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Research Article

Needle stick injuries

Knowledge Regarding Post-Exposure Prophylaxis of HIV /Aids Infection and Perceived Threat Due To Needle Stick Injury Among Nursing Students Of Selected Nursing College At Jaipur (Raj)

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Introduction: Needle stick injuries (NSI) has always been one of most important risk factors for healthcare workers (HCWs) for transmission of various infections such as hepatitis B, hepatitis C and human immunodeficiency virus (HIV). As per 2008-2009 HIV estimates, there are an estimated 23.9 lack people currently living with HIV/AIDS in India with an adult prevalence of 0.31% in 2009. **Material and methods:** It is a descriptive non-experimental study carried out among nursing students studying at teaching institutes in Jaipur city (Rajasthan). A study was conducted during year 2020 and 92 Bsc nursing students were selected by using total enumerative sampling technique respectively. The reliability of knowledge tool was conducted through Kuder and Richardson Formula 20 (KR20) result was 0.84 and reliability of 5 point rating scale was analyzed by using Cronbach Alfa method it was 0.92. **Result:** The level of knowledge of nursing students, in which (18) 22.5% had poor knowledge, (50) 62.50% had average knowledge and (12) 15% of them had good knowledge regarding post-exposure of prophylaxis of HIV/AIDS infection. The level of perceived threat of nursing students, in which (62) 77.5% had high level perceived threat, (17) 21.25% had moderate level perceived threat and (1) 1.25% of them had low level perceived threat due to needle stick injury. It evidenced that for correlation between knowledge and level of perceived threat calculated value of Karl Pearson's correlation coefficient is 0.76 and tabulated value of correlation coefficient is 0.250 for df 78 at 0.05 level of significance. **Conclusion:** The present study reveals that majority of nursing students had average knowledge regarding post-exposure prophylaxis of HIV/AIDS infection and low level perceived threat due to needle stick injury.

Keywords: Needle stick injuries (NSI), Knowledge, Nursing student

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Introduction

Stress full psychosocial working conditions and negative stress perception could increase the risk of needle stick injury that occur among health care workers. Common major life events that can trigger stress include job issues or retirement, lack of time or money, bereavement, family problems, illness, moving home, relationships, marriage, and divorce, excessive noise, overcrowding, and pollution. Some situations will affect some people and not others. Experience can impact how a person will react. Sometimes, there is no identifiable cause. Mental health issues, such as depression, or an accumulated sense of frustration and anxiety, can make some people feel stressed more easily than others. Health care settings are constantly exposed to numerous occupational hazards. The growing trend of HIV infection in recent years has rapidly become one of the hazards that people in the healthcare field fear the most. It has been reported that nearly 3 million health care workers suffer percutaneous exposures each year. Of these, an estimated hepatitis B of 66,000, hepatitis C of 16,000, and HIV infections of up to 1000 occur each year. [1].

