Status of knowledge, attitude, practice towards occupational exposure prevention to blood and body fluid among nurses and related factors at Hanoi Post Hospital in 2023

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ABSTRACT

Objective: *To describe the status on knowledge, attitude, practice about occupational exposure prevention to blood and body fluids among nurses and related factors at Hanoi Post Hospital in 2023.* ***Subjects and methods:*** *Cross-sectional descriptive study was conducted using a pre-designed questionnaire on 180 nurses from March to August 2023, selecting the entire sample. Satisfactory knowledge, positive attitude was achieved when the total score was over 50%, practice was considered satisfactory when all steps were completed.* ***Results***: *The rate of satisfactory knowledge about preventing exposure to blood and body fluids among nurses was low, only 58.9%. Nurses with a positive attitude accounted for a low rate of 54.4%. The rate of nurses' achieved practice in preventing exposure to blood and body fluids was 65%. University degree or higher was associated with knowledge of exposure prevention to blood and body fluids (p < 0.05). There was no factors related to attitudes toward preventing exposure to blood and body fluids (p > 0.05). Gender (male), department of work (surgery department) were found to be associated with practice in preventing exposure to blood and body fluids (p < 0.05).* ***Conclusion***: *Nurses' knowledge, attitude and practice about prevention of exposure to blood and body fluids were not high. To address this, the hostpial should consider an ongoing training courses on infection prevention every year to improve nurses' knowledge, attitude, and practice about exposure to blood and body fluids. Furthermore, it is recommended to implement regular monitoring programs for nurses' hand hygiene and safe injection practice.*

Keywords: *Knowledge, attitude, practice, exposure, blood and body fluids.*

INTRODUCTION

Nurses play an important role in the health care system, especially in providing health care to patients. However, they face many occupational risks related to infections, unsafe patient handling, toxic chemicals, radiation, heat and noise, psychological hazards, violence and harassment, injuries, safe water supply, poor sanitation and hygiene [1].

The main task of nurses is to perform procedures such as intravenous injection, taking blood, etc. therefore they are at high risk of transmitting infectious diseases due

to directly contact with the patient's blood and secretions or indirectly through medical instruments. According to the World Health Organization (WHO), the rate of needlestick injuries to healthcare workers was 39%, 37% and 4.4% of hepatitis C, hepatitis B and HIV infections, respectively. The prevalence of acute hepatitis B infection in healthcare workers globally was 5.3% [2]. In Vietnam, the rate of hepatitis B virus infection in the group of healthcare workers was 5.5% (National Children's Hospital 3.0%; Viet Duc Hospital 9.1% and National Hospital of Dermatology6.3%) [3]. .Many previous studies indicated that nurses' knowledge attitudes and practice related to exposure to blood and fluids during patient care need improvement [4, 5, 6].

Some studies reported that the knowledge, attitudes, and practices among nurses towards preventing occupational exposure were still low [5, 7]. On the contrary, some other studies showed that this rate was high and very high [6]. There are many factors related to the knowledge, attitude, and practice among nurses towards preventing occupational exposure. Common factors have been mentioned before such as gender [7], age , professional level [8]. In Vietnam, several studies have explored the knowledge, attitudes, and practices of nurses in preventing occupational exposure from various perpectives [9]. However, the results of these studies were inconsistent, especially regarding factors associated with nurses' knowledge, attitudes, and practices in preventing occupational exposure.

Post Office Hospital is a health care institute with many key specialties and a team of highly qualified and professional doctors and medical staff. Annually, the Hospital conducts over 150,000 physical exams, inpatient treatment for over 20,000 patients, outpatient treatment for more than 25,000 people, and nearly 8,000 surgeries (of which 55% are special surgeries and type I), nearly 20,000 periodic health examinations. Nurses who work at hospitals with a large number of patients, often perform procedures involving sharp objects such as giving injections and drawing blood. This raises important questions about whether there are gaps in nurses' knowledge of occupational exposure prevention towards blood and body fluids and whether their practices for occupational exposure prevention are adhering to safety standard? The answer to the above question can assess the current situation of the problem so that appropriate suggestions can be made to help ensure a safe working environment for nurses. With the above purpose, this study was conducted with two objectives:

1. Describe nurses' knowledge, attitude, and practice towards preventing occupational exposure to blood and body fluids of at Hanoi Post Office Hospital in 2023.

