

# Training of occupational safety and health: knowledge among healthcare professionals in Malaysia

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## ABSTRACT

**Introduction:** Awareness of occupational safety and health (OSH) plays an important role in the prevention of occupational injuries and diseases. Following the enactment of the Occupational Safety and Health Act (OSHA) in 1994, various programmes have been implemented by different agencies to increase awareness and knowledge of OSH in the workplace, including among healthcare workers. The objective of this study was to determine the level of OSH awareness and knowledge among healthcare professionals in Malaysia.

**Methods:** A cross-sectional study was conducted using a 21-item self-administered questionnaire addressing information on demographics, general OSH issues, OSH legislations, occupational hazards in the healthcare setting and personal protective equipment (PPE).

**Results:** The response rate was 93.1 percent (284 healthcare professionals). The overall level of knowledge on OSH was moderate, with a mean score of 62.0 percent. A larger proportion of doctors showed good OSH knowledge compared to other categories of healthcare workers, with administrative staff scoring the poorest marks. Participants were most knowledgeable about PPE, with a mean score of 72.0 percent (95 percent confidence interval [CI] 68.3, 75.6), compared to other sections such as general OSH, legislations and occupational hazards, with mean scores of 58.0 percent (95 percent CI 56.1, 60.1), 57.0 percent (95 percent CI 54.1, 60.8) and 64.0 percent (95 percent CI 61.7, 66.2), respectively.

**Conclusion:** Although the OSHA 1994 has existed in Malaysia for more than ten years, awareness of OSH remains relatively poor. This warrants a greater effort to promote

**OSH knowledge and principles among the professionals.**

**Keywords:** healthcare workers, healthcare professionals, Occupational Safety and Health Act (OSHA) 1994, occupational safety and health knowledge

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## INTRODUCTION

The right to work in a safe and healthy environment is the fundamental right of every worker. Regardless, the International Labour Organisation has reported that over 160 million workers fall ill due to workplace hazards and exposures, while more than 1 million workers have died as a result of occupational diseases and accidents.<sup>(1)</sup> The incidence of workplace accidents and diseases varies enormously among countries, with significant differences among developed and developing countries. The occupational safety and health (OSH) performance of industries also varies significantly among economic sectors and organisations within countries. The agricultural, forestry, mining and construction industries have been shown to have the highest incidents of occupational accidents and deaths among other industries worldwide.<sup>(1)</sup>

Traditionally, hospitals and health institutions were considered to be safer than other work environments, and healthcare workers are viewed as professionals who are capable of maintaining their health without assistance. Thus, administrators have allocated few resources to the occupational health of these workers. However, the healthcare environment exposes workers to various occupational health and safety hazards, including musculoskeletal diseases, needlestick injuries, carcinogenic agents, latex allergies, violence and stress. The rate of occupational injury among healthcare workers has been increasing over the past decade.<sup>(2)</sup> Sepkowitz and Eisenberg have estimated that 17–57 deaths per one million healthcare workers in the United States may have been a result of occupational events, including infection.<sup>(3)</sup> In Malaysia,

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**Table I. Sociodemographic features of the respondents.**

	No. (%)
Total	284 (100)
Gender	
Male	116 (40.8)
Female	168 (59.2)
Ethnicity	
Malay	130 (45.8)
Chinese	67 (23.6)
Indian	30 (10.6)
Others	57 (20.1)
Mean age $\pm$ SD (yrs)	43.2 $\pm$ 8.9
Job category <sup>a</sup>	
Doctor	45 (16.1)
Nurse	135 (48.2)
Medical support staff	33 (11.8)
Administrative officer	3 (1.1)
Others	64 (22.9)
Duration of service (yrs) <sup>b</sup>	
< 10	58 (24.0)
10–20	74 (30.6)
> 20	110 (45.5)
Employer <sup>c</sup>	
Government	201 (70.8)
Private	81 (28.5)

<sup>a</sup>Data was missing for 4 respondents. <sup>b</sup>Data was missing for 42 respondents. <sup>c</sup>Data was missing for 2 respondents.  
SD: standard deviation

the Occupational Safety and Health Act (OSHA) was enacted in 1994 with the primary aim of promoting safety and health awareness and instilling a safety and health culture among the Malaysian workforce.<sup>(4)</sup> The creation of awareness and implementation of OSH has been a slow and gradual process. There have been many positive developments since the enactment of the Act, in areas such as OSH services, education, promotion and research.

