

## ORIGINAL ARTICLE

# Understanding the Level of Awareness and Knowledge of Fire Safety Among Kindergarten Teachers in Perak, Malaysia

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## ABSTRACT

**Introduction:** Fire safety awareness among kindergarten teachers is vital beyond emergencies. It prevents accidents, calms kids, and provides a safe learning space. Teachers who prioritize fire safety demonstrate concern for students' well-being and improve overall school safety. Thus, the aim of this study was to evaluate the level of awareness and knowledge of fire safety among kindergarten teachers in Perak, Malaysia. **Methods:** A cross-sectional study was conducted involving 112 kindergarten educators from the Hilir Perak district. Respondents were recruited using random sampling and evaluated using a self-administered questionnaire of 37 items. All data was analysed using SPSS version 26.0. **Results:** Most respondents were women (95.5%) and aged between 40 and 59 years (49.1%). Overall, 90.2% of the respondents had a moderate knowledge of fire safety measures, and 70.5% had good awareness. Preschool teachers were significantly more concerned about fire safety than private kindergarten teachers were ( $X^2=5.198$ ,  $p=0.023$ ). There was a significant association between the level of education and awareness of fire safety measures, indicating that higher levels of education were linked to greater awareness ( $X^2=9.527$ ,  $p=0.002$ ). Attending a fire safety course also resulted in a higher level of knowledge compared to those who did not attend any course ( $X^2=6.475$ ,  $p=0.011$ ). **Conclusion:** The study showed that the respondents showed a good level of awareness of fire safety while demonstrating a moderate knowledge of fire safety. The management should therefore continue improving the teachers' knowledge and awareness to ensure that they can respond to emergencies and save the lives of building occupants.

**Keywords:** Kindergarten; Teachers; Preschool; Fire Safety; Awareness; Knowledge

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## INTRODUCTION

Schools are built to provide learning spaces and learning environments to teach students under the care of teachers. A school is a place where young children begin to step into the larger realm to gain knowledge and become someone useful to individuals, families, communities and nations (1). However, it's crucial to think about the safety measures that educational institutions should take to avoid any catastrophes or accidents, whether they are intentional or not, particularly fire disasters (2). Fires are adverse events that will result in various negative and unpredictable effects (3). This is because fires can cause terrible damage that can involve millions of ringgits, loss of property and even claim millions of

lives. Consequently, appropriate safety precautions should be followed to avoid this incident (2).

The Ministry of Education Malaysia in the Ikhtisas Circular Letter No. 6/2000 explains safe schools as "Schools are always safe and free from incidents that do not desire such as students being threatened, abducted, raped, involvement in drugs, gangster-style treatment and engaging in gangster activities or "triad society"" (4). The school is unsafe enough if regulatory and legal aspects are not considered. Consequently, a safe school is one that consistently works to protect its students from any risks and dangers of physical, mental, emotional, and psychological aspects that could compromise the success of the educational process in schools. The physical environment, traffic, food, buildings, fields, health, discipline, and behavior are all included in this component of safety (5). The Safe School policy was developed by the Malaysia Ministry of Education in 2002, as a blueprint to promote the Safe School

Programme. This policy carries a simple but important meaning: to create a peaceful, serene, and reassuring school environment in line with the demands of the teaching environment and conducive learning in meeting the latest and current aspirations, inspirations and potentials front.

A safe school environment is crucial for ensuring the well-being of students and teachers, particularly when it comes to fire safety. A safe school should provide a comfortable atmosphere that is free from intimidating environments, allowing students to learn and teachers to teach without fear. In order to promote a safe school environment, it is essential to foster a learning climate that encourages enthusiasm and acceptance while prioritizing the protection of every individual.

Fire safety plays a vital role in maintaining a safe school environment. To create a safe school, it is important to establish clear guidelines and rules regarding appropriate behavior in relation to fire safety (6,7). These guidelines should be fair and consistently enforced to ensure the safety of everyone within the school premises. By emphasizing the importance of fire safety and implementing measures to prevent and respond to fire incidents, a safe school can be established where the well-being of students and staff is prioritized. Safe school too is a school where its teachers, staff, and students are safe from any harmful environment that is exposed to fire.

