

**KNOWLEDGE, ATTITUDE AND PRACTICE ABOUT POST EXPOSURE  
PROPHYLAXIS FOR HIV IN UNDERGRADUATE CLINIC ATTENDING MEDICAL  
AND NURSING STUDENTS**

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**ABSTRACT**

**Introduction:** Occupational exposure of blood and other body fluids in health profession causes increase risk of HIV and other blood borne disease. Adequate knowledge and practice in health care provider about Post Exposure Prophylaxis (PEP) for HIV having crucial role to prevent HIV infection. The present study aimed to evaluate the knowledge, attitude and practice about PEP for HIV in clinic attending medical and nursing students. **Method:** The study questionnaire regarding PEP was given to 218 medical and 217 clinic attending medical and nursing students. Their responses were evaluated for adequacy of knowledge, attitude towards occupational exposure and post exposure prophylaxis. **Result:** 85.5% students heard about PEP and main source of information was formal education. 94.9% nursing students and 96.3% medical students stated needle stick injury as a risk of HIV infection. 35.8% medical and 16.6% nursing students provided  $\geq 75\%$  correct responses. Overall attitude of both medical and nursing students was positive towards prevention of occupational exposure and receiving PEP after needle stick injury. 8% students exposed to accidental risk of HIV infection. **Conclusion:** 26% clinic attending medical and nursing students had adequate knowledge towards PEP. Adequate knowledge was more in medical students than nursing students (35.8 vs. 16.6%). Medical students were having more awareness towards theoretical aspects and nursing students were having more awareness for practical aspects of PEP for HIV.

**KEYWORDS:** HIV, KAP study, Medical students, Post Exposure Prophylaxis.

**INTRODUCTION**

Health care providers are having main role in prevention of blood borne infections. Needle stick injury and exposure to contaminated blood, other body fluids are important occupational risk factors of getting HIV infection among health care workers.<sup>[1]</sup> Risk of HIV after single prick with contaminated needle is around 0.3%.<sup>[1]</sup> To reduce this exposure, universal precautions help a lot but due to un-availability of protective equipments in developing countries, exposure continues to occur.<sup>[2]</sup> A number of occupational exposures occur in health care setting each year.<sup>[3]</sup> Post-exposure prophylaxis (PEP) includes two or three drugs antiretroviral regimen for 4 weeks that reduces risk of transmission of HIV.<sup>[4]</sup> The various knowledge, attitude, practice studies have been conducted which shows deficient knowledge for PEP in health care professionals.<sup>[2,3]</sup> This results in delay to start the PEP after exposure. Therefore, health care professionals should have adequate knowledge and

positive attitude towards PEP. Clinic attending medical and nursing students performs various invasive procedures under supervision and being beginner to the procedures, they are at increased risk of getting occupational exposure. They should know about precautions to be taken during such procedures, how to proceed in case of exposure for PEP. Hence, the present study was designed to evaluate the current knowledge, attitude and practice about PEP among clinic attending undergraduate medical and nursing students of our institute.

**METHODOLOGY**

The study was started after approval of Institutional Review Board (IRB), Government Medical College, Bhavnagar, Gujarat, India. All clinic attending undergraduate medical and nursing students of Government Medical College and Government College of Nursing, Bhavnagar were invited to participate in the

study. After explaining them about a study in detail, they have been asked to participate in the study voluntarily. Those who gave the written informed consent were included. Data were collected using standard structured questionnaire. Questionnaire was made by giving due consideration to knowledge, attitude and practice of clinic attending undergraduate medical and nursing students towards PEP. The questionnaire consisted of 40 questions on demographics (n=4), knowledge (n=16), attitudes (n=15) and practice (n=5). Questionnaire was prepared with the help of previous survey based studies and validated by testing on small group of students before using on the study population. 45 minutes time was provided to complete the questionnaire.

Data were expressed in proportions. Descriptive statistics were used for demographic, knowledge, attitude and practice data. Adequate knowledge was considered if 75% responses to knowledge questions were correct. All statistical analysis was performed using Microsoft Excel.

## RESULTS

In the present study, total 435 undergraduate students participated. Medical (218) and nursing (217) students were termed as group A and group B, respectively. 372 (85.5%) students had heard about PEP in past, amongst which 166 were medical students and 206 were nursing students. For 266 students source of information about PEP was formal education and only 88 had it via media. The complete details of demographics are given in Table 1.