OSH awareness plays an important role in the prevention of occupational injuries and diseases among healthcare professionals. Awareness activities can be used to reinforce positive attitudes and fortify safe working behaviours. Although the OSHA 1994 has now been in existence for more than ten years, current knowledge and awareness of OSH among healthcare professionals in Malaysia is very limited, and there have been only a few published research studies on OSH awareness among the more than 100,000 healthcare professionals. The objective of this study was to determine the level of OSH awareness among healthcare professionals in Malaysia. OSH knowledge is defined in this study as awareness of or familiarity with facts and information on the field of OSH.

## METHODS

This study was conducted on healthcare professionals

**Table II. The mean scores for each section of the questionnaire.**

Type of questions	Score(%)		
	Mean	Minimum	Maximum
Overall scores	62.0	17.0	97.3
General	58.0	13.3	100.0
OSH legislation	57.0	3.3	100.0
Occupational hazards	64.0	8.9	100.0
PPE	72.0	0.0	100.0

OSH: occupational safety and health; PPE: personal protective equipment

who participated in a one-day seminar on 'Occupational Health for Healthcare Professionals', which was held in three private hospitals in various regions (north zone, south zone and East Malaysia) of Malaysia between June 2006 and February 2007. None of the participants attended the seminars more than once. A 21-item self-administered bilingual (English and Malay language) questionnaire was used as the study instrument. This questionnaire comprised a combination of closed and open-ended questions that addressed demographic information, general OSH issues, OSH legislations, occupational hazards in the healthcare setting and personal protective equipment (PPE). The questionnaire was distributed to each participant, with 45 minutes provided to fill out the questionnaire. The completed questionnaires were collected before the commencement of the seminar. Consent was obtained via a verbal request and was implied by the voluntary return of the questionnaire.

The Statistical Package for the Social Sciences version 12.0 (SPSS Inc, Chicago, IL, USA) was used to analyse the data. Each question was scored equally, and the overall score was calculated from the percentage of correct answers. Any unattempted question was considered as wrongly answered. The level of OSH knowledge among the respondents was categorised into good ( $\geq 75\%$ ), moderate (50%–74%) and poor (< 50%). In the analysis of variance, mean scores were compared among job, age and the duration of service categories by conducting Scheffe's *post hoc* test.

## RESULTS

A total of 311 participants attended the seminars, of whom 284 responded to the survey, thus yielding a response rate of 91.3%. The respondents included nurses (48.2%), doctors (16.1%), medical support staff, i.e. laboratory workers, pharmacists, physiotherapists and radiology technicians (11.8%), administrative officers

**Table III. Overall mean scores and scores for each section according to the job category.**

Job category	Score; 95% CI (%)				
	Overall	General OSH	OSH legislation	Occupational hazards	PPE
Doctor	68.1; 62.8, 73.5	65.0; 60.5, 69.5	62.7; 54.7, 71.1	71.3; 66.6, 75.9	77.0; 67.8, 86.3
Nurse	57.0; 53.7, 60.3	55.0; 52.1, 57.9	51.0; 46.4, 55.5	59.1; 55.8, 62.5	66.7; 61.1, 72.3
Medical support staff	61.4; 53.9, 69.0	56.3; 49.1, 63.5	52.9; 41.7, 64.2	63.4; 55.5, 71.3	76.8; 66.8, 86.8
Administrative officer	54.7; 44.3, 65.2	59.4; 13.8, 105.1	48.9; 17.5, 80.2	47.9; 38.9, 57.0	66.7; -16.1, 149.5
Others	68.6; 64.4, 72.9	60.7; 56.5, 64.8	69.0; 62.2, 75.8	70.7; 66.6, 74.8	76.6; 69.2, 83.9
p-value	< 0.05	< 0.05	< 0.05	< 0.05	0.12

CI: confidence interval; OSH: occupational safety and health; PPE: personal protective equipment

**Table IV. The level of occupational safety and health awareness according to the job category.**

Job Category*	No. (%) of respondents		
	Good (> 75%)	Moderate (50%–74%)	Poor (< 50%)
Overall	97 (34.2)	93 (32.7)	94 (33.1)
Doctor	24 (53.3)	9 (20.2)	12 (26.7)
Nurse	30 (22.2)	48 (35.6)	57 (42.2)
Medical support staff	11 (33.3)	14 (42.4)	8 (24.2)
Administrative officer	0 (0.0)	3 (100)	0 (0.0)
Other	30 (46.9)	18 (28.1)	16 (25.0)

\* Data was missing for 4 respondents

(1.1%) and others, including hospital attendants, security personnel and technicians who were not classified under the above categories (24%). The majority (59.2%) of the respondents were female. The respondents were aged 22–67 years, with a mean age of 43.2 ± 8.9 years. Their duration of employment in healthcare service was 1–45 years, with the majority having worked in the field for more than 20 years (45.5%) (Table I).