Regardless of the circumstances, fires can occur at any time, and whether a person is aware of this fact or not, they will always be in a scenario where they must deal with one (9). It is therefore important for each individual or user of a building to know about fire hazards as a whole such as fire theory, safety measures, ways to save oneself, ways to use fire prevention equipment found in the building as well as laws as well as the rules that the fire department has set for a building, especially school buildings that house students who need proper protection (10). As a result, the constituents emphasized the need to comply with the requirements specified by the Fire and Rescue Department of Malaysia (8). The education institutions also need to comply with the regulatory requirements, according to the Uniform Building By-Law 1984 and the Fire Service Act 1988. This system is essential so that the building may be occupied safely, and all required fire protection and prevention equipment must be installed. The system protects school occupants and property while preventing the building's structure from getting compromised during a fire. (10). To meet the requirements of fire protection and prevention, Ramli et al. (2021) urged that the buildings constructed must be able to withstand the collapse for a sufficient period of time to enable the occupants to save

themselves and curb the fury of fire and smoke from spreading rapidly (11).

In recent times the mass media has often covered the safety situation in schools even the Ministry of Education in September 2014 announced to closing of more than 60 preschools; primary and secondary schools are said to be unsafe due to various problems such as walls and cracked columns, old wiring systems, leaks in the roof and ceiling as well as many problems (12). According to the Malaysian National Occupational Safety and Health (NIOSH), the idea of "safe schools" should go beyond addressing disciplinary problems, crimes, student threats, bullying, and similar issues. It should also encompass the safety of school buildings, fire safety equipment, and facilities (13). The schools also need to be aware of the existence and importance of the Occupational Safety and Health Act 1994 and its application to educational institutions in the interest of safety and health aspects (12). The priority of the legislation is to protect employees, but it also has enough provisions to address "other concerns" that are affected (14). According to the act, the preschool management and the Department of Education representing the employer, have general responsibility for ensuring the safety and welfare of teachers and support staff, as well as protecting students and visitors (5). It is worth noting that the changing educational climate has created a need to identify methods, strategies, and program models that are able to improve the safety and excellence of students and teachers (15). School administrators, parent associations and the local community should be equally responsible for creating and implementing a "Safe Pre-School Policy".

Safety is an important practice in daily life not only at home but also at school where it is a shared responsibility of all parties. It becomes a source of life that should not be seen as an isolated element of all our actions and behaviors. Changes in the globalization of education have now made it mandatory for us to identify fire safety methods, strategies, and program models that we can develop to increase security capabilities, especially our property from being destroyed by fire sources (16). Recent observations have pointed out that fires in multiple schools within this country have been ignited by external influences (17).

To prevent the escalation of potential risks, it is crucial for educational organizations to prioritize the enhancement of their security measures, particularly in mitigating fire safety hazards. It is imperative that these organizations proactively allocate resources and effort towards addressing the diverse challenges that may arise, continually improving their fire safety protocols and controls. Electrical wire systems, for instance, must be replaced when their 15 to

20-year lifespan expires (18). Fire prevention equipment should be adequate and placed in the necessary places. For example, fire drills are to be conducted at least twice a year. Therefore, establishing a safe school to avoid danger in the pre-school, is the duty of all school residents and the local community. However, the important factor in every preschool safety plan is to depend on the school management (6). For instance, preschool administration must check the status of the school facility based on more than just reports; they must also tell the kids, instructors or staff, and the families of the students, rather than simply providing a letter or report (19-20). Therefore, based on the above issues this study aimed to explore the level of awareness and knowledge of fire safety among teachers in kindergartens.