**Table 1: Demographic details of study participants.**

| Demographic data   | Group A (Medical students; n=218) | Group B (Nursing students; n=217) | Total (N=435) |
|--|-----------------------------------|-----------------------------------|---------------|
| <b>Gender</b>  |                                   |                                   |               |
| Male   | 115(52.75)                        | 22(10.14)                         | 137(31.49)    |
| Female   | 103(47.25)                        | 195(89.86)                        | 298(68.51)    |
| <b>Study year</b>  |                                   |                                   |               |
| 1 <sup>st</sup> year                                       | 00                                | 00                                | 00            |
| 2 <sup>nd</sup> year                                       | 56(12.87)                         | 85(19.54)                         | 141(32.41)    |
| 3 <sup>rd</sup> Part I (3 <sup>rd</sup> year for nursing)  | 83(19.08)                         | 112(25.75)                        | 195(44.83)    |
| 3 <sup>rd</sup> Part II (4 <sup>th</sup> year for nursing) | 67(15.40)                         | 20(4.60)                          | 87(20)        |
| Intern   | 12(2.76)                          | 00                                | 12(2.76)      |
| <b>Heard about PEP</b>                                     |                                   |                                   |               |
| Yes  | 166(76.15)                        | 206(94.93)                        | 372(85.52)    |
| No   | 52(23.85)                         | 11(5.07)                          | 63(14.48)     |
| <b>Source of information about PEP of HIV/AIDS</b>         |                                   |                                   |               |
| Formal education   | 138(83.13)                        | 128(62.14)                        | 266(71.51)    |
| Media  | 33(19.88)                         | 50(24.27)                         | 83(22.31)     |
| Health program   | 48(28.92)                         | 105(50.97)                        | 153(41.13)    |
| Internet   | 37(22.29)                         | 56(27.18)                         | 93(25)        |
| Health facilities, doctor                                  | 75(45.18)                         | 79(38.34)                         | 154(41.40)    |
| Friends, relatives   | 35(21.08)                         | 53(25.73)                         | 88(23.66)     |

Values in ( ) are in percentage.

## ASSESSMENT OF KNOWLEDGE

Total 321(73.4%) students had an inadequate knowledge about the PEP. 140 (64.2%) medical students and 181(83.4%) nursing students were having inadequate knowledge. Up to 278 (63.91%) students had stated correctly that PEP should be started within 72 hrs of the exposure. Detailed evaluation of responses to various knowledge questions have been provided in table 2.

