FACTORS ASSOCIATED WITH PREOPERATIVE PATIENT PREPARATION BY NURSES AT THE SURGICAL DEPARTMENT, VINMEC TIMES CITY INTERNATIONAL HOSPITAL, 2024

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ABSTRACT

Objective: To analyze factors associated with preoperative patient preparation performed by nurses at the Surgical Department, Vinmec Times City International Hospital.

Methods: A cross-sectional analytical study was conducted at the Surgical Department of Vinmec Times City International Hospital from January to June 2024. The study included 184 surgical patients who were prepared preoperatively by nurses. Data were collected using a checklist evaluating five groups of standardized preoperative preparation activities. Data were analyzed using SPSS version 20.0, employing descriptive statistics and Chi–square (χ^2) tests to determine associations between variables, with a significance level of $p < 0.05$.

Results: Overall, 70.1% of nurses performed good-quality preoperative patient preparation, while 29.9% were rated as fair. All nurses achieved good performance in assessing vital signs and physical status (100%), with other preparation aspects ranging from 83.7% to 95.7%. Statistically significant associations were found between preparation outcomes and patients' occupation, comorbidities, diagnosis, type of surgery, and form of surgery ($p < 0.05$). Additionally, nurse-related factors such as age, educational level, and years of experience were significantly associated with better preparation outcomes ($p < 0.05$), whereas gender differences were not statistically significant ($p = 0.210$).

Conclusion: Factors significantly associated with nurses' preoperative patient preparation included nurses' age, educational level, and work experience, as well as patients' occupation, comorbidities, diagnosis, type, and form of surgery.

Keywords: Patient preparation, preoperative care.

1. INTRODUCTION

According to the World Health Organization (WHO), surgical safety refers to the safe delivery of perioperative care throughout the preoperative, intraoperative, and postoperative phases, aiming to minimize complications and adverse events caused by healthcare personnel. Surgical adverse events may range from minor, non–health-impacting incidents to permanent injury or death. Therefore, surgical safety is considered a central component of global healthcare quality improvement efforts [1], [2].

WHO estimates that approximately 230 million surgical procedures are performed annually, with around one million deaths, half of which are preventable if safety measures are strictly followed [2]. Previous studies have shown that the rate of surgical adverse events ranges from 3.2% to 16.6% of procedures, and more than 50% of these events are preventable [2].

To address this issue, WHO launched the "Safe Surgery Saves Lives" initiative, in which the Surgical Safety Checklist serves as the core tool to enhance safety practices, facilitate team communication, and mitigate risks. Among the perioperative phases, the preoperative preparation stage is pivotal in ensuring patients are physically, psychologically, and

administratively ready for surgery. Nurses are key personnel responsible for implementing these requirements.

Vinmec Times City International Hospital is one of the internationally accredited private hospitals in Hanoi, with a strong focus on adopting surgical safety programs in accordance with Joint Commission International (JCI) standards. However, data from the Quality Management Department in 2017 showed that compliance with the "Pre-operative Patient Preparation Checklist" averaged only 90%, while JCI requires 100% adherence. This raises questions about factors associated with nurses' compliance in the preoperative preparation process.

Based on this context, we conducted the present study with the objective:

To analyze factors associated with nurses' performance in preoperative patient preparation in the Surgery Department at Vinmec Times City International Hospital.

2. METHODS

2.1. Study design

A cross-sectional descriptive study with analytical components.

2.2. Study setting and period

The study was conducted at the Surgery Department of Vinmec Times City International Hospital from January 2024 to June 2024.

2.3. Study subjects

- The study population included:

+ Surgical cases with an indication for surgery and pre-operative preparation performed by nurses of the Surgery Department at Vinmec Times City International Hospital;

+ Medical records and pre-operative patient preparation checklists completed by nurses for eligible surgical patients.

- Exclusion: Cases prepared at other departments or specialties.

