

## Original Article

# Knowledge, attitudes, and perceived barriers on the provision of HIV post exposure prophylaxis following sexual exposure among healthcare workers in STD clinics, Sri Lanka

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## Abstract

**Introduction:** Despite significant advancements in the prevention and treatment of Human Immunodeficiency Virus (HIV), it remains a complex health and social challenge. Post-exposure prophylaxis following sexual exposure (PEPSE) is a vital biomedical intervention that reduces new HIV infections resulting from unprotected sex.

**Objectives:** The study aimed to assess the knowledge, attitudes, and perceived barriers to the provision of PEPSE for HIV among healthcare workers in STD clinics, Sri Lanka and identify factors associated with them.

**Methods:** An analytical cross-sectional study was carried out among 148 health care workers attached to STD clinics in Sri Lanka who were recruited by a stratified random sampling technique. Data was collected through self-administered questionnaires. SPSS version 22 was used for descriptive analysis of data and to identify associations, utilizing the chi-square test. The level of significance was considered at  $p < 0.05$ .

**Results:** While 85% of healthcare workers showed good knowledge of HIV, only 64% had good knowledge of PEPSE. Approximately 62% had favorable attitudes toward PEPSE, but 59% anticipated barriers to its provision. There was no significant association between knowledge of PEPSE and attitudes towards it. However, individuals with favorable attitudes were significantly more likely to prescribe PEPSE ( $p = .001$ ). The willingness to provide PEPSE was not significantly linked to either overall knowledge or perceived barriers.

**Conclusion:** This study validates the effectiveness of current HIV awareness programmes, while highlighting the necessity for enhanced PEPSE awareness initiatives. Future interventions should prioritize improving healthcare workers' attitudes towards PEPSE, necessitating further research into factors contributing to negative attitudes.

**Key words:** HIV, PEPSE, health care workers, knowledge, attitudes, barriers

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Sri Lanka Journal of Sexual Health and HIV Medicine 2025;7: 36-43

DOI: <https://doi.org/10.4038/joshhm.v7i1.109>

**Acknowledgements:** All the participants in the study

**Conflicts of interest:** No conflicts of interest, **Funding:** None, **Originality:** This is an original work that has not been previously published

Received: 2025-07-01 | Accepted: 2025-08-01



## Introduction

Despite major advancements in preventive as well as treatment modalities, HIV remains one of the most challenging health and social issues at present. There are estimated to be 39.9 million people living with HIV globally by the end of the year 2024 (1).

Sri Lanka is a country with a low-level HIV epidemic, with an estimated 4700 people living with HIV (PLWH) by the end of 2023. The main mode of HIV transmission is through unprotected sexual exposures (82%), and the main driver of the epidemic is identified as unprotected sex between men (2).

Therefore, it is evident that the country needs to consider appropriate evidence-based, new innovative interventions to accelerate the reduction of new HIV infections in the country. Post-Exposure Prophylaxis following Sexual Exposure (PEPSE) is one such biomedical intervention which has been proven to be effective in reducing new HIV infections (3-6).

Post-Exposure Prophylaxis for HIV (PEP) is defined as “use of ARVs within 72 hours of exposure to HIV to prevent infection. PEP includes counselling, first aid care, HIV testing, and administration of a 28-day course of ARV drugs with follow-up care.” The World Health Organization recommends the use of PEP for both adults and children following occupational and non-occupational exposures (6).

Healthcare workers (HCWs) play a key role in educating clients, identifying suitable candidates, and ensuring the timely provision of PEPSE to ensure its effectiveness in preventing HIV. Therefore, a good knowledge and favorable attitudes are vital for the successful delivery of this intervention.

To date, there have been no documented studies on PEPSE in Sri Lanka. Therefore, it is crucial to establish baseline data regarding the knowledge, attitudes, and perceived barriers to the provision of PEPSE among HCW in Sri Lanka. The findings from such a study would be critical in identifying specific educational and training requirements for staff, thereby improving the

provision of PEPSE through STD clinics nationwide.

## Objective

This study aimed to assess knowledge, attitudes, and perceived barriers concerning the provision of PEPSE for HIV among healthcare workers in STD clinics, Sri Lanka. It also sought to identify factors associated with their knowledge, attitudes and perceived barriers regarding the provision of PEPSE.

