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Original Article

Implementation of OSH Checklist in Primary Schools within Batu Pahat Zone, Malaysia

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Abstract: School-related accidents are increasingly becoming a concern in Malaysia, endangering the safety and well-being of students, teachers, and school staff. These incidents often arise due to poor safety measures, negligence, or a lack of awareness regarding occupational safety and health (OSH) practices. Ensuring a safe school environment requires consistent audits and inspections, for which the OSH school checklist serves as a practical and effective evaluation tool. This study aims to (i) identify the essential elements of the OSH school checklist, (ii) assess current OSH management practices in schools from the perspective of teachers, and (iii) propose improvements for effective checklist implementation. A qualitative research approach was adopted, involving purposive sampling of teachers from five selected primary schools in the Batu Pahat zone. Data were gathered through interviews and observations using an OSH checklist, adapted from the National Institute of Occupational Safety and Health (NIOSH). The findings were analyzed thematically and descriptively. The results indicate that environmental hazards and procedural systems are the most influential components affecting the state of OSH management in schools. All research objectives were met, and the study confirmed the relevance of using structured checklists to improve safety practices in primary education settings. In conclusion, implementing OSH management using standardized tools can significantly improve school safety. Policy implications include the need for institutionalized OSH training, regular monitoring, and integration of OSH practices into school operations. Future research should conduct the development of a safety culture among educators and schools' staff for a more comprehensive understanding of safety compliance.

Keywords: OSH School Checklist, Safety and Health, School Accident, Safety Management.

1. Introduction

School is one of the institutions that provided a building, infrastructure and other facilities that gather the teaching and learning session process for the teachers, students, and staffs in secure and calm environment. School run by the Ministry of Education fall under the category of public service industries and statutory in Malaysia authorities as listed which in the First Schedule of the Occupation Safety and Health Act ("Occupational Safety and Health Act 1994 (Act 514) (Malaysia). First Schedule," 1996). Malaysia's education system is diversified with many types of school accommodating to different needs and preferences. According to Malaysia Ministry Education, Malaysia's National Education System at the

school level is comprised of early childhood education which is preschool and kindergarten, primary education, secondary education, and higher educational institutions that are organized under the Category of Government Educational Institutions.

For primary education, an academic program of study at an elementary school that has duration for six years but can be done in five to seven years. In Malaysia, schools are categorized into three main types which are the national school (government school), national-type Chinese and Tamil type schools. Government aided school and private school that stated in Education Act ("Occupational Safety and Health Act 1994 (Act 514) (Malaysia). First Schedule," 1996)According to Malaysia's education system, the statistic of present number for primary school in 2023 was 7,779 schools that included from each state. While in Johor, the total number of primary schools had present 908 schools whereby 10 is government aided school, 598 is government 4 is special national 90 from national Chinese type school, and 19 from national Tamil type school. Johor is the third state highest primary schools after Sarawak, 1,266 and Sabah 1,075. Figure 1 shows the statistic number of primary school in Johor and the number of students and teacher may lead to safety and health implementation in school as for school safety.

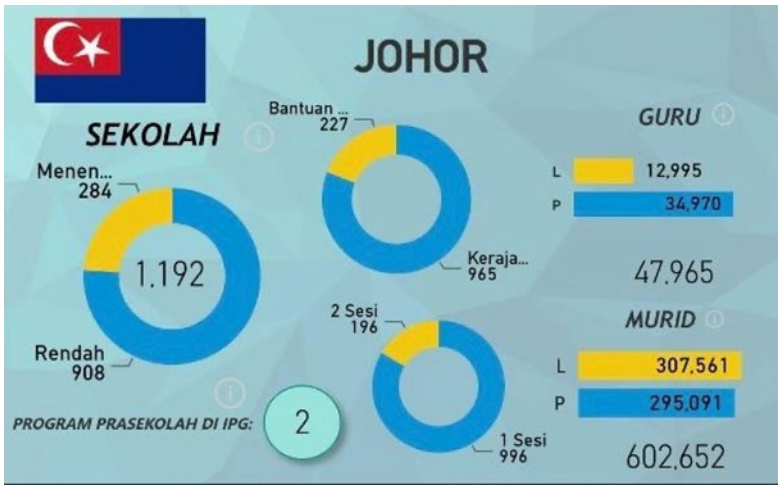

Figure 1. School profile in Johor

Source: Ministry of Education Websites (2023)

School safety is of paramount importance as it ensures the well-being and security of students, teachers, and staff within educational institutions. School safety includes a variety of factors, such as the culture of the school and the required resources and training to respond to risks and dangers (Hull, 2011). The government and the Ministry of Education have placed significant emphasis on creating a safe conducive learning and environment in which students are able to excel both academically and socially through the School Safety Level Self-Rating for Malaysian Ministry of Education Schools. The Director of Ministry of Education School Management Division, Aminuddin Adam said, "The authority has introduced a school safety rating system that is measured in April and August each year" (Borneo, 2017). Recognizing the importance of school safety, the government has implemented policies, guidelines, and measures in place to protect school across the country. These initiatives aim to address potential hazards, prevent accidents and injuries, and develop a culture on the premises of school. In 2017, the former ministry of human resources, Datuk Seri Richard Riot Anak Jaem mentioned that each school needs to establish the safety and health committee that involving in school management.

However, the effort to establish the committee has been proposed for quite a while, but its implementation was not given sufficient focus before, but he believed it can be achieved what is contained in the Safe School Concept Book and Manual provided by the Malaysia Ministry of Educator (Fadzilah, 2017). Concerned with the safety of students, teachers, and staff, schools must follow the Ministry of Education's safety standards and recommendations. In 2017, the former presidents of the National Institute of Occupational Safety and Health (NIOSH) (Hassan et al., 2017), Tan Sri Lee Lam They mentioned a total 31 school accidents that had occurred in the past five years in 2012. It was included the death of students because of being hit by goalposts and ceilings that recorded from Department of Occupational Safety and Health. Moreover, another incident includes cases of students being exposed to chemicals and mercury in school. However, the actual number of accidents in school may be higher because some schools remain

silent or reluctant to report because they think the cases involved are minor (Jiffar, 2017). Despite the number of accidents is low, the consequence of accidents involving fatalities remains severe. Therefore, all parties in the school need to acknowledge and aware with safety and health issues to avoid from any accidents happened in school.

Students are constantly exposed to the risk of accidents at schools if the school environment is not properly managed and compliant with regulations (Hassan et al., 2017). Incidents of accidents and injuries in schools are no longer uncommon. Every year, cases of accidents, injuries, and even deaths occur among students, both inside and outside school premises (Awang & Suyanto, 2017). In 2020, more than 32,000 injuries, averaging 90 cases per day, were reported among students in schools (Time, 2022). In 2022, an 11-year-old boy tragically died after the crossbar of a goal post fell on him during a sporting event at SJK (C) Lok Yu in Manggatal, Kota Kinabalu (Fong, 2022). Another recent incident involved the collapse of a roof at SMK Cheras Jaya; fortunately, no one was injured (Ismail, 2023). In Selama, Perak, three 8-year-old primary school girls were injured when a ceiling fan fell on them around 10:00 am (Arif, 2022). Additionally, at least two students were injured and three others traumatized near a school pedestrian area at about 10:00 am (Abdullah, 2022).