**Table 2: Evaluation of knowledge questions in study participants of various groups.**

| Knowledge Questions   | Group A -Medical<br>N1=218 (%) | Group B-Nursing<br>N2=217 (%) | Total<br>N=435 (%) |
|---|--------------------------------|-------------------------------|--------------------|
| <b>Occupational exposure includes</b>   |                                |                               |                    |
| Needle stick injury   | 210(96.33)                     | 206(94.93)                    | 416(95.63)         |
| Condom rupture  | 69(31.65)                      | 94(43.32)                     | 163(37.47)         |
| Blood spillage  | 123(56.42)                     | 98(45.16)                     | 221(50.80)         |
| Transferring body fluids  | 98(44.95)                      | 99(45.62)                     | 197(45.28)         |
| <b>PEP should be started within how many hours</b>                                      |                                |                               |                    |
| Correct   | 123(56.42)                     | 155(71.42)                    | 278(63.91)         |
| Incorrect   | 95(43.57)                      | 62(28.57)                     | 157(36.09)         |
| <b>Knowledge about specific guidelines available in the hospital</b>                    |                                |                               |                    |
| Aware   | 120(55.05)                     | 176(81.11)                    | 296(68.05)         |
| Not aware   | 98(44.95)                      | 41(18.89)                     | 139(31.95)         |
| <b>Department in charge of the PEP for HIV in your hospital</b>                         |                                |                               |                    |
| Medicine  | 70(32.11)                      | 16(7.37)                      | 86(19.77)          |
| Preventive medicine   | 29(13.30)                      | 14(6.45)                      | 43(9.89)           |
| Dermatology, venereology, leprosy   | 26(11.93)                      | 01(0.46)                      | 27(6.21)           |
| Pharmacy  | 12(5.50)                       | 10(4.61)                      | 22(5.06)           |
| VCTC  | 88(40.37)                      | 152(70.05)                    | 240(55.17)         |
| Microbiology  | 04(1.83)                       | 12(5.53)                      | 16(3.67)           |
| Don't know  | 38(17.43)                      | 21(9.68)                      | 59(13.56)          |
| <b>PEP recommended in<br/>Exposure – high risk<br/>Individual source – high risk</b>    |                                |                               |                    |
| Yes   | 201(92.20)                     | 203(93.55)                    | 404(92.87)         |
| No  | 02(0.92)                       | 06(2.76)                      | 08(1.84)           |
| May be  | 15(6.88)                       | 08(3.69)                      | 23(5.29)           |
| Not attempted   | 00                             | 00                            | 00                 |
| <b>PEP recommended in<br/>Exposure – high risk<br/>Individual source – unknown risk</b> |                                |                               |                    |
| Yes   | 176(80.73)                     | 157(72.35)                    | 333(76.55)         |
| No  | 06(2.75)                       | 18(8.29)                      | 24(5.52)           |
| May be  | 33(15.14)                      | 37(17.05)                     | 70(16.09)          |
| Not attempted   | 03(1.38)                       | 05(2.30)                      | 08(1.84)           |
| <b>PEP recommended in<br/>Exposure – no risk<br/>Individual source – no risk</b>        |                                |                               |                    |
| Yes   | 18(8.26)                       | 16(7.37)                      | 34(7.82)           |
| No  | 143(65.60)                     | 112(51.61)                    | 255(58.62)         |
| May be  | 46(21.10)                      | 80(36.87)                     | 126(28.97)         |
| Not attempted   | 11(5.05)                       | 09(4.15)                      | 20(4.60)           |
| <b>Measures to be taken after needle stick injury at work place</b>                     |                                |                               |                    |
| • Squeeze blood and finger in mouth   |                                |                               |                    |
| • Remove gloves   | 30(13.76)                      | 06(2.76)                      | 36(8.28)           |
| • Wash with soap or mild disinfectant that will not irritate skin                       | 58(26.61)                      | 81(37.33)                     | 139(31.95)         |
| • Rush to doctor  | 192(88.07)                     | 197(90.78)                    | 389(89.43)         |
| • Nothing to be done  | 136(62.39)                     | 121(55.76)                    | 257(59.08)         |
|   | 04(1.83)                       | 03(1.38)                      | 07(1.61)           |
| <b>Universal precautions includes</b>   |                                |                               |                    |
| • Hand washing  | 144(66.06)                     | 194(89.40)                    | 338(77.70)         |
| • Safe disposal of contaminated waste   | 186(85.32)                     | 139(64.04)                    | 325(74.41)         |
| • Using gloves, masks, apron, goggles, boots during invasive procedures                 | 176(80.73)                     | 192(88.48)                    | 371(85.29)         |

|   |            |            |            |
|---|------------|------------|------------|
| • Avoiding all invasive procedures in HIV positive patient                  | 22(10.09)  | 13(5.99)   | 35(8.05)   |
| <b>PEP reduces the likelihood of HIV infection after exposure</b>           |            |            |            |
| Yes   | 184(84.40) | 149(68.66) | 333(76.55) |
| No  | 14(6.42)   | 16(7.37)   | 30(6.90)   |
| Don't know  | 20(9.17)   | 51(23.50)  | 71(16.32)  |
| Not attended  | 00(0)      | 01(0.46)   | 01(0.23)   |
| <b>Report of HIV testing is needed to start PEP</b>                         |            |            |            |
| Yes   | 57(26.15)  | 117(53.92) | 174(40)    |
| No  | 146(66.97) | 80(36.87)  | 226(51.95) |
| Don't know  | 15(6.88)   | 18(8.29)   | 33(7.59)   |
| Not attended  | 00(0)      | 02(0.92)   | 02(0.45)   |
| <b>PEP is given according to level of exposure and HIV status of source</b> |            |            |            |
| Yes   | 169(77.52) | 126(58.06) | 295(67.82) |
| No  | 28(12.84)  | 33(15.21)  | 61(14.02)  |
| Don't know  | 21(9.63)   | 56(25.81)  | 77(17.70)  |
| Not attended  | 00(0)      | 02(0.92)   | 02(0.46)   |
| <b>PEP is given to victims of rape</b>                                      |            |            |            |
| Yes   | 102(46.79) | 74(34.10)  | 176(40.46) |
| No  | 45(20.64)  | 48(22.12)  | 93(21.38)  |
| Don't know  | 71(32.57)  | 90(41.47)  | 161(37.01) |
| Not attended  | 00(0)      | 05(2.30)   | 05(1.15)   |
| <b>Two drug regimen is given to high risk exposure</b>                      |            |            |            |
| Yes   | 78(35.78)  | 75(34.56)  | 153(35.17) |
| No  | 85(38.99)  | 26(11.98)  | 111(25.52) |
| Don't know  | 55(25.23)  | 109(50.23) | 164(37.70) |
| Not attended  | 00(0)      | 07(3.23)   | 07(1.61)   |
| <b>PEP is given for 4 weeks</b>   |            |            |            |
| Yes   | 133(61.01) | 76(35.02)  | 209(48.05) |
| No  | 21(9.63)   | 36(16.59)  | 57(13.10)  |
| Don't know  | 64(29.36)  | 102(47)    | 166(38.16) |
| Not attended  | 00(0)      | 03(1.38)   | 03(0.69)   |
| <b>Universal precaution can reduce the load of PEP</b>                      |            |            |            |
| Yes   | 200(91.74) | 154(70.97) | 354(81.38) |
| No  | 08(3.67)   | 18(8.29)   | 26(5.98)   |
| Don't know  | 10(0.46)   | 43(19.82)  | 53(12.18)  |
| Not attended  | 00(0)      | 02(0.92)   | 02(0.45)   |
| <b>Knowledge</b>  |            |            |            |
| Adequate  | 78(35.78)  | 36(16.59)  | 114(26.21) |
| Inadequate  | 140(64.22) | 181(83.41) | 321(73.79) |

