

# Occupational Health and Safety in Healthcare Settings – Effect of Training on the Knowledge of Resident Doctors

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## Abstract

**Background:** Over the past years several diseases and disorders associated with different kinds of occupations have been identified, including healthcare. It is important for medical personnel especially resident doctors to have adequate knowledge of occupational health and safety and prevention of occupational hazards.

**Objective:** To assess the knowledge among resident doctors regarding occupational health and safety in healthcare settings, and the effect of training on the same.

**Methodology:** A before and after intervention study without control was done among a group of resident doctors of a medical college in Delhi. Training on occupational health and safety was given to the study participants in the form of a two-day workshop. Pre- and post-test questionnaires filled by the participants were scored and the mean scores were compared and tested for statistically significant difference using Mann Whitney U test.

**Results:** The study was done on 17 post-graduate resident doctors. The mean post test score was higher than the mean pre-test score and the difference was statistically significant at  $p < 0.05$ .

**Conclusion:** Training of doctors and other health personnel on occupational health and safety and prevention and control of occupational hazards can prove to be effective in improving their knowledge regarding the same.

**Keywords:** Occupational hazards, Medical professionals, Training

## Introduction

Occupational health and safety is gaining its due importance worldwide. The aim of occupational health is to promote and maintain the highest degree of physical, mental and social well-being of workers in all occupations.<sup>1</sup> Over the past years several diseases and disorders associated with different kinds of occupations have been identified. This has led to growing concern regarding safety at the work environment and, consequently, the significance of having a healthy workplace has been recognised. Occupational hazards are those which a worker is exposed to at his workplace by virtue of his occupation. They may be in the form of physical, chemical, biological, mechanical and psychological hazard, depending upon the occupation. These may lead to a multitude of diseases and disorders including allergies, infectious

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diseases, accidents, injuries, pneumoconiosis, dermatitis, leukaemia and other cancers, to name a few. Healthcare industry is no exception and health care workers are subject to various forms of occupational hazards. The healthcare workforce comprises doctors, nurses, paramedical staff, social workers and other ancillary workers. Health care facilities around the world are exposed to a complex variety of health and safety hazards everyday including:<sup>2</sup>

- biological hazards, such as TB, Hepatitis, HIV/AIDS, SARS;
- chemical hazards, such as, glutaraldehyde, ethylene oxide;
- physical hazards, such as noise, radiation, slips trips and falls;
- ergonomic hazards, such as heavy lifting;
- psychosocial hazards, such as shiftwork, violence and stress;
- fire and explosion hazards, such as using oxygen, alcohol sanitizing gels;
- electrical hazards, such as frayed electrical cords; and
- building hazards, such as design, construction, signage, safety instructions, etc.

It is imperative for doctors to be aware of occupational health and safety, especially in healthcare settings. Ergonomics is the branch of science that deals with optimization of the job to the worker in order to minimize occupation related hazards and maximize work output and efficiency. Occupational health and safety broadly deals with protecting the workers from occupational hazards, bearing in mind the principles of ergonomics.

Occupational health is a topic which is not touched upon during medical training as much as communicable and lifestyle diseases or maternal and child health. Nevertheless, it is important for medical personnel especially resident doctors to be aware of the same. In order to assess their knowledge regarding occupational health and safety in healthcare settings, and the effect of training on the same, a small study was conducted among a group of resident doctors of a medical college in Delhi.

### Materials and methods

A before and after intervention study without control was done among a group of resident doctors of a medical college in Delhi. All residents of a particular clinical department were asked to participate in the study and no sampling was done. The baseline knowledge of the study participants regarding occupational health and safety in

healthcare settings was assessed using a self-administered questionnaire containing both multiple choice type and open-ended questions. This was followed by a workshop on occupational health and safety in healthcare settings for a total duration of nine hours distributed over two days. The workshop covered topics including occupational health and safety, occupational hazards in different industries, occupational hazards faced by health care workers, hazard identification and risk assessment, and prevention and control measures including personal protective measures and minimization of hazards. A practical exercise on hazard identification and risk assessment of different locations within the hospital premises was carried out by the participants as part of the workshop. Feedback regarding the workshop was collected from the participants at the end of the session. A post test questionnaire containing the same questions was distributed among the participants two months after the workshop.

