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Original Article

Nurses Knowledge of Post Needle Stick Injury Prophylaxis at a Public Sector Hospital Karachi

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ABSTRACT

Post Needle Stick Injury Prophylaxis (PNSIP) is a stepwise medical management to prevent nurses from blood borne pathogens such as hepatitis B, hepatitis C, and AIDS after Needle Stick Injuries (NSI). **Objective:** To assess the knowledge of nurses regarding PNSIP at a public sector hospital in Karachi, Pakistan. **Methods:** A descriptive cross-sectional study was conducted at a public sector hospital, Karachi, Pakistan, among 109 staff nurses. Sample size was calculated with the help of openepi.com, data were collected through conveniences sampling technique from september to december 2023, by an adopted questionnaire which was distributed in the wards in hard copy among nurses. Data were entered and analysed in Statistical Package for Social Sciences software (version-26). **Results:** The result revealed that majority of the participants 58.7% were male and were in 25-30 years age group, 53.2% were diploma holders and 46.8% were graduate, half of them had less than 5 years of service in the hospital and 39.4% had 5-9 years of service, majority of them 33.9% had worked in emergengy ward, 33% in critical area and 15.6% in operation room. 26.6% of the participants did not know about the antiretroviral drugs used in PNSIP. Knowledge results revealed that nurses have a good knowledge level 78% regarding PNSIP. **Conclusions:** Results showed that although nurses have a good knowledge level regarding PNSIP, however, there is still some percentage of nurses who need education to enhance their knowledge regarding PNSIP.

INTRODUCTION

Needle Stick Injury (NSI) is a risk faced by nurses that can expose them to infectious diseases, such as hepatitis B, hepatitis C, and AIDS [1]. Due to the only possible way to prevent these infections only being the PNSIP protocols post-NSI prophylaxis protocol, ensuring a sequence of steps starting from wound cleaning with soup water, followed by source patient rapid screening for infection, risk assessment of infection transmission, and finally selecting the appropriate antibiotics and antivirals [2]. Many studies have proven that nurses do not possess the required competence concerning PNSIP, although in developed countries, the presence of PNSIP and infection control unambiguously reduce the rate of infection transmission within health workers [3]. The CDC study indicates the 0.3% rate of HIV infection transmission after NSI; however, in developing countries, the risk remains higher due to the inadequate availability of PNSIP [4]. To illustrate, the Cameroonian study exemplifies that 34% of nurses had a favorable attitude toward PNSIP protocols and that 6.6% of nurses had sufficient understanding about PNSIP [5]. According to a survey conducted in the United Kingdom, 36% of nurses had formal training in PNSIP, while 59% of nurses were aware of it [6]. Similarly, a study done in 2021 in Pakistan revealed that 30% of the nurses had knowledge of PNSIP and 40% had access to PNSIP [7]. A study conducted in Karachi found that only 26.6% of nurses had adequate knowledge regarding PNSIP [8]. Similarly, according to a study done in Nishtar Hospital, Multan,

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78.4% of nurses had acceptable knowledge of NSI, but nearly 31% of nurses had satisfactory knowledge of PNSIP [9]. Likewise, another study conducted in 2022 determined that 44.8% of the nurses had good knowledge of PNSIP [10]. Similarly, a study done at Sindh Government Children Hospital, Lahore, to assess the knowledge of nurses regarding prevention from NSI showed that 58% of the nurses had poor knowledge of NSI and only 32% had obtained education on PNSIP [11]. In a neighboring country, India, research found that only 53% of nursing students were aware of PNSIP and its importance, and only 7.1% of them had ever gotten training on PNSIP [12]. Another study found that nursing students had inadequate knowledge of PNSIP, and 76.7% of nursing students were not aware of the perfect steps taken after NSI [13]. Similarly, another study of developing country suggested that only 9% of nursing students had knowledge of NSI and 85% did not [14]. It is vital to make sure that HCW have knowledge of PNSIP and are skilled in its right use to correctly lessen the chance of transmission of infection. There may be a need for advanced infrastructure and awareness to address the problems of NSI and PNSIP among nurses.

Therefore, the aim of this study was to evaluate the knowledge of nurses regarding PNSIP at a public sector hospital in Karachi.