#### Assessment of attitude

Attitude of medical and nursing students towards prevention of occupational HIV infection and PEP is shown in table 3.

Table 3: Attitude of medical and nursing students towards PEP.

| Statements   | Strongly Disagree<br>N (%) | Disagree<br>N (%) | Can't Say<br>N (%) | Agree<br>N (%) | Strongly Agree<br>N (%) |
|--|----------------------------|-------------------|--------------------|----------------|-------------------------|
| <b>I am not at a risk of getting blood borne infection.</b>                          | 55(12.6)                   | 140(32.2)         | 125(28.73)         | 70(16.09)      | 44(10.11)               |
| <b>I think wearing gloves during phlebotomy is wastage of time.</b>                  | 187(42.98)                 | 160(36.78)        | 28(6.43)           | 32(7.35)       | 28(6.43)                |
| <b>I should ask for PEP on exposure.</b>   | 11(2.52)                   | 6(1.37)           | 33(7.58)           | 169(38.85)     | 216(49.65)              |
| <b>I should know how to proceed for PEP.</b>   | 6(1.37)                    | 17(3.90)          | 30(6.89)           | 168(38.62)     | 214(49.19)              |
| <b>I don't like to take PEP because confidentiality is not maintained.</b>           | 133(30.57)                 | 186(42.75)        | 73(16.78)          | 28(6.43)       | 15(3.44)                |
| <b>Psychological fear prevents the use of PEP.</b>                                   | 68(15.63)                  | 129(29.65)        | 86(19.77)          | 121(27.81)     | 31(7.12)                |
| <b>PEP does not reduce the risk of getting infected after exposure.</b>              | 89(20.45)                  | 203(46.66)        | 81(18.62)          | 47(10.80)      | 15(3.44)                |
| <b>I don't want to take PEP due to adverse reactions.</b>                            | 102(23.44)                 | 212(48.73)        | 77(17.70)          | 36(8.27)       | 8(1.83)                 |
| <b>PEP is not readily available at my institute.</b>                                 | 129(29.65)                 | 164(37.70)        | 98(22.52)          | 23(5.28)       | 21(4.82)                |
| <b>One can avoid the use of universal precaution because of availability of PEP.</b> | 230(52.87)                 | 118(27.12)        | 36(8.27)           | 35(8.04)       | 16(3.67)                |
| <b>Every hospitalized patient should be tested for HIV.</b>                          | 27(6.20)                   | 82(18.85)         | 42(9.65)           | 133(30.57)     | 150(34.48)              |
| <b>We should be able to refuse to care for an HIV/AIDS patient.</b>                  | 220(50.57)                 | 140(32.18)        | 36(8.27)           | 23(5.28)       | 16(3.67)                |
| <b>HIV positive status is the individual's own fault.</b>                            | 155(35.63)                 | 188(43.21)        | 65(14.64)          | 22(5.05)       | 5(1.14)                 |
| <b>I should not practice if I am HIV positive.</b>                                   | 111(25.51)                 | 165(37.93)        | 70(16.09)          | 60(13.79)      | 29(6.66)                |
| <b>Additional precautions should be taken if patient is HIV positive.</b>            | 10(2.29)                   | 7(1.60)           | 28(6.43)           | 116(26.66)     | 274(62.98)              |

### Assessment of practices

248 (57%) students practiced invasive procedures and 35 (8%) students exposed to accidental risk of HIV infection. (Table 4).