## Methods

This analytical cross-sectional study was conducted in 29 of 41 STD clinics in Sri Lanka, selected based on predefined inclusion criteria. First-contact healthcare providers, including medical officers (MO), public health nursing sisters (PHNS), nursing officers (NO), and public health inspectors (PHI) with over 3 months of experience in the field, were considered eligible. Clinics with at least one medical officer and a NO, PHNS, or PHI were recruited. The sample size (148 out of 206) was determined using a calculation for finite populations.

A stratified random sampling technique, with probability proportionate to sample size, was used to select participants. Data was collected using a structured, pre-tested, self-administered questionnaire between November 1, 2021, and February 28, 2022.

Data analysis was performed using SPSS version 22. The level of significance was considered at  $p < 0.05$ . Ethical clearance was obtained from the Ethics Review Committee of the Postgraduate Institute of Medicine (PGIM), University of Colombo. Institutional clearance was also secured from the Director of the National STD/AIDS Control Programme and the consultants/Medical Officers-in-Charge of each selected STD clinic.

## Results

The study sample consisted of 146 participants with a response rate of 98.6% from STD clinics in Sri Lanka. Their Socio-demographic characteristics are shown in Table 01.

**Table 01:** Socio-demographic characteristics

| Characteristic                           | Frequency | Percentage (%) |
|------------------------------------------|-----------|----------------|
| Age categories                           |           |                |
| 25 – 34                                  | 23        | 15.8           |
| 35 – 44                                  | 49        | 33.5           |
| 45 – 54                                  | 58        | 39.7           |
| >55                                      | 16        | 11.0           |
| Total                                    | 146       | 100.0          |
| Gender                                   |           |                |
| Male                                     | 61        | 41.8           |
| Female                                   | 85        | 58.2           |
| Total                                    | 146       | 100.0          |
| Ethnicity                                |           |                |
| Sinhalese                                | 130       | 89.0           |
| Tamil                                    | 12        | 8.3            |
| Muslim                                   | 4         | 2.7            |
| Total                                    | 146       | 100.0          |
| Category of staff                        |           |                |
| MO                                       | 63        | 43.1           |
| PHNS                                     | 3         | 2.1            |
| NO                                       | 56        | 38.4           |
| PHI                                      | 24        | 16.4           |
| Total                                    | 146       | 100.0          |
| Working experience in STD clinic setting |           |                |
| <5 years                                 | 105       | 71.9           |
| >= 5 years                               | 41        | 28.1           |
| Total                                    | 146       | 100.0          |

The mean age of the sample was 44 years (SD=9.03), and most were female (58%, n=85). The majority worked in clinics in western province (37%, n=56).

### Knowledge of HIV and PEPSE

Five UNGASS core indicator questions were used to assess the knowledge on HIV and 85% of participants answered all 5 questions correctly (7). Furthermore, 97% correctly answered at least four out of five questions. This indicates a high level of HIV-related basic knowledge among HCW.

Regarding knowledge of PEPSE, 94% (n=138) of the study participants reported having heard of it. The primary sources of this knowledge for the

majority were in-service (54%, n=74) and pre-service (20%, n=27) programs organized by the National STD/AIDS Control Programme (NSACP). Knowledge of PEPSE in the study sample is described below.

**Table 02:** Distribution of study sample by knowledge of PEPSE

| Indications for PEPSE                                                                                                           | Count | %     |
|---------------------------------------------------------------------------------------------------------------------------------|-------|-------|
| Following a sexual assault                                                                                                      |       |       |
| Yes*                                                                                                                            | 103   | 74.6  |
| No                                                                                                                              | 26    | 18.8  |
| Not sure                                                                                                                        | 9     | 6.6   |
| Total                                                                                                                           | 138   | 100.0 |
| MSM presenting after unprotected receptive anal intercourse                                                                     |       |       |
| Yes*                                                                                                                            | 115   | 83.3  |
| No                                                                                                                              | 16    | 11.6  |
| Not sure                                                                                                                        | 7     | 5.1   |
| Total                                                                                                                           | 138   | 100.0 |
| Condom rupture while having sex with a regular heterosexual partner                                                             |       |       |
| Yes                                                                                                                             | 31    | 22.5  |
| No*                                                                                                                             | 97    | 70.3  |
| Not sure                                                                                                                        | 10    | 7.2   |
| Total                                                                                                                           | 138   | 100.0 |
| Following unprotected sex with a known HIV positive partner who is not on treatment/ detectable viral load even with treatment. |       |       |
| Yes*                                                                                                                            | 135   | 97.8  |
| No                                                                                                                              | 2     | 1.4   |
| Not sure                                                                                                                        | 1     | 0.7   |
| Total                                                                                                                           | 138   | 100.0 |
| A person with multiple sex partners who uses condoms consistently and correctly                                                 |       |       |
| Yes                                                                                                                             | 23    | 16.7  |
| No*                                                                                                                             | 103   | 74.6  |
| Not sure                                                                                                                        | 12    | 8.7   |
| Total                                                                                                                           | 138   | 100.0 |

