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Occupational Accidents and Safety Training Gaps among Assistant Medical Officers in Malaysia A Cross Sectional Study in Perak

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ABSTRACT

Assistant Medical Officers perform invasive procedures that may expose them to occupational accidents, yet their accident history and safety-training exposure in Malaysia are not well described. This cross-sectional descriptive study surveyed 141 Assistant Medical Officers at a tertiary hospital in Ipoh, Perak, representing an 82% usable response rate. The questionnaire recorded whether respondents had experienced an occupational accident at the current hospital, the number of reported accidents, safety-training exposure, and perceptions of safety-management practices. Overall, 49.6% reported at least one occupational accident at the current hospital. Reported accident counts ranged from one to fifteen, including 12.1% in the nine-to-fifteen category, but the questionnaire did not identify accident types, dates, severity, reporting status, or whether events involved needlesticks or sharps. In addition, 51.8% had never attended occupational-safety training at the hospital, and 40.4% reported training once a year. Safety promotion and policies had the lowest practice mean (3.20), whereas safety self-efficacy and safety compliance both had means of 4.03. These descriptive findings identify gaps in documented training exposure and safety-promotion perceptions but do not establish that training gaps caused the reported accidents. The results support reviewing induction and refresher training, incident-reporting processes, and safety communication at the study hospital. Multi-centre studies using verified incident records and defined exposure periods are needed to assess associations and guide intervention priorities.

1. Introduction

A needlestick can be an incidental wound with potentially life-threatening consequences. It can be a vector of hepatitis B virus and hepatitis C virus, as well as human immunodeficiency virus, and it might induce psychological stress at post-exposure exam [1,17]. It has been estimated that 2 million Health Care Workers are stabbed with bloodborne pathogens in the workplace annually [12]. These events may not be reported completely because some workers consider them as routine [10,16].

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Needlestick injuries in health care workers have been recorded in Malaysia [5]. Assistant Medical Officers may be exposed to blood and body fluids during the process of cannulation, taking blood, giving injections and performing emergency first aid. Very little published data has been available thus far to describe accident history and exposure to safety training specifically for Assistant Medical Officers. Hence, this study was conducted to describe the occupational accidents that occurred, exposure to training and perceptions about safety management among Assistant Medical Officers in a tertiary hospital in Perak.

2. Literature Review

2.1 Assistant Medical Officers are Exposed to a Number of Risks

Percutaneous injuries can be a significant source of bloodborne infection exposure in the workplace, and healthcare workers in emergency and dialysis departments may be exposed more than once [13]. Number and circumstances of injuries can be hidden by under-reporting [16]. Safety culture and climate are related to safety performance and reporting behaviour, but not causal effects can be derived from cross sectional evidence [7].

2.2 Safety Training, As a Control Measure

A randomised trial was conducted in China that found that participatory training could overcome the problem of accidental occupational injury [17]. Training can enhance knowledge, safe working practices and confidence in the use of protective equipment [2,9]. However, the amount of training measured by attendance does not necessarily indicate the content, timeliness, quality, or transfer to clinical practice. It must therefore be taken as a part of an occupational-safety system and not as an indicator of the effectiveness of prevention.

2.3 Occupational Exposure and Prevention Framework

Hazardous devices, patient movement, urgent work, environmental constrains, and human performance can all contribute to occupational accidents. Prevention must be done in the order of the hierarchy of controls. Needleless systems, engineered devices, and elimination are typically more reliable than behaviour. There are administrative controls which involve procedures, staffing, training, reporting, immunisation and post-exposure management. PPE is still required as the last line of defense.

When multiple accidents occur, a thorough investigation should be conducted, although current data will not give a reason for the multiple accidents. Opportunities for exposure may be greater in procedural or emergency areas, as well as equipment, disposal, fatigue, supervision and reporting. Safety climate and supervisory enforcement influences reporting behaviour [11]. It is important to have verified incident records and context before concluding that repeated incidents are due to a technique, equipment, or organisational weakness.

2.4 To Provide Training Frequency, Quality, and Transfer

Training attendance is not an endpoint, it's a means to an end. The efficacy of its prevention is linked to its content, opportunities for practice, trainer credibility, reinforcement, and transfer to the workplace. Participatory training enables staff to practice the decisions, detect hazards and get

feedbacks [17]. Induction can set up local procedures, refresher sessions can cover changes in equipment, clinical assignments, incident trends and observed competency.

It is important to take the safety-training perception score into consideration when interpreting the reported training frequency. Some staff may be given informal training or be provided with professional education not through an occupational safety programme, and competence may not be proven by attendance. A complete system should include documentation of participation, a performance assessment, and a monitoring for the presence or absence of expected practices.

3. Research Methodology

3.1 Study Design and Participants

This cross-sectional descriptive study was conducted at a tertiary public hospital in Ipoh, Perak. The hospital employed 208 Assistant Medical Officers. A total of 170 questionnaires were distributed during a Continuous Medical Education session, 157 were returned, and 141 were usable, giving an 82% usable response rate. The sample size followed the guidance of Krejcie and Morgan [8].

