Comprehensive structured training on occupational health hazards and vaccination: A novel initiative toward employee safety

Meenakshi Khapre¹, Shreya Agarwal¹, Vandana Dholka², Vivek Singh³, Rajesh Kathrotia⁴, Bela Goyal⁵, Tarun Goyal⁶, Puneet Kumar Gupta⁷, Shalinee Rao⁸, Radhika Yadav¹

Departments of ¹Community and Family Medicine, ²Nuclear Medicine, ³Orthopedic, ⁴Biochemistry and ⁵Pathology, AIIMS Rishikesh, Uttarakhand, ⁶Department of Physiology, AIIMS Rajkot, Baroda, Gujarat India, ⁷Department of Orthopaedics, AIIMS Bhatinda, Punjab, ⁸Department of Microbiology, AIIMS Bilaspur, Himachal Pradesh, India

Abstract

Introduction: Healthcare providers are vulnerable to occupational health hazards. However, they do not appropriately apprehend the serious health consequences of occupational exposures. This study was conducted to assess the effectiveness of “Occupational health hazards and vaccination” workshop organized periodically in institute. Material and Methods: We validated the questionnaire prior to assess the effectiveness of workshop. Expert performed “key check” of questionnaire. Item analysis of one best item questions was performed using difficulty index (p value), discrimination indices (DI), distractor efficiency (DE), and reliability using Kuder-Richardson 20 coefficients (KR20). Pre-test and post-test scores of study participants were compared. Effectiveness of workshop was determined using class average normalized gain. Result: The 14 item one-best questions had acceptable difficulty level (60.35 ± 9.46%) and ideal discriminating power (0.75 ± 0.17) with mean DE 73.81 ± 22.46%. The test was found highly reliable with KR20 as 0.90. Mean score in pre-test and post-test were 6.47 ± 3.38 and 13.69 ± 1.51, respectively, and significant improvement in post-test score was found compared to pre-test score. Class average normalized gain was 0.84. Conclusion: The Occupational health hazards and vaccination workshop effectively improved healthcare providers’ knowledge regarding workplace safety protocols. Questionnaire was found to be valid and reliable. Low baseline knowledge highlights the fact that implementation of such training on regular basis is the need of hour.

Keywords: Effectiveness, hospital, learning gain, multiple-choice questions, occupational hazard

Introduction

Healthcare institutions deliver healthcare services, including counseling, clinical, surgical, and/or psychiatric consultations and treatment services for the healthy, sick, and the injured.

Address for correspondence: Dr. Shreya Agarwal, Department of Community and Family Medicine, All India Institute of Medical Sciences Rishikesh, Uttarakhand, India. E-mail: shreyaag2493@gmail.com

Accepted: 16-02-2022 Published: 22-07-2022

Access this article online

Quick Response Code: Website: www.jfmpc.com
DOJ: 10.4103/jfmpc.jfmpc_2333_21

How to cite this article: Khapre M, Agarwal S, Dholka V, Singh V, Kathrotia R, Goyal B, et al. Comprehensive structured training on occupational health hazards and vaccination: A novel initiative towards employee safety. J Family Med Prim Care 2022;11:3746-53.
hepatitis C virus (HCV), 42% hepatitis B virus (HBV), and 8% human immunodeficiency virus (HIV) in healthcare workers is attributable to contaminated sharps. Literature documents that one-third of the HCWs do not appropriately apprehend the serious health consequences of occupational exposures and suffer from workplace hazards in hospital setting including tuberculosis, hepatitis B (Hep B), hepatitis C, HIV, asthma, dermatitis, musculoskeletal pains and other ergonomic and psycho-social hazards. Though nearly 50% HCWs have reported being vaccinated against hepatitis B, yet a remarkable proportion of health workers remain unvaccinated. Studies also reveal a lack of knowledge regarding personal protective equipment (PPE), post-exposure prophylaxis (PEP), and adherence to complete dosage of vaccination.

Knowledge as well as continuing education and training of HCWs including primary care providers are crucial for ensuring occupational safety and health. It is documented in literature that occupational safety training and education reduces the possibility of health hazards at workplace and can bring about behavioural change towards adherence to safety protocols. In addition, several studies have also highlighted the need for training programs for healthcare providers for creating awareness about timely reporting of accident, achieving maximum vaccination against Hepatitis B and appropriate PEP practices.