### Statistical analysis

The pre- and post-test responses of all the participants were scored. Participants received one mark for each correct response and there was no negative marking. The total scores were calculated for each participant, both for pre-test and post-test. Mann Whitney U test was applied to study the difference in mean pre- and post-test scores. A p-value of 0.05 or less was considered significant. Among the questions asked to the participants, four broad domains were identified, viz., occupational safety, needle stick injury, occupational hazards, and hazard identification and risk assessment. The mean pre- and post-test scores were calculated for each domain and plotted using a spider web or radar graph. All the study participants were explained about the study and were informed of the voluntary nature of the study. Written informed consent was taken before the commencement of the study from all study participants.

### Results

The study was done on 17 post-graduate resident doctors of a medical college in Delhi, all of whom filled the pre-test as well as the post-test questionnaires. None of the participants had any prior training on occupational health. All the participants attended the two-day workshop and took part in the hazard identification and risk assessment exercise. The mean post test score was higher than the mean pre-test score and the difference was statistically significant at  $p < 0.05$ . All the four domains showed higher post-test mean scores as compared to pre-test mean scores. (Figure 1).

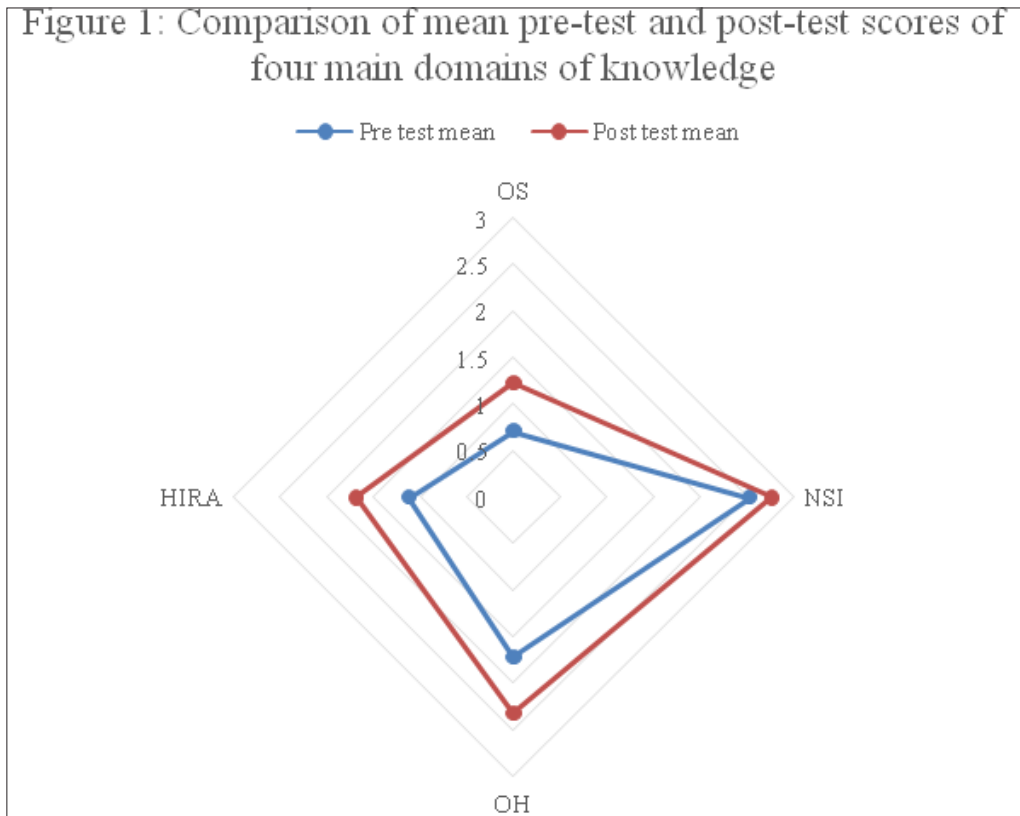


Figure 1.OS=Occupational safety, NSI=Needle stick injury, OH=Occupational hazard, HIRA=Hazard identification and risk assessment