## MATERIALS AND METHODS

### Study design, study location and respondents' selection

This research was conducted through a cross-sectional design. Prior to conducting this study, ethical approval was acquired from the Human Research Ethics Committee of Universiti Sains Malaysia [USM/JEPeM/210 10087] and the Ministry of Education Malaysia [KPM.600-3/2/3-eras (955)]. The study was conducted from December 2020 to June 2021 at the private kindergartens and preschools in Hilir Perak district with the consent of the Perak State Education Department [JPNPk.SPS.PSR.600-1/1 Jld.(103)]. Participants in the study included kindergarten teachers who were Malaysian citizens, aged above 18 years old, and able to read, write, and understand Malay. The statistics indicated that 68 kindergartens were registered with the Malaysian Ministry of Education in Hilir Perak, with 33 private kindergartens and 35 government preschools employing 99 and 57 instructors, respectively. The sample size was 112, calculated using a sample size formula from the previous study with a 95% confidence level and p-value is less than 0.05 are assumed (21).

There were two phases involved in the sampling selection. First, a stratified random sample was applied to distinguish the types of kindergartens. There are four types of kindergartens in Malaysia, namely government preschools, private kindergartens, Islamic preschools, and special education preschools (22-23). This study focuses only on government preschools and private kindergartens. Both kindergartens offer early education to the children before they enrol the formal education at the age of 7 years. The difference between these two kindergartens was the management of the school and the curriculum offered. Basically, government preschool is governed by the Malaysia Ministry of Education, while private kindergarten is a private educational institution

registered with the Ministry of Education Malaysia. Next, a simple random sampling was used to select the kindergartens from each preschool and private kindergarten. Out of 68 kindergartens, the researchers selected 35 of the combination between government preschools and private kindergartens. In the second phase, respondents were randomly selected based on the study criteria. Around 3 to 4 instructors from each kindergarten were randomly sampled to complete the participation. Their name list was obtained from the school or kindergarten administrator. If respondents were willing to take part in the study, they were then asked for their consent and answered a questionnaire booklet. The questionnaire required around 10 to 15 minutes to complete.

### Instrumentation

The questionnaire was adopted from the previous study and constructed in Malay language (19). The initial questionnaire, originally in English, underwent translation by a proficient translator. Following this, two subject matter experts were consulted to assess the quality of the translated questions. Subsequently, a pre-test was conducted among kindergarten educators to confirm their comprehension of the questionnaire's content. Based on the feedback received, the final version of the questionnaire in the Malay language was then prepared. The content was divided into three sections namely Section A, Section B, and Section C. Section A consisted of eight questions regarding the socio-demographic characteristics of the respondents. Section B, with 19 questions, focused on occupant awareness, whereas Section C, with 10 questions, focused on occupant knowledge of fire safety measures. Obedience, responsible attitude, and practicing attitude were included in the elements of fire safety awareness studied. For the questions in the knowledge section, the elements of teachers' knowledge on fire safety studied were fire hazard, fire safety equipment, safety measures, and proactive approach involvement. In this context, the respondents perceived knowledge of the topics was measured using Likert scale (24).

The section on awareness and knowledge was developed using a Likert scale comprising four response options: strongly disagree (1), disagree (2), agree (3), and strongly agree (4). The cumulative score for the awareness section was subsequently classified into three categories: inadequate ( $\leq 38$ ), moderate (39-57), and satisfactory ( $\geq 58$ ). Similarly, the cumulative score for the knowledge section was categorized based on the following ranges: poor ( $\leq 20$ ), moderate (21-30), and good ( $\geq 31$ ). The score range for fire safety knowledge and awareness was determined and adopted from the previous research (20). Based on the research objectives, the score range was identified into three classes which include poor,

moderate, and good.

**Data Collection**

Initially, a pre-test was conducted to ensure the reliability of the instrument. The respondents who took part in the phase were not among those who took part in the actual survey. A Cronbach’s alpha test showed internal consistency reliability for the knowledge and awareness items of 0.743 and 0.812 respectively. The result showed all two sections were acceptable and reliable with a Cronbach’s alpha value which was greater than 0.7.

After obtaining the approval from Ministry of Education and the State Department of Education, the researcher went to the selected kindergartens and approached the school administrator for consent to sample their workers. The chosen kindergarten can be divided into two types, which are government preschools and private kindergartens. Next, the randomly sampled workers were approached and briefed for research information. After obtaining their consent to participate in the study, questionnaires were distributed to obtain information regarding occupants’ knowledge and awareness about fire safety. Respondents were given one week to answer the questionnaire received, and through the time obtained, respondents had enough time to give better feedback on the study.