2.4. Sample size and sampling

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

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

Where:

+ n: Minimum required sample size

+ $Z_{1-\alpha/2}$: Standard normal deviate at 95% confidence level (Z = 1.96)

+ p: proportion of adequate pre-operative preparation reported by Nguyen Quang Huy (2020) at Phuong Dong

General Hospital = 77.5% [3]

+ d: acceptable margin of error (0.06)

Substituting into the formula, the minimum sample size was n = 184 patients.

2.5. Study variables/indicators

- Groups of variables included:

+ Patient-related variables: demographics (age, sex, occupation), clinical status (pre-operative diagnosis, type and mode of surgery, etc.);

+ Nurse-related variables: age, sex, qualification, working experience;

+ Variables related to the pre-operative handover process: documentation and administrative preparation, vital sign assessment, psychological preparation, infection control, and patient transfer.

2.6. Data collection tools and procedures

The research instrument consisted of three parts:

- Part A: Demographic and clinical information of patients;

- Part B: Characteristics of nurses performing pre-operative preparation;

- Part C: the standardized "Pre-operative Patient Preparation Checklist" currently used at the study hospital, including: documentation/administrative preparation (10 items); vital sign and physical preparation (7 items); psychological preparation (3 items); infection control (4 items); transfer and handover (7 items).

Data were collected using direct observation and indirect review of medical records, using the checklist.

2.7. Outcome assessment

Nurses' pre-operative preparation performance was classified into three levels based on the proportion of checklist items completed:

- Good: 100% of required items completed;

- Fair: 75% to <100% items completed;

- Average: <75% items completed.

2.8. Data processing and analysis

Data were entered and validated using Epidata 3.1 and analyzed using SPSS 20.0. Quantitative variables were presented as means and standard deviations; qualitative variables as frequencies and percentages. Associations between factors and pre-operative preparation outcomes were analyzed using the Chi-square (χ^2) test, with statistical significance set at p < 0.05.

2.9. Ethical considerations

Participation was entirely voluntary. Patient information was kept confidential. The study was approved by the Graduation Thesis Review Board of Thang Long University and received institutional approval from Vinmec Times City International Hospital.

3. RESULTS

Table 1. Characteristics of patients (n = 184)

Characteristics	n	%
Age (years)		
20 – 29	8	4,3
30 – 39	42	22,8
40 – 49	42	22,8
50 – 59	29	15,8
≥ 60	63	34,2
Mean ± SD (range)	51,3 ± 15,8 (2– 86)	
Sex		
Male	108	58,7
Female	76	41,3
Education level		
Primary school	0	0,0
Lower secondary	1	0,5
Upper secondary	9	4,9
Vocational/College	26	14,1
University/Postgraduate	148	80,4
Occupation		
Government employees	159	86,4
Others	25	13,6
Residence		
Urban	155	84,2
Rural	29	15,8
Type of surgery		
Laparoscopic surgery	163	88,6
Open surgery	21	11,4
Surgery setting		
Elective surgery	140	76,1
Day-case surgery	44	23,9
History of surgery		
No prior surgery	163	88,6
One prior surgery	16	8,7
≥ Two prior surgeries	5	2,7

The mean age of patients was 51.3 ± 15.8 years, with those aged ≥ 60 years accounting for the highest proportion (34.2%). Males constituted 58.7%, higher than females (41.3%). The majority of patients held a university or postgraduate degree (80.4%), were government employees (86.4%), and resided in urban areas (84.2%). Most underwent laparoscopic surgery (88.6%), elective procedures (76.1%), and had no prior history of surgery (88.6%).

