC removal.
- Cultivating a "Just Culture": Promote an organizational environment that prioritizes transparent, real-time reporting of near-misses. Root

Cause Analysis (RCA) of these incidents should drive continuous safety improvements.

- Implementation of emergency Algorithms: Develop and disseminate standardized clinical pathways (algorithms) for catheter embolism to ensure a synchronized and rapid response across multidisciplinary teams.

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COMPREHENSIVE NURSING CARE FOR PATIENTS WITH 46,XY DISORDERS OF SEX DEVELOPMENT (COMPLETE ANDROGEN INSENSITIVITY SYNDROME) A CASE REPORT

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ABSTRACT

Introduction: Complete androgen insensitivity syndrome (CAIS) is a rare 46,XY disorder of sex development (DSD) caused by pathogenic mutations in the androgen receptor (AR) gene. Affected individuals have a 46,XY karyotype but a completely female phenotype. Diagnosis is usually made during adolescence due to primary amenorrhea and may result in significant psychological distress, including anxiety, grief, and identity-related concerns. Nursing care is central to postoperative management, psychosocial support, and long-term patient education.

Case presentation: We report the case of a 20-year-old phenotypic female patient who presented with primary amenorrhea. CAIS was diagnosed based on a female phenotype (Tanner stage V, absence of pubic and axillary hair), a 46,XY karyotype, a pathogenic AR gene mutation, absence of the uterus and ovaries, and bilateral intra-abdominal testes. The patient expressed a consistent and explicit intention to continue living as a woman and underwent laparoscopic bilateral gonadectomy.

Nursing care process: This report focuses on three main aspects of nursing care: (1) immediate postoperative surgical care following laparoscopic gonadectomy; (2) patient education and preparation for lifelong estrogen replacement therapy (ERT); and (3) psychosocial support delivered with tactful and appropriate communication while respecting the patient's expressed gender identity.

Conclusion: Successful management of CAIS requires a multidisciplinary team approach. Nurses play a central coordinating role, helping patients adapt to the psychological impact of the diagnosis, ensuring postoperative safety, and preparing them practically and psychologically for long-term hormone therapy, thereby facilitating social integration.

1.INTRODUCTION

Disorders of sex development (DSD) are congenital conditions characterized by atypical development of chromosomal, gonadal, or anatomical sex characteristics. Androgen insensitivity syndrome (AIS) is one of the most common causes and results from mutations in the androgen receptor (AR) gene located on the X chromosome. AIS is rare, with an estimated prevalence of 1 in 20,000 to 1 in 64,000 individuals with a 46,XY karyotype.

In complete androgen insensitivity syndrome (CAIS), despite having a 46,XY karyotype and testes capable of androgen production, the body is entirely resistant to androgen action, resulting in a typical female phenotype. Consequently, diagnosis is often delayed until adolescence when patients present with primary amenorrhea. Prior to diagnosis, many cases are misidentified as inguinal hernias in children raised as girls.

Disclosure of information such as the presence of a 46,XY karyotype and the absence of a uterus to a young woman can cause profound psychological distress, particularly during adolescence, when social conformity is highly valued.

Management of DSD requires a multidisciplinary team involving endocrinologists, surgeons, geneticists, and mental health professionals. Within this team, specialized nursing care is essential, providing continuous support, tactful and appropriate communication, and serving as a trusted liaison between patients, families, and healthcare providers. This report presents a detailed nursing care process for a patient with CAIS treated at Hanoi Medical University Hospital.

2.CASE PRESENTATION

Clinical data were extracted from the medical records of patient Dao K. P., Hanoi Medical University Hospital.

Patient: Dao K. P., 20 years old (born in 2005), phenotypic female.

Reason for admission (October 2024): Primary amenorrhea.

Medical history and clinical examination

The patient presented with a female phenotype and a female gender identity and had been socially reared and living as a woman. Pubertal development was normal with breast development, but menstruation had never occurred.

Physical examination revealed a height of 170 cm and weight of 54.8 kg with a well-proportioned body habitus. Breast development corresponded to Tanner stage V. There was a complete absence of pubic and axillary hair. External genitalia were female, with a blind-ending vagina measuring 45–50 mm.

Laboratory and imaging findings

Hormonal evaluation (August 2023) showed elevated testosterone (27.28 nmol/L), elevated luteinizing hormone (36.33 mIU/mL), and elevated anti-Müllerian hormone (23.96 ng/mL), consistent with androgen resistance.

Pelvic magnetic resonance imaging (October 2024) demonstrated absence of the uterus and ovaries and identified bilateral testes located high in the inguinal canals, measuring approximately 33×18×13 mm and 32×22×13 mm.

Genetic analysis (October 2024) revealed a 46,XY karyotype and a hemizygous pathogenic variant in the AR gene: c.2566C>T (p.Arg856Cys).

Diagnosis

The patient was diagnosed with complete androgen insensitivity syndrome. She expressed a consistent and explicit intention to continue living as a woman.

Surgical intervention (October 2025)

Following multidisciplinary consultation, laparoscopic bilateral gonadectomy was indicated.

On 2nd October 2025, the patient underwent laparoscopic bilateral gonadectomy with preperitoneal mesh placement using the transabdominal preperitoneal (TAPP) technique.

Histopathological examination revealed benign Sertoli cell adenomas in both testes. The

tubules containing only Sertoli cells and no evidence of spermatogenesis. No malignant features were identified.

3.NURSING CARE

The patient was admitted to the elective care unit on 1st October 2025 for surgery. Nursing care followed standardized protocols and was individualized according to the patient's clinical and psychological needs.

3.1 Nursing Assessment

Preoperatively, the patient was alert with normal skin and mucosa. Nursing staff completed admission procedures, explained ward regulations, prepared the patient for surgery, and coordinated medical evaluation.

Postoperatively, the patient returned from the operating room fully conscious. Mild postoperative hyperthermia (37.5°C) and mild incisional pain were noted. Three trocar wounds were clean and dry, and an indwelling urinary catheter drained clear yellow urine.

3.2 Nursing Diagnoses

Acute pain related to laparoscopic surgical intervention.

Risk of infection related to surgical wounds and urinary catheter.

Mild postoperative hyperthermia.

Anxiety related to postoperative pain and recovery.

Insufficient understanding of postoperative care and the necessity of lifelong hormone replacement therapy.

3.3 Nursing Care Plan

The goals of care were to ensure postoperative safety, effective pain control, and infection prevention; to promote psychological stability while respecting the patient's expressed gender identity; and to provide structured patient education to support adherence to long-term estrogen replacement therapy and home care.

3.4 Nursing Interventions

Postoperative surgical care (2nd - 6th October 2025) included twice-daily monitoring of vital signs, with fever resolution by 3rd October. Analgesics were administered according to medical orders, with gradual resolution of pain by 5th - 6th October. Surgical wounds were monitored daily and remained clean and dry. The urinary catheter was removed on the evening of 3rd October, after which spontaneous urination resumed normally.

Nutritional intake progressed from a soft diet on 2nd October to a regular diet from 3rd October. Early ambulation was encouraged and well tolerated.

Psychosocial support was provided through reassurance, maintenance of privacy, and consistent respect for the patient's expressed gender identity. The patient remained emotionally stable throughout hospitalization.

Patient education was conducted daily, with emphasis before discharge on the importance of lifelong estrogen replacement therapy to maintain secondary sexual characteristics and prevent osteoporosis, appropriate home wound care and recognition of warning signs, and adherence to scheduled follow-up appointments and suture removal.

3.5 Evaluation

The patient was discharged on 6th October 2025 in stable condition. She was afebrile, pain-free, and independently mobile. Surgical wounds were clean with no signs of infection. The patient and her family demonstrated understanding of the ongoing treatment plan. Discharge instructions included follow-up after four weeks, suture removal after seven days at a local healthcare facility, and initiation of hormone therapy as scheduled.

4.DISCUSSION

This case highlights the multifaceted role of nursing in the management of disorders of sex development. Beyond routine postoperative care, nurses play a critical role in addressing psychological distress and supporting long-term endocrine management.

Gonadectomy at age 20 is consistent with current recommendations. Delaying surgery until

of female secondary sexual characteristics through aromatization of testicular testosterone to estrogen. However, after puberty, the risk of gonadal malignancy increases with age, supporting the indication for prophylactic gonadectomy.

Histopathological findings in this case revealed benign Sertoli cell adenomas, consistent with reports of benign stromal tumors in CAIS. Nevertheless, the risk of malignant transformation is well documented. Reports of seminoma developing in older patients with CAIS who declined surgery further support the recommendation for timely prophylactic gonadectomy. The presence of Sertoli cell tumors in this young patient suggests early pathological changes and reinforces the appropriateness of early surgical intervention.

Following gonadectomy, endogenous estrogen production ceases. Nursing education regarding strict adherence to estrogen replacement therapy is essential. Lifelong estrogen therapy until the age of natural menopause is required to maintain secondary sexual characteristics, preserve bone density, and support cardiovascular and psychological health.

Psychologically, nurses are often the healthcare professionals with the most frequent patient contact. Diagnosis during adolescence or young adulthood can be profoundly distressing; therefore, nursing interventions must prioritize confidentiality, respect for the patient's expressed gender identity, and facilitation of access to psychological counseling and peer support networks.

5.CONCLUSION

Comprehensive care for patients with 46,XY complete androgen insensitivity syndrome requires a multidisciplinary approach, with nursing care playing a central coordinating role. This case demonstrates that structured nursing interventions - from meticulous postoperative monitoring to psychosocial support and patient education - are essential in helping patients adapt to the diagnosis, accept their condition, and adhere to long-term hormone therapy,

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EVALUATION OF THE EFFECTIVENESS OF HEMODIALYSIS USING SINGLE-USE DIALYZERS THROUGH THE KT/V INDEX AT THE NEPHRO - UROLOGY DEPARTMENT IN 2025

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SUMMARY

This study aimed to evaluate the effectiveness of hemodialysis using single-use dialyzers in patients undergoing maintenance hemodialysis at the Nephro - Urology Department, Hanoi Medical University Hospital, in 2025. A cross-sectional descriptive study was conducted on 100 hemodialysis sessions from April to September 2025. Collected variables included age, sex, body mass index (BMI), dialysis duration, type of vascular access, pre- and post-dialysis blood urea and creatinine concentrations, Kt/V index, and dialysis-related complications. The mean age of participants was 55.2 ± 14.7 years, mean BMI was 21.4 ± 2.6 kg/m², and mean dialysis duration was 211.8 ± 41.5 minutes. Mean urea concentration decreased significantly from 27.7 ± 9.5 mmol/L to 16.0 ± 5.8 mmol/L, and mean creatinine concentration decreased from 712.3 ± 225.6 µmol/L to 474.4 ± 166.9 µmol/L ($p < 0.01$). The mean Kt/V value was 1.33 ± 0.32, with 69% of dialysis sessions meeting the KDOQI adequacy standard (Kt/V ≥ 1.2). Factors significantly associated with dialysis adequacy included sex, dialysis duration, BMI, and vascular access type ($p < 0.05$). The overall complication rate was 33%, predominantly hypertension (19%) and hypotension (12%). Hemodialysis using single-use dialyzers demonstrated satisfactory dialysis adequacy and contributed to improving treatment quality for patients undergoing maintenance hemodialysis.

Keywords: Efficacy, Hemodialysis, Single-use dialyzer.

I.INTRODUCTION

End-stage chronic kidney disease is one of the major challenges of global healthcare, with steadily increasing incidence and mortality rates. Maintenance hemodialysis is currently the most common form of renal replacement therapy,• helping to prolong survival and improve quality of life; however, treatment effectiveness largely depends on dialysis technique, equipment, dialysis duration, and particularly the type of dialyzer used.

Dialysis adequacy is commonly evaluated using the Kt/V index. According to the KDOQI guidelines, a Kt/V value ≥ 1.2 is considered adequate.[1] In Vietnam, studies conducted at Cho

Ray Hospital, Nghe An Friendship General Hospital, and People's Hospital 115 have demonstrated a close association between Kt/V and treatment effectiveness, as well as technical factors such as dialyzer type, dialysis duration, and blood flow rate.[2-4] Similarly, recent international studies have confirmed that Kt/V is a central measure in assessing dialysis adequacy and has a significant impact on patients' clinical outcomes.[5], [6]

In the current context, the use of single-use dialyzers is increasingly encouraged to reduce the risk of cross-infection, enhance dialysis efficiency, and ensure patient safety. However, in Vietnam, data on the effectiveness of hemodialysis using single-use dialyzers remain limited. Based on this practical need, we conducted the study entitled "Evaluation of the effectiveness of hemodialysis using single-use dialyzers through the Kt/V index at the Nephro-Urology Department in 2025", with the aim of assessing dialysis adequacy in patients undergoing hemodialysis with single-use dialyzers.