**Data Analysis**

The data were analysed descriptively and inferentially using IBM Statistical Packages for Social Sciences (SPSS) version 26.0. All continuous variables were analysed using descriptive statistics and presented as frequency (percentages) for categorical variables, while mean±S.D. was presented for continuous variables. The chi-square test was used to determine the association between the level of awareness and knowledge regarding fire safety between teachers in private kindergartens and teachers in government preschools. In addition, the correlation between knowledge and awareness was evaluated by using the Pearson correlation test. Besides that, the Chi-square test was used to analyze associations between sociodemographic characteristics of the kindergarten teachers with their knowledge and awareness levels. Statistical significance was defined as a p-value less than 0.05 (p<0.05).

**RESULTS**

**Socio-demographic Characteristics of the Respondents**

Table I shows the socio-demographic characteristics of the respondents. A total of 112 respondents completed the questionnaire given to them (response rate 100%). The majority of them were female (95.5%) workers, aged between 40 to 65 years old (54.5%),

**Table I : Socio-demographic Characteristics of the Respondents**

Variables	n (%)
Gender	
Male	5 (4.5)
Female	107 (95.5)
Age	
21-39 years old	51 (45.5)
40-65 years old	61 (54.5)
Race	
Malay	59 (52.7)
Chinese	33 (29.5)
Indian	19 (17.0)
Others	1 (0.9)
Education level	
Secondary education	21 (18.8)
Tertiary education	91 (81.3)
Teaching experience	
1– 5 years	24 (21.4)
6 – 10 years	24 (21.4)
>10 years	64 (57.1)
Attended Fire Safety Course	
Yes	51 (45.5)
No	61 (54.5)
Experience with Fire Drills	
Yes	84 (75.0)
No	28 (25.0)
Experience with Fire Incidents at Kindergarten	
Yes	3 (2.7)
No	109 (97.3)

N=112

of Malay ethnicity (52.7%), and had received tertiary level education (81.3%). Most of the respondents had more than 10 years of teaching experience in kindergarten (57.1%) and 54.5% of respondents had never attended any fire safety course but 75% of respondents had experience with fire drills. Finally, only 2.7% of the respondents had encountered a fire incident in the kindergarten.

**Distribution of Knowledge Towards Fire Safety Measures**

Table II shows the frequency distribution of knowledge about fire safety measures. More than half of the

**Table II : Distribution of Knowledge Towards Fire Safety Measures**

Statement	n(%)				mean±S.D.
	Strongly disagree	Disagree	Agree	Strongly agree	
1. I have been involved in fire drills many times before.	8 (7.1)	30 (26.8)	51 (45.5)	23 (20.5)	2.79±0.85
2. I know how to use a portable fire extinguisher without any doubt.	0	20 (17.9)	86 (76.8)	6 (5.4)	2.88±0.47
3. I really understand the concept of the Fire Triangle/fire tetrahedron.	5 (4.5)	57 (50.9)	50 (44.6)	0	2.40±0.58
4. I know what the main idea of a fire emergency action plan is.	0	18 (16.1)	86 (76.8)	8 (7.1)	2.91±0.48
5. I know what to do if I get stuck in a smoke-filled room.	0	22 (19.6)	78 (69.6)	12 (10.7)	2.91±0.55
6. I know exactly how to react if I spot a fire.	0	7 (6.3)	91 (81.3)	14 (12.5)	3.06±0.43
7. I know all classes of fire/types of fire based on the source of the material that produces the fire.	8 (7.1)	53 (47.3)	50 (44.6)	1 (0.9)	2.39±0.64
8. I know all the stages of fire development.	3 (2.7)	61 (54.5)	45 (40.2)	3 (2.7)	2.43±0.60
9. I know about the different types of fire extinguishers available.	0	52 (46.4)	60 (53.6)	0	2.54±0.50
10. I know about the "PASS" method for using a fire extinguisher.	5 (4.5)	44 (39.3)	60 (53.6)	3 (2.7)	2.54±0.63

N=112

respondents (57.2%) did not know about all the stages of fire development, and 55.4% of the respondents did not understand the concept of the fire triangle/fire tetrahedron. Meanwhile, most of the respondents (93.8%) knew exactly how to react if they spot a fire, the majority of them (82.2%) knew how to use a portable fire extinguisher without any doubt and 83.9% of respondents knew what the main idea of a fire emergency plan is.