Table 2. Nurses' performance in pre-operative patient preparation

Pre-operative preparation activities	Good n (%)	Fair n (%)
Documentation and administrative preparation	176 (95,7)	8 (4,3)
Vital signs and physical assessment	184 (100)	0 (0,0)
Psychological preparation	161 (87,5)	23 (12,5)
Infection control	158 (85,9)	26 (14,1)
Patient transfer and handover	154 (83,7%)	30 (16,3)
Overall pre-operative preparation performance	129 (70,1)	55 (29,9)

Overall, 70.1% of nurses performed pre-operative patient preparation at a "good" level and 29.9% at a "fair" level. The highest rate of good performance was found in vital signs and physical assessment, with 100% compliance. The proportions of good performance in other domains were 95.7% for documentation and administrative preparation, 87.5% for psychological preparation, 85.9% for infection control, and 83.7% for patient transfer and handover.

Table 3. Association between pre-operative preparation performance and patient characteristics

Patient characteristics	Good n (%)	Fair n (%)	OR (95% CI)	p
Sex				
Female	63 (82,9)	13 (17,1)	1,95 (0,94-4,04)	0,069
Male	77 (71,3)	31 (28,7)		
Age (years)				
<40	39 (78,0)	11 (22,0)	-	0,915
40-59	54 (76,1)	17 (23,9)		
>60	47 (74,6)	16 (25,4)		
Education level				
University / Postgraduate	117 (79,1)	31 (20,9)	2,13 (0,97-4,69)	0,056
Below university	23 (63,9)	13 (36,1)		
Occupation				
Government employees	126 (79,2)	33 (20,8)	3,00 (1,24-7,22)	0,011
Others	14 (56,0)	11 (44,0)		

Residence				
Urban	120 (77,4)	35 (22,6)	1,54 (0,65-3,69)	0,327
Rural	20 (69,0)	9 (31,0)		
Comorbidities				
≥ 2 conditions	23 (92,0)	2 (8,0)	4,13 (1,0-18,3)	0,045*
≤ 1 condition	117 (73,6)	42 (26,4)		
Diagnosis				
Urological diseases	56 (68,3)	26 (31,7)	1	-
Gastrointestinal diseases	64 (84,2)	12 (15,8)	0,40 (0,19-0,87)	0,019
Cancer / Others	20 (76,9)	6 (23,1)	0,64 (0,23-1,80)	0,40
Type of surgery				
Open surgery	128 (78,5)	35 (21,5)	2,74 (1,07-7,03)	0,031
Laparoscopic surgery	12 (57,1)	9 (42,9)		
Surgery setting				
Elective surgery	112 (80,0)	28 (20,0)	2,28 (1,09-4,80)	0,026
Day-case surgery	28 (63,6)	16 (36,4)		
History of surgery				
≥ 1 prior surgery	15 (71,4)	6 (28,6)	0,76 (0,28-2,09)	0,59
No prior surgery	125 (76,7)	38 (23,3)		

* Fisher's Exact Test

The results showed that occupation, comorbidities, diagnosis, type of surgery, and surgery setting were statistically associated with pre-operative preparation performance (p < 0.05). Other characteristics, including sex, age, education level, residence, and history of surgery, were not significantly associated (p > 0.05).

Table 4. Association between preoperative preparation quality and characteristics of nurses

Nurse characteristics	Pre-operative preparation		OR (95% CI)	p
	Good n (%)	Fair n (%)		
Sex				
Female	66 (80,5)	16 (19,5)	1,56 (0,78-3,14)	0,210
Male	74 (72,5)	28 (27,5)		

Age				
>35	29 (93,5)	2 (6,5)	5,49 (1,25-24,01)	0,012
25- 35	111 (72,5)	42 (27,5)		
Education level				
Bachelor's/ Postgraduate	107 (80,4)	26 (19,6)	2,24 (1,09-4,59)	0,025
College	33 (64,7)	18 (35,3)		
Years of experience				
< 5 years	13 (48,1)	14 (51,9)	1	-
5–10 years	80 (82,5)	17 (17,5)	0,20 (0,08-0,50)	0,000
> 10 years	47 (78,3)	13 (21,7)	0,26 (0,10-0,68)	0,005

The proportion of nurses achieving good preoperative preparation was higher among females (80.5%), those aged over 35 years (93.5%), those with a bachelor's or postgraduate degree (80.4%), and those with ≥5 years of experience (≥78%). Statistically significant associations were observed for age (p = 0.012), education level (p = 0.025), and years of experience (p < 0.05), whereas sex was not significantly associated with preoperative preparation performance (p = 0.210).