2. Identify some factors related to nurses' knowledge, attitude, and practice towards preventing occupational exposure to blood and body fluids of at Hanoi Postal Hospital in 2023.

RESEARCH PARTICIPANTS AND METHODS

Research participants

The participants were nurses at the Post Office Hospital.

* **Inclusion criteria:** Nurses who have worked in the hospital's clinical departments for at least 6 months at the time of the study and agreed to participate in the study.

* **Exclusion criteria:** Nurses who do not directly participate in patient care activities and nurses are on maternity leave.

Research time and location

The data collection time was from March to August 2023 at Hanoi Postal Hospital.

Research design: Descriptive cross-sectional study.

Sample and sample selection method

Sample size: Applying the formula for one-ratio study:

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

In which:

n: minimum sample size needed for the study

Z: Reliability coefficient with 95% confidence level, Z = 1.96

p: According to research by Tran Dinh Binh (2019), the correct rate of practice in preventing and handling exposure and infection among hospital medical staff is 78.4% [9], choose p = 0.784. The study opted to calculate sample size based on practice because when determining sample size based on knowledge and attitude, the resulting sample size is smaller than that derived from practice.

d: desired error. In this study, d = 0.06 was chosen.

Applying the formula, we may calculate the minimum sample size of 180.

Sampling technique: The total number of clinical nurses in the hospital was 244, after deducting the 30 nurses who participated in the research tool trial, the remaining was 214 people. Because the difference in sample size and the overall population was not too large, the entire sampling method was applied. Finally, the survey was completed by 180 nurses who met the inclusion criteria

Data collection

The measurement included 4 parts:

- Part 1: General information about research subjects including age, gender, qualifications, working experience, training, and department.

- Part 2: The knowledge rating questionnaire was developed based on the document Standard Prevention Instructions in medical health check and treatment facilities issued together with Decision No. 3671/QD-BYT dated September 27, 2012 of the Ministry of Health [10], and questionnaire in the study of Che Henry Ngwa (2016) and Teshiwal Deress Yazie (2019). The knowledge rating scale comprised 12 questions, with a total score of 26 points, the knowledge was considered satisfactory when the total knowledge reached over 50% [5, 6].

- Part 3: The attitude rating questionnaire was based on research by Che Henry Ngwa (2016) and Teshiwal Deress Yazie (2019). The questionnaire had 20 itemswith a total scoreof 20 points, positive attitude when total score exceeded 50% ....[5, 6].

- Part 4: Practical observation measurement using intravenous infusion procedures and hand washing procedures at Hanoi post office hospital issued together with the Nursing Procedures of the Post Office Hospital (2019) [11]. There were 6 items about hand washing procedures and 17 questions about intravenous infusion procedures. The total score was satisfactory when the nurse performed well all steps: 23 points [5, 6].

The measurement was original in English and was translated into Vietnamese by a nursing PhD who graduated from an Australian university. This individual had experience in conducting research for more than 5 years, and had scientific works published in prestigious international journals. After being translated, the measure was sent to a panel of three individuals to check its validity. The test results reported that the I-CVI value of all subsections was 0.99 and S-CVI/UA = 0.97 which showed that the measurement had relative validity. After adjusting the measurement based on experts' comments, the measurement was sent to 30 nurses of Post Office Hospital to check its reliability. The questionnaire was assessed for reliability using the test and retest method (the time for sending the questionnaire was 7 days apart). The test results indicated that the knowledge rating questionnaire exhibited very high reliability with the correlation coefficient of 0.713 - an acceptable level, $p < 0.001$.