#### Distribution for Awareness Towards Fire Safety Measures

Table III shows the distribution of awareness about fire safety measures. For safety reasons, the majority of respondents (98.2 %) were aware of not allowing children to enter the kitchen if there was no important purpose, and all respondents were aware of the location of the nearest fire extinguisher in the kindergarten and familiar with the layout plan of the kindergarten's buildings. Meanwhile, the majority of the respondents (83%) had never experienced fire occurrence in their life before.

#### Levels of Knowledge and Awareness Toward Fire Safety Measure

The knowledge and awareness score distribution about fire safety measures is indicated in Table IV. Most of the respondents (70.5%) had a good level of awareness of fire safety measures, whereas only 29.5%

of respondents had a moderate level of awareness. The majority of respondents had a moderate degree of knowledge of fire safety measures (90.2%). Meanwhile, a Pearson correlation test was used to assess the correlation between scores related to knowledge and awareness regarding fire safety measures. The results of the test indicated a significant correlation between knowledge and awareness scores ( $r=0.305$ ,  $p=0.001$ ).

#### Comparison Between Knowledge and Awareness Levels Towards Fire Safety Among Respondents

Table V shows the comparison results of knowledge and awareness levels between teachers in private kindergartens and preschools. The Pearson Chi-square test results showed that there were significant differences in awareness levels with regards to fire safety ( $X^2=5.198$ ,  $p=0.023$ ) between teachers in private kindergarten and preschool; while there were no significant differences observed for knowledge levels ( $X^2=2.520$ ,  $p=0.112$ ). Preschool teachers were observed to have a higher awareness level towards fire safety measures when compared to private kindergarten teachers.

#### Association Between the Knowledge and Awareness Levels with Selected Variables Toward Fire Safety Measures.

Table VI shows the association between the

**Table III : Distribution of Awareness Towards Fire Safety Measures**

Number	Statements	n (%)				Mean± S.D.
		Strongly disagree	Disagree	Agree	Strongly agree	
1	Fire is inevitable but there is surely something we can do to avoid it.	0	1 (0.9)	54 (48.2)	57 (50.9)	3.50±0.52
2	I'm aware of the Uniform Building By-Laws 1984	9 (8.0)	33 (29.5)	65(58.0)	5 (4.5)	2.59±0.71
3	I have heard about the Fire Service Act 1988.	6 (5.4)	19 (17.0)	80(71.4)	7 (6.3)	2.79±0.64
4	I'm aware of the danger and consequences of a fire incident.	0	1 (0.9)	47 (42.0)	64 (57.1)	3.56±0.52
5	I have always cared about fire safety precautions.	0	1 (0.9)	45 (40.2)	66 (58.9)	3.58±0.51
6	I will not let the children enter the kitchen if there is no important purpose for safety reasons.	1 (0.9)	1 (0.9)	32 (28.6)	78 (69.6)	3.67±0.54
7	I have experienced fire occurrences in my life before.	36 (32.1)	57 (50.9)	16 (14.3)	3 (2.7)	1.88±0.75
8	A fire extinguisher is the best tool for early-stage prevention.	0	2 (1.8)	62 (55.4)	48 (42.9)	3.41±0.53
9	I'm aware of what can ignite the fire in the kindergarten.	0	1 (0.9)	65 (58.0)	46 (41.1)	3.40±0.51
10	I'm aware of the emergency contact number for a fire emergency.	0	2 (1.8)	53 (47.3)	57 (50.9)	3.49±0.54
11	I memorize the fire action plan for my kindergarten.	0	1 (0.9)	72 (64.3)	39 (34.8)	3.34±0.49
12	I'm aware of the location of the nearest assembly area.	0	1 (0.9)	58 (51.8)	53 (47.3)	3.46±0.52
13	I'm aware of the location of the nearest fire extinguisher or hose reel in the kindergarten.	0	0	45 (40.2)	67 (59.8)	3.60±0.49
14	I am familiar with the layout plan of the kindergarten buildings.	0	0	61 (54.5)	51 (45.5)	3.46±0.50
15	I know exactly what to do if a fire happens at the kindergarten.	0	1 (0.9)	63 (56.3)	48 (42.9)	3.42±0.51
16	I am willing to help other occupants escape if a fire happens.	0	5 (4.5)	77 (68.8)	30 (26.8)	3.22±0.52
17	I will check all rooms and toilets for any occupants left if a fire occurs.	0	7 (6.3)	60 (53.6)	45 (40.2)	3.34±0.59
18	I will switch off all electrical appliances before leaving my room.	0	0	58 (51.8)	54 (48.2)	3.48±0.50
19	I will leave all my personal belongings and evacuate if a fire happens.	0	14 (12.5)	65 (58.0)	33 (29.5)	3.17±0.63