**Table 4: Practices of medical and nursing students for prevention of accidental HIV infection.**

| Statements  | Yes<br>N (%) | No<br>N (%) |
|---|--------------|-------------|
| I perform invasive procedures.                                | 248(57.01)   | 187(42.99)  |
| I wear gloves at the time of blood collection.                | 299(68.73)   | 136(31.27)  |
| I have been exposed to accidental risk of HIV.                | 35(8.04)     | 400(91.96)  |
| I have reported needle stick injury or occupational exposure. | 69(15.86)    | 366(84.14)  |
| If I will get needle stick injury, I will take PEP.           | 344(79.08)   | 91(20.92)   |

### DISCUSSION

The present study evaluated the knowledge, attitude and practice of post exposure prophylaxis among clinic attending medical and nursing students. 76.15% medical students heard about PEP which is less than in study conducted by Leopold et al (89%).<sup>[1]</sup> This was also lower than reported among health workers in Gonda Ethiopia (92.8%) and in Nigeria (97%).<sup>[2,3]</sup> In our study 94.93% nursing students heard about PEP, which is more than 83.8% in north west region of cameroon and 67% reported among nursing and midwifery students in Hawassa university, ethiopia.<sup>[4,5]</sup> In our study, main source of knowledge on PEP was formal education both in medical students (83.13%) and nursing students (62.14%) while in Leopold et al main source of knowledge on PEP in medical students was ward round.<sup>[1]</sup> Regarding participants' knowledge about occupational exposure, 96.33% medical students and 94.93% nursing students said it is due to needle stick injury that is common in ward. 88.07% medical students and 90.78% nursing students correctly stated about initial first aid measure to be started following needle prick as compared to 59% medical students and 48% nursing students in other studies.<sup>[1, 4, 6]</sup> In Gurubacharya DL et al, 66% health workers (nurses and paramedical staff) (66%) were aware of the Universal Precaution as compared to 75% medical and nursing students in present study.<sup>[7]</sup> 84.4% medical students stated that PEP reduces the likelihood HIV infection as compared to 87.0% health care workers in Sarah OA et al.<sup>[8]</sup> In this study, 56.42% of medical students were aware about appropriate time limit for initiating PEP while in other studies 43.5% medical students<sup>[1]</sup>, 33% junior doctors<sup>[9]</sup>, 31.6% medical interns<sup>[10]</sup> and 93.7% family physician of Nigeria<sup>[11]</sup> were aware of the appropriate time for initiating PEP. 71.42% nursing students were aware about time limit for initiating PEP in present study which was higher than the medical students and also higher than the nursing students (66.3%) in other study.<sup>[4]</sup> More knowledge in nursing students could be due to their more exposure to ward procedure and spending of more time in ward than medical students. However, adequate knowledge was more in medical students (35.78%) as compared to 16.59% nursing students. We included some theoretical questions of PEP to assess the knowledge and those were answered well by medical students as compared to nursing students. Based on pattern of

correct responses, we found that nursing students were having more knowledge for practical aspects as they are exposed to ward procedures early as compared to medical students. Nursing students are also exposed to procedures about getting PEP by staff nurses. Theoretical knowledge about PEP like duration of prophylaxis, no need for HIV report before starting PEP, deciding the regimen based on risk category was more among medical students. More focus can be given to procedures for getting PEP on exposure for medical students. According to 92.2% of medical students and 93.55% nursing students PEP should be given when individual source and exposure are of high risk group. 80.73% medical students and 72.35% nursing student also stated that PEP is also given when exposure is of high risk and status of individual source is not known. Stating correct indications for starting PEP could be due to informative posters available in hospital or formal training to them.

In this study, overall attitude of students was quite positive for wearing gloves during procedure, asking for PEP on exposure, knowing procedures to get PEP, universal precautions (Table 3). This suggests the positivity of students towards prevention of occupational exposure and also for receiving PEP on an exposure. Students should be taught about preventive aspects of occupational exposures so that they keep universal precaution while performing invasive procedures. Around 83% students disagree with the statement that they should be able to refuse treating HIV patients and 79% students showed disagreement to the statement of having HIV status is individual's fault. This suggests students are sensitive towards the issues of HIV.

57% students perform invasive procedures and 8% students have been exposed to risk of HIV. Exposure risk is less as compared to health care workers as students are less frequently involved in invasive procedures than health care workers. Students can be guided for future practices to reduce the exposure risk by more application of universal precaution.

Overall, we found only 26% clinic attending medical and nursing students with adequate knowledge towards PEP. Adequate knowledge was more in medical students than nursing students (35.8 vs. 16.6%). Medical students were having more awareness towards theoretical aspects and

nursing students were having more awareness for practical aspects of PEP for HIV. Attitude of students is quite positive towards PEP and related issues.

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