Furthermore, a lack of concern among schools and teachers contributes to these high-risk situations (Kalaiselvan & Daud, 2021). For example, tasks such as replacing lamps or cleaning fans at heights are often assigned to teachers or staff without providing appropriate ladders or safety equipment. This negligence resulted in the tragic death of a male teacher who fell from the first-floor balcony of a school building while preparing for the reopening of schools in Tanah Merah, Kelantan (Rahim, 2020). Many such incidents have occurred previously in other schools. All schools must learn from these tragedies to prevent their recurrence. The issue of school environment safety is worsening, despite schools being places for formal and informal teaching processes (Kalaiselvan & Daud, 2021). Therefore, conducting safety audits in schools to assess compliance with standard operating procedures in Malaysian schools is essential (Thegarathah, 2019). A study found that 51.9% of schools in Kota Bharu did not have any Occupational Safety and Health (OSH) management system in place, and only 5.2% had conducted or undergone an OSH audit (Ah & Ma, 2009).

Without regular safety audits, children and teachers remain exposed to hazards such as broken desks and chairs, slippery floors and staircases, unsanitary toilets, chemicals in laboratories, falling objects and sports equipment on fields, failing ceiling fans, and leaking roofs, especially in older buildings (Time, 2022). Previous studies indicate that school safety implementation remains inadequate, with key stakeholders uncertain about where and how to begin due to lack of enforcement and insufficient attention to school safety (Kandasamy, 2018). Moreover, research highlights a lack of focus on safety and health management systems in schools, with private international schools showing higher compliance levels than government schools (Thegarathah, 2019). Former Ministry of Human Resources official Datuk Seri Richard Riot Anak Jaem acknowledged that one of their past mistakes was not taking such safety efforts seriously, but he believes progress can be made according to guidelines in the Safe School Concept Book and Manual prepared by the Malaysian Ministry of Education (Fadzilah, 2017). Therefore, implementing safety and health checklists, routine audits, and observations is imperative to ensure the safety and health of students, teachers, and staff in schools.

2. Literature Review

2.1. Occupational Safety and Health Act (OSHA) 1994

Existing occupational safety and health law and legislation must be comprehensive, detailed, and enforceable. The legislative framework must make clear the right penalties for those who break the law as well as the authority of the safety inspectors. Occupational Safety and Health Act 1994 [Act 514] P.U.(A) 315/1997 Occupational Safety and Health (Safety And Health Officer) Regulations (1997) Occupational Safety and Health (Safety and Health Officer) Regulation 1997 explains “a person who acts as a safety and health officer required under the Act or any regulation made under the Act, and the employer of the organizations required to hire a safety and health officer under the Act”. The responsibility of a safety and health officer is as follow:

a. Advise the employer on appropriate safety measures.
b. Inspect and perform the routine checks on the machine, equipment, and facilities to identify hazards.
c. Conduct the investigation into any dangerous incidents or accidents that occur at the workplace.

d. Assists the employer or the safety and health committees in organizing any workplace safety and health programs.
e. Acts as the secretary of safety and health committee.
f. Assist the safety and health committee in conducting inspections or investigations regarding the effectiveness and compliance of safety and health management.
g. Collect, analyze, and maintain the data and statistic of any dangerous occurrence at the organization.
h. Assist any officer in any issues affecting safety and health of the workplace.

Followed to Occupational Safety and Health Act 1994 [Act 514] P.U.(A) 315/1997 Occupational Safety and Health (Safety And Health Officer) Regulations (1997) Occupational Safety and Health (Safety and Health Officer) Regulation 1997 Part IV explains "an employer of company or organization shall provide the safety and health officer employer by him adequate facilities including training equipment and appropriate information to enable the safety and health officer to conduct his duties as require under the Act. An employer is required to permit the safety and health officer to participate in any continuous education program at least once per year. An employer must assign one supervisor or someone who has direct responsibility over a person or activity at work to help the safety and health officer in any investigation of an accident, near-miss accident, dangerous event, occupational poisoning, or occupational disease". According to Occupational Safety and Health Act and Regulation 1994, describes the responsibilities of the employer fall to the headmaster or school principal to fulfill three sections which are:

a. Section 15- The duty of employers (e.g., school management) is to ensure the safety, health, and welfare of employees (teachers and staff).
b. Section 16- Duty to form safety and health policies or procedure.
c. Section 17- Ensuring as far as practical that employees and other people who are not employees (students and other people who come to school) are not exposed to safety and health risks.

Meanwhile, Occupational Safety and Health Act and Regulation 1994, outlines the duties of the employees that fall to teachers and school staff or gardener that stated in Section 24 which as follows:

a. Reasonable care for the safety and health of himself and others.
b. Cooperate with employer or any other person given responsibility.
c. Wear or apply Personal Protection Equipment (PPE).
d. Comply with instruction or occupational health and safety measure introduced by the employer.

Occupational Safety and Health Act 1994 {Act 514} P.U. (A) 39/1996 Occupational Safety and Health (Control of Industrial Major Accident Hazards) Regulations applies to all industries except nuclear installations, any installation under armed forces, vessels or vehicles transporting hazardous substances to or from the site of an industrial activity, and industries that use hazardous substances at or below 10% of the threshold value ("Occupational Safety and Health Act 1994 (Act 514) (Malaysia) First Schedule," 1996). The notification and reporting requirement upon any accident or injury are outlined in the Occupational Safety and Health Act 1994 OSH (Notification of Accident, Dangerous Occurrence, Occupational Poisoning, and Occupational Disease) Regulation 2004.

As the previous one has been mentioned from to Occupational Safety and Health Act 1994 [Act 514] P.U. (A) 315/1997 Occupational Safety and Health (Safety and Health Officer) Regulation 1997 Part IV that describes the responsibilities of the employer fall to the headmaster or school principal to fulfill three section which are:

a. Section 15- The employer's obligation (e.g., school headmaster) is to ensure the safety, health, and welfare of workers (teachers and staff) are practiced.
b. Section 16- Duty to formulate occupational safety health policy at school.
c. Section 17- Ensure that employees practices and people that are not its employees (students and visitors) not to be exposed to safety and health risks

Meanwhile, "Occupational Safety and Health Act 1994 (Act 514) (Malaysia). First Schedule," (1996) outlines the employees' responsibilities that fall to teachers and school staff to complete Section 24, which are as follows:

a. Reasonable attention to safety and health of himself and of others person who may be affected by his acts or omissions at work.
b. Cooperate with employers or any other person given responsibility.
c. Wear or use Personal Protection Equipment (PPE).
d. Follow the instruction or standard operational procedure related occupational safety and health that was introduced by employer.

Thus, "Occupational Safety and Health Act 1994 (Act 514) (Malaysia). First Schedule," (1996)should be implemented in schools to ensure school safety and to minimize any hazards that may jeopardize the safety and health of teachers, school personnel, students, and visitors. Most workplace accidents are caused by individual carelessness in following safety guidelines or regulations (Hamid et al., 2008). The most significant part is safety awareness for organizations to ensure compliance with safety guidelines and to decrease the rates among employers (Maziah, 2018).