Healthcare workers are at risk of HIV. They can be exposed to HIV by Needle sticks or cuts, Getting blood or other body fluids in their eyes or mouth or on their skin when it is chapped, scraped, or affected by dermatitis. [2]. Avoiding occupational blood exposures is the primary responsibility of a nurse to prevent transmission of hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) in healthcare settings. Due to an increasing problem of HIV infection from needle sticks, the Center for Disease Control has recommended post-exposure prophylaxis (PEP) for health care workers who are involved directly or indirectly in giving care to the patients. [3]. Post-exposure prophylaxis (PEP) means taking anti-HIV drugs as soon as possible after exposure to HIV to reduce the chances of becoming HIV positive. There are two types of PEP. The first one is occupational PEP, ("OPEP"), and the next one is non-occupational PEP, ("NPEP"). Occupational PEP (OPEP) means someone working in a health-care setting is potentially exposed to material infected with HIV and non-occupational PEP (NPEP) means someone is potentially exposed to HIV outside the workplace (E.g., condom breakage, sexual assault). To be effective, PEP must begin within 72 hours of exposure, if not virus may rapidly replicate in the body. PEP consists of 2-3 antiretroviral medications and it should be taken for 28 days. The physician will decide the type of treatment based on the exposure to HIV. These medications have serious side effects that can make it difficult to complete the treatment. Hence people need to be educated. [4]. Ruchita R, Dixit, (2011), A cross-sectional study was conducted to assess the knowledge, attitude and practice regarding HIV/AIDS among health care workers in Serbia. The results revealed that the majority of health workers had adequate knowledge on modes of HIV transmission, 89% of health care workers perceived that high professional risk of acquiring HIV infections and 29% of health personnel expressed that they use adequate protection during their daily work with patients. The study concluded that there is an urgent need to educate on HIV/AIDS among all categories of health care workers. [5]. As per the WHO Statistics (2007), it is estimated that worldwide 33.2 million people are infected with HIV. Each day, thousands of people around the world experience accidental exposure to blood and other body fluids or tissues while performing their work. Health care workers are especially vulnerable. Moreover, in many parts of the world, the potential for workplace accidents that may expose workers to HIV-infected blood and other body fluids is increasing. [6]. A report released in an International conference (2010) on "Stop AIDS. Keep The Promise- Universal Access and Human Rights" was conducted in Austria states that India remains one of the developing Asian countries having the highest number of infected patients. Being a developing country, the post-exposure prophylaxis strategy remains in the developing stage which attributes largely to various issues/controversies surrounding post-exposure prophylaxis. Hence there is an urgent need to conduct feasibility and utility studies in the public health sectors. [5]. Anti-retroviral therapy (ART) centre of Kolar district (2011-2012) records shows that the HIV positive people have touched the figure of 4706, which include males, females, children, and transgender and commercial sex workers. Surprisingly, the number of occupational exposures reported in the Kolar ART centre is 13, out of which a major count is shared by nurses. Above all, the shocking news reveals that none of them has undergone complete post-exposure prophylaxis.[7].

Objectives

To assess the knowledge regarding post-exposure prophylaxis of HIV/AIDS infection and perceived threat due to needle stick injury and the relationship between knowledge and perceived threat and also to seek its association with socio-demographic variables.

Material and Methods

It is a descriptive non-experimental study carried out among the nursing students studying at teaching institutes (GCON) in Jaipur city (Rajasthan). A study was conducted during the year 2020 and 92 BSc nursing students were selected by using the total enumerative sampling technique respectively. The tool develop and used for data collection contained TOOL: 1 section A: sociodemographic data (07 variables), Section B: Structured knowledge questioner related to knowledge regarding post-exposure prophylaxis of HIV/AIDS infection (General information and item regarding post-exposure prophylaxis) TOOL: 2 this section of tool consist of 14 attitude statement both positive and negative statement. A pilot study was performed on 10 BSc nursing students to test the reliability and feasibility of the study. The reliability of the knowledge tool was conducted through the **Kuder and Richardson Formula 20 (KR20)** the result was 0.84 and the reliability of 5 point rating scale was analyzed by using the **Cronbach Alfa method** it was 0.92.

Criteria for selection of the samples: The study is delimited to-

01. BSc nursing final year students of GCON Jaipur.
02. Who are willing to participate in the study?
03. Who will be available at the time of data collection?
04. 92 BSc nursing final year students.

Development and description of tool: The tool develop and used for data collection contained TOOL:1 section A: sociodemographic data (07 variables), Section B: Structured knowledge questioner related to knowledge regarding post-exposure prophylaxis of HIV/AIDS infection (General information and item regarding post-exposure prophylaxis) TOOL:2 This section of tool consist of 14 attitude statement Both positive and negative statement. A pilot study was performed on 10 BSc nursing students to test the reliability and feasibility of the study. The reliability of the knowledge tool was conducted through the **Kuder and Richardson Formula 20 (KR20)** the result was 0.84 and the reliability of the 5 poin2t rating scale was analyzed by using the **Cronbach Alfa method** it was 0.92.

Scoring Criteria of Knowledge Score:

Table 1: Scoring criteria of knowledge score.

Scoring criteria	Knowledge score
27-35	Good knowledge
18-26	Average knowledge
0-17	Poor knowledge

Table 2: scoring criteria of level of perceived threat.

Statement	Response	Marks
Positive statement	Always Very often Often Some time Never	5 4 3 2 1
Negative statement	Never Some time Often Very often Always	1 2 3 4 5

Scoring criteria	Ratting score
53-70	High level of perceived threat
36-52	Moderate level of perceived threat
0-35	Low level of perceived threat

Result

The finding is summarized as follows: The level of knowledge of nursing students, in which (18) 22.5% had poor knowledge, (50) 62.50% had average knowledge and (12) 15% of them had good knowledge regarding post-exposure to prophylaxis of HIV/AIDS infection.