II.MATERIALS AND METHODS

1.Study period and setting

The study was conducted from April to September 2025 at the Nephro - Urology Department, Hanoi Medical University Hospital.

2.Study population

- Inclusion criteria:

+ Patients aged ≥ 18 years with chronic kidney disease undergoing hemodialysis (including both maintenance and emergency hemodialysis);

+ Patients whose medical records contained complete information required for the study (demographic data, clinical and laboratory results, etc.).

- Exclusion criteria:

+ Medical records lacking sufficient data for research purposes;

+ Patients who did not consent to participate in the study.

III.METHODS

-Study design: Cross-sectional descriptive sessions using single-use dialyzers.

-Sampling method: All medical records of patients meeting the inclusion criteria within the study period were included.

-Study variables: Age, sex, body mass index (BMI), duration of the dialysis session, type of vascular access, serum urea and creatinine levels before and after hemodialysis, dialysis adequacy (Kt/V ≥ 1.2), and the incidence of complications.

The criteria for defining complications were as follows:

+ Hypertension: An increase in mean blood pressure ≥ 15 mmHg.7

+ Hypotension: A decrease in systolic blood pressure ≥ 20 mmHg.7

+ Dialyzer clotted: The presence of blood clots adhering to the dialyzer membrane.

+ Dialyzer rupture: Reddish discoloration of the dialysate or visible blood leakage from connectors or the dialyzer.

+ Muscle cramps: Sudden onset of painful muscle contractions, muscle stiffness, and difficulty in movement.

+ Nausea and vomiting: Patients experience gastric discomfort, loss of appetite, and vomiting of food or liquids.

+ Kt/V: Data were collected directly from the Nipro Surdial 55 Plus hemodialysis machine.

-Data analysis:

+ Data were entered and analyzed using SPSS software version 20.0;

+ Continuous variables were presented as mean ± standard deviation (mean ± SD),

while categorical variables were described using frequencies and percentages;

+ A p-value < 0.05 was considered statistically significant.

-Data collection tools and procedures:

+ Data collection tool: A data collection form designed based on the study variables, including information extracted from medical records such as age, sex, BMI, dialysis duration, type of vascular access, serum urea and creatinine levels pre- post hemodialysis, dialysis adequacy, and complications occurring during hemodialysis.

+ Data collection procedure: Data were extracted from medical records archived at the Nephro- Urology Department, Hanoi Medical

variables were clearly defined and standardized, and information on patients' general characteristics was cross-checked using the hospital management software in cases of inconsistency.

IV. ETHICAL CONSIDERATIONS

The study was approved by the leadership of the Nephro - Urology Department.

All personal information of participating patients was kept strictly confidential, ensuring data anonymity. Patients were fully informed about the study objectives, procedures, potential benefits, and possible risks, and were entitled to refuse participation or withdraw from the study at any time without affecting their medical care.

III.RESULTS

Table 1. General characteristics of the study population (n = 100)

Variables		X ± SD	
Age (years)		55,2 ± 14,7	
BMI (kg/m^2)		21,4 ± 2,6	
Dialysis duration (minutes)		211,8 ± 41,5	
Variables		**n**	**%**
Sex	Male	51	51
	Female	49	49
Type of vascular access	Femoral catheter	42	42
	Jugular catheter	36	36
	AVF	22	22

The mean age of the study participants was 55.2 ± 14.7 years. The mean body mass index (BMI) was 21.4 ± 2.6. The average duration of hemodialysis was 211.8 minutes. The gender distribution was relatively balanced. Catheters were the predominant type of vascular access, accounting for 76% of cases.

Table 2. Changes in serum urea and creatinine levels before and after hemodialysis

Variables		X ± SD	p
Urea level	Pre	27,7 ± 9,5	< 0,01
	Post	16,0 ± 5,8	
Creatinine level	Pre	712,3 ± 225,6	< 0,01
	Post	474,4 ± 166,9	

The mean serum urea concentration significantly decreased from 27.7 ± 9.5 mmol/L before dialysis to 16.0 ± 5.8 mmol/L after dialysis ($p < 0.05$). Similarly, the mean serum creatinine level significantly declined from 712.3 ± 225.6 before dialysis to 474.4 ± 166.9 after dialysis ($p < 0.05$).

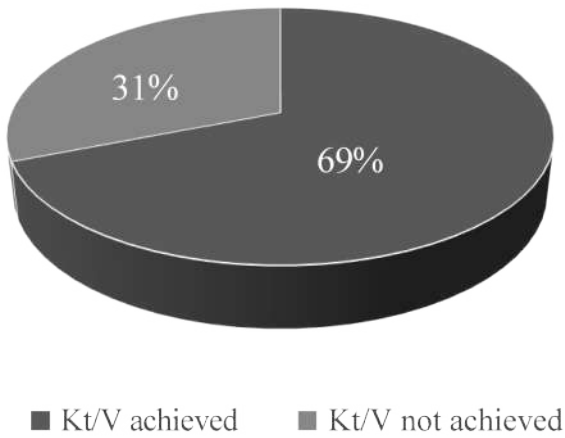

Figure 1. Proportion of hemodialysis sessions achieving target Kt/V

The mean Kt/V was 1.33 ± 0.32, with 69% of cases achieving the KDOQI-recommended target (Kt/V ≥ 1.2).

Table 3. Intra-dialytic complications

Complications	n	%
Hypertension	19	19
Hypotension	12	12
Dialyzer clott ed	1	1
Gingival bleeding	1	1
Nausea	1	1
No complications	67	67

Note: Each patient may experience more than one complication.

Hypertension and hypotension were the most frequently observed complications, with incidence rates of 19% and 12%, respectively.

Table 4. Relationship between selected factors and Kt/V

Variables		X ± SD	p
Sex	Male	1,23 ± 0,28	< 0,01 *
	Female	1,44 ± 0,33	
Dialysis duration	≤ 3h	1,00 ± 0,23	< 0,01 *
	> 3h	1,50 ± 0,21	
BMI (kg/m^2)	< 18,5	1,39 ± 0,38	0,001 **
	18,5 – 22,9	1,41 ± 0,27	
	≥ 23	1,14 ± 0,32	
Type of vascular access	Femoral catheter	1.22 ± 0,33	0,018 **
	Jugular catheter	1.4 ± 0,30	
	AVF	1.42 ± 0,27	

*Mann-Whitney Test **Kruskal-Wallis Test

The differences in mean Kt/V according to four factors—sex, dialysis duration, BMI, and type of vascular access—were statistically significant ($p < 0.05$).

IV.DISCUSSION

In this study, the mean age of the patients was 55.2 ± 14.7 years. In several studies conducted in Vietnam, the average age of study participants ranged from 44 to 50 years, which is considerably lower than that observed in our study.[2-4] However, international studies have reported that the highest prevalence of end-stage chronic kidney disease occurs in the 60–70 age group.[5,6] The age distribution in our study is consistent with the characteristics of patients with end-stage renal disease in Vietnam, where the majority of individuals undergoing hemodialysis are middle-aged to elderly. In our study, the proportions of male and female patients were 51% and 49%, respectively. Both domestic and international studies have consistently reported a higher prevalence of male patients compared with female patients.[2,5,6] The mean BMI was 21.4 ± 2.6 kg/m², which is comparable to the findings reported by Pham Van Hien (21,2 kg/m²).[2] When compared with the studies by Xu and Jeon, the mean BMI in our study was slightly lower.[5,6] This finding reflects a relatively stable nutritional status among patients undergoing hemodialysis. However, approximately 15% of patients had a BMI below 18.5 kg/m², indicating that malnutrition remains an important concern in the management of chronic kidney disease. The 2020 KDOQI guidelines emphasize the importance of routine nutritional assessment and individualized nutritional interventions to maintain muscle mass, reduce complications, and improve quality of life.[8]

The results demonstrated a marked reduction in serum urea and creatinine levels after hemodialysis, with statistical significance ($p < 0.01$). Specifically, the mean serum urea concentration decreased from 27.7 ± 9.5 mmol/L before dialysis to 16.0 ± 5.8 mmol/L after dialysis. The mean serum creatinine level declined from 712.3 ± 225.6 to 474.4 ± 166.9 µmol/L. These findings indicate that hemodialysis using single-use dialyzers was effective in removing urea and creatinine. This statistically significant reduction

($p < 0.01$) is consistent with previous studies by Pham Van Hien et al. (2022) conducted at Cho Ray Hospital and Nguyen Van Tuan et al. (2021) at Nghe An Friendship General Hospital, which also reported significant post-dialysis decreases in urea and creatinine levels ($p < 0.001$).[2, 3] The reduction of uremic toxins suggests that single-use dialyzer membranes provide effective diffusive clearance, meeting the requirements for safe and stable hemodialysis..

The mean Kt/V in our study was 1.33 ± 0.32, with 69% of patients achieving the KDOQI-recommended target (Kt/V ≥ 1.2). This proportion was higher than that reported by Nguyen Thanh Cong et al. (2025) at People's Hospital 115, where the rate of adequate Kt/V was 61.5%, suggesting that the use of single-use dialyzers may contribute to improved dialysis adequacy.[4] The mean Kt/V observed in this study is comparable to that reported in a multicenter study in China by Xu et al. (2025), which documented a mean Kt/V of 1.29 ± 0.27 among hemodialysis patients.[5] However, despite achieving the target mean Kt/V, the proportion of patients meeting the adequacy threshold (69%) remains lower than the target recommended by the Vietnamese Ministry of Health, which stipulates that at least 90% of patients should achieve these indices.[9] In comparison with international centers, a report by Saran et al. in the United States showed that 87% of maintenance hemodialysis patients achieved a Kt/V ≥ 1.2.[10] This highlights a gap in dialysis quality that requires further improvement. Achieving adequate Kt/V depends not only on the type of dialyzer used but also on dialysis duration, blood flow rate, and patients' nutritional status.[11]

The analysis of associations showed that Kt/V was significantly influenced by sex, dialysis duration, BMI, and type of vascular access ($p < 0.05$). Female patients had a higher mean Kt/V than male patients (1.44 ± 0.33 vs. 1.23 ± 0.28). This finding is consistent with the study by Jeon et al. (2024) and can be explained by the smaller urea distribution volume in females compared with males, resulting in higher Kt/V values for the same dialysis dose.[6] Dialysis sessions lasting longer than 3 hours had a significantly higher mean Kt/V (1.50 ± 0.21) compared with sessions lasting ≤ 3 hours (1.00 ± 0.23). This demonstrates that extending dialysis duration improves the clearance of urea and creatinine. Similarly, a study by Datu et al. (2023) reported a significantly higher mean Kt/V in patients undergoing 4-hour dialysis sessions (M = 1.38) compared with those receiving 3-hour sessions (M = 1.17).10 Patients with higher BMI (≥ 23 kg/m²) had lower Kt/V values (1.14 ± 0.32). This finding aligns with the observations of Xu et al. (2025), who reported that larger body volume reduces the amount of urea removed per unit volume of blood.5 Moreover, Xu et al. (2025) indicated that overweight and obese patients had a 5.516- and 15.761-fold higher risk, respectively, of receiving inadequate dialysis compared with patients with normal BMI.[5] Patients using an arteriovenous fistula (AVF) or internal jugular venous catheter achieved higher Kt/V values than those using femoral venous catheters. This may be explained by the lower blood flow rates and higher risk of obstruction associated with femoral catheters. These findings are consistent with the report by Nguyen Van Tuan and Nguyen Thi Thuy Linh (2021).[3]

The overall complication rate in this study was 33%. Hypertension (19%) and hypotension (12%) were the two most common complications observed. This rate of blood pressure instability (31% in total) is comparable to the findings reported by Nguyen Van Tuan and Nguyen Thi My Thanh (2021), who documented a blood pressure fluctuation rate of approximately 28.4%.[7] The use of single-use dialyzers may contribute to a reduction in complications related to infection and inflammatory reactions associated with dialyzer reuse. However, hemodynamic events, particularly blood pressure fluctuations,still persist, indicating the need for stricter control of ultrafiltration rates.

The results of this study indicate that the use of single-use dialyzers in hemodialysis at Hanoi Medical University Hospital is effective, with a proportion of patients achieving adequate Kt/V (69%) that is higher than that reported in several domestic studies. This finding supports the current trend toward the use of single-use dialyzers in accordance with contemporary clinical practice guidelines, contributing to improved

treatment efficacy and a reduced risk of cross-infection. The factors that significantly influenced dialysis adequacy included dialysis duration, sex, BMI, and type of vascular access. To further improve dialysis effectiveness, optimization of dialysis duration (ensuring ≥ 4 hours in accordance with general recommendations) and appropriate weight management strategies tailored to patients' BMI are necessary. In addition, Kt/V remains a central measure in assessing dialysis adequacy and has a significant impact on patients' clinical outcomes.