With the aim to create awareness among healthcare providers to minimize the exposure to workplace hazards, the workshop on “Occupational Health Hazards and Vaccination” is periodically organized at tertiary care centre, Rishikesh. This ‘four-hour’ workshop is intended for students, physicians, and surgeons to develop an understanding on deleterious occupational health effects and safety and motivate them to get vaccinated and follow protocols for post-exposure prophylaxis to protect themselves against occupational health hazards.

In order to ensure that learners can demonstrate the integration of knowledge and skills in a realistic setting, we conducted this study to assess the effectiveness of “Occupational health hazards and vaccination” training workshop. Since the validated tool should be used for assessment, we performed item analysis of multiple-choice questions (MCQs) and reformulated items as required.

**Methodology**

The study was conducted at the Advanced Center of Continuous Professional Development, AIIMS Rishikesh. The department regularly organizes the Occupational Health Hazards and Vaccination workshop once a month for employees of Institute. Each batch consists of 30–40 participants, duration lasting for 4 hrs. The objective of workshop was to create awareness regarding physical, chemical, biological, and ergonomical hazards prevailing in hospital environment and how to prevent or protect self and others. Five sub-modules consisted of Introduction to Occupational hazards in hospital settings, Chemical Hazards, Radiation safety, Ergonomic hazards, Biological hazards, and vaccination. Demonstration sessions were conducted on Donning and doffing of PPE and blood spillage cleanup. Expert gave participants hands on experience of physical exercises for back, neck, and hands. (Photograph 1) Participants are motivated to vaccinate themselves with Td (Tetanus–diphtheria), Hep B, influenza, etc., to report accidents and promptly get post-exposure prophylaxis for Hep B and HIV in case of accidental exposure.

**Phase 1: Validation of test questionnaire**

Content and face validation was done by one expert each from field of Microbiology, Biochemistry, Orthopedics, Nuclear Medicine, and Community Medicine. Considering the time limit of only 15 min for the test to accommodate in workshop schedule, we prepared 14 one best answer type questions with four options and one open-ended question. [Annexure 1] MCQ test consisted of one question each from introductory and ergonomic, three questions each on biological, chemical, radiation hazards and PPE and spillage cleaning proportional to time devoted for each section.

Construct validity was ascertained using ‘key check’ and item response analyses such as item difficulty analysis, discrimination index and distractor evaluation. Key check was done by expert in content area. A total of responses of 219 participants enrolled during year 2017–2018 were evaluated. Fourteen question and 42 distractors were analyzed for difficulty index (p), discrimination index (DI), and distractor efficiency (DE) using MS Excel 2016. A correct answer was awarded a mark of 1 and 0 for the incorrect answer. The maximum possible score of the test was 15 and minimum 0. Scores were arranged in ascending order. High and low groups consisting of upper and lower 27% students, respectively, that is, 60 in each group. The P value and DI were then calculated as follows:

\[
p = \frac{[H + L]}{N} \times 100,
\]

\[
DI = 2 \times \frac{[H-L]}{N}
\]

Where, N is the total number of students in both high and low groups, H and L are the number of correct responses in the high and low groups, respectively. Items with P value between 30%–70% and DI >0.24 were considered as “ideal”. Non-functional distractors (NF-Ds) refers to those selected by less than 5% of students. Distactor efficiency ranged from 0 to 100% and was determined on the basis of the number of NF-Ds in an item. Three NF-Ds: DE = 0%; 2 NF-Ds: DE = 33.3%; 1 NF-D: DE = 66.67%; No NFD: DE = 100%. For measuring internal consistency, Kuder-Richardson (KR-20), a specific form
of the coefficient alpha formula for dichotomous data was calculated using formula

$$\gamma_{KR,20} = \left( \frac{k}{k-1} \right) \left( 1 - \frac{\Sigma \sigma_{pq}}{\sigma^2} \right)$$

where k is number of items, P is the proportion of the test takers who pass an item, q is the proportion of test takers who fail an item, $\sigma^2$ is the variation of the entire test, a reliability coefficient of 0.70 or greater is generally considered acceptable. According to the finding, the questionnaire was modified and used to assess the effectiveness of workshop.