\* Correct answer

In addition to assessing the indications for PEPSE, the knowledge of HCWs regarding the drug regimen was also evaluated. The study found that approximately 86% of participants correctly identified triple ART as the recommended regimen. Furthermore, 96% of

participants (n=133) knew that PEPSE should be initiated within 72 hours of exposure, and 88% (n=121) were aware that the correct duration of treatment is 28 days.

A final knowledge score was calculated by allocating 10 marks for each correct response and zero for incorrect or "not sure" answers. The scores were categorized as "good" or "poor" using the mean score of 75 as the cut-off value. The results indicated that nearly two-thirds of the participants (64%, n=88) had a good knowledge of PEPSE.

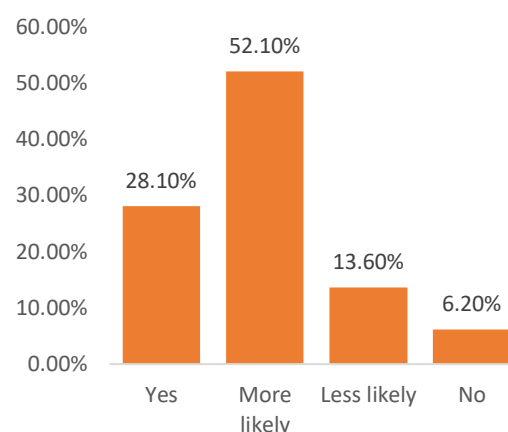
### Attitudes on post-exposure prophylaxis for HIV after sexual exposure

Table 03 describes the distribution of attitudes of HCWs towards PEPSE.

The five statements regarding attitudes were evaluated using a five-point Likert scale, with responses receiving scores from 0 to 20. In favorable attitudes, strongly agree receiving 20 while strongly disagree receiving 0 marks. Participants' overall attitudes toward PEPSE were categorized as "favorable" or "non-favorable" based on a mean score of 65. According to this classification, 62% (n=91) of participants had favorable attitudes.

When considering the willingness to provide PEPSE (Figure-01), only 28% of participants were certain they would provide PEPSE, though approximately 50% indicated they were more likely to provide it to eligible clients.

**Figure 01:** Distribution of willingness to prescribe/provide PEPSE



Nearly 60% (n=85) of the participants mentioned that there would be barriers to implementing PEPSE in their clinic setting. The three main barriers they had identified included lack of knowledge about PEPSE among clients (80%, n=69), inadequate training for HCW on PEPSE (75%, n=64) and reluctance of clients in disclosing their sexual behaviors to HCW (72%, n=61).

### Factors associated with knowledge, attitude, and perceived barriers to the provision of HIV PEPSE

Table 04 describes the association between level of knowledge on PEPSE and Socio-demographic variables.

**Table 03:** Distribution of attitudes towards PEPSE

| Attitudes toward PEPSE                                                                           | strongly agreed /agreed (%) | strongly disagreed/ disagreed (%) | Neutral (%) | Total (%) |
|--------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------|-------------|-----------|
| PEPSE will lead to an increase in high-risk sexual behaviors                                     | 30.8                        | 54.8*                             | 14.4        | 100       |
| Allocating resources to provide PEPSE is a waste of public money                                 | 5.5                         | 82.9*                             | 11.6        | 100       |
| Provision of PEPSE to individuals who practice unsafe sex is against cultural or religious norms | 13                          | 73.3*                             | 13.7        | 100       |
| PEPSE is an effective measure of preventing HIV transmission                                     | 67.8*                       | 21.9                              | 10.3        | 100       |
| Island-wide provision of PEPSE should be implemented to reduce new HIV infections                | 69.2*                       | 17.8                              | 13          | 100       |