N=112

knowledge and awareness levels with selected variables (gender, age, educational level, attended fire safety course, and fire drill training) among teachers in private kindergarten and preschool. The result showed that there was a significant association between knowledge level with attending fire safety courses ( $X^2=6.475$ ,  $p=0.011$ ); and the level of awareness with education

level among the kindergarten teachers ( $X^2=9.527$ ,  $p=0.002$ ). Teachers who attended a fire safety course demonstrated a good level of knowledge, whereas teachers with tertiary education demonstrated an excellent level of awareness toward fire safety measures.

**Table IV : Distribution scores of Knowledge and Awareness**

Variables	Level	Score	n	Frequency (%)
Knowledge	Good	31-40	11	9.8
	Moderate	21-30	101	90.2
	Poor	10-20	0	0
Awareness	Good	58-76	79	70.5
	Moderate	39-57	33	29.5
	Poor	19-38	0	0

N=112

**Table V : Association Between Awareness and Knowledge Levels Regarding Fire Safety between Teachers in Private Kindergarten and Teachers in Preschool**

Variables		(n, %)		X <sup>2</sup>	p-value
		Preschool teachers (n=56)	Private kindergarten teachers (n=56)		
Knowledge level	Poor	.	.	2.520	0.112
	Moderate	48 (47.5%)	53 (52.5%)		
	Good	8 (72.7%)	3 (27.3%)		
Awareness level	Poor	.	.	5.198	0.023*
	Good	11 (33.3%)	22 (66.7%)		
	Excellent	45 (57.0%)	34 (43.0%)		

N=112

Chi-square Test

\*Significant at p&lt;0.05

## DISCUSSION

This is one of the first studies in Malaysia to investigate kindergarten teachers' knowledge and awareness of fire safety measures. The study discovered that kindergarten teachers had a high level of awareness about fire safety measures, while their knowledge was generally moderate. After analyzing the data, the overall study found that the majority of the respondents had a moderate level of knowledge about fire safety, with 90.2% scoring between 21 and 30. Meanwhile, only 9.8% of respondents had a good understanding of fire safety. Similarly, the previous study also found that the respondents in their study had a moderate level of knowledge about fire safety measures (25). A lot of improvements had to be made in order to improve the level of knowledge regarding the importance of fire safety. Lack of preparedness on the subject matter was also one of the factors that resulted in the lack of respondents' knowledge. In case of a major fire, lack of knowledge would lead to danger because it can lead to panic and cause severe loss if this issue was underestimated. Furthermore, fire safety management was critical in educating users to be more responsible and proactive in fire safety (11). The management of the preschool

or kindergarten must emphasize and monitor the degree of knowledge of their teachers and staff in order to ensure the safety of kindergarten occupants, particularly children. In a nutshell, based on the finding of a moderate level of knowledge, certain parties should find a solution to this problem so that kindergarten teachers can improve their fire safety knowledge to the best level possible in order to have a significant impact, particularly on fire safety. Furthermore, these registered kindergartens have met the environmental and infrastructure requirements specified by technical agencies like the Ministry of Housing and Local Government, the Fire and Rescue Department, the Department of Social Welfare and the Health Department (8). These agencies included the emergency procedures and educators' safety and emergency training, as one of the criteria for evaluation for every registered kindergarten premise. These premises are also being monitored annually by the Malaysian Ministry of Health, for the safety of equipment and premises, as well as emergency preparation (8).

