



## SAFETY AND HEALTH PRACTICE AMONG SCHOOL LABORATORY STAFF IN KELANTAN

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### Abstrak

Keselamatan adalah isu yang paling penting dalam sektor perindustrian seperti pembinaan dan pembuatan. Baru-baru ini, peningkatan jumlah kes kemalangan yang dilaporkan melibatkan persekitaran sekolah menunjukkan kepentingan isu keselamatan dalam sektor pendidikan. Kesedaran keselamatan di kalangan kakitangan di sektor ini adalah penting untuk mengetahui kaedah untuk mencegah kemalangan yang berlaku pada masa akan datang. Kajian ini dijalankan untuk menganalisis pengetahuan kakitangan makmal dari segi amalan keselamatan dan kesihatan di makmal. Soal selidik tinjauan mengedarkan antara 255 makmal kakitangan dari sepuluh Pejabat Pendidikan Daerah di Kelantan. Analisis deskriptif menunjukkan bahawa pemahaman tentang amalan keselamatan dan kesihatan adalah rendah semasa melakukan beberapa aktiviti pekerjaan di makmal. Selain itu, sesetengah kakitangan juga tidak melaksanakan amalan keselamatan yang boleh menyumbang kepada kejadian tidak dirancang yang berlaku di makmal. Oleh itu, cadangan kajian ini adalah kakitangan di makmal perlu menjalani latihan Keselamatan dan Kesihatan Pekerjaan untuk mengekalkan dan mewujudkan persekitaran yang selamat di tempat kerja.

**Kata Kunci:** Pendidikan, Makmal, Kakitangan, Keselamatan

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## Abstract

*Safety is the most important issue in industrial sector such as construction and manufacturing. Recently, the increasing number of accident cases reported involving school environment shows the important of safety issues in education sector. Safety awareness among staff in this sector is crucial in order to find out the method to prevent the accident occurred in future. This study was conducted to analyze the knowledge of laboratory staff in term of safety and health practice in laboratory. Survey questionnaires were distributing among 255 of staff laboratory from ten District Education Offices in Kelantan. Descriptive analysis shows that the understanding of safety and health practice are low while doing some job activities in laboratory. Furthermore, some of the staff also did not implemented safety practice that may contribute to unplanned event occur in laboratory. Suggestion that the staff at laboratory need to undergo on Occupational Safety and Health training to maintain and create safe environment in workplaces.*

**Keywords:** Education, Laboratory, Staff, Safety, Accident

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## 1.0 Introduction

Safety and health has become important issue, which has been developing in the social context that increasing the concern for prevention of danger situations for people at surrounding (Anna, 2012). Safety is defined as a method of preventing accidents or reducing personal injury or property damage that may be caused by an accident (Ngowi, 1996). Recent years have showed increasing reports of accidents that occur in school area. The reported accidents that involved not only report on injuries but also to deaths. Parents normally feel that school is a safe place for their children to be in. Schools become one of the largest categories of the workplace because children, teachers and other members of staff spend a lot of their time in schools exposing them to a variety of risks and hazards through physical and social activities. Students spend their 180 days in a year, 6 hours daily in a school (Erkan, 2009). This condition may negatively affect their life (Anna, 2012). In year of 2016 till early 2007, according to report, there are 16 cases of accidents in school involving mercury spill in laboratories. Mercury is one of the chemical hazards that will harmful to human body. Table 1 shows the accident cases that involve within that year. Besides that, there are also accidents occurs in school involving death which are student hit by goalpost at the field, student fall into sewer and fall from a high building and so on. However, school accidents causing injuries have not been fully investigated as those occurring at home or in road traffic accidents rather than manufacturing, construction and other sector (Scheps, 1987).

**Table 1:** Accident Cases in School Laboratory from 2016 till March 2017

No	Accident cases	Date	Sources
1	Anxious broken thermometer in the laboratory in Kota Tinggi	2 March 2017	Sinar Harian, (2017)
2	Thermometer breaks, the mercury spilled in the laboratory in Alor Gajah	23 Feb. 2017	GPS Bestari, (2016)
3	Liquid mercury spilled on the floor in a school laboratory in Kota Bharu	18 October 2016	GPS Bestari, (2016)
4	Reliable liquid mercury spilled in the school laboratory. In the scene at 2 pm, thermometer in the school laboratory believed to have fallen and broken in Machang	18 October 2016	GPS Bestari, (2016)