\*Favorable attitude

**Table 04:** Association between level of knowledge on PEPSE and Socio-demographic variables

| Variable           | Level of knowledge |      |                |      |       |       | Significance                          |
|--------------------|--------------------|------|----------------|------|-------|-------|---------------------------------------|
|                    | Poor knowledge     |      | Good knowledge |      | Total |       |                                       |
|                    | Count              | %    | Count          | %    | Count | %     |                                       |
| Age category       |                    |      |                |      |       |       |                                       |
| <44 years          | 20                 | 29.8 | 47             | 70.2 | 67    | 100.0 | $\chi^2 = 4.36$<br>df = 1<br>p= .025  |
| =>44 years         | 38                 | 48.1 | 41             | 51.9 | 79    | 100.0 |                                       |
| Total              | 58                 | 39.7 | 88             | 60.3 | 146   | 100.0 |                                       |
| Gender             |                    |      |                |      |       |       |                                       |
| Male               | 21                 | 34.4 | 40             | 65.6 | 61    | 100.0 | $\chi^2 = 1.229$<br>df = 1<br>p= .268 |
| Female             | 37                 | 43.5 | 48             | 56.5 | 85    | 100.0 |                                       |
| Total              | 58                 | 39.7 | 88             | 60.3 | 146   | 100.0 |                                       |
| Staff category     |                    |      |                |      |       |       |                                       |
| Medical officers   | 17                 | 27.0 | 46             | 73.0 | 63    | 100.0 | $\chi^2 = 7.514$<br>df = 1<br>p= .006 |
| Other health staff | 41                 | 49.4 | 42             | 50.6 | 83    | 100.0 |                                       |
| Total              | 58                 | 39.7 | 88             | 60.3 | 146   | 100.0 |                                       |

**Table 05:** Association between perceived barriers in providing PEPSE and overall knowledge score and overall attitude score

| Variable                             | Presence of barriers in prescribing PEPSE |      |       |      |       |       | Significance                          |
|--------------------------------------|-------------------------------------------|------|-------|------|-------|-------|---------------------------------------|
|                                      | Yes                                       |      | No    |      | Total |       |                                       |
|                                      | Count                                     | %    | Count | %    | Count | %     |                                       |
| Overall knowledge score for PEPSE    |                                           |      |       |      |       |       |                                       |
| Good                                 | 43                                        | 48.9 | 45    | 51.1 | 88    | 100.0 | $\chi^2 = 7.971$<br>df = 1<br>p= .005 |
| Poor                                 | 42                                        | 72.4 | 16    | 27.6 | 58    | 100.0 |                                       |
| Total                                | 85                                        | 58.2 | 61    | 41.8 | 146   | 100.0 |                                       |
| Overall attitude score towards PEPSE |                                           |      |       |      |       |       |                                       |
| Favorable attitudes                  | 51                                        | 56.0 | 40    | 44.0 | 91    | 100.0 | $\chi^2 = .470$<br>df = 1<br>p= .493  |
| Non-favourable attitudes             | 34                                        | 61.8 | 21    | 38.2 | 55    | 100.0 |                                       |
| Total                                | 85                                        | 58.2 | 61    | 41.8 | 146   | 100.0 |                                       |

A statistically significant difference in PEPSE knowledge was observed based on age ( $p=0.025$ ), with participants under 44 years old demonstrating notably higher understanding than those over 44. MOs exhibited significantly greater knowledge of PEPSE compared to other staff categories ( $p=0.006$ ).

Attitudes toward PEPSE: HCWs' attitudes toward PEPSE did not show any significant association with the aforementioned socio-demographic factors ( $p>0.05$ ). Furthermore, no significant association was found between overall knowledge and attitudes toward PEPSE ( $p>0.05$ ).

The willingness to prescribe/provide PEPSE was not significantly linked to overall knowledge. However, a strong association was found with overall attitudes toward PEPSE; participants with favorable attitudes were significantly more willing to prescribe or provide it ( $p=.001$ ).

Perceived barriers to providing PEPSE: A statistically significant association was found between overall knowledge of PEPSE and perceived barriers to its prescription or provision ( $p=0.005$ ). Specifically, lower knowledge was associated with the belief that barriers exist in STD clinic settings. However, no significant association was observed between overall

attitudes toward PEPSE and these perceived barriers (Table 05)

## Discussion

The mean age and gender of our study population align with "Health Labour Market Analysis" findings of Sri Lanka (8).

Participants demonstrated good knowledge of HIV, likely attributable to the effective training initiatives provided by NSACP. The level of knowledge on HIV was high among our sample population, when compared to other studies conducted among non-medical populations in Sri Lanka, such as construction site workers (9) and key population groups for HIV (10). This underscores the importance of sustaining these successful training initiatives.