3.2 Measures and Analysis

The questionnaire recorded demographic characteristics, whether respondents had experienced an occupational accident at the current hospital, the number of reported accidents, whether they had attended occupational-safety training, training frequency, six safety-management practices, safety self-efficacy, and safety behaviour. Perception items used five-point Likert scales. Reliability coefficients ranged from 0.72 to 0.92, exceeding the commonly used 0.70 threshold [15]. Data were analysed descriptively in SPSS using frequencies, percentages, means, and standard deviations.

3.3 Measurement Considerations

The study describes distributions and does not estimate causal effects. The accident question referred to experience at the current hospital, but the dataset did not provide a fixed recall period or person-time denominator. Respondents with longer tenure therefore had more opportunity to accumulate events. Accident counts were self-reported and were not linked to occupational-health records. The questionnaire did not distinguish needlestick and sharps injuries from other occupational accidents, nor did it record the date, task, device, severity, reporting status, or clinical outcome of each event.

Training-frequency categories describe reported exposure but do not measure programme duration, content, recency, or competence. Practice means provide perception data and should not be treated as direct observation of organisational controls. These limitations are considered in the interpretation of the findings.

4. Results

Table 1 summarises the demographic characteristics, occupational-accident history, and training exposure of the 141 respondents.

Table 1
Demographic and occupational accident profile of respondents n 141

Characteristic
Aged 26 to 35 years
Male
Single
Diploma as highest education
One to five years at current hospital
Ever had an occupational accident at current hospital
One to three reported accidents
Nine to fifteen reported accidents
Never attended occupational-safety training at current hospital
No reported safety-training frequency
Safety training once a year

Source James [6]

Nearly half of the respondents (49.6%) reported at least one occupational accident at the current hospital. This is a proportion of respondents with any accident history, not an accident incidence rate. The distribution of reported counts shows that some respondents experienced multiple events, including 12.1% in the nine-to-fifteen category. The data do not identify whether these events were needlesticks, sharps injuries, or other occupational accidents.

Table 2 presents mean scores for safety-management practices, self-efficacy, and safety behaviour.

Table 2
Mean scores for safety variables on a five point scale

Variable	**Mean**	**Standard Deviation**
Safety self-efficacy	4.03	0.57
Safety compliance	4.03	0.73
Safety participation	3.83	0.85
Safety rules and procedures	3.65	0.71
Management commitment	3.59	0.54
Safety training	3.59	0.79
Employee involvement	3.51	0.82
Safety communication and feedback	3.50	0.80
Safety promotion and policies	3.20	0.92

Source James [6]

Safety promotion and policies had the lowest mean (3.20), followed by safety communication and feedback (3.50). Safety self-efficacy and safety compliance both had means of 4.03. These scores describe respondent perceptions and self-reported behaviour; they do not prove the presence or absence of specific controls.

Figure 1 shows the reported frequency of occupational-safety training. Nearly half reported no training frequency, while 40.4% reported training once a year. Smaller proportions reported training every six months, every three months, or monthly.

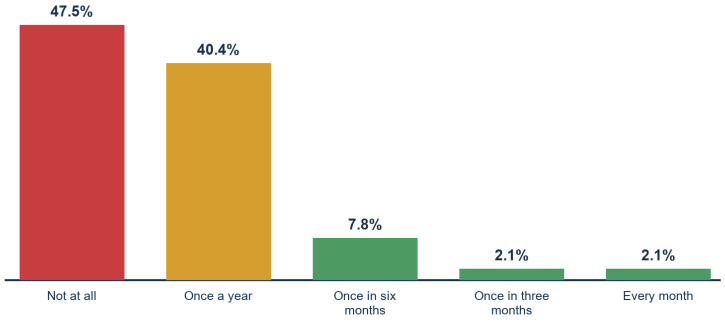

Fig. 1. Frequency of safety training attendance among assistant medical officers
Source James [6]

5. Discussion

5.1 Analysis of Occupational Accident Information

Accident experience is common in this sample as 49.6% of respondents reported at least one occupational accident in the present hospital. It should not be interpreted as the frequency or incidence of events since no defined exposure period, person-time or procedures performed were measured. The 9-15 age group classifies a population that reported several events but the data did not make it possible to identify any of the reasons why these events happened.

The accident measure was for the general case of an occupational accident. Did not indicate the type of accident (needlestick or other sharp). It was also not able to capture the task, device, clinical unit, severity, reporting status, or outcome. Therefore, the explanations of increased procedural exposure, inappropriate equipment, technique, fatigue, insufficient follow-up, etc. are hypotheses and not results of this study.

Reviewer, trainer, and safety manager perceptions of training and safety management

More than half of the respondents reported that they had never attended occupational-safety training at the hospital, and 40.4% reported training once a year. These results indicate that there is a lack of reported training exposure. They did not conclude that the lack of training contributed to the occupational accidents due to the descriptive nature of the study, which lacked tests of associations between training and accident history.