Table 3: Frequency and percentage distribution of knowledge.

Category	Frequency (F)	Percentage (%)
Poor (0-17)	18	23
Average (18-26)	50	62
Good (27-35)	12	15

Table no.3clearly represent the level of knowledge of nursing students in terms of predecided categories i.e.50 (62%) majority of nursing students were found to have an average level of knowledge whereas only 12 (15%) had a good level of knowledge regarding post-exposure prophylaxis of HIV/AIDS infection, and only 18(23%) were

Found to possess the poor level of knowledge of post-exposure prophylaxis of HIV/AIDS infection.

The mean, SD and mean percentage, median and mode of aspects of knowledge of students regarding post-exposure prophylaxis of HIV/AIDS infection the present study shows that the highest mean score of subjects is 20.83 with SD 6.04 and mean percentage of 26.04%, the median is 21.5 and mode is 21 was obtained for knowledge regarding post-exposure of prophylaxis of HIV/AIDS infection that indicates the nursing students had Average knowledge regarding post-exposure of prophylaxis of HIV/AIDS infection.

The level of the perceived threat of nursing students, in which (62) 77.5% had high level perceived threat, (17) 21.25% had moderate level perceived threat and (1) 1.25% of them had low level perceived threat due to needle stick injury.

Table 4: Frequency and percentage distribution of level of perceived threat.

Category	Frequency (F)	Percentage (%)
Low level perceived threat (0-35)	1	1%
Moderate level perceived threat (36-52)	17	21%
High level perceived threat (53-70)	62	78%

Table no.4 represent the level of the perceived threat of nursing students in terms of predecided categories i.e. 62 (78%) majority of nursing students were found to have a high level of perceived threat whereas only 1 (1%) had a low level of perceived threat regarding needle stick injury, and only 17(21%) were had a moderate level of perceived threat due to needle stick injury.

The mean, SD, mean percentage, median and mode of a perceived threat of nursing students regarding due to needle stick injury. The overall mean level of perceived threat score of the subject is 29.06 with an SD of 10.20 and mean percentage is 36.32%, the median is 28.5 and mode is 30, was obtained for the perceived threat due to needle stick injury among nursing students. This indicates that students had a low level of perceived threat due to needle stick injury.

It evidenced that for correlation between knowledge and level of perceived threat calculated value of Karl Pearson's correlation coefficient is 0.76 and tabulated value of correlation coefficient is 0.250 for DF 78 at 0.05 level of significance. The calculated value of the correlation coefficient is 0.76 is More than the tabulated value 0.250 for df 78 at 0.05 level of significance hence there is a significant correlation between knowledge and level of a perceived threat of nursing students regarding post-exposure prophylaxis of HIV/AIDS infection among nursing students. Therefore investigator accept the research hypothesis H_1 and null hypothesis H_{01} is rejected

Table 5: Finding related to Relationship between knowledge and level of a perceived threat of nursing students. N=80.

Correlation value	Type of correlation	Tabulated value	Degree of freedom	Level of significance	Result
0.76	Positive	0.250	78	0.05	Significant

It is evident from table No. 5 that for the relationship between knowledge and level of perceived threat, the calculated value of Karl Pearson's correlation coefficient is 0.76 and the tabulated value of correlation coefficient is 0.250 for DF 78 at a 0.05 level of significance.

The calculated value is found to be greater than the tabulated value, This means that the relationship between knowledge regarding post-exposure prophylaxis of HIV/AIDS infection and the perceived threat due to needle stick injury among nursing students is a true relationship and not by chance. Therefore investigator accepts the research hypothesis H_1, so it can be stated that with an increase in knowledge regarding post-exposure prophylaxis of HIV/AIDS infection of nursing students, the level of perceived threat due to needle stick injury decreases. There is no significant association between knowledge of nursing students and demographic variables such as gender ($\chi 2=0.43$), Types of family ($\chi 2=2.88$), and areas of residence ($\chi 2=1.79$) is not significant at 0.05 level of significance. Hence hypothesis H_2 is rejected and null hypothesis $H_{02}$is accepted.