The results of the study showed that 70.5% of the respondents had a high level of awareness of fire safety. Most of the items on the awareness segment

**Table VI : Association between Knowledge and Awareness levels with selected factors**

Variable	Knowledge			X <sup>2</sup>	p-value
	Poor	Moderate	Good		
Gender					
Male	0	3 (3.0%)	2 (18.2%)	5.382	0.075
Female	0	98 (97.0%)	9 (81.8%)		
Age					
21-31years old	0	95 (94.1%)	11 (100%)	0.690	1.000
40-65 years old	0	6 (5.9%)	0		
Education level					
Secondary	0	21 (20.8%)	0	2.815	0.121
Tertiary	0	80 (79.2%)	11 (100%)		
Fire Safety Course					
Yes	0	42 (41.6%)	9 (81.8%)	6.475	0.011*
No	0	59 (58.4%)	2 (18.2%)		
Fire Drill Training					
Yes	0	74 (73.3%)	10 (90.9%)	1.647	0.286
No	0	27 (26.7%)	1 (9.1%)		

  

Variable	Awareness			X <sup>2</sup>	p-value
	Poor	Good	Excellent		
Gender					
Male	0	2 (6.1%)	3 (3.8%)	0.280	0.630
Female	0	31 (93.9%)	76 (96.2%)		
Age					
21-31years old	0	30 (90.9%)	76 (96.2%)	1.286	0.358
40-65 years old	0	3 (9.1%)	3 (3.8%)		
Education level					
Secondary	0	12 (36.4%)	9 (11.4%)	9.527	0.002*
Tertiary	0	21 (63.6%)	70 (88.6%)		
Fire Safety Course					
Yes	0	11 (33.3%)	40 (50.6%)	2.809	0.094
No	0	22 (66.7%)	39 (49.4%)		
Fire Drill Training					
Yes	0	23 (69.7%)	61 (77.2%)	0.702	0.402
No	0	10 (30.3%)	18 (22.8%)		

N=112

\* Significant at p<0.05



had a high percentage of respondents who agreed with the statements, with an average of more than 80-90 percent. However, item 2 of the awareness question on awareness of the Uniform Building By-Laws 1984, did not reach the figure of 80% of respondents who knew about it. According to the findings, 37.5% of respondents were unaware of this information. Uniform Building By-Law 1984 (UBBL 1984) was a guideline on the construction of a building to meet safety characteristics in addition to being able to resist fire. However, the overall fire safety awareness of these kindergarten teachers was high and satisfactory, as no one received a low or poor score below 38.

Previous research stated that most hostel occupants in multi-story hostels around the campus had low fire safety awareness (2). This previous study assessed the level of fire safety awareness among students living in multi-story hostels and discovered that the vast majority of respondents were unaware of fire safety measures. Based on the findings, the hostel management, which was directly responsible for fire safety management on campus, failed to carry out its responsibilities to keep students safe (12).

This view concurred with another previous study stating that the majority of healthcare workers had significant awareness regarding fire safety preparedness but still had not reached a good stage (26). It was extremely crucial for the institution to hold regular classes for fire safety preparedness or to schedule fire safety training for all healthcare workers on a regular basis. The management should also arrange for fire safety equipment such as smoke detectors and fire alarms and raise awareness once those items are available (26).

Based on the studies that have been done, awareness should be nurtured starting from the management in order to have an impact on an organization. Therefore, the management of the school or kindergarten must play a responsibility to continue to increase the awareness of teachers from time to time to achieve the best level in all aspects of fire safety measures.