Data collection: For knowledge and attitudes, self-administered questionnaire was used, and for practice, observation techniques were used. The data collection was conducted as follows:

(i) After being approved by the hospital's leader, the researcher worked with the Head of Department and the chief nurses to present the purpose, reasons, and methods of implementing the research.

(ii) Collect data on knowledge and attitudes: the researcher invited nurses in the department to gather in the department's administrative office after the Department's briefing hours. The nurses who agreed to participate were instructed on how to answer the designed set of questions Clear explanations were given and questions were clarified before the participants began answering. The questionnaire were distributed to each participant in the study, ensuring a space of approximately 1 meter between each individual. The participants were reminded not to exchange information and the completed questionanire were collected after 30 minutes.

(iii) Collecting data on practice: Investigators are head of departments and head nurses. Nurses were informed that they would be observed performing the procedure, but did not know by whom or when the observation would be. Investigators observed each nurse performing the procedure once. Every day 10 - 15 nurses were observed.

Data analysis: The collected data would be managed, processed and analyzed using IBM-SPSS version 20.0. Use frequency distribution tables and percentages to describe the variables General information, current status of knowledge, attitudes, and practices on prevention Occupational exposure to blood and body fluids of nurses. Use logistic regression model to learn and predict related factors knowledge, attitude, and practice of prevention Occupational exposure to blood and body fluids of nurses. A p value < 0.05 was used as the acceptance threshold for statistical analyses.

Ethical issues: Participants were explained about the objective of the study, agreed to participate in the study voluntarily and could stop answering questions at any time if they wanted. Ensure confidentiality of research participants' personal information. The research was carried out under the permission of the Ethics Council according to Decision No. 939/GCN-HDĐĐ of Nam Dinh Nursing University and Post Office Hospital.

RESULTS

Table 1. General characteristics of nurses

Variable	Characteristic	Frequency (n)	Percentage (%)
Age	≤ 30 years old	66	36.7
	> 30 years old	114	63.3
Gender	Male	41	22.8
	Female	139	77.2
Qualification	Intermediate level, college	150	83.3
	Graduate, postgraduate	30	16.7
Working experience	≤ 5 years	125	69.4
	> 5 years	55	30.6
Training in the past 1 year	Yes	117	65
	No	63	35
Department	Medical	52	28.9
	Surgical	128	71.1

The study surveyed 180 nurses, of which about 2/3 of nurses were > 30 years old, accounting for 63.3%, the proportion of women (77.2%) that was higher than men (22.8%). Nurses with intermediate level or college qualifications made up 83.3% and worked at the hospital for ≤ 5 years (69.4%). Nurses who were trained on standard prevention in the past year accounted for 65%..Nurses who worked in surgical departments accounted for the highest proportion (71.1%).

Table 2. Nurses' knowledge about preventing exposure to blood and body fluids

		Frequency (n)	Percentage (%)
Knowledge	Satisfactory	106	58.9
	Unsatisfactory	74	41.1

The proportion of nurses with satisfactory knowledge of occupational exposure prevention accounted for 58.9%.

Table 3. Nurses' positive attitudes towards preventing exposure to blood and body fluids

		Frequency (n)	Percentage (%)
Attitude	Positive	98	54.4
	Negative	82	45.6

Nurses with positive attitudes (54.4%) had a higher proportion than nurses with negative attitudes (45.6%).

Table 4. Nurses' general practices for preventing exposure to blood and body fluids

		Frequency (n)	Percentage (%)
General practice	Satisfactory	117	65
	Unsatisfactory	63	35

From the above table, it may be seen that: 65% of nurses' general practice met the criteria for preventing exposure to blood and body fluids.