METHODS

A cross-sectional study design was used from September to December 2023 at a public sector hospital in Karachi, among 109 staff nurses, through convenient sampling techniques, all nurses whose clinical experience was more than 1-year were included in the study and those who were on leave and were unwilling to participate in the study were excluded. Sample size was calculated with the help of openepi.com. Data were collected via an adopted questionnaire taken from a study conducted in 2020, which consisted of two sections. Section I has 5 questions regarding demographics and Section II has 11 questions regarding knowledge of PNSIP [15]. All 11 items were assigned one mark each, nurses who obtained more than 75% score considered as having good level of knowledge, 50-74% moderate and belove 50% having low level of knowledge regarding PNSIP. The questionnaire and consent forms were distributed in the wards in hard copy, and the benefits of the study were explained to the participants. Permission for data collection was obtained from the institution with reference number HSNHS/2023/369 dated 13 September 2023, and informed consent was also obtained from staff nurses after they were told about the objective and purpose of the study, their rights to leave at any time they wanted, were persuaded, and were also assured of their confidentiality and anonymity. Data were entered and analyzed using SPSS software version 26.0, frequency and percentages were used for results.

RESULTS

Table 1 showed that 58.7% were male and 41.3% were female; the majority of the nurses, 45.9%, were in the age range of 25–30 years; 33.9% were in the age range of 20–25 years; and the remaining 20.2% were above the age range of 30 years. Moreover, 46.8% were degree holders and 53.2% were diploma holders. Half of the respondents (50.5%) had less than 5 years of service in the hospital, 39.4% had 5–9 years, and only 10.1% had more than 10 years of service. The study also found that the majority of the nurses (33.9%) worked in the emergency ward, followed by 33% in critical care, 13.8% in surgical wards, and 15.6% in the operation room.

Table 1: Sociodemographic Characteristics of the Nurses (n=109)

S. No.	Variables	Factors	N (%)
1.	Sex	Male	64 (58.7%)
		Female	45 (41.3%)
2.	Age (in Years)	20 -25	37 (33.9%)
		25-30	50 (45.9%)
		≥ 30	22 (20.2%)
3.	Education Level	Degree	51 (46.8%)
		Diploma	58 (53.2%)
4.	Length of Service in Hospital	<5 Years	55 (50.5%)
		5-9 Years	43 (39.4%)
		More than10 Years	11 (10.1%)
5.	Place of Work	Emergency Ward	37 (33.9%)
		Surgical Ward	15 (13.8%)
		Operation Room	17 (15.6%)
		Critical Area (ICU,PICU, NICU)	36 (33.0%)
		Other	4 (3.7%)

Table 2 showed that most of the respondents (95.4%) had heard of PNSIP; 22% of them declared that they had gained knowledge of PNSIP from their colleagues or seniors; 17.4% from college; and 15% from books and journals. 79.8% stated that they have attended training or seminars on PNSIP. 56% of the nurses said that a needle stick is an indication of PNSIP. A total of 29.4% of the participants reported that promoting active bleeding from the wound is a first aid measure after the NSI. However, 68% of them reported that washing the wound with soap and water is a first aid protocol after NSI. 78% of the participants were aware that the protocol should be started within one hour of exposure, but 22.1% were not. Moreover, 60.6% said that prophalyxis should be considered 24 hours after injury, 20.2% mentioned 48 hours, and 19.3% said that PNSIP should be considered for 72 hours. Similarly, the table also showed that the majority of the participants (56%) reported that PNSIP should be continued for 2 weeks, whereas 36.7% said 4 weeks and 7.3% said 8 weeks. 61.5% of nurses

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said that PNSIP is 80% effective, 21.1% said it is 100% effective, and 11.9% said it is 60–70% effective. Moreover, 29.4% of the nurses were aware that Zidovudine is used as an anti-retroviral drug, 25.7% of Tenofovir, and 18.3% of Lamivudine. In the end, 92.7% of the respondents reported that they knew the hospital's policy relating to PNSIP for HIV, HBV, and HCV, while 7.3 did not know about any policy.

Table 2: Knowledge of Nurses Regarding Post-NSI Prophylaxis (n=109)