There is a significant association between knowledge of nursing students such as any history of needle stick injury ($\chi 2=7.80$), any history of prophylaxis of HIV/AIDS infection ($\chi 2$ 8.54), occupation of parents ($\chi 2$ 9.6) and any history of exposure to HIV/AIDS infection ($\chi 2=$ 18.42), at 0.05 level of significance. Hence hypothesis H_2 is accepted and null hypothesis H_{02} is rejected. There is no significant association between the perceived threat of nursing students

And demographic variables such as gender ($\chi 2=2.47$), and areas of residence ($\chi 2=1.28$) is not significant at 0.05 level of significance. Hence hypothesis H_3 is rejected and null hypothesis H_{03} is accepted. There is a significant association between the perceived threat of nursing students and demographic variables such as Types of family ($\chi 2=34.96$), any history of needle stick injury ($\chi 2=9.09$), any history of prophylaxis of HIV/AIDS infection ($\chi 2=10.97$), occupation of parents ($\chi 2= 6.4$) and any history of exposure to HIV/AIDS infection ($\chi 2= 11.03$), at 0.05 level of significance. Hence hypothesis H_3 is accepted and null hypothesis H_{03} is rejected.

Discussion

The finding of this present study is similar to previously studied by J Miller et al whereas the study titled knowledge regarding post-exposure prophylaxis Ugandan nurses at aga khan university Nairobi, Kenya the nurses did not have adequate knowledge perhaps the difference in finding is due to small sample size.[8]. Lucina Kimaro, Juma A Dinan, et al, the study was undertaken on Prevalence of occupational injuries and knowledge of availability and utilization of post-exposure prophylaxis among health care workers in Singida District Council A descriptive cross-sectional study was conducted Out of 239 participants, slightly more than half, 124 (52%) had inadequate overall knowledge of HIV PEP. Of the 239, 121(50.6%) participants experienced occupational exposure. Two leading types of exposure were blood splash 57(47.1%) and needle stick injuries 45 (37.2%), respectively. Among the 121 exposed participants, 83(68.6%) reported the exposure incident, 91(75.2%) had an HIV test, 32 (26.4%), started HIV PEP after testing, 28 (23.1%), completed HIV PEP, and 65 (53.7%) had a follow-up HIV test. About two thirds (159/239), of participants, reported that HIV PEP services were available at the time the study was conducted, and 49 (20.5%), reported daily access to HIV PEP service.[9]. Owalabi RS et al, Conducted A quasi-experimental study to assess knowledge and attitude among 245 hospital staff on occupational exposure to bloodborne viruses was conducted at Scotland at tertiary hospital Nigeria. The results revealed that 70% of respondents had sufficient knowledge on infectivity of HIV / hepatitis B / hepatitis C viruses. 94 respondents were unaware Of a regimen for post-exposure prophylaxis of HIV infection, 37 thought they were at risk of blood borne viral infection and had contacted the occupational health department for advice. The study concluded that there is a need for educational initiatives for new and existing staff.[10].

Kumakech E, Achoras, et al, conducted a longitudinal study on Post-exposure prophylaxis of HIV transmission among health care workers in the UK. The study revealed that out of 203 Occupational injuries, the majority were with needle stick injuries (76.3%). Among this half of the clients were in a training period. It is also reported that many nurses and clinical officers were not fully vaccinated for Hepatitis B.PEP.[11].

Sharma R. et al Jan**,** Studied the Occupational Exposure to Blood and Body Fluids among Health Care Workers was conducted in a Teaching Hospital of Mumbai, India. Using random sampling technique residents, interns, nurses and technicians (*n* = 830) were selected. The results revealed that occupational exposure to blood and body fluids was highest among the nurses, needle-stick injury was the most common mode of exposure (92.21%). The Index finger and thumb were the commonest sites of exposure. Only 50% of the affected individuals reported the occurrence to concerned hospital authorities. Less than a quarter of the exposed persons underwent post-exposure prophylaxis (PEP) against HIV, although the same was indicated in about 50% of the affected health care workers. [12].

Dixit S et al, Conducted a study to assess the knowledge regarding HIV, occupational exposure and Post Exposure Prophylaxis (PEP) among nursing students in Tertiary Care Hospital at Indore. For the study 50 final year, nursing students were included. The results revealed that Knowledge regarding the risk of transmission of HIV by needle-stick injury and body fluids against which universal precautions were increased after structured teaching programme from 36% to 72% which was statistically significant. The study concluded that a structured teaching programme was effective in improving knowledge among nursing students [13]. Trim JC, et al conducted a study to evaluate the level of knowledge among 200 nurses regarding the occupational risk of exposure to blood borne pathogens. The researcher found that the nurses had inadequate knowledge of inoculation

Injuries and associated issues regarding occupational safety measures, policies and procedures that were not followed by them. Furthermore, gloves were not routinely worn in the clinical setting [14].