Table 5. Multivariate analysis of factors related to nurses' knowledge of preventing exposure to blood and body fluids

Variable	Characteristic	B	OR	95%CI	p
Age	≤ 30 years old	0.4	1.5	0.8 - 2.9	0.2
	> 30 years old	-	1	-	
Gender	Male	-0.1	0.9	0.4 - 1.8	-0.7
	Female	-	1	-	
Qualification	Intermediate and college	- 1.3	0.3	0.1 - 0.7	0.007
	Graduate and post graduate	-	1	-	
Working experience	≤ 5 years	0.3	1,3	0.7 - 2.6	0.5
	> 5 years	-	1	-	
Training	Yes	- 0.2	0.8	0.4 - 1.5	0.5
	No	-	1	-	
Department	Medical	0.7	2.0	1.0 - 4.0	0.1
	Surgical	-	1	-	

Sample size (n) = 180; "*" comparison group "-" is not applicable

From the above results it may be concluded as follows: Nurses with intermediate or college level exhibit a knowledge gap of only 0.3 times compared to those with bachelor degrees or higher.

Table 6. Multivariate analysis of factors associated with nurses' attitudes about preventing exposure to blood and body fluids

Variable	Characteristic	B	OR	95%CI	p
Age	≤ 30 years old	0.004	1.0	0.5 - 1.9	0.991
	> 30 years old				
Gender	Male	-0.03	0.9	0.5 - 2.0	0.9
	Female				
Qualification	Intermediate and college	0.2	1,3	0.5 - 2.8	0.6
	Graduate and post graduate				

Variable	Characteristic	B	OR	95%CI	p
Working experience	≤ 5 years	-0.3	0.7	0.4 - 1.4	0.3
	> 5 years				
Training	Yes	-0.3	0.7	0.4 - 1.4	0.3
	No				
Department	Medical	0.333	1.4	0.7 - 2.7	0.3
	Surgical				
Knowledge	Satisfactory	0.416	1.5	0.7 - 3.2	0.3
	Unsatisfactory				

Sample size (n) = 180; "*" comparison group "-" is not applicable

When analyzing multivariate, the factors like age, gender, qualification, working experience, training in the past year, and knowledge were not related to nurses' attitudes towards preventing blood exposure and body fluids because $p > 0.05$.

Table 7. Multivariate analysis of factors related to nurses' practice of preventing exposure to blood and body fluids

Variable	Characteristic	B	OR	95%CI	p
Age	≤ 30 years old	-0.3	0.7	0.4 - 1.4	0.4
	> 30 years old				
Gender	Male	1.1	3.1	1.5 - 6.6	0.003
	Female				
Qualification	Intermediate and college	0.3	0.5	0.6 - 3.2	0.5
	From university and above				
Working experience	≤ 5 years	-0.1	0.9	0.5 - 1.9	0.8
	> 5 years				
Training	Yes	0.1	1,111	0.56 - 2.2	0.7
	No				
Department	Medical	0.9	2.5	1.1 - 5.6	0.02
	Surgical				
Knowledge	Satisfactory	-0.4	0.6	0.3 - 1.4	0.3
	Unsatisfactory				
Attitude	Positive	0.02	1.0	0.5 - 1.9	0.9
	Not positive				

From the above table it may be seen that male nurses have a practice gap 3.1 times higher than female nurses. MoreoverThose who work in the surgical department exhibit a practice gap 2.5 times higher than those in medical department ($p < 0.05$).

DISCUSSION

The results of table 2 indicated that 41.1% of nurses had unsatisfactory knowledge regarding preventing exposure to blood and body fluids while only 58.9% exhibited satisfactory knowledge. Notably, this proportion of satisfactory knowledge is higher than Che Henry Ngwa's (2016) study at Fako Faculty, where 42% of medical staff had satisfactory knowledge about post-exposure prophylaxis [5]. However, this proportion is higher than Farzad Abaszadeh's study (2019), in which 29.3% of medical staff had satisfactory knowledge about occupational exposure to blood-borne pathogens [7].

The results of Table 3 reported that nurses had positive attitudes towards preventing exposure to blood and body fluids (54.4%) had a higher rate than those with negative attitudes (45.6%). The rate is almost similar to Farzad Abaszadeh's study (2019), in which 52.5% of medical staff had a positive attitude towards occupational exposure to blood-borne pathogens [7]. However, the rate of nurses with positive attitudes is lower than that in Che Henry Ngwa's study (2016), where 60.6% of medical staff had a positive attitude towards post-exposure prophylaxis [5].