2.2. Safety and Health Audit Checklist

Occupational Safety and Health Act 1994 Occupational Safety And Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulation, (2013) the audit is defined as a systematic, independent, and documented procedure for gathering data and objectively evaluating it to determine the extent to which the established criteria are met. Safety and health audit is an assessment of processes and activities to evaluate whether they are carried out in line with the safe operating method, whether they are correctly implemented, and whether they are appropriate to accomplish the organization's policy and objectives (Thegarathah, 2019). Implementation of the checklist was related with lower rates of death and complication among patients aged 16 and older receiving non-cardiac surgery in a broad set of hospitals (Haynes et al., 2009). Another previous research the implementation of the WHO surgical safety checklist indicated the ability to drastically reduce death rates from 1.5% prior to the checklist was introduced to 0.8% after the checklist implementation (Matharoo et al., 2014) The number of errors found and any changes to unit policies or guidelines brought on by the audit's findings were counted in order to evaluate the utility of actual time safety auditing during routine clinical work (Ursprung, 2005). The checklist is a crucial tool for error management across these fields, considerably reducing the likelihood of errors and improving overall findings (Ursprung, 2005). National Institute Occupational Safety and Health (NIOSH) (Hassan et al., 2017) have developed the guidelines and handbook occupational safety and health for Tahfiz School where it contains an OSH checklist for Tahfiz School. It is to provide guidance and information about OSH at Tahfiz School and to be implements the OSH checklist in Tahfiz School.

2.2.1. Environment

Department of Occupational Safety and Health (DOSH) (*Occupational Safety and Health Act 1994 Occupational Safety And Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulation 2013*, 2013), define the workplace is as any physical area in where work related activities are performed and whenever OSH effected on persons is involved. The European Agency for Safety and Health at Work has outlined five key characteristics that must be taken into account (Rusu-Zagar et al., 2013). Indoor workplaces, such as a classroom, a staff office, or a kitchen, must be well ventilated and illuminated, with an appropriate level of humidity, adequate space, and cleanliness. If automobiles access the site, there must be appropriate signage, and the driveway and pedestrian area must be clearly defined wherever possible. The flooring must be well maintained and kept clean to reduce the risk of slipping and stumbling. Care should be taken to avoid falls from height places like staircase and balcony areas. Young children may require more railings. Doors and glass windows must be properly labeled and made of appropriate materials. Workplace monitoring is required to ensure a healthy working environment. This monitoring must include systematic monitoring of the aspects in the workplace and working practices that may have an impact on employee's health, to ensuring that the workplace fulfills with safety and health standards (Alli, 2008).

Meanwhile, school infrastructure must meet the requirement and standards to assure the daily teaching and learning process in a convenience and safe condition to teachers and students. Poor infrastructure necessitates immediate maintenance, such as wiring upgrades, building renovations, and the construction of new infrastructure (Maziah, 2018). The infrastructure of school building needs to be sturdy in the face of earthquakes and natural disasters (Tabancalı & Bektaş, 2009). Another part of environment safety is the implementation of safety aspects of facilities within the school that included classroom, laboratory, workshop, and office. This is because teachers and student much more spend their time while learning and teaching process. Students spend their 180 days in a year, 6 hour per day at school (Tabancalı & Bektaş, 2009). Class sizes should be adequate in accordance with the number of students to ensure that students can learn in a more comfortable and convenient environment. In the event of theft and assault, doors and windows should be lockable and sturdy (Tabancalı & Bektaş, 2009). The OSH issues are a concern not only in high-risk industries but also in educational facilities like teaching laboratories where chemicals are used on a regular basis for experimentation and research (Paul et al., 2022). Students and teachers should inform with the possible hazards in the laboratory by following the instructions and guidelines and aware with the

basic of first aid. When chemicals are not handled properly without follow the safety procedure, it can lead to accidents. Safely without follow the safety procedure (Hassan et al., 2017).

2.2.2. Hazard

Department of Occupational Safety and Health (DOSH)(*Occupational Safety and Health Act 1994 Occupational Safety And Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulation,* (2013), define the hazard is a source, situation, or act with a potential for harm in terms of human injury or illness and damage to property. According to Hazard Identification, Risk Assessment and Risk Control (Suhardi et al., 2016), hazard can be classified intro three categories: health hazards, safety hazards and environmental hazards. Safety hazard is usually obvious that includes such slipping, fire hazards, work at height and fall form height. Environmental hazards are exposures into the environment that could trigger danger or have a negative effect that is not immediately apparent. As a result, it must identify all workplace causes, conditions, and situations that tend to cause harm in either the form of human injury or illness, property, and environmental damage, or all of these (Maziah, 2018). According to Occupational Safety and Health in School, Work Safe (Victoria, 2017), the most frequently encountered forms of injuries and illnesses in schools, concerning psychological injuries and illnesses, as well as injuries caused by manual handling and slips, trips, and falls. Manual handling in the school environment may result in hazardous if it involves either:

a. Repetitive or sustained application of force, awkward posture, or motions.
b. Task that people would find difficult due to the degree of force require manual handling of students.
c. Manual handling of unstable object that are difficult to grasp or hold.

As a result, it is critical to ensure that safety at the school is practiced by avoiding student exposure to hazardous chemicals, furnishings, equipment, or tools, as this may contribute to significant injuries. All these need to be identified and informed with rules of safety and health to students to prevent from injury happened.

2.2.3. Signage

This has also been supported by Cohen et al., (2017), which stated that there is most important safety step that can be emphasized to decrease accidents and injuries which is the availability of exact safety signage. Accidents have been linked to a lack of clear instructions such as labeling and signage (Burlet-Vienney et al., 2015). According to Safe Work Australia, General Guide for Workplace Traffic (Australia, 2014), the parking area at the workplace should be clearly marked and sign-posted, well- lit, and unobstructed. Meanwhile, vehicle routes should be clearly marked with speed limits, traffic control devices such as speed humps, and parking places. Moreover, while loading and unloading vehicles at workplace, it can be using it the warning device that includes signage, cones, light alarms, and horns.

2.2.4. Traffic

Pedestrian traffic should be supervised and guard especially during beginning and finish time of school hours (Tabancalı & Bektaş, 2009). This is because each student, staff and teachers go to school with different transportation and different routes. Changeable behavioral and vehicle-related risk aspects are probably leading to work-related traffic injury (Thegarathah, 2019). From Safe Work Australia, General Guide for Workplace Traffic (Australia, 2014), vehicle pathways at work should have a firm and even surface, be wide and high enough to accommodate the largest vehicles and be properly maintained and clear of impediments. This is to minimize workplace speed limits. Furthermore, the parking lot should be positioned away work areas and traffic routes, with pathways heading to and from the parking area. According to Workplace Safety and Health Guidelines: Workplace Traffic Safety (Australia, 2014) important points that need to be included in the set of rules are:

a. Only authorized vehicles and personnel are allowed into the compound.
b. Keep all traffic safety measures at workplace under observation.
c. Keep all the traffic signage and display under observation.
d. Ensure that the pedestrians use the designed walkway.
e. Ensure that the speed limits are obeyed.

2.2.5. Medical

According to the Occupational Safety and Health (Classification, Packaging, and Labeling) (*Occupational Safety and Health Act 1994 [Act 514] P.U.(A) 315/1997 Occupational Safety and Health (Safety And Health Officer) Regulations 1997*, 1997), employers must establish if workers have received significant chemical exposure and whether additional medical monitoring is required. Meanwhile, the Occupational Safety and Health (Use and Standards of Exposure to Chemicals Hazardous to Health) Regulation 2000 is another initiative aimed at improving chemical safety and health of usage. Medical surveillance must be performed by an Occupational Health Doctor (OHD) and must be based on the Chemical Health Risk Assessment (CHRA) stipulated in the regulation. Occupational Safety and Health (Use and Standard of Exposure of Chemical Hazardous to Health) Regulation ("The Occupational Safety and Health Act," 2006) is a guideline that guides, clarifies, and explains the content and frequency of medical surveillance that must be performed by the Occupational Health Doctor to comply with regulation 27(2), which is the health surveillance requirement. Employers and employees must understand and aware the importance of the occupational health surveillance programs and is prepared to collaborate with OHD. Health surveillance includes any medical examination and inquiry with the goal of detecting exposure levels, biological effects, and reactions. Medical Surveillance Programs components include:

a. Pre-employment and pre-placement medical examination.
b. Biological monitoring and biological effect monitoring.
c. Health effects monitoring.
d. Investigation of occupational disease and poisoning including workplace inspections.
e. Notifications of occupational disease and poisoning.
f. Assist in disability assessment.
g. Return to work examination after medical removal protection.
h. Record keeping and monitoring.