S. No.	Variables	Factors	N (%)
1.	Have You Ever Heard About PNSIP	Yes	104 (95.4%)
		No	5 (4.6%)
2.	Source Of Information	College	19 (17.4%)
		Colleagues/Seniors	24 (22.0%)
		Internet/Media	19 (17.4%)
		Books/Journals	16 (14.7%)
		Seminar/Training	28 (25.7%)
		Can't Remember	3 (2.8%)
3.	Have You Got Training On PNSIP	Yes	87 (79.8%)
		No	22 (19.3%)
4.	For what Reason PNSIP Is Used	NSI	61 (56.0%)
		Seeing of Blood/ Fluids on Body	41 (37.6%)
		Sex	2 (1.8%)
		I Don't know	5 (4.6%)
5.	First Aid Action Taken After NSI	Activate Bleeding From The Wound	32 (29.4%)
		Soap Water	75 (68.8%)
		Don't Know	2 (1.8%)
6.	Should PNSIP Be Started In 1 Hour After Injury ?	Yes	85 (78.0%)
		No	24 (22.1%)
7.	PNSIP Should Be Continued For How Long Time?	24 Hours	66 (60.6%)
		48 Hours	22 (20.2%)
		72 Hours	21 (19.3%)
8.	Duration For PNSIP	2 Weeks	61 (56.0%)
		4 Weeks	40 (36.7%)
		8 Weeks	8 (7.3%)
9.	Effectiveness Of PNSIP	100%	23 (21.1%)
		80%	67 (61.5%)
		60-70 %	13 (11.9%)
		50%	5 (4.6%)
		<50%	1 (0.9%)
10.	Which Anti-Retroviral Drugs Are Used In PNSIP?	Tenofovir	28 (25.7%)
		Zidovudine	32 (29.4%)
		Lamivudine	20 (18.3%)
		Don't Know	29 (26.6%)
11.	Do You Know Hospital Policy For NSI	Yes	101 (92.7%)
		No	8 (7.3%)

Table 3 showed knowledge level of nurses regarding PNSIP, 77.9% had good level of knowledge, 15.5% average and 6.4% had poor level of knowledge regarding Post-NSI Prophylaxis.

Table 3: Nurses Knowledge Level of Post-NSI Prophylaxis (n=109)

Knowledge Level	N (%)
Good (> 75%)	85 (77.98%)
Moderate (50-74)	17 (15.59%)
Low Level (<50%)	7 (6.43%)

DISCUSSION

Nurses performing clinical duties in the hospitals should know about how to save themselves against blood borne pathogens like hepatitis B and C and HIV as they are prone to NSI, therefore, they should know the PNSIP protocols. In a nationwide survey conducted in 2016 on 1000 nurses from different healthcare settings in Pakistan, it was found that 55% of the nurses were aware of PNSIP treatment, which is lower than the percentage found in the present study, with 77.9% of the nurses being aware of PNSIP [16]. In another study conducted in 2018 on nurses working in a tertiary hospital in Karachi, it was found that 58% of the nurses were aware of PNSIP treatment, which is also lower than the present study [17]. Similar to our study's finding that training and college education are the main sources of information for nurses regarding PNSIP, a study conducted in 2021 in Lahore also found that 90% of the nurses acquired knowledge about PNSIP through in-service training and education programs [18]. In terms of knowledge about indications for PNSIP, our study found that 80% of the nurses correctly identified NSI as an indication for PNSIP, which is similar to the findings of a study conducted in 2018 on nurses working in tertiary hospitals in Karachi, which reported that 79% of the nurses correctly identified NSI as an indication for PNSIP [19]. In addition, three out of five antiretroviral drugs that the present research respondents identified is used for post-NSI prophylaxis. According to the current study, there are Tenofovir, Zidovudine, and Lamivudine. In 2018 in Karachi, a study found that all three substances, including Tenofovir, Zidovudine, and Lamivudine, were identified as antivirals as prophylactic. 60% of the nurses in this research claimed that PNSIP should be continued two weeks and at least for 24 hours after exposure to NSI. The aforementioned estimates match with the results of a study conducted in Quetta in 2014, where 64 % of nurses recognized the duration for PNSIP [20]. Likewise, a study conducted in Saudi Arabia showed that 80% of healthcare workers had knowledge of PNSIP, whereas, a study done in Ethioia found that 76.4% of healthcare workers had knowledge of PNSIP [21-22]. Similarly, a study conducted in India showed that 87% of healthcare workers had knowledge of PNSIP. All these results are higher as compared to the present study [23]. In contrast to the above, a study conducted in Ethiopia showed that 46% of HCW had knowledge of PNSIP, which is lower as compared to the present study [24].

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Another result from a meta-analysis in 2022, showed that 98% of HCW had knowledge of PNSIP, which is very high as compared with the present study [25]. The present study results contrasts to a study conducted in Bhutan, in 2020, which showed that majority (80.1%) of the participants had poor knowledge regarding Post Exposure Prophalaxis (PEP) for HIV and half (51.1%) of them had heard about PEP, but only 1.4% attended a formal training program on PEP for HIV [26].

CONCLUSIONS

The study showed that nurses at a public sector hospital in Karachi have a good level of knowledge (78%) regarding Post-NSI prophylaxis; however, there is still some percentage of nurses who need education to enhance their knowledge regarding Post-NSI prophylaxis and to protect them from the deadly viruses.

Authors Contribution

Conceptualization: RAK
Methodology: JK, SJ
Formal analysis: AURYZ, BH
Writing, review and editing: MA, GR, FU, AF

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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