LIMITATIONS

This study was limited by its cross-sectional design and relatively small, single-center sample, which restrict causal inference and generalizability. In addition, the absence of a comparison group using reused dialyzers prevented direct evaluation of the long-term clinical and cost-effectiveness of single-use dialyzers.

V.CONCLUSIONS

The study results demonstrate that the use of single-use dialyzers in hemodialysis at Hanoi Medical University Hospital is effective, with 69% of patients achieving the target Kt/V. Dialysis adequacy was significantly influenced by dialysis duration, sex, BMI, and type of vascular access ($p < 0.05$).

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SLEEP QUALITY AND ASSOCIATED FACTORS AMONG PATIENTS AFTER ABDOMINAL SURGERY AT HA DONG GENERAL HOSPITAL IN 2024

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ABSTRACT

Objectives: To assess the status of sleep quality and analyze associated factors among patients after abdominal surgery at Ha Dong General Hospital in 2024.

Methods: A cross-sectional descriptive study was conducted on 90 post-abdominal surgery patients from the 2nd to the 4th postoperative day. Measurement tools included the Richard-Campbell Sleep Questionnaire (RCSQ) for sleep quality, the Numeric Rating Scale (NRS) for pain, the HADS-A for anxiety, and an environmental factor checklist. Data were analyzed using SPSS 20.0 with t-tests and Pearson correlation coefficients.

Results: The average sleep quality score was 324.75 ± 56.74, significantly improving from the first night (281.11 ± 56.25) to the third night (366.55 ± 60.58). The poor sleep rate on the first night was 27.8%. Significant negative correlations ($p < 0.05$) were found between sleep quality and: anxiety levels ($r = -0.474$ on night 1), pain levels ($r = -0.377$ on night 3), and environmental disturbances ($r = -0.248$ on night 3). Patients undergoing laparoscopic surgery and those receiving analgesic/sedative medication had significantly better sleep quality than others ($p < 0.05$).

Conclusions and Recommendations: Sleep quality recovers gradually but is heavily impacted by psychological anxiety in the first 24 hours and physical pain in subsequent days. Nurses should implement multidimensional interventions: effective pain management, preoperative psychological support to reduce anxiety, and establishing "Quiet Time" in wards to optimize patient recovery.

Keywords: Sleep quality, abdominal surgery, postoperative pain, anxiety, RCSQ.

1. INTRODUCTION

Abdominal surgery is a common invasive intervention, accounting for a significant proportion of surgical procedures in Vietnam. Although advancements in surgical techniques have improved success rates, the postoperative period remains fraught with challenges for patients, among which sleep disturbance is a serious yet often overlooked issue [2]. Sleep is not merely a physiological necessity but also plays a pivotal role in the recovery process: it modulates immune responses, promotes wound healing, and maintains psychological stability [7].

In surgical departments, patients' sleep quality (SQ) is often severely compromised due to the synergy of physiological factors (pain, nausea), psychological factors (illness-related anxiety), and environmental factors (noise, ward lighting) [3], [8]. Research by Seid Tegegne (2022) indicated that up to 89.1% of postoperative patients experience poor sleep, leading to prolonged hospitalization and increased treatment costs [8]. At Ha Dong General Hospital, while nursing care has undergone numerous improvements, specific data regarding the sleep status and factors directly influencing abdominal surgery patients have not been systematically studied.

Currently, several research questions remain: (i) How does the sleep quality of patients following abdominal surgery at Ha Dong General Hospital progress during the first three postoperative nights?; and (ii) Which factors (physiological, psychological, environmental) play a decisive role in the decline of sleep quality in this population?

Answering these questions is essential to provide scientific evidence for nurses in developing individualized intervention protocols, thereby enhancing the quality of comprehensive patient care. For these reasons, the research project titled "Sleep quality and associated factors among patients after abdominal surgery at Ha Dong General Hospital in 2024" was conducted with two specific objectives: To assess sleep quality and analyze associated factors among patients after abdominal surgery at Ha Dong General Hospital in 2024.

2. SUBJECTS AND METHODS

2.1. Study Subjects

•Inclusion criteria: Patients aged ≥ 18 years; indicated for abdominal surgery (including intestinal, hepatobiliary, gastric procedures, etc.); conscious with the ability to communicate and understand Vietnamese; and voluntarily agreed to participate in the study.

•Exclusion criteria: Patients with a history of mental or neurological disorders; concurrent traumatic brain injury; or postoperative conditions involving coma, delirium, or unconsciousness.

2.2. Study Design

A cross-sectional descriptive study design combined with correlational analysis was employed.

2.3. Sample Size and Sampling Method

•Sample size: The sample size was calculated using the formula for estimating a single proportion.

$$n = Z^2_{\alpha/2}\frac{p(1-p)}{d^2}$$

where:

•α: The statistical significance level, set at alpha = 0.05.

•Z2 1-α/2: The critical value for the confidence level; here, Z2 1-(0.05/2) = 1.962.

•p = 0.626: Based on the study assessing factors influencing the sleep quality of abdominal surgery patients during the postoperative period at Thai Nguyen Central Hospital in 2017 [5].

•d: The margin of error, set at 10%.

•Study sample size: n = 90 patients.

Sampling method: A convenience sampling method was applied, including all patients who met the inclusion criteria until the required sample size was achieved.

2.4. Data collection instruments and scoring

The study utilized standardized instruments that have been validated for reliability, consisting of the following components:

•General and Clinical Characteristics: A self-developed questionnaire including demographic information (age, gender, education level, etc.) and clinical data (type of surgery, surgical method, medications used, etc.).

•Sleep Quality (Richard-Campbell Sleep Questionnaire - RCSQ):

oStructure: Comprises 5 short items: (1) Sleep depth; (2) Sleep latency (time to fall asleep); (3) Number of awakenings; (4) Ability to return to sleep; and (5) Overall sleep quality.

oScoring: Each item is evaluated on a scale from 0 to 100. The total mean score of the 5 items (ranging from 0 to 500) represents the overall sleep quality.

oClassification: A score < 250 indicates poor sleep; a score ≥ 250 indicates good sleep.

•Pain Level (Numeric Rating Scale - NRS):

oInstrument: An 11-point scale ranging from 0 to 10 is utilized.

oScoring: 0 represents no pain; 1-3 indicates mild pain; 4-6 indicates moderate pain; and 7-10 represents the most severe/intense pain.

•Anxiety Level (Hospital Anxiety and Depression Scale - Anxiety subscale, HADS-A):

oInstrument: The HADS-A subscale consisting of 7 questions is utilized.

oScoring: Each question has 4 options (scored 0-3 points), with a total score ranging from 0 to 21.

oClassification: 0: No anxiety; 1-7: Mild anxiety; 8-14: Moderate anxiety; and 15-21: Severe anxiety.

•Environmental Disturbance Factors:

oStructure: Consists of 12 items assessing impacts from: nursing activities, lighting, equipment noise, and conversation noise.

oScoring: Each item is evaluated from 0 (no disturbance) to 10 (significant disturbance). The total score ranges from 0 to 120.

oClassification: 0: No disturbance; 1-39: Mild; 40-79: Moderate; and 80-120: Severe disturbance.

2.5. Study Procedure

•Clinical data were extracted from the patients' medical records.

•The investigators conducted direct bedside interviews with the patients during morning hours (8:00 AM – 11:00 AM) on the 2nd, 3rd, and 4th postoperative days to assess their sleep status during the preceding night.

2.6. Data Analysis

Data were coded and analyzed using SPSS software, version 20.0. Independent T-tests were utilized for mean comparisons, and Pearson correlation coefficients were employed to determine the relationships between variables. A p-value < 0.05 was established as the threshold for statistical significance.

3. RESULTS

3.1. Characteristics of Study Subjects

Table 3.1. Demographic characteristics of study subjects (n=90)

Characteristics	Category	Frequency (N)	Percentage (%)
Age group	18 – 35 years old	32	35.6
	36 – 55 years old	20	22.2
	≥ 56 years old	38	42.2
Gender	Male	40	44,4
	Female	50	55,6
Education level	Illiterate	3	3,3
	General education	64	71,1
	College and higher	23	25,6
Marital status	Married	53	58,9
	Single	34	37,8
	Widowed	3	3,3

Comment: Analysis of demographic characteristics revealed that the elderly group (aged ≥ 56 years) accounted for the highest proportion at 42.2%. Regarding gender, females constituted the majority (55.6%) compared to males (44.4%). The education level of the study subjects was primarily at the general education level (71.1%), and most patients were currently married (58.9%).

Table 3.2. Clinical characteristics and treatment methods (n=90)

Characteristics	Category	Frequency (N)	Percentage (%)
Surgical method	Laparoscopic surgery	64	71,1
	Open surgery	26	28,9
Type of surgery	Elective surgery	57	63,3
	Emergency surgery	33	36,7
Duration of surgery	1 - 2 hours	37	41,1
	> 2 - 3 hours	42	46,7
	> 3 hours	11	12,2
Surgical history	No prior surgery	60	66,7
	Prior surgery	30	33,3

Comment: Regarding clinical characteristics, laparoscopic surgery was the significantly predominant method (71.1%) compared to open surgery (28.9%). The majority of cases were elective surgeries (63.3%), with surgical durations primarily concentrated between 2 and 3 hours (46.7%). Notably, 67.8% of patients self-assessed their pre-admission sleep status as poor or very poor.

3.2. Sleep quality of Study Subjects

Table 3.3. Sleep quality across three postoperative nights according to the RCSQ scale (n=90)

RCSQ Indicators (Score 0-100)	Night 1 (X^{-}±SD)	Night 2 (X^{-}±SD)	Night 3 (X^{-}±SD)
Sleep depth	52,67 ± 13,20	63,22 ± 14,59	72,11 ± 15,25
Sleep latency (Time to fall asleep)	53,33 ± 11,21	62,67 ± 14,28	71,11 ± 15,24
Number of awakenings	57,89 ± 12,85	66,22 ± 13,28	74,00 ± 13,55
Ability to return to sleep	58,11 ± 13,31	65,56 ± 13,83	74,00 ± 13,05
Self-reported sleep quality	59,11 ± 12,05	67,44 ± 13,53	75,33 ± 12,82
Total mean score (0-500)	281,11 ± 56,25	325,11 ± 59,96	366,55 ± 60,58
Poor sleep rate (< 250 points)	27,8%	12,2%	6,7%

Comment: Sleep quality according to the RCSQ scale improved gradually over the postoperative nights. The total mean score increased from 281.11 ± 56.25 (Night 1) to 366.55 ± 60.58 (Night 3). The proportion of patients with poor sleep decreased significantly from 27.8% on the first night to only 6.7% by the third night. Among the sub-indicators, "sleep depth" and "sleep latency" typically had the lowest scores on the first night, reflecting the difficulty of adaptation immediately following surgery.

Table 3.4. Mean scores of pain, environmental disturbance, and anxiety across nights (n=90)

Assessment Indicators	Night 1 (Mean±SD)	Night 2 (Mean±SD)	Night 3 (Mean±SD)
Pain level (NRS: 0 -10)	5,33 ± 1,21	3,71 ± 1,21	2,58 ± 1,12
Environmental disturbance (0 -120)	28,78 ± 1,73	19,43 ± 1,46	12,34 ± 1,16
Anxiety level (HADS-A: 0-21)	9,76 ± 3,31	9,33 ± 2,66	9,15 ± 2,28

Comment: Postoperative pain intensity peaked on the first night (5.33 ± 1.21) and gradually decreased to a mild level by the third night (2.58 ± 1.12). Similarly, the impact of environmental disturbance factors diminished over the recovery period (from 28.78 to 12.34 points). In contrast, anxiety levels (HADS-A) remained at a moderate level with minimal fluctuation across the three nights, ranging from 9.15 to 9.76 points.

Table 3.5. Factors associated with sleep quality (n=90)

Influencing factors	Index	Night 1	Night 2	Night 3
Postoperative pain	r	-0,289	-0,356	-0,377
	p	< 0,05	< 0,05	< 0,05
Environmental factors	r	-0,137	-0,219	-0,248
	p	< 0,05	< 0,05	< 0,05
Postoperative anxiety	r	-0,474	-0,376	-0,302
	p	< 0,05	< 0,05	< 0,05

Comment: The correlation analysis results between sleep quality (SQ) and influencing factors presented in Table 3.5 reveal the following key findings:

•Consistency in the direction of impact: All factors, including postoperative pain, anxiety, and environmental disturbances, showed a significant negative correlation with total sleep quality scores ($r < 0$ and $p < 0.05$). This confirms that as levels of pain, anxiety, or environmental disturbance increase, the patient's sleep quality significantly declines in a statistically meaningful way.