Occupational Safety and Health Act 1994 {Act 514} (*Occupational Safety and Health Act 1994 [Act 514] P.U. (A) 78/1995 Occupational Safety and Health (Employer's Safety and Health General Policy Statement*, 1994) Part VII Safety and Health Organizations under Section 28 (1) explain where it appears to the Minister that in any of the industries or class or description of industries:

a. Cases of illness have occurred which he has reason to believe may be due to the nature of the process or other condition of work.
b. By reason of changes of any new process or in the substances used in any process or by reason of the introduction of any new process or new substances for use in a process there may be risk of injury to the health of person employed in the process.
c. Persons below the age of sixteen years are or are about to be employed in work which may cause risk of injury to their health.
d. There may be risk of injury to the health of persons employed in any occupations specified in the third schedule, or from any substance of material brought to the industries to be used or handled there in or from any change in the conditions in the industries.

2.2.6. Management

In order to enable the efficient and effective completion of projects, the firm must plan, define policies, use management principles, and ensure adherence to the company's goals, just as it does in all other aspects of business. To manage safety and health effectively, an organization must pay attention to some critical factors (Reese & Eidson, 2006). According to the Guideline on Managing Safety, Health, and Welfare in Post-Primary School (2018), the employer is legally required to have a safety statement, a live written document that describes how safety, health, and welfare are managed in a school along with information on school structures, school operations, practices, procedure, and resources for carrying out and maintaining safety, health, and welfare. According to International Labor Organization (ILO), as part of the Safety Statement required by Section 14 of the Occupational Safety and Health Act, 2006, the employer of the organization should:

a. Prepare, and as often as may be appropriate, revise a written statement of policy with respect to the safety and health of employees while at work.
b. Make arrangements for carrying out the statement of policy.
c. Bring the statement of policy and any revision of it to the notice of all the employees.

"An organization has to establish a written policy to protect the following: the safety and health of workers while at work; the safety and health of other individuals who may be present at the workplace, such as customers, visitors, and members of the public; and the safety and health of the general public". This requirement is found in Section 20 of the Safety, Health, and Welfare at Work Act 2005. A policy is necessary in the classroom because it provides everyone to students, teachers, staff, and visitors—with guidelines (Paul et al., 2022). Therefore, school safety and health management must be implemented by schools. However, managing safety has a major financial caused implication in terms of intrinsic cost of safety-related activities in the school and the opportunity cost of spending on safety in relation to other school needs such as staff or academic development which cause most of school tend to give more attention on academic achievement as rather than safety issues which are thought of less important in education sector (Srichai et al., 2013).

3. Materials and Methods

3.1. Design of the Study

A qualitative research design was adopted for this study. Qualitative methods do not assess relationships between variables and cannot express such relationships as correlational, causal, or comparable (Westerman et al., 2015). In this research, a cross-sectional design was employed to examine the implementation of the OSH school checklist in primary schools. A cross-sectional design involves administering data collection tools (e.g., surveys or interviews) once to a sample, thereby capturing information on the measured characteristics at a specific point in time (Graziano, 2000). The researcher collected all data simultaneously, similar to a case-control study, and classified responses based on categorical characteristics (Adams, 2014). According to Kesmodel (2018), cross-sectional studies are characterized by the collection of relevant information at a given point in time, without a time dimension. All data are typically collected during or around the time of the study. While cross-sectional studies are said to occur at "a point in time," this point is rarely explicitly defined (Kesmodel, 2018). This study employed two main data collection methods: (1) distribution of the OSH school checklist, and (2) interviews with school representatives.

3.2. Population and Sample

The population of this study comprised schoolteachers from primary schools in the Batu Pahat zone, Johor. The focus was specifically on primary schools within the Batu Pahat zone. The schools were selected using random sampling, based on data retrieved from the Ministry of Education's website, published on 31st May 2023 (refer to Appendix A). According to statistics from the Ministry of Education, there are 103 primary schools in the Batu Pahat district, which encompasses multiple zone areas. Batu Pahat has the highest number of primary schools in the state of Johor. Out of the total, 68 primary schools are located within the Batu Pahat zone. The Batu Pahat city comprises 17 zone areas, each with different postal codes. Of the 68 schools, 4 are in rural areas, while the remaining 13 are situated in urban areas, as shown in Table 1. The sampling technique used in this study was purposive sampling. According to Teddlie & Yu (2007), purposive sampling is employed in various research contexts, including to achieve representativeness, allow for comparisons, focus on specific or unique issues, and generate theory through the accumulation of data from diverse sources. The respondents for this study were members of the school's top management, specifically the Senior Assistant for Student Affairs, the Senior Assistant for Administration, and 3K teachers (teachers responsible for safety, health, and environment), as these roles are directly involved in school safety management and relevant to the study's objectives.

Table 1. Postcode of Batu Pahat city zone area

No	Postcode	Area	No	Postcode	Area
1	83600	Rural	10	83030	Rural
2	86400	Rural	11	83040	Rural
3	83000	Urban	12	83200	Urban
4	83020	Urban	13	83100	Urban
5	83500	Urban	14	83400	Urban
6	83010	Urban	15	86100	Urban
7	83050	Urban	16	83400	Urban

8	83300	Urban	17	86100	Urban
9	83307	Urban			

3.3. Sample size

The data collected for this study were based on three main objectives: (i) to identify the elements of the Occupational Safety and Health (OSH) school checklist, (ii) to initiate the implementation of the OSH school checklist in schools, and (iii) to understand the current implementation of OSH management practices from the schools' perspectives. The sample for this study consisted of individuals working in schools who are directly involved in safety management. This includes top management personnel, namely the Senior Assistant for Student Affairs, the Senior Assistant for Administration, and teachers responsible for safety management (3K teachers). A total of 20 respondents participated in this study, with 4 respondents selected from each of 5 different primary schools. This sample was chosen to assess their level of awareness regarding OSH management practices in primary schools. Ultimately, ensuring a safe school environment is the shared responsibility of all staff members, particularly those in leadership and safety-related roles.

3.4. Data Collection

The data collected for this study were aligned with its three main objectives: (1) to identify the elements of the Occupational Safety and Health (OSH) school checklist, (2) to initiate the implementation of the OSH school checklist in schools, and (3) to understand the current implementation of OSH management practices from the schools' perspectives. Data were collected using two primary methods: an Occupational Safety and Health (OSH) school checklist and interviews with teachers from selected primary schools in the Batu Pahat zone area, Johor. The respondents were school personnel involved in safety management. According to (Morse, 2000), the quality and depth of data obtained from each individual are more important than the number of participants. She emphasizes that researchers should consider factors such as the scope of the study, the nature of the issue (e.g., complexity and accessibility), the quality of data, and the overall study design when determining the sample and data collection strategy. The data collection process in this study was conducted in six phases, as illustrated in Figure 2. These phases provided a systematic flow for gathering and organizing data relevant to the study objectives.