5	The thermometer used a student fell and caused the spill of mercury in Kota Bharu	13 October 2016	GPS Bestari, ( 2016)
6	5 students in Balik Pulau expose to mercury	5 October 2016	Sinar Harian (2016)
7	Three girls are exposed to mercury in Labuan	29 Sept. 2016	Metro (2016)
8	Thermometer breaks, the mercury spilled in the laboratory school in Kota Bharu	28 Sept. 2016	Sinar Harian (2016)
9	Mercury spilled in the car students in Ipoh	28 Sept. 2016	Sinar Harian (2016)
10	Sulphuric Acid in the laboratory spill in Sungai Petani	27 Sept. 2016	Sinar Harian (2016)
11	Nitric acid spilled in the laboratory school in Kuala Lumpur	1 Sept. 2016	Metro (2016)
12	Students exposed to mercury in Seremban	25 August 2016	Metro (2016)
13	Liquid mercury contained in thermometers broken, resulting in spillage of chemical in Kota Bharu	15 August 2016	GPS Bestari (2016)
14	Chemical Spill at School in Port Dickson	12 August 2016	Berian Harian (2016)
15	Two Students horticulture Mercury Thermometer Bursts On Science Laboratory in Kepala Batas	28 July 2016	Mstars (2016)
16	56 students were quarantined due to mercury spill in Bukit Mertajam	26 May 2016	Utusan (2016)





Accidents rate in the industry can be reduced if students at the school are exposed to issues of occupational safety and health (Fong, 2000). This means that teachers and staffs play an important role in exposing students regarding safety practice while they were in the school surrounding (Brad, 2012). Thus, the school community needs to create a culture of safety in school in order to maintain a safer work environment. Misnan (2009) suggests that the involvement of all community is the foundation of development safety culture in school.

Moreover, the issue of safety is not only exposing in industries but also in educational institutions such as school laboratory which always involved with the use of chemical risk. Laboratory is one place used to create a practical work-related engineering. Sabri (2012) point out that safety practices are very important when they are working or exercising in the laboratory. Students are constantly exposed to the danger of accidents at work if they are not handled properly and according to the regulations. Knowledge of the use of equipment, safe environment and safety regulations is important enough to change the attitude of the employees to carry out the task safely and effectively. Awareness among staff in this safety aspect is quite important and must be known and should be researched (Fazreen, 2013).

Apart from that, safety rules in laboratory should be practiced from time to time and staff should be responsible for avoiding accidents from happening (Sohin, 2002). Therefore, to prevent and reduce the risk of accidents, awareness of the importance of safety practices need to be improved. Normally accidents have particular relevance contributed by negligence, the lack of knowledge of any works to be carried out as well as damage or failure either on materials, equipment and chemical used (Jamaludin, 2001). According studied by Dilley and Kleiner (1996), they found that 85% to 98% of injuries in the workplace is not attributed to the act safe practices of certain individuals who are negligent. Negligence can also associate with awareness. This shows that safety awareness an important aspect in ensuring safety in the laboratory.

Accidents happen very easily if they do not adopt measures safety when working in laboratory (Jaafar, 2001). In laboratory, there are rules that must be followed before doing practical work. Teachers, students and staff need to understand each of these rules. Good management will helped reduce accidents in laboratory. Therefore, before practical work, students should be reminded about the safety aspect. Fazreen (2013) highlighted that safety must be practiced while in the laboratory or during experiments conducted. Safety is the most important aspect in the management of a laboratory science (Kamaruddin and Yazit, 2011). On the other hand, UKKPK (2005) states that the laboratory are expose with high risk for accidents and injuries occur and will cause disease as a result of the work conducted in the laboratory. The use of chemicals can cause accidents if not handled in a safe manner.





Staff laboratory are responsible for providing a healthy and safe environment for students. They should ensure that health, safety and environmental aspects of the practical are considered in laboratory. Besides that, students will receive the appropriate information and good supervision for them to carry out their studies and work practices safely. Students also are warned about the particular hazards, and how to avoid, eliminate or minimize their exposure to them. Meanwhile, laboratory staff also need show good attitude in term of health and safety practices and transferred to the students so that students can conduct and perform work in safety condition (OSH guideline, 2013). Thus, this paper is aiming at safety and health practice among staff laboratory in school.