Pisal H. Sultar S. et al**,** Undertook a Cross sectional study to assess the knowledge and practice of post-exposure prophylaxis (PEP) on HIV infection among health care providers was conducted in Nigeria for the study, 230 health care providers were included. The result revealed that the majority (97.0%) of the health care providers heard about PEP, only a few (30.9%) of them. Could correctly identify the drugs used and duration of PEP, HIV test was carried out in about two-thirds (64.8%) of the source patients. Thirteen (28.3%) of the patients were HIV-positive. Of the 13 health care providers that were exposed to HIV-positive patients, only 3 (23.1%) received PEP, and these three completed PEP, while the majority, 10 out of 13 (76.9%) did not receive PEP despite their exposure to HIV-positive sources. The study concluded that the knowledge and practice of PEP among health care providers are very poor [15].

M Y Chen, et al**,** The study was undertaken on Post-exposure prophylaxis for human immune deficiency virus: knowledge and experience of junior doctors at St Thomas's NHS Trust, London, UK A questionnaire were sent to all junior doctors working in two major teaching hospitals in London (461 DOCTOR'S), the study result was Most junior doctors had heard of PEP (93%) but fewer were aware that it reduced the rate of HIV transmission (76%). Only a minority of doctors (8%) could name the drugs recommended in recent national guidelines and a significant proportion (43%) could not name any. Almost one third (29%) did not know within what period PEP should be administered. This was even though the majority of respondents (76%) had experienced high-risk exposure to potentially infective material at some stage in their careers and that a significant proportion (18%) had sought advice about PEP following potential exposures. [16].

Harini M R, et al awareness on anxiety associated with finger-prick method among dental college students, a self-administered questionnaire was designed based on awareness. The questionnaire contained various awareness and knowledge-based questions about the anxiety associated

With the finger-prick method. The questionnaire was distributed through an online survey monkey link. The study population included students in a dental college. The study result was it is essential to be aware of anxiety and anxiety disorders not only related to finger pricking but anxiety in general. according to this study, when asked the study population about which emotion they experience when pricking themselves, 2.70% answered that they feel excited, 64.86% answered that they were nervous and 32.43% upright answered that they were anxious. When asked if they felt anxious at the thought of pricking themselves, 81.08% answered positively. Majority of the study population that is 81.08% answered positively when asked if they were scared of the pain that would be caused due to the finger prick.[17].

Wang, C., et al Conducted a study to assess "Relations between psychosocial working conditions, stress perception, and needle-stick injury among healthcare workers" A total of 1956 valid samples were collected from eight teaching hospitals Most of the correlation coefficients between psychosocial conditions at work, stress perception, and needle-stick injury are of statistical significance ranging from 0.004 to 0.869. Results of the internal consistency test show that Cronbach's α is between 0.770 and 0.925. All three models for effect analysis demonstrated satisfactory global goodness and acceptable path loadings. Psychosocial working conditions and stress perception were directly associated with events of needle-stick injury, like 0.39 (95%CI: 0.32 to 0.48) and 0.32 (95%CI: 0.22 to 0.39), respectively. Furthermore, stress perception had been proved to have a mediating effect (0.25, 95%CI: 0.19 to 0.31) between psychosocial working conditions and needle-stick injury, which occupied over one-third of the total effect.[18].

Mr Amar C.et al The study was undertaken to Evaluate the Effectiveness of the Structured Teaching Programme on knowledge regarding Coping Strategies of examination anxiety among tenth standard students in selected schools, Delhi A one group pre-test – post-test pre-experimental research design was adopted. The study was conducted among 60 students studying the tenth standard by purposive sampling in the selected schools. The study result was The overall mean post-test knowledge score of tenth class students was found to be 67.83% as compared

To mean pre-test 48.66% with an enhancement of 19.17%. A paired test result indicated a significant difference between the pre-test and post-test knowledge scores regarding coping strategies of examination anxiety (t=10.083*, p<0.05) [19].