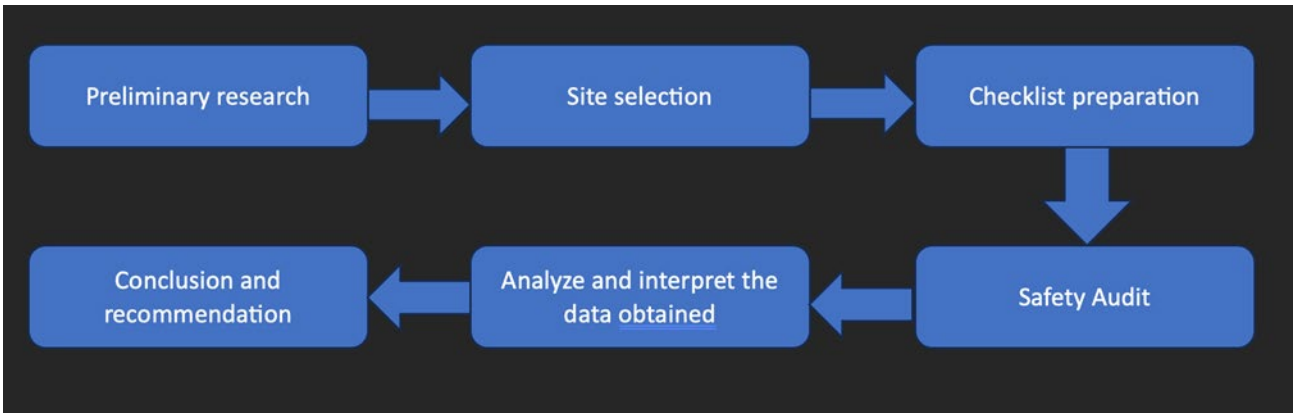

Figure 2. Phase of data collection

3.5. Instrumentations

The assessment tool, instrumentation and methods used for each parameter tested is illustrates as in Table 2.

Table 2. Parameter tested assessment tools and instrumentation used

Parameter	Assessment tool & instrument	Methods	Quality control
		Checklist was adapted by (Institut	

Parameter	Assessment tool & instrument	Methods	Quality control
Occupational Safety and Health (OSH) checklist	Questionnaire from OSH school checklist	Keselamatan dan Kesihatan Pekerjaan Negara (NIOSH), (2017). Buku Panduan Keselamatan Dan Kesihatan Pekerjaan Untuk Sekolah Tahfiz, Southampton City Council School Health and Safety Inspection Checklist, (2012), School Safety Inspection Checklist for Virginia Public School, (2016), Texas School Safety Center. School Safety and Security Checklist, (2019)	The questionnaire was reviewed and compared with the existing OSH checklist to verify and validate the attributes in checklist that suitable for school to be audited.
Current implementation of occupational safety and health management practice in school according to school's perspective	Interview questionnaire	Interview questionnaire was adapted by (Alberta Construction COR Audit Tool, 2021; Safety and Health Assessment System in Construction, 2020)	The interview questionnaire was reviewed to identify and verify that suitable to be adapted in interview questionnaire.

3.6. Checklist

A set questionnaire was prepared to access the information from teachers and staff and the current implementation of OSH management in primary school. The questionnaire was structured into six elements: management, environment, traffic, signage, medical and hazard. The questionnaire was in closed ended question, which is limit the options accessible to respondents, yet many of them find these simple to work with and while the questionnaire type in checklist, where the respondent is asked to tick suitable responses such as reasons for an action or anything they have experienced (Adams, 2014). The questionnaire covers the Malay language medium of communication for this primary school. For the measurement in this checklist, this study employs which questions yes - no response options are used for all statement of compliance in each element in the checklist.

3.7. Interview

The interview in this study is conducted in orally through conversation with formal interview with schoolteachers during an onsite observation and the answers are recorded in writing and recordings. Semi-structured interview method is conducted in this study. The interview question form for divided into two sections. Section A of the interview questionnaire present the current implementation of OSH management practice in school according to school's perspective to the top management of school while Section B also focus on the teacher that involved in safety and health management (3K) about their perspective on current implementation of OSH management practice in school on this study.

3.8. Data analysis

The interviews in this study were conducted orally through formal, semi-structured conversations with schoolteachers during onsite observations. Participants' responses were documented both in writing and through audio recordings. The use of a semi-structured interview method allowed for flexibility while maintaining a consistent framework for data collection. Once all questionnaire responses and checklist data had been gathered, the primary data were compiled and interpreted into a clear and concise report format. The qualitative data obtained from the interviews were analyzed using ATLAS.ti 9 software, as shown in Table 3.3. The interview data were transcribed into written text and underwent a systematic analysis

process, which involved repeatedly reviewing the transcripts, identifying emerging themes, grouping related themes into major themes, categories, and subcategories, assigning codes to each theme and aligning them with the relevant segments of text, including direct quotations, and organizing the content within each category to identify meaningful patterns and insights. In parallel, the OSH checklist results were analyzed quantitatively by calculating the percentage of compliance for each item. This analysis allowed for a comparison of safety and health compliance levels across the selected schools and helped identify existing gaps in OSH practices based on the checklist criteria.

Table 3. Statistical data analysis

No.	Objective(s)	Variable(s)	Analysis
1	To identify the elements of OSH school checklist	-Management -Environment -Hazard -Traffic -Signage -Medical -Demographic of school	Thematic Analysis
2	To determine the current implementation of OSH management practice in school according to school's perspective.	-School background -OSH management in school -Suggestion and recommendation	Thematic Analysis
3	To initiate on OSH school checklist to implemented in school.	-Management -Environment -Hazard -Traffic -Signage -Medical	Descriptive Analysis

4. Results and Discussion

4.1. Essential Elements of the OSH School Checklist

The interview in this study is conducted in orally through conversation with formal interview with schoolteachers during an onsite observation and the answers are recorded in writing and recordings. Semi-structured interview method is conducted in this study. In order to initiate Occupational Safety Health (OSH) school checklist that can be apply to primary school for the data was determined from in Malaysia especially in Batu Pahat zone area. The school checklist was adopted four different school checklists from each school and country. Each of safety and health school checklist has been identified by coding each attribute to categorize in each element of occupational safety and health checklist. Each attribute was analyzed into six elements; management, environment, hazard, signage, medical and traffic of occupational safety and health checklist by coded using thematic analysis Each attribute been identified that suitable with occupational safety and health in Malaysia of primary school condition that attached at Appendix A. These attributes of safety and health school checklist validated by expertise after coded and analyzed through thematic analysis. These attributes become the questionnaire for the occupational safety and health (OSH) school checklist that been finalized after made some amendments to create and initiate a new Occupational Safety and Health (OSH) school checklist in primary school.

4.2. Informants

The interview in this study is conducted in orally through conversation with formal interview with schoolteachers during an onsite observation and the answers are recorded in writing and recordings.

Semi-structured interview method. The table 4.1 show information related to the respondent's background which consists of 10 respondents consisting of senior assistant teacher of student affairs and administration and 3K (health, cleanliness, and safety).