•Shift in the role of the Pain factor: The correlation coefficient between pain intensity and SQ tended to increase over time, rising from r = -0.289 on the first night to r = -0.377 on the third night. This suggests that as the effects of anesthetics and analgesics diminish, physical pain becomes a more direct and potent barrier to maintaining stable sleep during the late postoperative phase.

•Significance of the Psychological factor (Anxiety): Notably, anxiety showed the strongest negative correlation with SQ during the first night after surgery (r = -0.474). This moderate-to-strong correlation indicates that psychological insecurity and fear of surgical complications are leading causes of sleep disturbance immediately upon the patient's arrival at the ward. The impact of this factor gradually decreases in subsequent nights as the patient's psychological state stabilizes (r decreases to -0.302 on Night 3).

•Cumulative impact of the Environment: Although environmental disturbance had the lowest correlation coefficient among the three factors, it demonstrated a progressive increase in impact (with r rising from -0.137 to -0.248). This can be explained by a change in the patient's sensitivity threshold; as acute pain subsides, patients become more observant and more easily awakened by noises, lighting, and nursing care activities in the ward.

4. DISCUSSION

The study results indicate that the sleep quality (SQ) of patients after abdominal surgery at Ha Dong General Hospital in 2024 significantly improved over time, with the mean RCSQ score increasing from 281.11± 56.25 (Night 1) to 366.55 ± 60.58 (Night 3). However, the rate of poor sleep during the first night remained high (27.8%). This reflects the critical necessity of sleep support interventions within the first 24 postoperative hours—the "golden" period for physical recovery.

4.1. The Relationship between Pain Intensity and Sleep

Pain was the primary physiological factor causing sleep disruption in this study, demonstrated by a negative correlation across all three nights (r ranging from -0.289 to -0.377). The mean pain score on the first night was 5.33±1.21$, coinciding with the lowest SQ scores [6], although the pain scores in our study were slightly higher. This discrepancy may be attributed to differences in surgical composition: the Ha Dong study had a relatively high rate of emergency surgeries (36.7%), where inflammation and pain responses are typically more intense than in elective procedures. According to Lenz's "Theory of Unpleasant Symptoms," pain is not merely a sensation but an activator of the brainstem reticular system, inducing a state of forced alertness that suppresses deep sleep stages (NREM) and rapid eye movement (REM) sleep [4]. The improvement in SQ on the third night, accompanied by a decrease in pain scores (2.58 ± 1.12), reinforces the argument that pain control is the "key" to re-establishing the sleep cycle [2].

4.2. Impact of Psychological Anxiety

A significant finding was that anxiety (HADS-A) showed the strongest negative correlation with SQ on the first night (r = -0.474). This correlation was markedly stronger than that of physical pain during the same period. This result is higher than that recorded by Seid Tegegne (2022) [8]. The difference may lie in demographic characteristics: 71.1% of our participants had a general education level, and 42.2% were elderly. This population tends to have thigher anxiety regarding surgical success, self-care ability, and financial burden [5]. Anxiety triggers the hypersecretion of stress hormones such as cortisol and adrenaline, keeping the body in a "fight or flight" state, which prolongs sleep latency—an indicator that scored very low on our RCSQ scale (53.33 points on Night 1).

4.3. Surgical Methods and Supportive Medication

The study indicated that the laparoscopic surgery group had better SQ than the open surgery group ($p < 0.05$), aligning with the results of Duong Thi To Anh (2022) [1]. The rationale for this difference lies in the level of invasiveness: laparoscopic surgery minimizes tissue damage and systemic inflammatory responses, allowing earlier patient mobilization. Early mobilization helps reduce circulatory stasis and generates healthy physiological fatigue, supporting natural sleep better than the open surgery group, who must remain immobilized longer due to extensive incisions. Furthermore, the use of sedatives and analgesics showed a statistically significant difference ($p < 0.05$$). This reflects clinical reality at the hospital: pharmacological intervention remains the dominant method. However, from a nursing perspective, over-reliance on sedatives may alter natural sleep architecture; therefore, non-pharmacological therapies deserve greater attention [7].

4.4. Ward Environmental Factors

Environmental disturbance showed a progressively increasing negative correlation in subsequent nights (r from -0.137 to -0.248). This result is interpreted through the "sensitivity threshold" phenomenon: on the first night, when pain and anxiety predominate, patients pay less attention to their surroundings. However, as physiological symptoms subside, they become more sensitive to equipment noise, family conversations, and ward lighting. The fact that 58.9% of patients had family members providing constant bedside care was both a source of support and a significant source of noise pollution [3]. This carries vital

clinical significance for nursing; "Quiet Time" protocols should be implemented to protect patient sleep during the recovery phase [7].

4.5. Summary of key trends

The study results reveal a distinct trend: SQ among abdominal surgery patients at Ha Dong General Hospital was lowest on the first postoperative night and recovered gradually over the following nights. The mean ZBI score of 52.47±13.65 indicates a substantial symptom burden.

Regarding pain and surgical methods, the mean pain score on Night 1 was 5.33 ≥ 1.21, corresponding to the highest poor sleep rate (27.8%). The negative correlation between pain and SQ (r = -0.289 to -0.377) validates the Theory of Unpleasant Symptoms [4]. Compared to the study by Nguyen Thi Truong Xuan (2014) in Ho Chi Minh City, our results are consistent in identifying pain as the primary barrier to sleep [6]. Notably, the open surgery group had poorer SQ than the laparoscopic group. This can be explained by the degree of tissue trauma: open surgery causes prolonged stimulation of pain receptors, increasing blood levels of cortisol and catecholamines, leading to insomnia and disruption of deep sleep stages [2], [7].

Regarding psychological impact and medication, the recorded negative correlation between anxiety and SQ (r = -0.474 on Night 1) was higher than in the international study by Seid Tegegne [8]. This variation may be explained by socio-economic factors: patients at Ha Dong are predominantly farmers who worry not only about their incision but also about costs and family labor. Analysis also showed that the group using analgesics and sedatives had significantly better SQ ($p < 0.05$), proving that timely pharmacological intervention is the "key" to re-establishing the wake-sleep cycle for postoperative patients [2].

Regarding environmental factors, noise and ward lighting accounted for a high percentage of disturbance on the first night. Unlike the study by Rampes (2019) in developed countries where patients often have private rooms [7], in Vietnamese public hospitals, the concentration of multiple patients in one room and frequent family movements create a continuous "noise environment." This explains why environmental factors showed an increasing negative correlation with SQ in the later nights (r from -0.137 to -0.248), as patients became more sensitive to ambient noise once their acute pain had eased.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

The study on sleep quality (SQ) among patients following abdominal surgery at Ha Dong General Hospital in 2024 reveals the following:

•Current status of sleep quality: Patients' SQ was at a moderate level and showed significant improvement over the postoperative period. The total RCSQ score increased from 281.11 ± 56.25 (Night 1) to 366.55 ± 60.58$ (Night 3). The proportion of patients experiencing poor sleep decreased sharply from 27.8% to 6.7% after three days.

•Associated factors:

oPhysiological factors and treatment methods: Postoperative pain was the most significant physical barrier, showing a negative correlation with SQ and an increasing impact by the third night (r = -0.377). The laparoscopic surgery group and the group utilizing supportive medications (analgesics, sedatives) had significantly better SQ compared to the remaining groups ($p < 0.05$).

oPsychological and environmental factors: Anxiety was the most potent disturbing factor within the first 24 hours ($r = -0.474$). Environmental factors (lighting, noise) showed a progressive increase in disturbance levels as patients recovered physically (r increased from -0.137 to -0.248).

5.2. Recommendations

Based on the aforementioned findings, the study proposes feasible solutions to enhance SQ for postoperative patients:

•Individualized pain management: Nurses

should perform routine pain assessments using the NRS scale and proactively collaborate with physicians to implement multimodal analgesia, with a particular focus on effective pain relief for the open surgery group to prevent pain-induced insomnia.

•Implementation of preoperative and early postoperative psychological support: It is essential to develop counseling protocols and provide detailed explanations regarding the surgical procedure and recovery methods from the time of admission to reduce the HADS-A anxiety index, thereby helping patients fall asleep more easily on the first night.

•Establishment of "Quiet Time" protocols: The hospital should regulate time frames to minimize disruptive activities (from 10:00 PM to 5:00 AM the following morning). During these hours, nurses should dim the lighting, limit noise from medical devices, and control the number of bedside caregivers to protect the patients' sleep architecture.

•Promotion of laparoscopic surgery: Priority should be given to laparoscopic techniques whenever clinical conditions permit to minimize trauma and promote early recovery of natural sleep.

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PSYCHOSOCIAL FACTORS ASSOCIATED WITH SLEEP QUALITY IN OLDER ADULTS: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Sleep disturbances are highly prevalent among older adults and represent a significant public health challenge. While emerging evidence suggests that psychosocial determinants are pivotal to sleep health in later life, existing findings remain fragmented, particularly regarding community-dwelling populations.

Objective: This systematic review aimed to synthesize current evidence on psychosocial factors associated with sleep quality and sleep disturbances among community-dwelling older adults.

Methods: A systematic literature search was performed across PubMed, Cochrane Library, and Google Scholar for studies published between January 2015 and December 2025. This review included observational studies examining the associations between psychosocial factors and sleep outcomes (sleep quality, sleep disturbance, or insomnia) among community-dwelling adults aged 60 years and older. Sleep outcomes comprised sleep quality, sleep disturbance, or insomnia assessed using validated instruments or standardized self-report measures. Study selection adhered to the PRISMA guidelines, and a narrative thematic synthesis was employed to integrate the findings.

Results: Eighteen community-based observational studies were identified, with sample sizes ranging from 109 to 95,045 participants. Depression and anxiety were the most frequently investigated psychosocial factors and were consistently associated with diminished sleep quality and increased sleep disturbances. Stress-related conditions, including post-traumatic stress disorder, also demonstrated strong correlations with adverse sleep outcomes. Furthermore several studies indicated that loneliness and social isolation were independently associated with greater sleep disturbance, maintaining significance even after adjusting for depressive symptoms and physical comorbidities.

Conclusions: This systematic review highlights that a multifaceted range of psychosocial

factors is significantly associated with sleep health in community-dwelling older adults. Targeted interventions addressing mental health, social connectedness, and psychological resilience are essential strategies for optimizing sleep outcomes and enhancing the overall well-being of aging populations.

Keywords: Older adults; Sleep quality; Insomnia; Sleep disturbance; Psychosocial factors; Depression; Anxiety; Loneliness; Social support

1.INTRODUCTION

With increasing age, human sleep physiology undergoes substantial changes, leading to a higher prevalence of sleep disorders among older adults [1]. Sleep quality reflects an individual's subjective perception and level of satisfaction with their sleep experience [2]. Among older adults, poor sleep quality has been identified as one of the most common health problems [3].

Accumulating evidence indicates that poor sleep quality in later life is associated with a wide range of adverse physical and psychological outcomes, including an increased risk of falls, cognitive and memory impairment, a higher likelihood of depression and anxiety, impaired immune function, and an elevated risk of chronic diseases such as diabetes mellitus and cardiovascular disease [4,5]. In addition, loneliness and social isolation [6], as well as social support, have been shown to be associated with sleep quality among older adults [7]. These adverse effects collectively contribute to a decline in quality of life and overall well-being in older populations [4-7].

Although numerous studies have examined the relationship between psychosocial factors and sleep quality among older adults, there remains a lack of systematic reviews that synthesize this evidence in a structured manner, particularly among community-dwelling older populations. This gap limits the ability to comprehensively appraise existing evidence and to translate research findings into community health care programs and practical nursing interventions. Therefore, conducting a systematic review of the associations between psychosocial factors and sleep quality among community-dwelling older adults is warranted to clarify the existing evidence, identify risk and protective factors, and provide a scientific basis for appropriate community health interventions.

2.METHODOLOGY

2.1. Literature Search Strategy

Information sources: A systematic literature search was conducted in PubMed, the Cochrane Library, and Google Scholar.

Search period: The search was performed from 15 to 31 December 2025, and included studies published between January 2015 and December 2025.

Search terms: The following search terms were used:

("Sleep Quality" [Mesh] OR sleep quality OR insomnia OR sleep disturbance) AND ("Aged" [Mesh] OR elderly OR older adults OR geriatric) AND ("Depression" [Mesh] OR depression OR "Anxiety" [Mesh] OR anxiety OR "Psychological Stress" [Mesh] OR stress OR loneliness OR "Social Support" [Mesh]) AND ("Public Health" [Mesh] OR community-dwelling OR community-based).

The search strategies were adapted for each database. In addition, the reference lists of the included studies were manually screened to identify additional relevant publications. The review was designed and reported in accordance with the PRISMA 2020 guidelines [8].