4. DISCUSSION

The findings of this study showed no statistically significant association between preoperative preparation quality and patients' demographic characteristics, including sex, age, educational level, or place of residence. However, occupation was significantly associated with preparation outcomes, with civil servants exhibiting a higher proportion of good preparation compared with other occupational groups (p = 0.011). This is consistent with the study by Luong Thi Thoa (2021) at Thai Nguyen Central General Hospital, which reported differences in procedural adherence among patients with different socioeconomic conditions [4].

The study also identified a significant association between comorbidities and the quality of preoperative preparation. Patients with ≤1 comorbidity were 4.13 times more likely to achieve good preparation compared with those with ≥2 comorbidities (p = 0.045). This finding aligns with the conclusion of Tong Thi Minh Nhung (2017) at Son La General Hospital, who reported that patients with multiple underlying conditions often experience greater challenges with adherence and cooperation during the preparation phase [5].

Regarding disease type, patients with gastrointestinal disorders had significantly better preparation than those with urologic diseases and cancer (p = 0.019). This may

be attributed to differences in procedural requirements and infection risks among surgical specialties. Similarly, Thach Kim Long et al. (2018) at Cho Ray Hospital found higher rates of non-compliance with preoperative preparation protocols in specialties with more complex surgeries, such as otorhinolaryngology and general surgery [6].

Regarding surgical characteristics, patients undergoing open surgery demonstrated better preparation than those undergoing laparoscopic procedures (p = 0.031). Additionally, those scheduled for elective surgery exhibited higher preparation quality than those undergoing day surgery (p = 0.026). This finding aligns with Tran Thanh Van et al. (2021) at Ha Dong Eye Hospital, who noted that preparation protocols were more thoroughly implemented in cases involving greater complexity and longer preparation times [7].

Regarding nurse-related factors, there were significant associations between preparation outcomes and nurses' age, education, and years of experience. Nurses aged >35 years, holding a bachelor's/postgraduate degree, and with ≥5 years of professional experience had significantly higher rates of good preparation (p < 0.05). This supports the findings of Le Thi Hang and Hoang Ngoc Hai (2022) at Military Hospital 6, who emphasized that professional competence, experience, and duration of employment are key determinants of adherence to surgical safety protocols [8]. Likewise, the study by Nguyen Thi Oanh (2019) at Quynh Phu Hospital highlighted the role of continuous training, supervision, and coaching in improving preoperative preparation performance [9].

Overall, the findings suggest that, in addition to patient-related characteristics, nurse-related factors—exceptionally professional seniority, educational attainment, and clinical experience—play a crucial role in ensuring the effectiveness of preoperative preparation. These results underscore the need to strengthen training, standardize procedures, and enhance nursing competencies to improve the quality of preoperative care, which is consistent with the recommendations of Duoc Thach Thanh et al. (2020) regarding the importance of organizational management and human resources in adherence to surgical safety procedures [10].

5. CONCLUSION

The study showed that 70.1% of patients rated the quality of preoperative preparation as good, and 19.9% as fair. Occupational status, comorbidities, diagnosis, type of surgery, and surgical setting were significantly associated with the quality of preoperative preparation (p < 0.05). In contrast, sex, age, educational attainment, residence, and surgical history were not associated with preparation outcomes (p > 0.05). The proportion of nurses achieving good preparation was higher among those aged >35 years, holding a bachelor's/postgraduate degree, and with ≥5 years of experience, with these differences reaching statistical significance (p < 0.05).

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