Table 4. Background of respondents (External studies 2023)

Respondent	Position	School
R1	Senior assistant teacher of student affair	SK Bukit Soga
R2	Senior assistant teacher of administration	SK Parit Raja
R3	Senior assistant teacher of student affair	SK Seri Gading
R4	Senior assistant teacher of student affair	SK Sri Manggis
R5	Senior assistant teacher of administration	SK Sri Nasib Baik
R6	3K Teacher	SK Bukit Soga
R7	3K Teacher	SK Parit Raja
R8	3K Teacher	SK Seri Gading
R9	3K Teacher	SK Sri Manggis
R10	3K Teacher	SK Sri Nasib Baik

4.3. Qualitative Analysis

The interview in this study is conducted in orally through conversation with formal interview with schoolteachers during an onsite observation and the answers are recorded in writing and recordings. Semi-structured interview method. In this study, thematic analysis was used by the researcher for analyze the questions presented in the interview session with describe the behavior identified through communication. Data qualitative is data obtained by involving, notes and texts many and the data obtained through interviews need to be interpreted first. Therefore, ten respondents were interviewed to complete the research.

4.4. Interviews

The interviews in this study were conducted orally through formal conversations with schoolteachers during onsite observations. The responses were documented both in written form and via audio recordings. A semi-structured interview method was employed, allowing for flexibility in responses while maintaining a consistent set of core questions. The duration of each interview varied depending on the number of questions directed to each respondent. The interview questions were divided into two sections, targeting two different groups: the school's top management and teachers. An interview, as a research method, involves a conversation between two parties: the interviewer and interviewee, where the interviewer poses questions, and the interviewee provides answers based on their knowledge and experience. The questions focused on the current status of safety and health practices in primary schools, the participants' opinions regarding Occupational Safety and Health (OSH), and their suggestions and actions for improving safety and health within the school environment. The interview questions, as outlined in Table 5, were designed by the researcher and categorized into two parts. Overall, the interview method was used to achieve the second objective of the study: to determine the current implementation of OSH management practices in schools from the perspective of school staff.

Table 5. Parts of the interviews

Section	Remarks
Section A	Top management from the primary school
Section B	School teachers from the primary school

4.5. Themes and Codes

On the basis of the interview responses regarding the current status of OSH (Occupational Safety and Health) management practices in schools from the perspective of primary school staff, the data were analyzed and coded according to key elements of safety and health. Thirteen themes were identified: management, commitment, awareness, environment, hazard, signage, systems and procedures, traffic, medical, training, accidents and injuries, and actions. All interview transcripts were analyzed thematically

and coded by the researcher. Since the researcher conducted all interviews, they possessed a strong and comprehensive understanding of the emerging themes, enabling consistent and accurate coding throughout the analysis.

Table 6. Themes and codes for management

Themes	Codes	Participants Quotes
Management	Safety Plan	*Ada tapi berfokus kepada murid*
	3K	*untuk kesihatan, ada jawatankuasa dia, keselamatan, se…kebakaran pun kita ada jawatankuasa dia dan kesihatan pun ada*
	Safety audit	*...hurm setakat ni macam tak ada audit keselamatan*
	Involve allocation from ministry	*sekolah tak de geran khusus untuk baik pulih, dan baik pulih kami tak pegang*
	Class control book	*buku ni kawalan dalam bilik darjah*
	Insurance	*perlindungan insurans daripada KPM memang tidak ada secara khusus*

The outcome of the thematic analysis identified five codes under the management theme related to safety and health practices in primary schools. These include the safety plan, 3K program, safety audit, allocation from the Ministry, and class control book.

Table 7. Themes and codes for commitment

Themes	Codes	Participants Quotes
Commitment	Scope of work	*...sebab keutamaan kita ni dekat…dekat bidang pendidikan ni lebih kepada pembelajaran murid*
	Responsibility	*guru perlu memastikan keselamatan murid semasa berada di sekolah*
	Private sector workers	*pekerja swasta, pembersih, keselamatan, pembersihan dengan er keselamatan…menjaga semua warga sekolah ah macam tu…*
	Rules	*...semua yang bekerja ataupun semua penjawat awam ni tertakluk kepada peraturan*

The outcome of the thematic analysis has coded 4 codes for commitment themes related to safety and health practice in primary school that consists of scope of work, responsibility, private sectors workers and rules.

Table 8. Themes and codes for awareness

Themes	Codes	Participants Quotes
Awareness	Legislation	*tak ada pendedahan*
	role model	*cikgu dah jadi pendidik, awak didik itu lah role modelnya kalau awak jadi pendidik pun tak boleh nak bagi role model terbaik ah budak ikut ah*
	NIOSH	*...faham kalau NIOSH ni memang langkah keselamatannya adalah pada pekerja ah daripada pekerja tu selamat baru lah dia boleh lindung yang bawah*

The outcome of the thematic analysis has coded 3 codes for awareness themes related to safety and health practice in primary school that consists of legislation, role model and NIOSH. According to the interview result from top management, there some respondents not really aware and realize and clearly enough know about their responsibilities under legislation whether from the ministry of education (KPM) or by OSHA.

Table 9. Themes and codes for environment

Themes	Codes	Participants Quotes
Environment	Limited of rooms	*memang ah kami adalah tempat yang terhad bilik pun terhad*
	School building	*sekolah memang mengalami kerosakan bangunan..*
	Flood	*...bahagian sekolah ni hah diwarkan lah tak boleh masuk kawasan sekolah masa banjir*
	Cleanliness around the school area	*penggunaan penggunaan yang bilik-bilik, alatan kalau keselamatan dan Kesihatan di tempat kerja er..rutin yang sama lah kita macam jaga kebersihan*
	Electrical wiring system	*...sini selalu berlaku wayar litar pintas dan pernah berlaku beberapa kali terbakar pun dia punya wayar dia ah jadi kita terus call dengan JKR*
	Ceiling	*...cikgu PJ kena masuk ambilkan barang, budak tak boleh sebab kita takut entah siling yang mana pula jatuh kan*

The outcome of the thematic analysis has coded 5 codes for environment themes related to safety and health practice in primary school that consists of limited of rooms, school building, flood, and school facility cleanliness.

Table 10. Themes and codes for hazard

Themes	Codes	Participants Quotes
	Uneven surface	*...bangunan tu yang agak tak rata so cikgu yang pakai kasut tinggi kena hati-hati*

Themes	Codes	Participants Quotes
Hazard	The bridge cracked	*...bawah dah crack sebab bila air, kami ni ada satu fenomena bila tenghari air pasang kalau air tinggi kan air pasang dia akan melalui jambatan*
	Wild animal threat	*Selalu dia berlari…. tupai dah biasa tempat dia bermain,,,*

Next is hazard, there are 3 codes been coded in hazard themes that consist of surfaces uneven, the bridge cracked, and wild animal threat. The school building in SK Parit Raja has cracks, the effect of cracked is causing to uneven surfaces in that school. According to R7, the respondents stated that the building of surfaces is a bit uneven so the teachers who wear high shoes must be careful when walk past that area and the teachers also must remind the student to be careful when walk past at uneven surface area. Next, R5 stated that the bridged in front of SK Sri Nasib Baik had cracks, this issue has been clarified and monitored from Universiti Tun Hussein Onn Malaysia (UTHM) before. R5 from SK Sri Nasib Baik mentioned that the school facing the threat from monkeys, squirrels. The monkey usually will always appear at noon while squirrels during in the morning.