Safety promotion and safety policies received the lowest perception mean and safety communication and feedback received lower mean than self-efficacy and compliance. A mean that is lower does not necessarily mean that there was not an area for review, but it does mean that it was not a part of the visible safety promotion. Likewise, the study failed to measure reporting behaviour and therefore, under-reporting of these data cannot be verified. The high self-efficacy and compliance ratings do not necessarily reflect that a person's confidence level overcame organisational controls.

5.2 Evidence Based Recommendations

This reported lack or limited training may warrant a review of the induction and refreshers offered at the hospital. A sensible first step is to confirm training records, establish the training content for Assistant Medical Officers and evaluate competence of local procedures. The use of participatory training could be considered as the evidence has shown that it can reduce accidental

occupational injuries [17] when used in a randomised way. The interval and content should be based on risk assessment, changes in devices / procedures, incident trends, and observed competency, and not just on this current study.

Multiple event categories enable a review of incident records to look for repetitive tasks, devices, locations and contributing conditions. These details should be collected through the confidential reporting process and feedback be provided on corrective action. This recommendation is aimed at enhancing measurement and organisational learning, but it is not concluded that events were not reported or that feedback was not provided in the context of the current study.

Comparative low safety promotion and communication means support examines the communication of policies, exposure procedures and reporting routes. The areas of monitoring that may be carried out by management include training completion, demonstrated competency, reporting of incidents and near misses, time to post-exposure assessment, immunisation coverage, repeat-event review and closure of corrective actions. These measures should be examined in combination as a change in reporting could be as much due to better reporting as it is to a change in risk.

5.3 Policy and Workforce Implications

Assistant Medical Officers are exposed to blood and body fluids when performing procedures. The facilities will thus have uniform expectations for induction and refresher training, assessment of competency, access to post-exposure training, and documentation of incidents. Implementation needs to be flexible to local risk and local resources. This is, of course, a single hospital study, so it does not form the basis for national prevalence and should not be relied upon as the basis for national policy.

Time and service coverage are necessary for training. General experience in clinical work does not provide enough information about the local facilities' equipment, reporting route, and post-exposure pathway for new, rotating, and transferred staff. The support for occupational health should cover the biomedical follow-up and psychological support following exposure.

6. Limitations and Future Research

The study design is a single site and a cross section study, which restricts the generalisability of the study. Data on accidents were self-reported, and not verified with occupational-health records. The length of the exposure period varied among subjects and the questionnaire failed to differentiate the types of accidents or record the date, unit, task, device, circumstances, severity, reporting status, or clinical outcome of each accident. Training covered neither content nor duration, nor recency, nor observed competence, only attendance and frequency. These restrictions make it impossible to calculate an incidence rate and restrict the descriptions of the categories of multiple events. Future multi-centre study should employ verified incident records, employment exposure time and defined reference periods. Prospective surveillance may be able to determine unit-specific patterns of events per procedure or full-time-equivalent year. As well, studies can explore relationships between training exposure, accident history, safety compliance, and incident reporting. It is recommended that process, behaviour and injury outcomes are all evaluated to the training and reporting interventions.

7. Conclusion

Nearly half of Assistant Medical Officers in this tertiary hospital experienced an occupational accident at the current hospital and more than half of them had not attended occupational-safety training at the current hospital. Several respondents indicated that there were more than one accident; however, the types of accident, duration of exposure, and causes of the accidents were not identified. However, lower perception scores for safety promotion and communication indicate areas for review without any direct causal relationships. The hospital should confirm that training has been completed, as well as review the information contained within incident records and evaluate the communication of hospital safety procedures. Information from multiple centres with accurate records is required to establish associations and intervention priorities.

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Conflict of Interest
The authors declare no conflict of interest.

Ethics Statement
This manuscript presents a secondary analysis and scholarly interpretation of anonymised aggregate findings reported in James [6]. No new participant recruitment, intervention, or collection of identifiable information was undertaken for this manuscript. The original institutional ethics approval identifier was not available in the supplied source material and is therefore not asserted here. The corresponding author is responsible for retaining the original approval and consent documentation and providing it to the journal if requested.

Author Contributions
Abdul Raimi Abd Kadir contributed to conceptualisation, formal analysis, manuscript integration, original drafting, project administration, and correspondence. AP Dr Alias Mahmud contributed to supervision, methodology review, validation, interpretation, and critical revision. Joemmaicca Augustta Anak Joggery, Siti Maisarah Amdan, Mohd Azroy Ag Rajak, Kamariah Hussein, and Ts Mohd Tajuzzaman Hassanor contributed to the literature review, interpretation, and manuscript revision. Muhammad Zaki Saat and Ab Farid Fajilah Ab Aziz contributed to clinical interpretation and critical revision. All authors reviewed and approved the final manuscript.

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