**Phase 2: Effectiveness of workshop**

For effectiveness of workshop, 494 attendees from medicine stream enrolled in workshop during 2018 - Feb 2020 were invited for participation. Those who did not attempt the test either in pre- or post-test were removed from final analysis. Absolute gain is calculated as difference between pre-test and post-test score. Statistical significant difference between pre- and post-test score was analyzed using Student t-test. Relative gain is absolute gain in relation to pretest score, that is, post-test - pretest/pre-test score. Class average normalized gain is calculated by Hake’s formula,\(^{[9]}\) that is,

$$g = \frac{\text{class av % post} - \text{class av % pre}}{100 \% - \text{class av % pre}}$$

Effectiveness of workshop was determined using predetermined target of at least 0.3 for class average normalized gain <g> as given by Hake.\(^{[9]}\)

Normalized changed score measure learning gain for each student rather than entire class was calculated by Marx and Cummings formula\(^{[8]}\) as

$$c = \left( \frac{\text{post} - \text{pre}}{100 - \text{pre}} \right) \frac{\text{if post} > \text{pre}}{\text{if post} < \text{pre}}$$

Ethical approval was sought from Institutional Ethics Committee, AIIMS Rishikesh.

**Result**

**Phase 1**

All questions were marked as relevant by experts. Responses of 219 participants were analyzed for difficulty index, discrimination index, and distractor efficiency. \([\text{Table 1]}\) Difficulty index was 60.35 (9.46) which reflects that all items were in acceptable range of difficulty. DI was 0.75 (0.17), that is, ideal discriminating power. In Q1, 4, 9, 10, 13, all three distractors were efficient; in Q6 and 11 only one distractor was efficient while in other questions two distractors were efficient. After going through questionnaire, we changed the inefficient distractor a (Not time in radiation) of Q6 (related to important factors to reduce radiation exposure) to “decrease time and shielding” and c option Keep maximum time, distance and energy to keep distance, reduce energy, and shielding. Q11 related to “Double person double lock” had two non-functional distractors but discrimination index was very high (0.88) and we could not identify any evident problem in distractors, so retained both the distractors. KR-20 was 0.899 showing high test reliability.

**Phase 2**

A total of 494 participants attended the workshop and paired scores of 483 were analyzed as five of them did not attempt pre-test and other six did not attempt post-test. Of 483 participants, 123 (25.5%) were faculty, 230 (47.6%) were residents, 24 (4.97%), and 98 (20.3%) were PhD scholars and intern, respectively. \([\text{Table 1}\) Table 2 and Figure 2 compare the pre-test and post-test scores of participants. In pre-test 416 (86.1%) participants scored less than 10 while in post only 7 (0.28%) participants scored less than 10. Mean score in pre-test and post-test was 6.47 (3.38) and 13.69 (1.51), respectively, and significant improvement in post-test score was found in comparison to pre-test score (CI: -7.5 to -6.9). Table 3 shows absolute learning gain as 47.95% and relative gain as 111%.

**Table 1: Difficulty index, discrimination index, and distractor efficiency of Test Questionnaire**

| Item No. | Difficulty index (P) | Discrimination index (DI) | Distractor efficiency (DE) |
|----------|----------------------|---------------------------|---------------------------|
| 1        | 62.5                 | 0.75                      | 100                       |
| 2        | 55                   | 0.9                       | 66.67                     |
| 3        | 81.67                | 0.37                      | 66.67                     |
| 4        | 50                   | 0.97                      | 100                       |
| 5        | 67.5                 | 0.65                      | 66.67                     |
| 6        | 76.67                | 0.47                      | 33.33                     |
| 7        | 56.67                | 0.87                      | 66.67                     |
| 8        | 65.83                | 0.68                      | 66.67                     |
| 9        | 55.83                | 0.88                      | 100                       |
| 10       | 56.67                | 0.73                      | 100                       |
| 11       | 55.83                | 0.88                      | 33.33                     |
| 12       | 61.67                | 0.63                      | 66.67                     |
| 13       | 47.5                 | 0.82                      | 100                       |
| 14       | 51.67                | 0.9                       | 66.67                     |
| Mean (SD)| 60.35 (9.46)         | 0.75 (0.17)               | 73.81 (22.46)             |

**Table 2: Distribution of participants based on scores in the pre-test and post-test assessment (n=483)**

| Scores (0-15) | Pre-test n (%) | Post-test n (%) | Paired t-test |
|--------------|----------------|----------------|---------------|
| <5           | 120 (24.8)     | 2 (0.4)        | -44.75 (CI=-7.5-| 6.9), P<0.0001 |
| 5-10         | 296 (61.3)     | 5 (2.4)        |               |
| 10-15        | 67 (13.9)      | 476 (97.2)     |               |
| Mean score (SD)| 6.47 (3.38)  | 13.69 (1.51)   |               |