While a high proportion of participants (75%) demonstrated general awareness of PEPSE, their understanding of specific details, particularly the indications for PEPSE, was insufficient. This is a critical gap, especially given their role as first-contact HCWs for PEPSE in Sri Lanka, necessitating precise knowledge. Although a majority correctly identified the triple ART regimen for PEPSE, they struggled to identify incorrect drug regimen options. These discrepancies highlight a disparity between general awareness and a comprehensive understanding of critical details.

While nearly two-thirds of the study population held favorable overall attitudes toward PEPSE, this was not uniform across all statements. Only half of the participants believed that PEPSE did not increase high-risk sexual behaviors. This finding is consistent with studies conducted in Tanzania (11) and the United States (USA) (12), despite existing evidence to the contrary (13), (14). On the other hand, most participants held a favorable attitude regarding the utilization of public funds for PEPSE provision, believing it was not a waste of public money. This response can be considered highly encouraging for the successful implementation of PEPSE for indicated clients.

Despite more than 60% of participants having good knowledge and favorable attitudes towards PEPSE, only 28% were certain they would prescribe it. A study done in two major

metropolitan areas in USA revealed that the likelihood of prescribing PEPSE varied significantly based on patient factors, with lower rates for those without regular clinic visits or past condom use, and higher rates for exposures with HIV-positive partners (12). This highlights a poor understanding of indications for PEPSE, suggesting similar factors may influence prescribing behavior in our study group. Further research is needed to identify contributing factors for the effective nationwide implementation of PEPSE.

The provision of PEPSE was implemented recently in the STD clinic setting and was a relatively new experience for HCWs in Sri Lanka. Therefore, perceived barriers were assessed instead of asking about barriers they experienced in the clinic setting. The majority (58%) of the study participants mentioned that there would be barriers to implementing PEPSE in the STD clinic setting.

The main perceived barrier for the provision of PEPSE in this study was the lack of knowledge about it among clients (80%, n=69). A study done in the USA similarly found that healthcare providers were significantly more likely to prescribe PEPSE when patients requested it (13). The client's awareness about the PEPSE might be an important factor in our context as well. Therefore, it's essential to sensitize high-risk groups for HIV in the country about PEPSE to improve the uptake of this effective prevention measure.

Overall PEPSE knowledge was linked to job category ( $p=0.006$ ), with medical officers showing greater understanding, likely due to their comprehensive undergraduate education. This contrasts a Kegalle study where nursing officers were more knowledgeable (15). Unlike the Kegalle study's link to working experience, our findings show PEPSE knowledge associated with age ( $p=0.025$ ), with younger participants (<44) demonstrating better knowledge. This could be due to PEPSE being integrated into Sri Lanka's pre-service programs in 2019, providing younger healthcare workers with more current information and familiarity with electronic data sources.

The significantly high number of HCWs from STD clinics in Western Province, Sri Lanka had

favorable attitudes towards the effectiveness of PEPSE. This is likely due to the high HIV prevalence and larger key population groups for HIV in the area, which leads to more frequent awareness programs and increased clinical experience in providing PEPSE.

Our study found no significant association between overall PEPSE knowledge and overall attitudes toward PEPSE. This suggests that the mere provision of information may be insufficient to influence attitudes. Similarly, the willingness to prescribe or provide PEPSE was not significantly associated with knowledge level, indicating that knowledge alone is not a sufficient predictor of prescribing behavior. This finding is further supported by Steven et al, who reported that despite healthcare providers possessing PEPSE knowledge, only 43.5% prescribed it for clients (16).

A significant association was observed between the willingness to prescribe PEPSE and overall attitudes ( $p=0.001$ ), indicating that a favorable attitude is the most influential factor in prescribing behavior within our context. Therefore, it is crucial to not only expand knowledge of PEPSE but also to actively improve healthcare workers' attitudes and mitigate identified barriers to its provision.

## Conclusion

This study reveals a high level of knowledge on HIV among HCW in STD clinics, underscoring the effectiveness and importance of existing educational programs in maintaining this foundational knowledge. While nearly two-thirds of the study participants demonstrated good knowledge of PEPSE, gaps in understanding were identified. Therefore, we advocate for the initiation and strengthening of awareness programs to enhance healthcare workers' knowledge of PEPSE.

More critically, our findings indicate that while knowledge is important, it is favorable attitudes that predominantly influence the willingness to prescribe PEPSE. Therefore, future interventions should prioritize not only knowledge dissemination but also targeted programs designed to improve healthcare workers' attitudes towards PEPSE. Further research is warranted to comprehensively identify and

understand the factors contributing to negative attitudes, thereby enabling more effective and strategic interventions.

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