### Discussion

In hospital settings, the most common occupational hazards are hospital acquired infections. Healthcare workers are at high risk of acquiring airborne as well as bloodborne infections. Physical hazard in the form of exposure to X rays is not uncommon. Healthcare workers also have to deal with various chemicals in the process of diagnostic and laboratory tests, medical and surgical procedures and disinfection which often cause chemical injuries. Psychological hazards are intrinsic to most occupations including healthcare. It is therefore important for healthcare workers to have adequate knowledge about the various hazards that they are vulnerable to as well as means to protect themselves from these hazards.

Several studies done to assess the knowledge, attitude and practice of doctors and other healthcare workers on specific occupational hazards like needle stick injuries and blood borne diseases have reported varying degrees of knowledge among different class of healthcare workers.<sup>3,4,5</sup> However, there is a paucity of literature on the effect of training on the knowledge and practices related to occupational health and safety. Our study showed that the workshop successfully increased the knowledge among the resident doctors regarding the importance of principles of ergonomics and measures to reduce and prevent occupational hazards.

We saw that reiterating the importance of occupational

safety among resident doctors in the form of a workshop was able to significantly improve their knowledge regarding the same. People working in healthcare settings are at constant exposure to all kinds of occupational hazards. Biological hazards pose as risk of infections since healthcare workers have to handle body fluids, tissues and specimens. This leads to increased chances of contracting infections like Hepatitis B and HIV/AIDS. Use of surgical instruments also increase the risk of accidental punctures and needle-stick injuries. Apart from blood-borne infections, healthcare workers are also prone to infections by air-borne agents. Tuberculosis, pneumonia and meningitis are some of the common diseases which are hospital acquired. Hospitals and health centres also require healthcare workers to work in laboratories where they are exposed to chemical agents which have a potential to cause a multitude of diseases from dermatitis to cancer. Healthcare workers are also exposed to physical agents causing injuries, most notably exposure to radiation which can have both short term and permanent adverse health effects.<sup>2</sup> In addition to the above, healthcare workers often suffer from psychological disorders due to work-related stress.

Hazard identification and risk assessment is an important part of prevention of occupational diseases. A hazard is any source that has a potential to harm, damage or cause any adverse health effect under work conditions. Risk, on the other hand, is a combination of the likelihood and severity of a specific hazardous event occurring.<sup>6</sup> Hazard

identification and risk assessment of an area includes listing down the sources of hazards present, the persons having access to and the tasks performed in that area, and the probable hazardous outcomes using the HIRA scoring matrix. It also involves the assessment of control measures which are present and feasible to be incorporated into the system.<sup>6</sup>It is necessary for healthcare workers to be aware of the procedure of hazard identification and risk assessment. In our study, as a part of the workshop, the participants underwent hands on training on the same, and were assessed on their ability to successfully identify the hazards and give them risk assessment scores in different wards and other areas in a tertiary care hospital. Measures required to be taken to prevent occupational diseases and injuries were identified based on the identification of hazards and their risk scores.

Healthcare workers should also be familiar with prevention and control measures for occupational hazards and the consequent diseases. It is mandatory for resident doctors to know how to minimize hazards at workplace and prevent diseases and injuries. Simple methods like handwashing before and after any medical procedure can go a long way in preventing hospital acquired infections. The use of personal protective equipment and following of universal precautions and safe injection practices must be mandated.

### Limitations

The study was done on a relatively small group of resident doctors. Similar studies must be done on a larger number of medical professionals from various disciplines in order to confirm the findings of our study.

### Conclusion

Training of doctors and other health personnel on

occupational health and safety and prevention and control of occupational hazards in the form of workshops can prove to be effective in improving their knowledge regarding the same.

**Conflict of Interest:** None

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