The overall score was 17.0%–97.3%, with a mean of 62.0% (95% confidence interval [CI] 59.7, 64.2). Respondents were most knowledgeable about PPE, with a mean score of 72% and least knowledgeable about legislations, with a mean score of 57% (Table II). When the scores among different job categories were compared, there was a significant difference ( $p < 0.05$ ) in the mean overall scores, with nurses and administrative officers scoring the worst compared to the other categories (Table III). Based on the criteria stated earlier, only 34.2% of the respondents had good OSH knowledge (Table IV). There was no significant difference in the level of OSH knowledge of the respondents in terms of the duration of service and age.

The mean score of general OSH awareness was 58.0% (95% CI 56.1, 60.1). 75.8% of the respondents were aware that safety in the hospital should cover

every person within the premises, and 58.7% recognised the fact that it is every worker's responsibility to ensure safety and health in the healthcare setting. In the event of an accident occurring in the ward, only 40.5% of the respondents knew that they have to first notify their immediate supervisor instead of the safety and health officer (43.7%) or other officers. Only 57.8% of the respondents were familiar with the functions of an occupational health doctor, which include diagnosing and treating occupational diseases, performing disability assessment and fitness for work assessments, as well as performing risk assessments of health and safety hazards at the workplace (Table V). Awareness of OSH legislation appeared to be the lowest, with a mean score of 57.0% (95% CI 54.1, 60.8). Only 55.3% of the respondents correctly identified the OSHA 1994 as the act that governs OSH in Malaysia. 71.5% of the respondents were aware that a safety and health committee is required in each hospital organisation, but 14% left this question unanswered. Only 45.4% of the respondents knew that the head of the organisation should be the chairman of the OSH committee, 18.0% left the question unanswered, while the rest either answered that the chairman should be the safety and health officer or the engineer. 66.0% of the respondents

were well informed that in Malaysia, the Act does not cover the armed forces and maritime workers, but only 39.1% knew that the Department of Occupational Safety and Health under the Ministry of Human Resources is the enforcement agency for OSHA 1994. Another 19.4% wrongly answered that it was the Department of Environment, 14.1% thought it was the National Institute of Occupational Safety and Health and 16.2% did not answer this question.

The mean score for the section on occupational hazards was 64.0% (95% CI 61.7, 66.2). 77.5% of the respondents, were aware of the various types of occupational hazards in the hospital. Most respondents (78.9%) (95% CI 75.5, 82.1) were familiar with perilous practices that predispose to needlestick injury, i.e. recapping, disposing and needle changes, and the mean scores for this question by job category were 88.1% for doctors, 85.4% for others, 75.5% for nurses, 68.7% for medical services support staff and 66.7% for administrative officers. Only 68.6% of the respondents, were aware of the types of hazards at the workplace, i.e. physical, biological, chemical, ergonomic/mechanical and psychosocial hazards. 64.6% knew the hierarchy of controls that are used to reduce hazards at the workplace, which include elimination, substitution, engineering control, administrative control and PPE. Only a small proportion of the respondents (39.1%) were able to identify the correct definition of ergonomics.

The mean score for the section on PPE was 72.0% (95% CI 68.3, 75.6), where almost all (97.9%) of the respondents provided the correct answers for three common PPE used by healthcare workers. 62.7% of the respondents acknowledged that gloves should be worn during all activities predisposing to exposure to blood-borne pathogens, but when asked about the respiratory mask as a PPE in an airborne disease outbreak, only 55.3% knew that N95 is the minimal standard requirement.

## DISCUSSION

Based on the results of this survey, the level of OSH knowledge among this group of healthcare professionals was moderate (mean score of 62.0%), and the proportion of respondents who had good OSH knowledge was low (34.2%). The general OSH awareness was also unconvincing (mean score of 58.0%). This is an important finding which suggests that although the OSHA 1994 has existed in Malaysia for more than ten years, awareness of OSH remains relatively poor. Thus, more effort is required to promote OSH knowledge and principles among healthcare professionals. Awareness

of the existence of the OSHA 1994 among the group of healthcare professionals surveyed in this study was 55.3%, which is consistent with the findings of two previous OSH awareness studies conducted in Malaysia. Rampal et al, who conducted a study on awareness of the OSHA 1994 among employers and employees from various companies in Malaysia in 2004, found that only 60.5% of employees and 96.8% of employers had heard about or knew of the Act.<sup>(5)</sup>

The current study also found that awareness of ergonomics and its definition is quite low (39.1%) among healthcare professionals. This is alarming as musculoskeletal diseases are a significant source of disability and work absences among hospital nurses.<sup>(6)</sup> Similar findings were obtained concerning blood borne pathogens such as the hepatitis B virus (HBV), which is a major occupational hazard for healthcare workers. In this study, only 54.2% of the respondents were able to identify accurate facts about HBV infection.