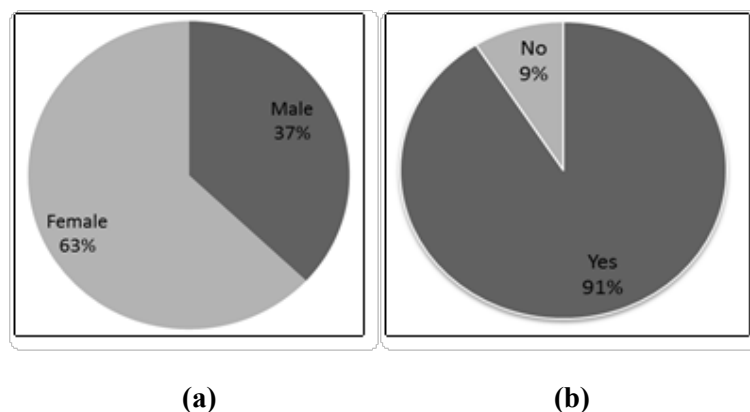
## 2.0 Research Methodology

This study used a quantitative approach to assess the safety and health practice among laboratory staff in the state of Kelantan, Malaysia. Kelantan is a state located in the north east of peninsular Malaysia with a total number of 592 schools spreading all over ten District Education Offices. The questionnaire was adopted from The University of Texas Health Science Centre which conduct survey on Laboratory Safety (UTHealth, 2008). Thus, this questionnaire was distributed among 255 of staff laboratory from 111 schools that randomly selected from the ten District Education Offices. The purpose of the questionnaires is to measure awareness level of laboratory staff toward the importance of safety and health practices in school laboratory. The questionnaire was divided into two parts. Section A is for demographic background of the respondents. Section B is for safety and health elements. The question were using closed-ended question with 4 likert scale. The respondent need to answer the question whether they 1- Strongly Disagree, 2- Disagree, 3- Agree or 4- Strongly Agree. Thus, the data collected were analysed using Statistical Package for the Social Sciences (SPSS).

## 3.0 Result and Discussion

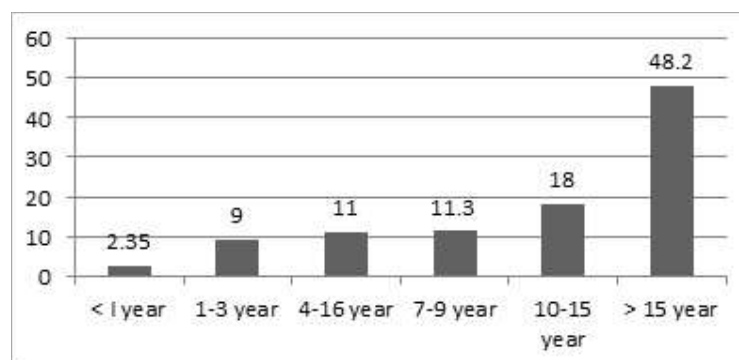
This section presents the result obtained from the questionnaire survey. The results were analyzed by using Statistical Package for the Social Sciences (SPSS). Figure 1 (a) shows the percentage of respondents by gender. It shows that 37 % are males and 63% are females. While, Figure 1 (b) shows the percentage of safety knowledge among staff laboratory. From the result, it shows that, most of them have basic knowledge regarding safety and health aspect.





**Figure 1:** (a) Percentage of respondent's gender (b) Percentage of respondent's safety knowledge

Besides that, Figure 2 shows the percentage of working experience among laboratory staff. Based on the result, it shows that 48.2 % of laboratory staff are work more than 15 year, 18% work for 10 to 15 year, 11.3% of staff work for 7 to 9 year, 11% work for 4 to 6 year, 9% for 1 to 3 year and 2.35 % of staff work less than 1 year.



**Figure 2:** Percentage of working experience for respondents





Table 2 show the reliability statistics for the questions used in this study. The result shows that Cronbach's Alpha is 0.97 and 0.91, which is considered reliable for the data [41]. Meanwhile, this study also measures the validity of each question. The alpha value for total correlation is lower than Cronbach's Alpha If Item Deleted, which means the questions used in this study are valid and accepted (Mohd,2010).

**Table 2:** Reliability Statistic for Question

Question	Cronbach's Alpha	No. of Items
Safety awareness in Laboratory	0.969	12
Safety practice in Laboratory	0.910	9

Table 3 shows the data of safety awareness among staff laboratory. The mean score for each question is between 3 and 4, indicating that respondents agree with the questions in term of those aspects. According to the finding collected, most of them understand about the safety and health element that would be implementing in laboratory. The highest awareness was regarding the safety environment and surrounding in laboratory. They know and realize that, the surrounding in laboratory need to be free and safe from any obstacle or hazard that could contribute accidents such as electrical equipment. They also ensure that all electrical were switch off after laboratory activity. Cable and wires can be serious tripping hazards that pose electrical shock and fire hazards (Department of Administrative and Financial Services, 2016). Besides that, most of the staff also agreed about the important of supervision that should give to students while doing some practical works in laboratory. Appropriate supervisory practice helps to ensure safe environment in school for all academic activities that they had involved including activity in laboratory (Chima, 2016). Other researcher found that some of students ignoring safety practices while doing practical work in the laboratory, which was disturbing their friend, and play around while doing some activity (Boon and Kamarudin, 2010). This behavior can contribute to accident happen in laboratory. Therefore, monitoring from staff or teachers is required when students do their practical work.