Table 11. Themes and codes for signage

Themes	Codes	Participants Quotes
Signage	Fire safety plan	*...contohnya kalau berlaku kebakaran je kita dah ada pelan*
	Speed bump	*ah tapi kawasan masuk dan kawasan kampung sekolah dia tak ada bonggol*
	AWAS sign	*'AWAS' kawasan murid melintas tu inisiatif kami sendiri*
	Non-smoking area	*kalau kawasan larangan merokok tu ada jadi itu untuk keselamatan pekerja lah*

The outcome of the thematic analysis has coded 4 codes for signage themes related to safety and health practice in primary school that consists of fire safety plan, speed bump, AWAS and non-smoking are.

Table 12. Themes and codes system & procedure

Themes	Codes	Participants Quotes
System & procedure	EMIS	*web aduan*
	WhatsApp & Telegram	*melaporkan keadaan sekolah yang tidak selamat*
	SPKS	*...berkenaan dengan keselamatan sekolahlah…dia lebih kepada murid…*

Next for outcome of the thematic analysis, has coded 6 codes for system & procedure themes related to safety and health practice in primary school that consists of EMIS, WhatsApp & Telegram, SPKS, District Education Office (PPD), Permission leave form and permission letter. (EMIS) Education Management Information System or called as Sistem Maklumat Pengurusan Pendidikan is a platform developed by the Malaysia Ministry of Education (KPM) to improve the school administration and management system. According to the respondent answers, 3 of the respondents stated EMIS is a platform to make a complaint and report about the unsafe of school building and infrastructure condition. SPKS or called as Sistem Penaarafan Keselamatan Sekolah one of system that require for 3K committee members of senior assistant teacher of student affairs to fill in through the website. It works for implementation of school safety

standards score that need to fill in twice a year which in April and October. In consist of 70 statements with 5 elements in SPKS. Most of respondents know and aware regarding this platform.

Table 13. Themes and codes for medical

Themes	Codes	Participants Quotes
Medical	Eye test medical	*web aduan…kesihatan pasal mata tu daripada pihak luar lah*
	Prohibited from giving medicine to students	*…sebenarnya bagi ubat pun sebenarnya tak boleh*

The outcome of the thematic analysis, has coded 2 codes for medical themes related to safety and health practice in primary school that consists of eye test medical, prohibited from giving and medicine to students.

Table 14. Themes and codes for training

Themes	Codes	Participants Quotes
Training	Safety and Health Officer	*pernah ikut course tu tapi tak ambil untuk sampai ke peringkat apa…sijil lah, persijilan tu*
	External agency	*ada buat program juga lah*
	Fire drills	*latihan kebakaran dengan bomba*
	Uniform bodies unit	*…kita ada unit pengurusan risiko dalam hurm…organisasi*
	Never involve	*tak pernah*

Next for outcome of the thematic analysis, has coded 5 codes for system & procedure themes related to safety and health practice in primary school that consists of safety and health officer, external agency, fire drills, and uniform bodies unit and never involve.

Table 15. Themes and codes for accidents & injury

Themes	Codes	Participants Quotes
Accident & Injury	Fainted	*…cikgu dekat sekolah ni pengsan*
	Fell	*….jatuh macam masa main*
	Broken (Fractured)	*patah tangan*
	Miscarriage	*..Pernah keguguran semasa mengajar*

Table 16. Themes and code for action

Themes	Codes	Participants Quotes
	Call and inform parents	*…hubungi ibubapa dia maklumkan anak dia akan kita bawa ke hospital…*
	Give a treatment	*terus ambil tindakanlah, ambil tindakan sama ada beri pertolongan cemas kalau boleh…*

Themes	Codes	Participants Quotes
Action	Send to the clinic or hospital	*…tengok jenis kecederaan lah macam budak jatuh, injured ataupun luka, tahap luka tu kalau perlu tindakan segera kita terus ke…klinik Kesihatan lah untuk dapatkan rawatan …*
	Inform and discuss with school management	*kita kena berbincang dulu dalam pihak dalaman kalau di sekolah kita akan berbincang dulu dengan pentadbir dengan guru besar dengan jawatankuasa yang ada lepas tu baru kita refer dengan PPD, JPN baru KPM*

4.6. OSH School Checklist Analysis for Six Elements of Safety

OSH school checklist which has been initiated consists of six elements of safety which are chosen according to first objective analysis through thematic analysis with selected existing checklist. The six elements are management, signage, and environment, medical, traffic and hazard. Closed-ended questions Method that used in this checklist There were 20 set of checklists distributed to 20 of respondents are chosen to answer it. There were 20 set of checklists distributed to 20 of respondents are chosen to answer it. They are selected from top management of school, 3K teacher and the schoolteacher from each five primary school. Each element is followed by questions based on the item that attached on Appendix B.

4.6.1. Management

For management attributes, two aspects are emphasized: the Occupational Safety and Health (OSH) plan in the school and the safety and health committee. Referring to Table 4.6, all five schools (100%) have an established safety plan. About 85% of schools display the plan publicly, while the remaining 15% do not. Among staff interviewed, 90% were informed about the safety plan, but 10% were not aware of it. All five schools have a safety and health committee, consisting of administrators, teachers, and school staff. However, only 60% of these committees hold regular meetings, at least once every three months. Meanwhile, 80% of committee members actively perform the functions of the Occupational Safety and Health Committee (JKKP). SK Sri Nasib Baik was specifically noted for its fire safety plan.

4.6.2. Signage

In terms of signage from the checklist, two key aspects were highlighted: self-security facilities and the fire alarm system. All schools (100%) have established fire safety procedures, guidelines, and safety notices. At SK Seri Gading, fire training is conducted regularly. Regarding evacuation facilities, 95% of the five schools have an emergency staircase, while SK Seri Gading relies on the same set of stairs for evacuation. Meanwhile, 85% of the schools provide at least two exit doors from the building. SK Sri Nasib Baik stands out for having smaller class sizes and fewer students, which may help in evacuation. About 70% of the schools have doors and windows fitted with iron gratings designed to be easily opened during a fire. However, only 65% have proper emergency exit signage at every exit door, and 60% of schools lack emergency lighting. For fire alarm systems, all schools (100%) are equipped with fire extinguishers on every floor, maintain emergency contact information, and conduct fire and evacuation drills at least once a year. Furthermore, 80% of schools have a fire hydrant located within 90 meters of the building and also provide basic first aid training. At SK Seri Gading, basic first aid training is included as part of the uniformed unit's activities. In terms of signage and systems, 75% of schools have designated assembly points for emergency evacuation. Around 70% are equipped with automatic alarm systems and glass-break alarms. However, 75% of the schools do not yet have heat or smoke detection systems in place.

4.6.3. Environment

For the environment's statement in OSH school checklist, there are two things that emphasized which is welfare and facilities condition (class, canteen, and office). In welfare term, 100% of them have a toilet

facility (different for boy and girl). Have a canteen (place to eat during recess) and sports and social facilities. 95% of them are having bath and storage area while SK Seri Gading was remarked because not having it. 80% of them provide the prayer hall for the staff and student to pray. SK Seri Nasib Baik was remarked for not provide it. For the school facilities section, 100% in the five-school interviewed are 100% have adequate lighting, fire extinguisher was provided and there`s no obstacles in the emergency route. 95% of them had good electrical wiring. 90% of them provided a good condition for table and chair while SK Seri Nasib Baik were not since that school was not affected in flood. While for cleanliness and comfort only 65% of them were good for the student.