Malihe Sadat Moayed et alUndertook a study to assess "Effect of Education on Stress of Exposure to Sharps Among Nurses in Emergency and Trauma Care This Quast- Experimental Study was conducted on 35 nurses in emergency and trauma departments of our hospital in 2013. Data were collected using a two-part questionnaire; part one consisted of demographic data and part two consisted of questions about stress-induced due fear from needle stick exposure; 15 individuals of the target group filled out a questionnaire with two-week intervals. Reliability was calculated with α = 0.92 and ICC = 0.94. Samples were all nurses who had at least one year of clinical experience and they had at least an associate degree Wards[20].

*Hiva Azmoon*et al Conducted an assessed the "Evaluation of trait anxiety levels between exposed and non-exposed health care workers to needle stick in Isfahan Al-Zahra hospital, Pakistan This present case-control study was performed on 48 exposed (case) and 48 non-exposed (control) HCWs. Independent t-test showed that mean scores of trait anxiety between two groups (exposed and non-exposed health care workers to needle stick) did not have a significant difference. But trait anxiety level was higher in the case group compared to the control group. Independent t-test also revealed that the control group had more experience than the case group significantly (p < 0.001[21].

Malihe Sadat Moayed et al conducted an assessed the "Effect of Education on Stress of Exposure to Sharp Objects among Nurses Working in Emergency and Trauma Care Wards." semi-empirical study was conducted on 35 nurses in the emergency and trauma departments of our hospital. There was no statistically significant correlation between age and stress (P = 0.26 and r = -0.19) and there was also no correlation between education and needle stick stress score (P = 0.34). 4.2. Job Characteristics 31 (8.6%) were bachelor's degree nurses, 17 (48.6%) were contract and 18 (51.4%) official employees. The mean of work experience was 10.02 ± 7.8 years and (minimum 1 year and maximum 33 years). No significant relation was

Found between work experience and needle-stick stress (P =0.67, r = -0.75). Also, the overtime did not affect stress score (P = 0.39). Stress from sharp instruments exposure before the intervention was 64.96 ± 15.6 and mean stress after training was 43.91 ± 10.7 and paired t-test (P < 0.001) indicated that the stress was significantly reduced. In each of the areas, stress was assessed before and after training. In the first part which included Safety Policy, the nurses' pre-education stress was 60.00 ± 17.4 and after training was 38.84 ± 12.2 (P > 0.001), which shows a significant decrease. The second part was Occupational Safety which was 72.34 ± 23.2 before intervention and 45.94 ± 14.9 after training (P < 0.001). In the third part, the level of stress among the nurses was assessed. Results showed a mean of 60.80 ± 14.0 before the intervention and 40.91 ± 12.8 after the intervention [22].

Gurabhacharya DL et al**, A** study was conducted to assess the knowledge, attitude and practices on needle stick injuries among 70 nurses and paramedical staff from different departments of Kathmandu Medical College and Teaching Hospital. A 15-item questionnaire was administered for analysis. Results revealed that 4% and 61% of healthcare workers, respectively, were unaware of the fact that hepatitis B and hepatitis C can be transmitted by needle stick injuries. 74% had a history of needle stick injuries and only 21% reported the injuries. Only 23% were in the habit of using gloves for phlebotomy procedures all the time.79% were of the impression that the needle should be recapped after use. Only 66% were aware of universal precaution guidelines. The study concluded that knowledge of health care workers about the risk associated with needle stick injuries and the use of preventive measures is inadequate [23].

Conclusion

The present study reveals that the majority of nursing students had average knowledge regarding post-exposure prophylaxis of HIV/AIDS infection and low level perceived threat due to needle stick injury. The study shows that most of the socio-demographic variables indicate significant association with the level of knowledge regarding post-exposure prophylaxis of HIV/AIDS infection except gender, types of

Family and areas of residence. So hypothesis H_2 is accepted and the null hypothesis is Rejectedat 0.05 level of significance. So, the recommendation based on the above findings needs more activities to enhance the level for that.

- A similar study can be conducted on a larger and wider sample to draw generalizations.
- A comparative study may be conducted on urban and rural nursing students.
- A similar study can be conducted among staff nurses and nursing students.
- A similar study can be conducted by taking samples from govt. and private hospitals.

A similar study can be replicated on a sample with different demographic variables.

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