The analysis revealed a significant difference in awareness levels between teachers in private kindergartens and preschools. The mean between the awareness score of preschool teachers also had a significant difference that was  $(63 \pm 5.5)$  compared to the mean of teachers in private kindergarten with  $(61 \pm 6.3)$ . This shows that the awareness level of preschool teachers was higher than that of private kindergarten teachers. This may be because teachers in pre-schools were more exposed to programs run by schools on fire safety other than the Ministry of Education Malaysia (MOE) which is serious about the increase in fire cases.

The most effective method of increasing fire safety awareness was to organize fire safety management programs that involved all staff, teachers, and students, such as educational talks about the dangers of fire and the important actions to take in the event of a fire emergency (27). This was supported by previous research, which sought to investigate middle and high school teachers' perceptions of fire safety education (7). This current study showed that fire safety awareness among the respondents was at a good level. Drawing from findings in earlier research, fire safety education was conducted in schools in order to aim at having a safe lifestyle and respect for life (24-25). The training on fire safety was conducted once every six months, on average, and the training took about 30 to 45 minutes. Fire safety education in schools was conducted in cooperation with fire-related organizations in the form of experience-oriented education following the plan of the school (27-29). Educational texts from the Internet and related publications were used and utilized. It is important to run an experience-related education program on fire safety and to participate in the students' fire safety education at the school actively.

Furthermore, teachers in preschool had a higher level of knowledge and awareness about fire safety measures than teachers in private kindergartens because the school management's programs lead them to be more cautious and not careless about fire issues in kindergarten or school. Involvement in related fire safety programs and distribution of pamphlets or brochures regarding fire safety was the most effective method to improve the awareness of fire safety level (29-32).

The analysis indicated that there was no significant relationship between educational level and knowledge of fire safety measures among teachers in private kindergartens and preschools ( $p > 0.05$ ). However, there was a significant association between educational level and awareness of fire safety measures ( $p < 0.05$ ). This suggests that while educational level may not directly impact knowledge, it does play a role in influencing the awareness of fire safety measures among teachers in these educational settings. The previous study also agreed that respondents with a degree had a higher level of awareness of safety and health than respondents who only had certificates in the study (10). In essence, acknowledging fire safety needs within OSH management aligns with the principle of proactive risk assessment and management (32). It represents the organization's commitment to building a safe culture in which employees and occupants can execute their responsibilities with confidence, knowing that their safety and the preservation of the workplace are paramount concerns (33-34).

One of the study's key strengths was the use of a validated questionnaire with good reliability (greater than 0.7) and suitability for the target population. The current study looked at kindergarten teachers in Perak Hilir, which is a district in Perak. The study's limitation was that the sample only represented a subset of the population in that district, not the entire population. The status of the unregistered kindergartens was unknown because the current study analyzed the registered kindergartens. As a result, the findings implying that educators are highly prepared for safety and health in early childhood settings cannot be applied to unregistered institutions. However, the findings were useful in providing the necessary information for future investigations as well as actionable strategic recommendations by the government or school management to improve kindergarten teachers' awareness of fire safety.

## CONCLUSION

In conclusion, the majority of participants were found to have a high level of awareness about fire safety, with a moderate level of knowledge about fire safety. Furthermore, significant awareness gaps between the teachers in preschool and private kindergarten were identified. The analysis of the level of awareness clearly showed that teachers in preschool have a higher level than teachers in private kindergartens. Furthermore, the findings revealed that the level of education had a significant influence on the awareness of respondents regarding fire safety measures. On the other hand, attending a fire safety course had a positive impact on the knowledge level of the respondents. These results highlight the importance of considering demographic factors, such as education level, in enhancing the awareness of individuals towards fire safety, and the effectiveness of fire safety courses in improving knowledge in this area. Comprehensive strategies should be formulated and implemented to disseminate knowledge and awareness about fire safety measures among kindergarten teachers. The authors highly advise school administration to play an important role in giving appropriate knowledge about fire safety or an intensive fire safety program for teachers to be prepared in the event of a fire at kindergarten.

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