**Table 3: Learning gain among study participants**

| Variable                  | Gain           |
|---------------------------|----------------|
| Absolute gain             | 47.95%         |
| % Relative gain           | 111%           |
| Class average normalized gain | 0.84          |
| Normalized changed score  | 0.85 (0.15)    |
Class average normalized gain was 0.84. Forty participants got pre-test scores equal to or more than post-test and were dropped to calculate individualized changed score. Individualized change score was calculated as 0.85 (0.15).

A common feedback mentioned by participants was to include psychological health hazards due to work pressure in subsequent sessions. All agreed that workshop had sensitized them towards importance of occupational safety.

**Discussion**

Comprehensive structured training of Occupational health hazard and vaccination was found to be effective to improve the knowledge of participants as measured by validated test questionnaire. Workshops are recognized in medical education as a facilitating profound approach to learning and assessment of knowledge gain is very important as it helps in framing curricular content and delivery methods. Educational assessment can be done objectively using MCQs. Item analysis of MCQs is essential to identify items that need to be discarded, retained, or revised.

In the present study, MCQs were in the acceptable range of difficulty index (30-70%) and had ideal discriminating power (>0.24). In contrast to this, Obon AM & Anne Rey KM (2019) in their item analysis reported most of the items with acceptable difficulty level but poor discrimination. Item analysis of MCQs in another similar study reported mean difficulty index 39.4 ± 21.4% well within the acceptable range. Since the workshop was intended to improve the knowledge, awareness, and practice of the healthcare personnel regarding occupational health and safety in hospital premises; inclusion of all MCQs with acceptable difficulty level was justified. In this study, we did not intend to rank the study participants or examine their knowledge level compared to others. Instead, the test questions were designed with an appropriate level of difficulty so that all the participants were able to achieve that benchmark level of knowledge. Synthesis of rational distractors and reducing the NFDs is a crucial aspect for constructing quality MCQs. Mean DE in the present study was 73.81% (22.46%). Though some items were having one NFD we retained them considering the good discrimination ability.

Our study showed improvement in knowledge in post-test which was found to be statistically significant and high class averaged normalized gain, reflecting effectiveness of the training program. This finding is consistent with many other studies that report education intervention to develop sound knowledge for safety precautions. Dev et al. reported an improper understanding of HBV and the infection it causes to be the most common reason for not taking vaccination. Surprisingly the pre-test score was found to be very low that also confirm the previous finding by Senthil et al. This finding suggests that there is an urgent need to sensitize the healthcare providers including family physicians for Occupational health hazards and vaccination. These workshops will increase the awareness thereby improving the proportion of healthcare providers taking appropriate vaccination and follow safety appropriate protocols.

**Strength**

The major strength of this study was the use of validated tool for assessment of the workshop’s effectiveness. We had representation of all target population as participants belonged to different levels of healthcare with variable job descriptions intimately involved in patient care and hospital management. Comprehensive structured interactive practical oriented training also added strength to workshop.

**Limitations**

It was outside the scope of the present study to assess the behavioral change and long-term retention of knowledge regarding occupational health hazards and vaccination. Also, we did not include the session on psychological health hazards (due to excessive workload/shift work) an issue as addressed on feedback from participants.
Conclusion

The Occupational health hazard and vaccination workshop had significant improvement in knowledge of healthcare providers related to occupational hazards and safety. The assessment tool used showed good reliability and validity. Low baseline knowledge of participants highlights the fact that regular implementation of such training by healthcare institution or professional bodies like Indian Medical Association is the need of an hour.

Recommendations

The occupational vulnerability of healthcare providers threatens quality of healthcare delivery in developing countries. Therefore, occupational health and safety training should be mandated for all healthcare providers. Such training could be conducted by Occupational Health Physician or Family physician accredited by professional bodies. Workplace-based assessment for compliance to occupational protocol should be conducted periodically in different settings.

Acknowledgements

We are thankful to all the participants of workshop and office staff of Department.

Financial support and sponsorship

Infrastructure from Advanced Centre of Continuous Professional Development AIIMS Rishikesh.

Conflicts of interest

There are no conflicts of interest.