In the study, 65% of nurses satisfactorily practiced both hand washing and intravenous infusion procedures while 35% did not. The rate is almost similar to Nguyen Ngoc Bich's study (2020). Research results showed that 64.6% of nurses exhibited correct practice in handling exposure to sharp objects or blood and body fluids [12]. Research by Tran Dinh Binh (2019) at Hue University of Medicine and Pharmacy Hospital, the proportion of medical staff practicing satisfactorily prevention and management of exposure was 78.4%. However the rate of unsatisfactory practice was still high at 21.7% [9]. Furthermore, Teshiwal Deress Yazie's study (2019) reported that 57.4% of medical staff's exhibited satisfactory practices of infection prevention [6].

Multivariate analysis revealed a statistically significant relationship between qualification (bachelor's degree and higher) and nurses' knowledge of exposure to blood and body fluids with $p < 0.05$. The results are different from the study by Le Thanh Mong (2021), where the rate of nurses who have been trained in exposure prevention demonstrated higher level of satisfactory knowledge about exposure prevention with sharp objects compared to those who have not been trained. [8]. This shows that nurse's qualifications are quite important in preventing exposure to blood and body fluids for nurses.

When analyzing multivariate results for age, gender, qualification, working experience, and training in the past year, knowledge had no relationship with nurses' attitude towards blood exposure prevention. and body fluids because $p > 0.05$. The result is similar to the study of Farzad Abaszadeh (2019), which reported that the average score of attitudes towards occupational exposure to blood-borne pathogens is not related to qualification. different tasks, marital status, age, gender and working experience [7].

Multivariate analysis showed that gender and department where nurses worked had a statistically significant relationship with nurses' practice of preventing exposure to blood and body fluids , given that $p < 0.05$. Men often have logical and flexible thinking skills, and they are often more assertive than women, which may be the reason why the rate of male nurses with satisfactory practice

is higher than those of women. Nurses working in the surgical department often perform surgical procedures on patients, therefore, these nurses often fully practice the steps according to the regulations of the Ministry of Health.. In the study, knowledge and attitudes were not related to nurses' practice of preventing exposure to blood and body fluids. The results are different from the research by Penilaian Pengetahuan (2018), there is a significant correlation between Knowledge and Practice (r = 0.194, p = 0.018) of medical staff on needlestick injuries, there is a significant correlation between Attitude and Practice (r = 0.182, p = 0.026) regarding needlestick injuries [13].

Descriptive cross-sectional study on 180 nurses, the research results only describes the current status of nurses' knowledge, attitude, and practice towards hand washing and intravenous infusion but nurses' other practical procedures have not been evaluated. This study was only conducted at only one hospital therefore it is not possible to generalize to the Vietnamese nursing population. However, the research results have contributed to proving further research. Hospitals can rely on the results of this study to conduct further surveys on practice procedures and can encompass all medical staff at the hospital to attain a more comprehensive status.

CONCLUSION

The rate of satisfactory knowledge about preventing exposure to blood and body fluids among nurses is low, only 58.9%. Nurses with a positive attitude account for a low rate of 54.4%. The rate of nurses' having satisfactory practice in preventing exposure to blood and body fluids is 65%.

Qualification (bachelor's degree and higher) is related to knowledge of exposure

prevention to blood and body fluids (p < 0.05). There were no factors related to attitudes toward preventing exposure to blood and body fluids (p > 0.05). Gender (male), Department (surgery) were related to satisfactory practice in preventing exposure to blood and body fluids (p < 0.05).

RECOMMENDATIONS: The results showed that nurses' knowledge and practice of preventing exposure to blood and body fluids is not satisfactory, hospitals need to:

- Continuously organize training courses and annually update guidance documents on infection prevention in hospitals.

- Develop and implement a plan to periodically monitor hand hygiene and safe injection practices of nurses at the hospital, especially at medical section.

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