It has been reported that almost two thirds of all reported sharp injuries occur among nursing staff.<sup>(7)</sup> In another study conducted in Malaysia, 60.7% of the Accident and Emergency Department staff in a major general hospital practised the recapping of needles after use.<sup>(8)</sup> Our study showed fairly good knowledge of the risks associated with needlestick injuries among healthcare workers (mean score 78.9%). However, since the study was not designed to determine the practice of handling sharp needles, the translation of this knowledge into practice is not known. Healthcare workers should be familiar with the recommended standard precautions,<sup>(9,10)</sup> as they are routinely exposed to such health hazards in their line of duty. Our study found that knowledge of situations in which gloves should be worn can still be improved upon (mean score 62.7%).

Overall, administrative officers fared poorly in this survey, especially in terms of their knowledge of OSH legislation and occupational hazards. This finding is important as administrative officers usually represent employers in the makeup of the OSH committee at the workplace. Poor OSH knowledge among this group might lead to less emphasis being placed on OSH activities in the workplace. The full support and commitment of the organisation's administration is extremely vital in order to ensure a strong and effective OSH committee, which plays an important role in articulating worker concerns, identifying potential hazards, educating members and improving work practices to ensure safe work environments.

The small sample size of this study limits its

**Table V. The mean scores for each question.**

Question	Mean Score (%)
General OSH	58.0
1. Person to notify if an accident occurs in the ward	40.5
2. Scope of coverage of safety in a hospital	75.8
3. Who is responsible for ensuring safety and health in a hospital setting?	58.7
4. Functions of an Occupational Health doctor	57.5
OSH legislation	57.0
5. Requirement of a safety and health committee in a hospital setting	71.5
6. Act that governs occupational and safety in Malaysia (OSHA 1994)	55.3
7. Agency responsible for enforcement of the law on occupational safety and health in Malaysia	39.1
8. Chairman of occupational safety and health committee in the workplace	45.4
9. Workers who are covered under the OSHA 1994	66.0
Occupational hazards	64.0
10. Definition of ergonomics	39.1
11. Common route of exposure to formalin	50.0
12. Occupational hazards to healthcare workers	77.5
13. Types of hazards in the workplace	68.6
14. Components of hierarchy of control to reduce hazards in the workplace	64.6
15. Routes of entry for hazardous substances into the body	75.0
16. Disposal of excess disinfectant/sterilisation chemicals used in the laboratories or wards	67.9
17. Practices predisposing to needle stick injury	78.9
18. Correct statements on Hepatitis B infection	54.2
Personal protective equipment	72.0
19. Minimal respiratory mask standard to be used in case of an outbreak of an airborne disease	55.3
20. Situations in which gloves should be worn	62.7
21. Types of personal protective equipment	97.9

OSH: occupational safety and health; OSHA: Occupational Safety and Health Act

representativeness. Despite the small population studied, various job categories that are typical in any healthcare setting, be it public or private, were represented. Furthermore, this study included healthcare professionals from three out of five regions in Malaysia, and had a high response rate among the participants.

In order to take care of their own health and safety, workers must understand occupational risks and dangers. A large proportion of occupational hazards in the workplace can be prevented or controlled through different measures, such as safe work practices, appropriate tools, work organisation and provision of information to the workers to enable them to minimise risks while performing their duties. Workers should therefore be well informed of hazards and adequately trained to carry out their tasks safely. Training enables workers not only to perform their jobs, but also to protect their lives and health, as well as that of their co-workers. OSH training at all levels should be emphasised as a means of improving working conditions and the work environment, and thus inculcating a healthy and safe work culture. Despite awareness campaigns conducted through promotion and public talks for many years, the knowledge of OSH is still not up to the desired level. Healthcare organisations should plan a more focused

strategy, such as conducting more workshops and training for specific healthcare worker groups. The strategy should be altered to impart more practical knowledge rather than merely increasing awareness of OSH issues.

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