References

1. National Health Profile 2019: Central Bureau of Health Intelligence, Director General of Health Services, Ministry of Health & Family Welfare, Government of India. 2019. Available from: http://www.chbidghs.nic.in/showfile.php?id=1147. [Last accessed on 2021 Feb 15].

2. World Bank. World Developmental Indicators: Population, total – India 2019. Available from: https://databank.worldbank.org/source/world-development-indicators. [Last accessed on 2021 Feb 15].

3. Thirunavukkarasau A, Alrawaili KAH, Al-Hazmi AH, Dar UF, ALruwaili B, Mallick A, et al. Prevalence and risk factors of occupational health hazards among health care workers of northern Saudi Arabia: A Multicenter Study. Int J Environ Res Public Health 2021;18:11480.

4. Rapiti E, Prüss-Üstün A, Hutin Y. Sharps Injuries: Assessing the Burden of Disease from Sharps Injuries to Health-Care Workers at National and Local Levels. Geneva: World Health Organization; 2005. 50 p. (WHO Environmental Burden of Disease Series, No. 11).

5. Senthil A, Anandh B, Jayachandran P, Thangavel G, Josephin D, Yamini R, et al. Perception and prevalence of work-related health hazards among health care workers in public health facilities in Southern India. Int J Occup Environ Health 2015;21:74–81.

6. Shekhawat K, Chauhan A, Sakthidevi S, Nimbeni B, Golai S, Stephen L. Work-related musculoskeletal pain and its self-reported impact among practicing dentists in Puducherry, India. Indian J Dent Res 2020;31:354–7.

7. Gupta SB, Gupta A, Shah B, Kothari P, Darall S, Boghara D, et al. Hand eczema in nurses, nursing auxiliaries and cleaners—A cross-sectional study from a tertiary hospital in western India. Contact Dermatitis 2018;79:20–5.

8. Rajkumari N, Thanbuana BT, John NV, Gunjiyal J, Mathur P, Misra MC. A prospective look at the burden of sharps injuries and splashes among trauma health care workers in developing countries: True picture or tip of iceberg. Injury 2014;45:1470–8.

9. Batra V, Goswami A, Dadhich S, Kothari D, Bhargava N. Hepatitis B immunization in healthcare workers. Ann Gastroenterol 2015;28:276–80.

10. Dev K, S KS, Abhay G, Gajanan K, Akash S, Bisure K. Knowledge and awareness of the health care workers about the hepatitis B infection and their vaccination status in a newly started medical college. J Assoc Physicians India 2018;66:27–30.

11. Vardhini H, Selvaraj N, Meenakshi R. Assessment on knowledge and practice of postexposure prophylaxis of human immuno-deficiency virus among staff nurses and paramedical workers at a tertiary care hospital in South India. J Educ Health Promot 2020;9:279.

12. Kumar HNH, Namhapatra S, Khanna A, Praveen R, Sai Bhavana D. A Cross-sectional study on hepatitis B vaccination status and post-exposure prophylaxis practices among health care workers in teaching hospitals of Mangalore. Ann Glob Health 2015;81:664–8.

13. Rajkumari N, Mathur P, Gunjiyal J, Misra MC. Effectiveness of intensive interactive classes and hands on practice to increase awareness about sharps injuries and splashes among health care workers. J Clin Diagn Res 2015;9:DC17–21.

14. Yao WX, Wu YL, Yang B, Zhang LY, Yao C, Huang CH, et al. Occupational safety training and education for needlestick injuries among nursing students in China: Intervention study. Nurse Educ Today 2013;33:834–7.

15. Sheth SP, Leuva AC, Mannari JP. Post exposure prophylaxis for occupational exposures to hiv and hepatitis B: Our experience of thirteen years at a rural based tertiary care teaching hospital of western India. J Clin Diagn Res 2016;10:OC39–44.

16. Beanland C, Schneider Z, Wood L, Haber J. Nursing Research: Methods, Critical Appraisal and Utilization. 1st Australian ed. Australia: Harcourt Brace & Company; 1999.

17. Kelly TL. The selection of upper and lower groups for the validation of test items. J Educ Psychol 1939;30:17–24.

18. Sarin YK, Khurana M, Natu MV, Thomas A, Singh T. Item analysis of published MCQs. Indian Pediatr 1998;35:1103–7.

19. Hake RR. Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. Am J Phys 1998;66:64–74.

20. Marx JD, Cummings K. Normalized change. Am J Phys 2007;75:87–91.

21. Forsetlund L, Bjornadal A, Rashidian A, Jamtvedt G, O’Brien MA, Wolf F, et al. Continuing education meetings and workshops: Effects on professional practice and health care outcomes. Cochrane Database Syst Rev 2009;2009:CD003030.
22. Fuentesalba C. The role of assessment in the student learning process. J Vet Med Educ 2011;38:157–62.