2.2. Inclusion and Exclusion Criteria

Inclusion criteria: All studies examining psychosocial factors associated with sleep

quality among community-dwelling older adults aged 60 years and above were eligible for inclusion. Only studies with Level IV evidence, specifically cross-sectional studies, were included. Eligible studies were published articles with full-text available in English.

PEO research question: Which psychosocial factors are associated with sleep quality among community-dwelling older adults?

Population (P): Community-dwelling older adults aged 60 years and above.

Exposure (E): Psychosocial factors, including depression, anxiety, psychological stress, loneliness, social isolation, and social support.

Outcome (O): Sleep quality, insomnia symptoms, sleep disturbances, and poor sleep.

Exclusion criteria: Studies were excluded if full-text articles were not accessible, if insufficient data were available for extraction, or if the study population included participants younger than 60 years, or mixed-age samples without separate data for older adults. Studies focusing on institutionalized populations, such as those living in nursing homes or hospitals, were also excluded.

2.3. Study selection process

The literature search, study selection, quality appraisal, and data extraction were conducted independently by two investigators, adhering to the four-stage screening protocol of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology [8]. To ensure objectivity, any discrepancies during the selection process were resolved through consensus-based discussion and synthesis.

Initially, a systematic search across electronic databases and registers yielded 3,170 records, comprising 391 from PubMed, 109 from Cochrane, and 2,670 from Google Scholar. During the preliminary screening phase, all identified records were evaluated for relevance; 2,975 titles and abstracts were excluded as they did not meet the research focus. Of the 86 reports sought for retrieval, all full-text documents were successfully obtained for further analysis.

Subsequently, 62 reports underwent a rigorous eligibility assessment against pre-defined inclusion and exclusion criteria. Following a comprehensive critical appraisal, 44 reports were excluded for failing to satisfy specific study requirements. Ultimately, 18 studies fulfilled all criteria and were included in the final qualitative synthesis and review. For data management and organization, bibliographic references were managed using EndNote XIX. All aggregated data were meticulously processed and analyzed using statistical methods within Microsoft Excel.

2.4. Quality Appraisal

The quality of the included studies was independently assessed by two authors using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies (Moola S., Munn Z.) [9]. This checklist consists of eight items (Appendix 1), with response options of "yes," "no," "unclear," or "not applicable." Each "yes" response was scored as 1 point, while all other responses were scored as 0 points. Studies were considered of acceptable methodological quality if they achieved a quality score of 60% or higher (a minimum of 5 out of 8 points).

2.5. Data Extraction

Data were independently extracted by two reviewers using a standardized data extraction form. The extracted information included: author(s) and year of publication; country; study design; sample size; age range; measurement instruments; psychosocial factors; key findings regarding the associations between psychosocial factors and sleep quality; level of evidence; and quality appraisal scores (Tables 3.1 and 3.2).

3. RESULTS

3.1. Study Selection

The database search identified a total of 3,170 records, including 391 records from PubMed, 109 records from the Cochrane Library, and 2,670 records from Google Scholar. No duplicate records or records removed by automated tools were identified at this stage.

After title and abstract screening, 2,975 records did not meet the inclusion criteria and were excluded, leaving 86 reports for full-text retrieval. Of these, 62 full-text articles were assessed for eligibility. Following full-text review, 44 studies were excluded for not meeting the inclusion criteria. Ultimately, 18 eligible studies were included in the systematic review (Figure 1).

3.2. Quality Appraisal of the Included Studies

Among the 18 studies included in the synthesis, 11 studies achieved a full quality score of 8/8 based on the JBI checklist and were classified as having strong methodological quality. The remaining 7 studies achieved quality scores ranging from 5 to 7 out of 8, primarily due to insufficient control of confounding factors and limitations in multivariable analysis. No studies were excluded due to poor methodological quality.

3.3. Characteristics of the Included Studies

The 18 studies included in the review were published between 2015 and 2025 and were conducted across diverse geographic regions, including China [10-14], Japan [15,16], the United States [17,18], South Korea [19], Thailand [20], India [21,22], New Zealand [23], Turkey [24], Iran [25], Canada [26], and Sweden [27] (Table 3.1).

All included studies employed a cross-sectional design and were conducted among community-dwelling older adults aged 60 years and above. Sample sizes varied substantially, ranging from small community-based samples with fewer than 200 participants [17,21,22] to large population-based datasets involving more than 90,000 participants [23].

Sleep-related outcomes were assessed using validated and standardized instruments, most commonly the Pittsburgh Sleep Quality Index (PSQI) [10,11,13-15,17,19-21,24] and the Athens Insomnia Scale (AIS) [16]. In addition, some studies utilized standardized survey-based sleep measures embedded within large administrative or population-based datasets [23].

The psychosocial factors examined across the included studies comprised depression [15, 19, 20, 21, 22, 24], anxiety [16, 17, 21, 22, 26, 27], psychological stress [13], loneliness [10, 14, 23, 25], social isolation [12, 18, 23], social support [10, 11, 15], and psychological resilience [13].

Table 3.1. General characteristics of the included studies

Author (year), Country and Study design	Sample size and Age (mean/range)	Tools	Psychosocial factors assessed	Main findings
Gould et al. (2018) USA Cross-sectional [17]	109 66-92 (75.3 ± 7.0)	Pittsburgh Sleep Quality Index (PSQI); Epworth Sleepiness Scale (ESS); Geriatric Anxiety Scale (GAS); Beck Depression Inventory-II (BDI-II)	Anxiety symptom clusters (affective, cognitive, somatic); depressive symptoms; perceived health	Greater affective and somatic anxiety symptoms were independently associated with poorer global sleep quality, while somatic anxiety was also associated with greater daytime sleepiness.
Pang et al. (2024) China Cross-sectional [10]	1,205 ≥60 years	PSQI; Social Support Rating Scale (SSRS); UCLA Loneliness Scale (ULS-6)	Social support; Loneliness	Social support was negatively associated with both sleep disturbance and loneliness, while sleep disturbance was positively associated with loneliness among older adults; these associations differed between migrant and local older populations.
Kishimoto et al. (2016) Japan Cross-sectional [15]	3,732 ≥65 years (72.4 ± 5.3)	PSQI; Geriatric Depression Scale (GDS-15); Jichi Medical School Social Support Scale	Social support; depressive symptoms;	Depressive symptoms and weak social support from spouse and family were independently associated with sleep disturbance. Participants with GDS-15 ≥6 had higher odds of sleep disturbance (AOR = 2.29, 95% CI: 1.86–2.81), and those with weak spousal or familial support also showed significantly increased odds.
Chiou et al. (2016) Taiwan Cross-sectional [19]	4,047 ≥65 years	PSQI; DSM-IV criteria; Geriatric Depression Scale–Short Form	Depression	Depressive symptoms and pain were common correlates of both short-term and persistent insomnia, with more severe depression and pain associated with longer insomnia duration.

Author (year), Country and Study design	Sample size and Age (mean/range)	Tools	Psychosocial factors assessed	Main findings
Inanc & Ercin (2025) Türkiye Cross-sectional [24]	205 80–101 (84.9 ± 4.1)	PSQI; Geriatric Depression Scale (GDS)	Depression	Poor sleep quality was significantly associated with higher levels of depressive symptoms among adults aged 80 years and older li ving in rural areas.
Thichumpa et al. (2018) Thailand Cross-sectional [20]	266 60–85 (67.8 ± 7.1)	PSQI; PHQ-9; Family Relationships Scale; Barthel Index	Depressive symptoms; family relationships; social context	Mild depressive symptoms and poor family relationships were independently associated with poor sleep quality among community-dwelling older adults.
Das et al. (2020) India Cross-sectional [21]	180 ≥60 years	PSQI; 5-item GDS; GAD-7; GPAQ	Depressive symptoms; anxiety; vital life events; marital status	Depression and anxiety were independently associated with poor sleep quality, with higher odds observed among unmarried or widowed older adults and those experiencing recent vital life events.
Li et al. (2025) China Cross-sectional [11]	359 ≥65 years	PSQI; Connor – Davidson Resilience Scale (CD-RISC); Perceived Social Support Scale (PSSS)	Psychological resilience; Social support	Higher psychological resilience was associated with better sleep quality, and social support partially mediated the relationship between resilience and sleep quality among older adults.
Yang et al. (2025) China Cross-sectional [12]	7,762 ≥60 years (71.1 ± 6.8)	Sleep duration & sleep quality questionnaire; PHQ-9; GAD-7; Social isolation index	Social isolation; depressive symptoms; anxiety	Social isolation was associated with both abnormal sleep duration and poor sleep quality, with depression partially mediating these associations, while anxiety showed no mediating effect.
McLay et al. (2021) New Zealand Cross-sectional [23]	95,045 65–109 years	interRAI-HC sleep items	Loneliness; Social isolation	Loneliness and social isolation were independently and synergistically associated with insufficient sleep over

Author (year), Country and Study design	Sample size and Age (mean/range)	Tools	Psychosocial factors assessed	Main findings
				time, with stronger and more persistent effects observed among those who were both lonely and living alone.
Cao et al. (2022) China Cross-sectional [13]	1,173 65–90 (72.7 ± 6.5)	PSQI; PTSD Checklist – Civilian Version (PCL-C)	Post-traumatic stress symptoms (re-experiencing, avoidance, hypervigilance)	Greater severity of PTSD symptoms was associated with poorer overall sleep quality and higher prevalence of sleep disorders, with consistent associations across all PSQI dimensions.
Suzuki et al. (2024) Japan Cross-sectional [16]	7,873 Mean 71.7 years (majority ≥60)	Athens Insomnia Scale (AIS)	Anxiety; subjective happiness; living conditions; environmental factors	Insomnia symptoms were independently associated with anxiety, lack of happiness, difficult living conditions, and unfavorable environmental factors, highlighting the combined influence of psychological and social contexts on sleep.
Grossman et al. (2021) Israel Cross-sectional [25]	243 60–92 (69.8 ± 6.7)	UCLA Loneliness Scale (3-item); sleep problems items; COVID-19 worries scale; CD-RISC	Loneliness; COVID-19–related worries; psychological resilience	Greater loneliness was associated with more sleep problems, with stronger associations observed among older adults with higher COVID-19–related worries and lower psychological resilience.
Jia & Yuan, (2020) China Cross-sectional [14]	1,658 ≥60 years (70.4 ± 7.6)	SF-36, the PSQI; UCLA Loneliness Scale (20-item); SF-36	Loneliness; family relationships; socioeconomic and social factors	Poor sleep quality was independently associated with higher levels of loneliness among rural older adults, even after adjustment for sociodemographic, health, and quality-of-life factors.
Cho et al. (2019) USA Cross-sectional	2,541	PSQI; loneliness scale; social network size;	Subjective social isolation (loneliness);	Subjective social isolation was strongly associated with sleep

Author (year), Country and Study design	Sample size and Age (mean/range)	Tools	Psychosocial factors assessed	Main findings
[18]	60–103 (72.6 ± 8.4)	CES-D; Chalder Fatigue Questionnaire	objective social isolation	disturbance, whereas associations with objective social isolation were weak and largely attenuated after accounting for loneliness.
George et al. (2018) India Cross-sectional [22]	170 ≥60 years	PSQI; GAD-7; GDS-5	Anxiety; depressive symptoms	Severe anxiety and depressive symptoms were significantly associated with poor sleep quality among community-dwelling older adults.
Dragioti et al. (2017) Sweden Cross-sectional [27]	6,205 ≥65 years (76.2 ± 7.5)	Insomnia Severity Index (ISI); General Well-Being Schedule (anxiety, depression); pain intensity and pain spreading measures	Anxiety; depressive symptoms; pain characteristics	Anxiety and depressive symptoms were independently associated with greater insomnia severity across pain and no -pain groups, with anxiety showing the strongest association with insomnia.
Leblanc et al. (2015) Canada Cross-sectional [26]	2,759 ≥60 years	DSM-IV-TR structured interview; sleep problem items based on PSQI	Anxiety disorders; mood disorders	Sleep onset latency and frequent awakenings were associated with anxiety and mood disorders, whereas perceived sleep quality showed no significant association with mental disorders.