**Table 3:** The mean score for safety and health element in laboratory

No	Questions	Mean	Standard Deviation (SD)
Q1	Ensure that electrical wires are not tangled on the floor	3.69	0.54
Q2	Ensure switch off all the electrical equipment's in laboratory after use	3.6	0.48
Q3	Ensure the environment in laboratory are clean and tidy	3.67	0.49
Q4	Students need supervise by staff or teachers while doing practical work	3.66	0.47
Q5	Chemicals are labeled and storage in safe place	3.65	0.48
Q6	Laboratory have good ventilation	3.63	0.54
Q7	Fire extinguisher are put in suitable place and well-function	3.63	0.52
Q8	The exit way from laboratory should free from obstacles	3.62	0.48
Q9	There is a complete set of first-aid kit are put in laboratory and should always be checks to ensure there is no running out of medication.	3.60	0.53
Q10	Safety sign and symbol are display in laboratory	3.60	0.54
Q11	Safe operating procedure (SOP) of equipment should be displayed conspicuously	3.55	0.51
Q12	Teachers, staff or students can be exposed to chemicals that can be inhaled, ingested or absorbed by the body.	3.51	0.64

Table 4 shows the data regarding safety practice that implementing in laboratory. From the result, the mean score for each question is between 2 and 3. It means that some of the staff agree and disagree with those aspects. Behavior also plays significant role in each organizational. According to researcher stated that, the factors that led to the accident is caused by the individual attitude on matters related to the safety and health (Laney,1987). Poor behavior regarding safety practice will effect smooth operation in school (Chima, 2016). Based on the result, most of the staff was skilled to handle chemical in laboratory, know how to identify the hazard, danger and risk and know how to read Material Safety Data Sheet (MSDS) for chemical. This practice show good attitude for create safety environment in laboratory. According to Fazreen (2013), staff can establish a positive work culture and always concern about safety and health in any work done.



Besides that, most of staff not knows how to give cardiopulmonary resuscitation (CPR) training if emergency happen. The International Liaison Committee on Resuscitation published a consensus document on education in year 2003 which strongly recommended that CPR should be a standard part of the school curriculum. This skill is for their preparation for a response to medical emergencies in school (Chamberlain and Hazinski, 2003). Moreover, some studies also found and recommend that training in CPR should be required elements in school curricula and provides the rationale for implementation of CPR training for guidance and safety measure in overcoming barriers or accident that may occur in school (Diana and Tom, 2011). Thus, staff should attend the training and know how to act while emergency happen.

**Table 4:** The mean score for safety and health practice among staff laboratory

No	Questions	Mean	Standard Deviation (SD)
Q1	Laboratory staff skilled in handling chemical in laboratory	2.97	0.66
Q2	I know the different between hazard, danger and risk that occur in laboratory	2.92	0.59
Q3	Laboratory staff know how to read Material Safety Data Sheet (MSDS) for chemical	2.92	0.67
Q4	I use Personal Protective Equipment while performing tasks in the laboratory	2.85	0.69
Q5	I know how to use fire extinguisher in the event of an emergency	2.87	0.71
Q6	I know the procedure of Emergency Response Plan	2.87	0.71
Q7	I can conduct hazard identification, risk assessment and risk control in schools	2.80	0.65
Q8	I know how to label and classify the chemical properly	2.73	0.40
Q9	I can give first aid and CPR training in case of emergency	2.41	0.80





#### 4. 0 Conclusion

The study shown that some of the staff in school laboratory understand and practice on safety and health matter in school. Meanwhile, some of them not develop safety and health practice while conducting activity in laboratory. This condition would contribute to unplanned event occur in laboratory. Knowledge and safety practice is important because it can create safety environment in workplace. For improvement, laboratory staff must be provided with information and occupational safety and health training that relevant to the hazards present in their laboratory. The training must be provided including new exposure situations. Knowledge regarding safety practice is very important while working in laboratory to prevent or minimize accidents. It is hoped that the number of accidents in school (including the loss of property whether directly or indirectly) also can be reduced with the good safety practice of staff laboratory. Thus, they can create safe environment in laboratory.

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