23. Obon AM, Anne Rey KM. Analysis of Multiple-Choice Questions (MCQs): Item and test statistics from the 2nd year nursing qualifying exam in a University in Cavite, Philippines. Abstract Proc Int Scholars Conf 2019;7:499–511.

24. Kumar P, Sharma R, Rana M, Gajjar S. Item and test analysis to identify quality multiple choice questions (MCQs) from an assessment of medical students of Ahmedabad, Gujarat. Indian J Community Med 2014;39:17-20.
Annexure-1

Questionnaire

Occupational Health Hazard and Vaccination

Participant number: __________

1. Which one of the following is correct regarding risk of transmission following occupational exposure?
   a. HIV >HBV >HCV
   b. HBV >HIV >HCV
   c. HCV >HBV >HIV
   d. HBV >HCV >HIV

2. Identify the hierarchy of controls that should be implemented to control hazards in the workplace.
   a. Elimination, Substitution, Engineering Control, Administrative Control, Personal Protective Equipment
   b. Engineering Control, Elimination, Substitution, Administrative Control, Personal Protective Equipment
   c. Substitution, Engineering Control, Elimination, Administrative Control, Personal Protective Equipment
   d. Personal Protective Equipment, Elimination, Substitution, Engineering Control, Administrative Control

3. The following symbol refers to:
   a. Chemical Hazard
   b. Radiation Hazard
   c. Biohazard
   d. Heat Hazard

4. If HBsAg titre falls down <10mIU/ml for a previously protected HCW and if he gets NSI from source positive/unknown exposures: what to do according to CDC recommendation?
   a. Do not do anything
   b. Give a booster vaccine
   c. Give a booster vaccine + Ig
   d. Give complete vaccine and Ig

5. What is the most common site for pain due to ergonomical hazards?
   a. Low back and neck
   b. Neck and shoulder
   c. Shoulder and low back
   d. Wrist and shoulder

6. What is the most important factors to consider for reduce exposure to radiation?
   a. Decrease time and shielding
   b. Keep optimum time, distance, shielding
   c. Keep distance, reduce energy, and shielding
   d. Wear radiation protective gear all the time

7. A HCW coming to you saying that he has been vaccinated with two doses of Hepatitis B vaccine three years back but no documentation. He wants to know how should he continue up with the vaccination. Suggest the appropriate vaccination strategy, according to CDC recommendation.
   a. Vaccinated before three years, start fresh vaccination series
b. Since no documentation of the previous two doses start the fresh vaccination series

c. Check for antibody titres and give a booster dose if not protected

d. Irrespective of the time gap-vaccinate the 3rd dose

8. What does the colour code blue stand for?

a. Fire hazard
b. Special hazard
c. Reactivity hazard
d. Health hazard

9. Main principle for radioactive waste disposal is:

a. Decay for 1 half life
b. Decay for 5 half lives
c. Decay for 10 half lives
d. Decay for 20 half lives

10. The following equipment is used for monitoring:

a. Delivering radiation
b. Personnel monitoring
c. Protection from radiation
d. Recovery from radiation effects

11. A blood is spilled on the floor of approximate 4 cm radius now what to do?

a. Wipe with absorbent material and put in yellow bag then clean area with warm water and detergent.
b. Wipe with absorbent material and put in red bag then clean area with warm water and detergent.
c. Pour 1% sodium hypochlorite on the blood and keep it for 15 min.
d. Put absorbent material on blood sample now pour 1% sodium hypochlorite on it and keep it for 15 min.

12. What is annual limit of effective radiation dose for Public?

a. 1 mSv
b. 20 mSv
c. 1000 mSv
d. 150 mSv

13. “Double person double lock” to use for storage of

a. Fumigant
b. Disinfectants
c. Hazardous chemicals
d. Narcotics

14. The best protection will be achieved if first dose of PEP for HIV is taken within-

a. 2 hrs of exposure
b. 6 hrs of exposure
c. 12 hrs of exposure
d. 72 hrs of exposure