Table 3.2. Quality appraisal of the included studies

Author, Year	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Total Score
Gould et al., (2018) [17]	1	1	1	1	1	1	1	1	8/8
Pang et al., (2024) [10]	1	1	1	1	1	1	1	1	8/8
Kishimoto et al., (2016) [15]	1	1	1	1	1	1	1	1	8/8
Chiou et al., (2016) [19]	1	1	1	1	1	1	1	1	8/8
Inanc & Ercin , (2025) [24]	1	1	1	1	0	0	1	0	5/8
Thichumpa et al., (2018) [20]	1	1	1	1	1	1	1	1	8/8
Das et al. , (2020) [21]	1	1	1	1	1	1	1	1	8/8
Li et al., (2025) [11]	1	1	1	1	1	1	1	1	8/8
Yang et al. , (2025) [12]	1	1	1	1	1	1	1	1	8/8
McLay et al., (2021) [23]	1	1	1	1	1	1	1	1	8/8
Cao et al. , (2022) [13]	1	1	1	1	1	0	1	1	7/8
Suzuki et al., (2024) [16]	1	1	1	1	1	1	1	1	8/8
Grossman et al., (2021) [25]	1	1	1	0	1	1	0	1	6/8
Jia & Yuan , (2020) [14]	1	1	1	1	1	1	0	1	7/8
Cho et al., (2019) [18]	1	1	1	1	1	1	1	1	8/8
George et al., (2018) [22]	1	1	1	1	1	0	0	0	5/8
Dragioti et al., (2017) [27]	1	1	1	1	1	1	0	1	7/8
Leblanc et al. , (2015) [26]	1	1	1	0	1	1	0	1	6/8

Q1 - the criteria for inclusion in the sample clearly defined?

Q2 - the study subjects and the setting described in detail?

Q3 - the exposure measured in a valid and reliable way?

Q4 - objective, standard criteria used for measurement of the condition?

Q5 - confounding factors identified?

Q6 - strategies to deal with confounding factors stated?

Q7 - outcomes measured in a valid and reliable way?

Q8- appropriate statistical analysis used?

Each Item was scored as follows: Yes = 1; No/Unclear or Not/Applicable = 0.

4. DISCUSSION

4.1. Psychosocial Determinants of Sleep Quality in Community-Dwelling Older Adults

Across the global literature, depression [15, 19-22, 24] and anxiety [16, 17, 21, 22, 26, 27] emerge as the most prevalent psychosocial factors significantly correlated with poor sleep quality and fragmented sleep architecture among community-dwelling older populations. Empirical evidence consistently indicates that individuals exhibiting depressive or anxiety symptoms face a heightened risk of overall sleep degradation, insomnia, and nocturnal disturbances [15, 16, 21, 22].

Research conducted in South Asian contexts, specifically India, has established that depression and anxiety serve as robust predictors of sleep disturbances [21, 22]. Notably, George et al. found that both depressive symptoms and anxiety—particularly severe anxiety—showed significant statistical associations with poor sleep quality [22]. Das et al. further reinforced this by demonstrating that these psychological factors remained independently associated with sleep problems even after adjusting for potential confounding variables [21]. Similar data from Japan and Thailand highlight that the risk of poor sleep quality persists among depressed individuals regardless of demographic or health-related factors [15, 20].

The severity of psychological distress appears to have a dose-response relationship with sleep degradation. Studies in Japan have identified a graded increase in sleep disorder risk corresponding to rising levels of depressive symptoms [15], while research in Taiwan suggests that depression is more strongly associated with chronic insomnia (lasting six months or longer) than with acute, short-term disturbances [19]. Within the oldest-old cohort (≥80 years), this correlation remains evident; research in Turkey suggests that depressive symptom severity positively correlates with multiple sleep components, with women appearing particularly vulnerable to these depression-related sleep pathologies [24].

Regarding anxiety, large-scale studies in Japan and Sweden have identified it as a primary psychological driver of insomnia severity [16, 27]. In Sweden, anxiety was the sole psychological factor remaining significantly associated with poor sleep quality among participants without pain [27]. However, the impact varies across anxiety dimensions; evidence from the United States indicates that affective and somatic symptoms—rather than cognitive anxiety—play a more prominent role in sleep disruption, likely due to heightened physiological and emotional arousal [17]. Clinically, distinct patterns have been observed: anxiety is more strongly associated with sleep initiation difficulties and nocturnal awakenings compared to depression, providing a critical diagnostic marker for differentiating these conditions [26]. Furthermore, Post-Traumatic Stress Disorder (PTSD) represents a significant risk factor, with research in China showing that individuals with PTSD symptoms exhibit nearly twice the prevalence of sleep disturbances compared to their counterparts, with sleep quality declining as PTSD severity increases [13].

4.2. Loneliness, Social Isolation, and Sleep Outcomes

Synthesis of community-based evidence indicates that while both loneliness and social isolation correlate with poor sleep quality, their impacts are distinct. Research in the United States and New Zealand demonstrates that the subjective experience of loneliness maintains a more robust and consistent association with sleep disturbances than objective indicators of social isolation. Specifically, social isolation alone appears to have a negligible impact on sleep outcomes in the absence of perceived loneliness [18, 23].

Psychological mediation plays a critical role in this relationship. Data from China suggest that depression partially mediates the pathway between social isolation and poor sleep quality [12]. Furthermore, structural equation modeling highlights a bidirectional loop where sleep disturbances can act as a mediator between social support and loneliness [12].

The impact of loneliness is further modulated by individual resilience and context. During the COVID-19 pandemic, evidence from Israel reported that higher anxiety exacerbated the adverse effects of loneliness on sleep, whereas psychological resilience served as a protective factor [25].

In rural China, loneliness was significantly correlated with multiple sleep dimensions, including prolonged latency, reduced duration, and increased use of sedative-hypnotics [14]. The higher prevalence of loneliness among women and the oldest-old (≥80 years) reflects the cumulative burden of social disadvantages across age and gender [14].

In conclusion, loneliness—as a subjective perception—plays a central role in linking social adversity to sleep quality, while objective isolation primarily influences sleep through psychological mediators. This distinction clarifies the pathways linking social environments, mental health, and sleep outcomes in older populations.

4.3. Protective Roles of Social Support and Psychological Resilience

Beyond psychosocial risks, community-based studies identify social support and psychological resilience as critical protective determinants of sleep quality in older populations. Research in Japan highlights the direct protective effects of close interpersonal relationships, where robust support from spouses or family correlates with superior sleep health, while low support levels significantly elevate the risk of disturbances [15].

Complementing these findings, a study in China demonstrated that social support is inversely associated with sleep disturbances and loneliness [10]. Notably, mediation analysis revealed that sleep disturbances partially mediate the relationship between social support and loneliness, suggesting that insufficient social connectivity may exacerbate feelings of isolation through its detrimental impact on sleep quality [10].

From a positive psychological perspective, higher resilience levels are significantly associated with improved sleep. Social support serves as a key mediator in this association, implying that the protective effects of resilience are strengthened through enhanced perceived social resources [11]. Collectively, these findings validate a "buffering model," wherein the synergistic interaction of social support and resilience mitigates psychosocial disadvantages and maintains healthy sleep in community-dwelling older adults.

4.4. Implications for Nursing Practice and Community Health

The findings of this review underscore the pivotal role of community nurses in the proactive screening of psychosocial determinants—specifically depression, anxiety, loneliness, and social support—to identify older adults at high risk for sleep disturbances. Integrating sleep evaluations into comprehensive mental and social health assessments facilitates early clinical intervention. Furthermore, nursing professionals are central to the delivery of non-pharmacological psychosocial strategies, such as sleep hygiene education, stress management, and resilience-building programs. These interventions align with person-centered care models and are essential for addressing the healthcare needs of an aging population within community-based frameworks.

4.5. Strengths and Limitations

This systematic review is characterized by its rigorous methodological framework, a specific focus on community-dwelling older populations, and the application of standardized tools for critical quality appraisal. However, several inherent limitations warrant consideration. The predominance of cross-sectional designs among the included studies precludes the establishment of definitive causal inferences. Furthermore, the reliance on self-reported sleep metrics introduces potential information bias, while the conceptual and methodological heterogeneity in assessing psychosocial factors may constrain the direct comparability of findings across diverse study contexts.

5. CONCLUSIONS AND RECOMMENDATION

Conclusions: This systematic review confirms that psychosocial determinants are profoundly associated with sleep quality among community-dwelling older adults. Specifically, depression, anxiety, psychological stress, loneliness, and social isolation are established as significant risk factors that exacerbate sleep disturbances. Conversely, social support, psychological resilience, and subjective well-being function as vital protective resources that mitigate sleep-related impairments. These findings underscore the complex interplay between mental health, social connectivity, and sleep architecture in the geriatric population.

Recommendations: To advance the field, future research should prioritize longitudinal designs to elucidate definitive causal pathways between psychosocial factors and sleep outcomes. Furthermore, there is a critical need for robust intervention studies to evaluate the efficacy of nurse-led psychosocial programs—such as resilience-building and social connectivity initiatives—in enhancing sleep health. Clinical practice should move toward an integrated care model that incorporates psychosocial screening into routine geriatric nursing assessments to facilitate early and holistic interventions.

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APPLICATION OF WISN IN DETERMINING NURSINGWORKFORCE REQUIREMENTS: A LITERATURE REVIEW

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ABSTRACT

Aims: Nurses constitute the largest segment of the health workforce, yet persistent global shortages, particularly in low- and middle-income countries, expose the limitations of traditional staffing models based on fixed ratios. In response, the World Health Organization (WHO) developed the Workload Indicators of Staffing Need (WISN) as an evidence-based method to estimate nursing workforce requirements based on actual workload. This review aims to synthesize available evidence on nursing workload and staffing needs using the WISN method in Vietnam and internationally, and to examine the role of Annual Working Time (AWT) in sustainable nursing workforce planning.

Method: A literature review was conducted in accordance with PRISMA guidelines. Relevant studies were identified through searches of PubMed, CINAHL, Google Scholar, and Vietnamese medical journals using keywords related to WISN, nursing workload, and staffing needs. Studies published between 2014 and 2022 were screened and selected based on predefined inclusion criteria. A total of 18 studies were included in the review, comprising 10 international studies and 8 studies conducted in Vietnam.

Results: The findings consistently indicate substantial nursing workforce shortages across settings. Most studies reported WISN ratios below 1,0, reflecting staffing levels insufficient to meet actual workload demands. In several low and middle-income countries, WISN values ranged from 0.33 to 0.72, suggesting severe shortages and high work pressure. In Vietnam, WISN ratios commonly ranged from 0.6 to 0.85, indicating widespread nursing shortages in public hospitals, In addition, Vietnamese nurses were found to spend a considerable proportion of their working time (approximately 30–45%) on indirect and administrative tasks, which reduces time available for direct patient care, Annual Working Time varied substantially across countries, ranging from 1,227 to 2,112 hours per year; in Vietnam, AWT was relatively stable at approximately 1,800–1,920 hours per year.

Conclusion: The WISN method provides a robust and practical approach for estimating nursing staffing needs based on actual workload, Accurate calculation of AWT and optimization of nurses' work structure are essential for developing realistic and sustainable staffing norms, thereby improving quality of care and patient safety,

Keywords: Workload Indicators of Staffing Need (WISN); nursing workforce; workload-based staffing; annual working time; health workforce planning

1.INTRODUCTION

Human healthcare services are the backbone of every health system, directly determining service quality and patient safety [19], Among them, the nursing workforce constitutes the largest proportion and is the primary force providing direct, continuous care to patients. However, the global shortage of nurses remains a major challenge, According to the World Health Organization (WHO) report, the world will face a shortage of approximately 5.7 million nurses by 2030 without timely interventions [18,20].

In Vietnam, the rapid rise in non-communicable diseases, combined with the growing healthcare demands of the population, has placed significant pressure on the nursing workforce. Previously, nursing staffing needs were determined using traditional indicators such as the nurse-to-bed ratio or nurse-to-physician ratio (per Circular 03/2023/TT-BYT and previously Joint Circular 08/2007/TTLT-BYT-BNV) [1]. However, these norms have notable limitations, as they do not account for fluctuations in actual workload, care intensity, or differences across clinical specialties [5]. To address these shortcomings, WHO developed the Workload Indicators of Staffing Need (WISN) method. This is an evidence-based management tool that enables policymakers to calculate required staff numbers based on the actual activities they perform [21].

Globally, WISN has been widely applied in countries such as Bangladesh (Joarder et al., 2020), India (Shivam et al., 2014), and Iran (Nayebi et al., 2019) [11,15,17], International studies not only identify staffing shortages but also highlight serious consequences of workload overload, such as occupational burnout and incomplete care processes. In Vietnam, the WISN method gained attention and was actively implemented after 2015 through studies at central and local hospitals, such as Vietnam-Sweden Uong Bi Hospital, Hậu Giang, Can Tho General Hospital, and Bac Giang Provincial General Hospital [2,3,6,7].

Despite numerous individual studies, no systematic review has yet compared domestic research results with international trends to provide a comprehensive overview of the nursing workload situation in Vietnam. This article aims to synthesize scientific evidence on nursing workload based on the WISN method both domestically and internationally; analyze factors affecting effective working time and nursing staffing norms; and propose solutions for optimizing human resource management based on actual workload.

2.METHODS

A literature review was conducted following PRISMA guidelines. Databases such as CINAHL, PubMed, and Google Scholar, along with specialized medical journals, were consulted. The search strategy used English terms: "Workload index staffing needs, nursing care", and Vietnamese terms: "Chỉ số khối lượng công việc, chăm sóc điều dưỡng", Publications from 2014 to 2022 were included. Documents were selected if they met four criteria: study type; focus on nursing workload; content emphasizing workload calculation and nursing working time; and articles in English or Vietnamese.

For selection, titles and abstracts were first screened, followed by full-text review, and finally

backward searching in the references of selected studies. Preferred reporting items for systematic reviews and meta-analyses (PRISMA) were used for full-text evaluation. Three team members independently conducted detailed reviews to ensure objectivity in the dual appraisal process.

The key indicator reviewed was Annual Available Working Time (AWT), calculated in hours per year, AWT = (A - B - C - D - E) × F). Components ảe derived from the following factors:

-A: Number of working days in a year (typically 365 days minus non-working days).
-B: Annual leave days.
-C: Sick leave days.
-D: Public holidays.
-E: Other leave types.
-F: Hours worked per day (e,g., 8 hours), used to convert total available days into hours,

The Workload Indicators of Staffing Need ratio (WISN ratio = AWT/ Required staff per (A×B+C) was also examined, where:

-A: Total standard workload = Total service activities / Standard time per activity (usually in minutes/hours).
-B: Category allowance factor = 100% / (100% - % time for breaks/support activities), e,g,, 25% for nurses.
-C: Staff requirement for additional activities (non-service work such as training or meetings), typically 5-10% of A×B.

3.RESULTS

A synthesis of 15 international and Vietnamese studies reveals significant discrepancies between current staffing levels and actual workload-based needs, particularly in developing countries, WISN index statistics and nursing workforce status indicate that most ratios are <1 (1: workforce adequately meets workload; <1: staff shortage (high workload pressure); >1: staff surplus relative to actual workload).

Annual Working Time (AWT) for nurses varies markedly across countries and Vietnam, AWT ranges from 1,336 to 1,982 hours/year, depending on leave days and daily working hours, Countries with more leave days and fewer hours per day typically have lower AWT, In Vietnam, nurses' AWT remains relatively stable at 1,675–1,941 hours/year, at a moderate level compared to international studies (Table 1).

Table 1. Summary of WISN results for nursing staffing needs (N = 15)

No	Author (Year)	Location / Countries	AWT (Hours/Year)	WISN (Nursing)
1	Ekawati (2018) [**Error! Reference source not found.**]	Hospital. Indonesia	1,982	0.7
2	Joarder (2020) [**Error! Reference source not found.**]	Primary healthcare. Bangladesh	1,632	0.69
3	Nayebi (2019) [**Error! Reference source not found.**]	Emergency Department. Iran	1,909	0.87

Conclusion: The WISN method provides a robust and practical approach for estimating nursing staffing needs based on actual workload, Accurate calculation of AWT and optimization of nurses' work structure are essential for developing realistic and sustainable staffing norms, thereby improving quality of care and patient safety,

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4	Shivam (2014) [**Error! Reference source not found.**]	District Hospital . India	1,960	0.35
5	Okoroafor (2019) [**Error! Reference source not found.**]	Community health level. Nigeria	1,336	0.85
6	Dimiri D. et al (2022) [**Error! Reference source not found.**]	Braun District Hospital. Papua New Guinea	1,880	0.67
7	Gialama F. et al (2019) [**Error! Reference source not found.**]	Public hospitals in Greece	1,608	0.83 - 1.33
8	Mohamed N. et al (2018) [**Error! Reference source not found.**]	Primary healthcare . Oman	1,484	0.66
9	Nair A. et al (2022) [**Error! Reference source not found.**]	Rural health centers . India	1,944	0.17
10	Đồng Thị Thuận et al . (2019) [**Error! Reference source not found.**]	Vietnam-Sweden Uong Bi Hospital (clinical departments)	1,941	0.8 - 0.98
11	Lương Văn Trình et al . (2021) [**Error! Reference source not found.**]	General Hospital of Binh Dinh Province	1,675	1.2
12	Phùng Thanh Hùng et al . (2016/2019) [**Error! Reference source not found.**]	Can Tho Central General Hospital (3 clinical departments)	1,811	0.68 - 0.78
13	Nguyễn Thị Hoài Thu. et al. (2022) [**Error! Reference source not found.**]	4 public hospitals in Vietnam	1,929	0.88 – 0.95
14	Phạm Văn Tác et al . (2016) [**Error! Reference source not found.**]	Bac Giang Provincial General Hospital	1,922	0.82
15	Lê Văn Tạo (2015) [**Error! Reference source not found.**]	Outpatient Department. Hau Giang Provincial General Hospital	1,912	0.70 - 0.90

4.DISCUSSION

WISN Index and Workload Pressure on Nurses

In South and Southeast Asian countries, the WISN index is typically low. In India. Shivam et al. (2014) reported that nurses bear a very high workload relative to their actual capacity. with WISN ratios ranging from 0.30 to 0.35. and only 0.25 in suburban hospitals, meaning current staffing meets just about one-third of needs [17]. Additionally, WISN calculations by specialty reveal uneven distribution across units; Nayebi (2019) emphasized that in Iran, the Emergency Department faces 1.5 times higher workload intensity than other departments due to the non-deferrable nature of tasks [15]. Meanwhile, Gialama (2019) reported localized surpluses and shortages across regions in Greece, highlighting that workforce challenges relate not only to quantity but also to uneven distribution [10].

The workload of Vietnamese nurses in an international context

Results from six studies in Vietnam also reflect global trends, while also showing the unique characteristics of the national health system. The shortage of nurses is consistently reported in public hospitals. with a WISN ratio below 1.0 in most studies, including those conducted at public hospitals [1,3,5,6,7]. However, as with the results of Gialama (2019) [10], the study of Luong Van Trinh at Binh Dinh Hospital, the WISN surplus and shortage ratios in departments are not uniform [4].

When compared internationally. the shortage of nurses in Vietnam (WISN around 0.68–0.98) is comparable to lower-middle-income countries, although not as serious as in countries like Bangladesh or some parts of India. This suggests that, although human resource pressures in Vietnam are significant, there is still potential for improvement through more effective human resource management and organizational interventions, rather than relying solely on large-scale recruitment.

Workload structure and administrative burdent

Comparative analysis of workload structure reveals that administrative burden is a distinct feature of nursing practice in Vietnam. In healthcare systems with higher levels of digitalization and more streamlined processes, such as Oman (Mohamed. 2018), indirect activities are managed more efficiently, allowing nurses to dedicate more time to direct patient care [12]. Conversely, studies in Vietnam indicate that nurses spend approximately 30-45% of their working time on indirect and administrative tasks, including record keeping, medication management, and health insurance-related procedures [1,4,5]. Furthermore, while supplemental activities in countries such as Bangladesh (Joarder. 2020) and India (Nair. 2022) often focus on training and community engagement, similar activities in Vietnam often involve poorly defined administrative tasks. This reduces the time spent with patients and may affect the quality of care [12].

Available Working Time (AWT) and its significance for human Resource planning

Available working time (AWT) is a key parameter in human resource calculations based on WISN. Evidence from Indonesia shows that AWT can exceed 1.982 hours per year [9], higher than in the surveyed countries. The AWT index in Vietnam ranges from 1.675 to 1.941 hours per year [1,4]. These differences reflect not only legal regulations on working hours but also differences in leave policies, continuing education and other non-clinical obligations. Furthermore, the requirement for continuing education to maintain professional certification is a factor that needs to be calculated in AWT. If managers only calculate AWT based on the theoretical 40 hours/week without subtracting actual hours of study and meetings, the resulting human resource allocation will always be underestimated compared to actual operations.

Differences between prescribed staffing levels and actual needs from WISN

Domestic studies show that the shortage of nurses is not high compared to other countries,

and there is a difference between the staffing levels according to Circular 03/2023/TT-BYT (formerly Joint Circular 08/2007) and the actual needs calculated through WISN. The current standards of the Ministry of Health are mainly based on the nurse/bed ratio or the nurse/doctor ratio. This approach assumes that all beds have the same intensity of care. However, results from studies at Swedish Uong Bi and Can Tho Hospitals show that departments with the same number of beds have completely different WISN indices due to the severity of patients and specific technical procedures [1,7]. Furthermore, the value of WISN proves that staffing should not be calculated based on beds, but on actual work activities. This explains why many clinical departments, despite having sufficient staffing according to the Ministry of Health's standards, still experience nursing overcrowding (WISN < 1.0).

Significance for Service Quality and Management

The results of 15 studies confirm that work overload is not only a personnel issue, but also a safety issue in the care field. When the WISN index is low (< 0.7), psychological pressure and emotional exhaustion increase, leading to the risk of medical incidents [12]. The shortage of nursing staff in emergency departments [15] or intensive care units in Vietnam needs to be prioritized by transferring personnel from departments with high WISN indices, local surplus instead of recruiting new personnel indiscriminately.

Based on the available evidence, it is possible to propose improvements in human resource management such as gradually shifting from bed-based staffing to workload-based staffing (WISN). In addition, optimize processes and reduce administrative tasks for nurses through information technology to increase direct care time. Furthermore, using WISN as a periodic assessment tool, hospitals should calculate WISN annually to flexibly adjust staffing between departments instead of maintaining fixed staffing levels for extended periods.

5.CONCLUSION

The review of domestic and international studies demonstrates that the WISN method is a scientific and practical tool for determining nursing staffing needs based on actual workload. Most studies report nursing shortages (WISN index < 1.0). particularly in developing countries and Vietnam. Additionally, Vietnamese nurses allocate a significant portion of time to indirect and administrative activities, reducing workforce efficiency and posing risks of occupational burnout. Therefore, accurately calculating Annual Working Time (AWT) is crucial for establishing reasonable and sustainable staffing norms.

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PROACTIVE NURSING CARE DURING TET: SEVEN PRINCIPLES OF BODY NOURISHMENT BASED ON THE MEDICAL PHILOSOPHY OF ZEN MASTER TUE TINH

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One of the most endearing features of the Vietnamese Lunar New Year (Tet) is that people remain busy yet joyful. Busy with shopping, preparing gifts, cooking, hosting, visiting, exchanging greetings— busy to the point of losing track of fatigue. Only when spring has passed its first few days do many suddenly "wake up" with an honest realization: "It was joyful indeed, but why do I feel so utterly exhausted?"

Even more puzzling is the fact that many people are not clinically ill—medical tests remain normal—yet after Tet they feel as though they have endured a long storm. This is because fatigue is not always a matter of disease. Often, it is simply the body falling out of rhythm: disrupted sleep rhythms, eating rhythms, breathing rhythms, movement rhythms, and even emotional rhythms.

In professional healthcare, nursing is not limited to caring for the sick. Nursing is also the art of maintaining balance in the healthy: biological rhythms, functional rhythms, and recovery rhythms. Those who practice proactive nursing can enjoy Tet without suffering from indigestion, insomnia, hypertension, hyperglycemia, prolonged stress, or the lingering exhaustion that often follows the holiday.

Traditional Tet is a cultural gift. But to fully receive this gift, we need another one as well: the ability to care for ourselves.

Photo: Altar of Zen Master Tue Tinh at Bia Temple, Hai Phong, Vietnam.

Centuries ago, Zen Master and Medical Patriarch Tue Tinh left behind concise yet profound teachings that guided people to live in harmony with nature. These teachings, distilled from generations of observing life, remain remarkably relevant when viewed through the lens of modern medicine: prevention as the foundation, balance as the goal, timely intervention for recovery, and holistic care of the human being as an integration of body, mind, and environment.

What Is Proactive Nursing During Tet?

Proactive nursing during Tet can be understood simply as caring for the body before it begins to complain, maintaining balance before rhythms fall out of sync. While Tet is joyful, it is also a period of physiological overload: later bedtimes, richer and heavier meals, alcohol consumption, frequent travel, prolonged sitting, excessive social interaction, and intense emotional stimulation. Just a few days of such patterns can disrupt a previously stable biological rhythm, leading to poor appetite, shallow sleep, mental heaviness, and physical lethargy.

Thus, proactive nursing during Tet is not about rigid restriction, but about preserving rhythm: regular eating, sufficiently deep sleep, slow and steady breathing, gentle daily movement, and relaxed emotional states. Perfection is unnecessary; mindfulness is enough—listening to the body with awareness and treating it with kindness at the right moments—so that when Tet passes, strength remains, the spirit stays light, and spring lingers within the body.

Depicting Zen Master Tue Tinh in his role as a royal envoy to China, the Medical Patriarch of Vietnamese Southern Medicine (Nam Y), conveying his deep nostalgia for his homeland in the timeless phrase: "Whoever goes back to the land of the South, let me return with them."

Let us now walk through seven principles of body nourishment—seven small anchors that help the body remain steady throughout the spring season.

Seven Principles of Body Nourishment According to the Wisdom of Zen Master Tue Tinh

1. Preserving Vital Essence (Bế tinh) – Conserving Energy for Lasting Joy

Tet brings a form of joy that easily drains one's "battery": joy from family reunions, abundant meals, well-wishes, and festive gatherings. When prolonged excessively, this joy can quietly deplete the body. Fatigue does not appear immediately, but surfaces later—after nights of staying up late, after overly full meals, after unavoidable drinking occasions.

In nursing terms, preserving vital essence means conserving life energy and preventing depletion. Proactive nursing begins with a simple principle: enjoy in moderation and know when to stop. If you stay up late, try to maintain a consistent waking time to protect circadian rhythms. When traveling, schedule breaks rather than pushing through exhaustion. When fatigue arises, allow yourself to withdraw early—without guilt.

The body does not demand perfection. It only asks to be treated as a living organism with limits, rhythms, and the need for energy preservation. At the start of the year, nothing is more valuable than maintaining sufficient internal "battery" to carry you through the entire spring.

2. Nourishing Vital Energy (Dưỡng khí) – Cultivating Breath and Vitality

Among all proactive nursing methods, there is one remedy that is simple, free, and always available: the breath. Ironically, during Tet we often breathe more shallowly without realizing it. Overeating, excessive talking, dense schedules, emotional fluctuations, and social roles all shorten and quicken the breath. Shallow breathing places the body in a prolonged stress state, allowing fatigue to accumulate rapidly.

Physiologically, nourishing vital energy means slowing and deepening the breath to activate the body's relaxation response. Just one minute is enough: inhale for 4 seconds, hold for 2 seconds, exhale for 6 seconds; repeat five times. A slower breathing rhythm—especially with a longer exhalation—stimulates the parasympathetic nervous system, calming the heart rate, relaxing muscles, and shifting the body into recovery mode.

Try this after meals, after social interactions, or before sleep. One minute can feel like opening a small door through which both mind and body can rest.

3. Stabilizing the Spirit (Tồn thần) – Preventing Tet from Becoming a "Mental Storm"

Tet is a season of laughter, but also of constant stimulation: sounds, messages, phone calls, photos, social media, and overlapping schedules. The brain rarely gets a chance to rest. Like muscles, when the brain becomes fatigued, dysfunction follows—irritability, poor concentration, forgetfulness, stress, and insomnia.

Stabilizing the spirit in proactive nursing means allowing the nervous system time to recover. Physiologically, the brain requires brief but regular periods of quiet to lower activation levels and restore balance between excitation and inhibition. Therefore, consciously turn off screens for at least 30 minutes each day. When impatience arises, pause rather than argue—change the subject or step into a different space. During long drives or travel, rest appropriately to protect both the nervous system and personal safety.

Preserving mental stability does not diminish joy; it prevents joy from turning into exhaustion. Only with a steady nervous system can we truly be present during the first days of the year.

4. Purifying the Heart (Thanh tâm) – Lightening the Mind, Softening Words

Some forms of fatigue do not reside in the stomach or show on blood pressure readings, but lie deep within the heart. Fatigue from expectations, comparisons, and seemingly innocent questions that touch sensitive places: "Why haven't you…?", "When will you…?", "How is your work these days…?". Such tensions quietly keep the nervous system in a prolonged defensive state, preventing true relaxation.

Thus, proactive nursing sometimes requires caring for the mind as much as the body. When the mind is unsettled, heart rate increases, breathing becomes shallow, and sleep deteriorates. Purifying the heart does not mean avoiding

all conversations, but learning to live gently—to avoid harming oneself or others.

Small, soft phrases can ease the atmosphere:

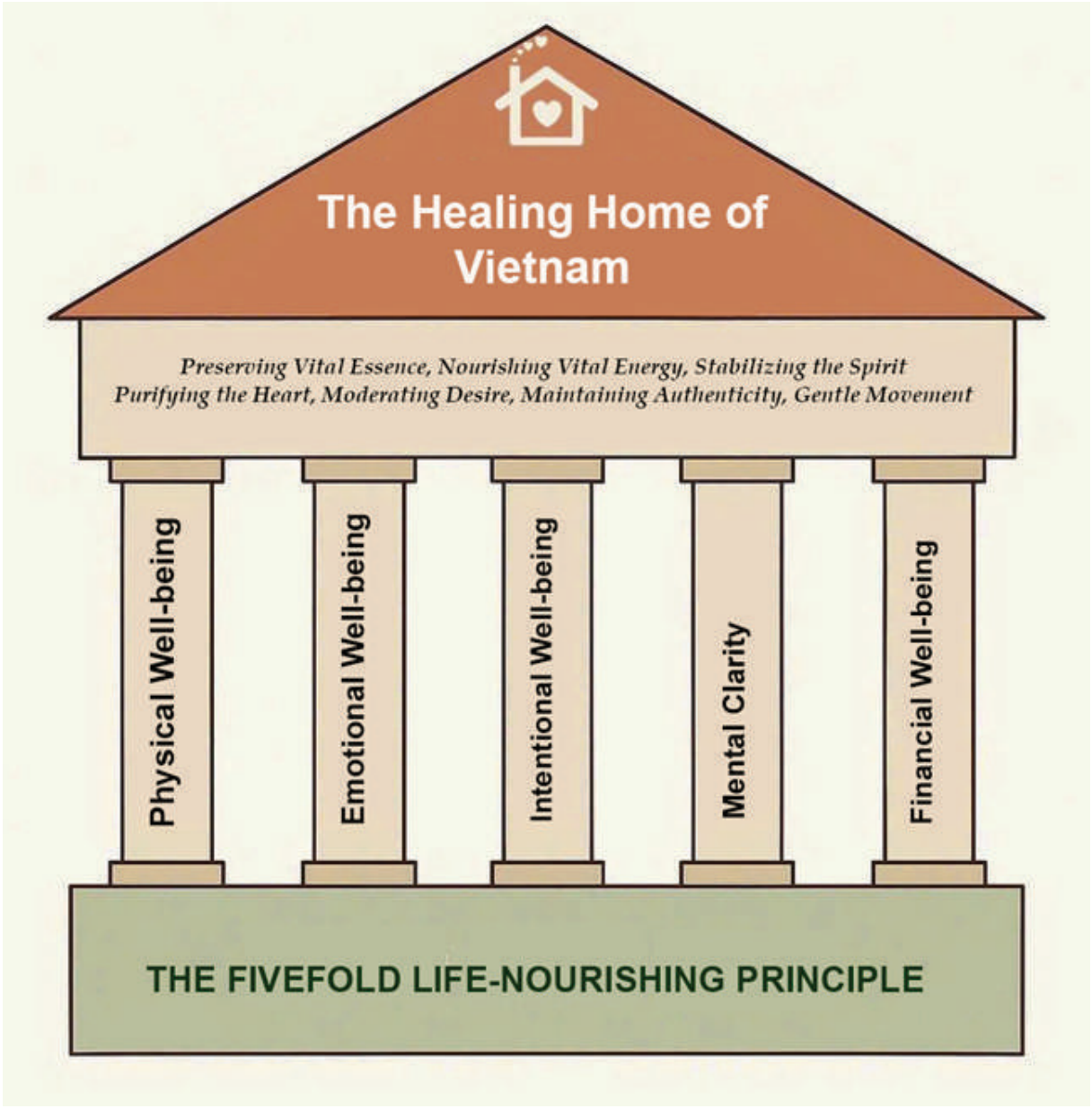
- "Let's smile first."
- "We'll think about that tomorrow."
- "Have a piece of cake just for the joy of it."

A single gentle sentence can cool the family atmosphere. As the environment softens, so does the body: blood pressure stabilizes, breathing deepens, and sleep comes more easily. During Tet, being warm often matters more than being right.

5. Moderating Desire (Quả dục) – Restraint for Sustainable Health

Tet is full of sweet temptations: snacks always within reach, lavish meals, enthusiastic drinking invitations. We eat more for joy, drink more out of politeness, stay up later for fear of missing out. The body, however, does not understand politeness—it only registers overload.

Proactive nursing is not strict dieting, but timely moderation. Physiologically, overeating forces the digestive system to overwork, causes blood glucose fluctuations, raises heart rate and blood pressure, and brings fatigue quickly.



Simple principles suffice:

•Eat until about 70% full; stop while food still tastes good.
•Follow protein- or fat-heavy dishes with soup or vegetables to ease digestion.
•Pair each alcoholic drink with a glass of water to reduce dehydration and liver burden.
•After meals, walk gently for 10 minutes instead of lying down immediately.

Moderation does not diminish joy; it sustains it. A long Tet with a healthy body and light spirit is the true blessing of the new year.

Maintaining authenticity in proactive nursing means returning to basic physiological needs: real meals, real rest, real living. Eating regular meals stabilizes digestion and prevents erratic blood glucose fluctuations. Reducing scattered snacking allows the gut to rest. Prioritizing warm foods, soups, and boiled dishes eases gastric workload. Drinking warm water and reducing carbonated beverages lowers the burden on the liver and kidneys. And when fatigue appears, allowing rest instead of forcing completion.

The body possesses a remarkable capacity for self-regulation and recovery—if we do not continuously obstruct it with excess. When simplicity is preserved, calm naturally follows.

The ceremonial rite of "hóa sớ" (ritual burning of memorial petitions) during the death anniversary ceremony of the Great Physician and Zen Master Tue Tinh at Bia Temple, Vietnam.

6. Maintaining Authenticity (Thủ chân) – Returning to Simplicity for Bodily Calm

The body thrives on simplicity and stability, yet during Tet we often do the opposite: constant snacking, layered flavors with heavy oils, consecutive late nights, sugary drinks replacing water, strong tea replacing sleep. Accumulated, these habits overburden digestion, the nervous system, and metabolism.

7. Gentle Movement (Luyện hình) – Opening the Joints to Promote Circulation

One hallmark of Tet is prolonged sitting: sitting to eat, to chat, to scroll on phones, to watch television—until the neck and shoulders stiffen,

the back aches, and the legs feel heavy. Prolonged sitting slows circulation, stagnates joints, impairs digestion, and amplifies fatigue.

Movement during Tet is not about weight loss or intense exercise, but about awakening the body. Just a few minutes of gentle motion can restore circulation, lubricate joints, support digestion, and improve sleep quality.

A simple "3-minute movement routine":

•Gently rotate the neck, shoulders, and hips to release tension.
•Stretch arms upward while inhaling deeply and exhaling slowly to open the chest.
•Walk around the house or outdoors for 10–15 minutes.

A few rounds are enough to shed a layer of accumulated fatigue. The body needs movement to flow, just as water needs motion to remain clear.

"After-Tet, No-Fatigue" Nursing Checklist

•Morning: Warm water + 10 minutes of gentle movement.
•Midday: Moderate meal + 10-minute walk.
•Afternoon: Rest the eyes + reduce screen time for 30 minutes.
•Evening: Warm shower + 1 minute of breathing + sleep as early as possible.

If warning signs appear—worsening dizziness, chest pain, shortness of breath, unilateral weakness or numbness, slurred speech, irregular heartbeat—seek medical care promptly. Proactive nursing also means avoiding complacency.

PhD, Herb Doctor Phung Tuan Giang wrapping traditional "bánh chưng" (traditional Vietnamese square sticky rice cake) together with the staff of Tho Xuan Duong Pharmacy to welcome the Lunar New Year (Tet).

Proactive nursing care during Tet inspired by the wisdom of Zen Master Tue Tinh, the Medical Patriarch of Vietnamese Southern Medicine (Nam Y)

from spring within the body to spring in the home and the vitality of the nation.

Spring in the Home Begins with Spring in the Body

The beauty of Vietnamese Tet lies in the sharing of goodwill. But goodwill is not only in greetings or red envelopes—it resides in a peaceful body: deep sleep, light breathing, moderate eating, and unforced smiles. When the body is at ease, joy becomes whole and enduring.

The seven principles passed down by Zen Master Tue Tinh, when applied to modern life, become seven everyday gifts: conserving energy to prevent depletion, nurturing breath for inner calm, stabilizing the mind to avoid mental storms, purifying the heart for household harmony, moderating desire for sustainable health, living authentically for lightness, and moving gently so that spring flows through every joint.

We then realize that spring is not only outside or on the feast table. Spring also lives in how we care for ourselves—daily, through small acts.

May every family enjoy a true Tet: joyful without exhaustion, abundant without excess, reunited yet peaceful. For in the end, the most precious "lucky money" is health—the foundation that carries us fully through the year ahead. ■

TRONG SỐ NÀY

TRONG SỐ NÀY

SÂM NGỌC LINH
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