4.6.4. Hazard

Based on the findings obtained from the checklist, there were 9 statements for hazard system. In this case hazardous things were included in the term of safety of building, electrician, and storage. 100 % in the school had adequate lighting (not dim), no path is blocked and how to be organized safely. 90% form school has arranged item in neat and labeled the item also Electrical equipment is connected and in a safe condition. 85% out from 5 school has a good floor and roof condition (not slippery and no fungus). School also makes sure that condition was maintained by competent person hired by school. SK Bukit Soga was remarked by two blocks are being maintained and renovated.

4.6.5. Medical

According to the result obtained from the checklist, the first statement for medical included trained person and first aid. 90% from schools are having a first aid kit and enough first aid kit that are still not expired. 85% from them are having enough first aid kit stock while SK Bukit Soga only in the certain rooms and special rooms. 75% are using a hand glove for treating wounds in the infected area. 70% of they know how the procedures to ensure first aid kits comply with current laws and guidelines. 60% from them were displayed the first aid- ere name and some of the staff also know the medical management policy. 60% out of five schools does not have the trained first aider person. 75% of them are not having the certified and recognized certificate.

4.6.6. Traffic

Referring to the last element in the checklist, which is traffic management, all schools (100%) have designated parking spaces and specific areas for student drop-off and pick-up. Around 95% of schools have staff on duty during these times to ensure safety. The designated parking lots are adequately lit, and footpaths are in safe condition with multiple routes available. Additionally, 90% of schools have staff overseeing the parcel delivery areas. About 75% of schools clearly display traffic warning signs, and 70% have their traffic areas properly marked. At SK Seri Gading, only part of the traffic area is marked. Approximately 65% of schools have separate paths for vehicles and students, as well as different parking zones for guests, buses, and staff. However, 60% of schools have not marked specific areas for buses, limiting the use of other vehicles. At SK Bukit Soga, the bus parking markings were worn out and need replacement, while SK Seri Gading did not require it. In terms of parking conditions, 80% of schools do not have well-maintained bus parking areas or good street conditions. SK Bukit Soga requires attention for its van lot, while SK Seri Gading does not. Lastly, 85% of schools do not have external video cameras covering the bus parking areas.

5. Conclusions

This study successfully addressed all three research objectives regarding the implementation of Occupational Safety and Health (OSH) in selected primary schools. Firstly, the study identified the key elements of OSH based on the existing school safety checklist, which include management, traffic, medical, signage, environment, and hazard. These elements were categorized and coded through thematic analysis, revealing their relevance and appropriateness to the conditions of primary school facilities in Malaysia. Secondly, the current practices of OSH management in schools were explored through interviews with ten respondents from five primary schools in the Batu Pahat zone. The findings revealed that while schools do provide safety policies, these are often limited in scope focusing mainly on students and infrastructure, with little emphasis on the safety and health of teachers and staff. Fire safety remains the primary concern, with most schools collaborating with external agencies such as firefighters, civil defense, and police, but lacking

comprehensive OSH training or engagement with the National Institute of Occupational Safety and Health (NIOSH).

Furthermore, many staff members are unaware of their legal rights and responsibilities under OSH legislation, and some have even undertaken unsafe tasks due to procedural delays and budget constraints. Thirdly, an audit of the adapted OSH school checklist was conducted, revealing partial compliance with OSHA 1994. While some elements, such as signage or medical provisions, showed high compliance in certain areas, others, like traffic safety, exhibited poor adherence. Particularly concerning was the condition of "Sekolah Kurang Murid," which suffer from inadequate infrastructure and limited oversight from authorities such as the Ministry of Education and the District Education Office. Despite efforts by school management to report issues through the EMIS system, responses have been insufficient due to systemic constraints like underfunding and backlog of complaints. These findings highlight the critical need for a more comprehensive, inclusive, and enforceable approach to OSH in Malaysian primary schools, ensuring the safety of not only students but also teachers and staff.

5.1. Limitations of the Study

One of the main limitations of this study was the difficulty in scheduling appointments with the top management of the primary school. This challenge arose due to the mismatch between the availability of the researcher and that of the school administrators and teachers. In addition, the school's busy schedule, filled with various programs and activities, makes it even more difficult for teachers to allocate time for interviews. Consequently, arranging a suitable date for the interviews was a significant constraint in this study. Despite these challenges, the researcher was eventually able to conduct interviews with the school management, thereby allowing the second and third research objectives to be addressed. Another limitation involved obtaining clear and consistent feedback from respondents. The participants, comprising senior assistant teachers and schoolteachers from diverse age groups, educational backgrounds, and experiences, sometimes expressed their thoughts in ways that were difficult to interpret. Some responses were delivered informally, and in certain cases, participants misunderstood the questions and provided unrelated answers. This required multiple follow-up interviews to ensure that the data collected was aligned with the study's objectives.

5.2. Recommendations for Future Research

Based on the findings of this study, it is evident that there is a lack of research and attention given to the implementation of safety and health management systems in schools. Therefore, it is strongly recommended that further studies be conducted focusing on the safety aspects of schools, particularly because they serve as the learning environment for our younger generation. A safe school environment is crucial, and proper implementation of safety practices is necessary to cultivate a strong safety culture. This, in turn, ensures that students, teachers, and staff feel secure within their educational and working environments. Moreover, public primary schools employ more workers than private schools, as the majority of students attend public educational institutions (Reese & Eidson, 2006). Therefore, the researcher recommends further investigation into the development and promotion of safety culture among schoolteachers and other school personnel. Enhancing safety awareness and ensuring adherence to safety protocols can significantly reduce the risk of accidents and injuries within school premises. Teachers and staff who are trained to identify hazards and take preventive measures play a vital role in maintaining a safe learning environment. When school employees perceive that their safety is a priority, it can lead to improved morale and greater job satisfaction.

In support of this need, the Malaysian government, under the 2024 Budget (Malaysia Madani initiative), announced by Prime Minister Datuk Seri Anwar Ibrahim, has allocated RM1.9 billion for the upgrading and maintenance of schools nationwide, including the redevelopment of dilapidated school buildings. Specifically, RM930 million is designated for the upgrading of 450 schools, including 185 in Sarawak and 155 in Sabah, while RM1 billion is allocated for the maintenance of various types of schools, including national, religious, government-assisted, and special education institutions catering to students with autism (Leong, 2023). A safe work environment not only reduces stress levels among school staff but also contributes to increased job satisfaction. Additionally, schools are required to comply with safety regulations and standards established by local and national authorities. Promoting a culture of safety ensures compliance with these regulations, minimizes legal liabilities, and upholds the concept of a "safe school" in primary education settings.

5.3. Significance of the Study

5.3.1. Government

The adoption of an Occupational Safety and Health (OSH) checklist in primary schools, as highlighted in this study, underscores the government's responsibility to safeguard the welfare and safety of workers, including teachers and school staff in accordance with existing laws and regulations. The study enables the identification of gaps in current practices, supports the establishment of clear guidelines and standards, and facilitates more effective allocation of resources. Its findings contribute to the development of comprehensive occupational safety and health policies, legislation, and guidelines tailored for educational settings. Moreover, these insights can be used to formulate school-specific standards and procedures aimed at ensuring a safe and healthy working environment.

5.3.2. Industry

The findings of this study have significant implications for the broader industry. They serve as a valuable guide for other educational institutions and related sectors, encouraging the adoption and prioritization of similar safety measures. By disseminating the research findings and best practices, the study helps to foster a culture of safety awareness and contributes to the development of standardized practices that can be applied across various industries.

5.3.3. Society and workers

Teachers play a crucial role in ensuring a safe and secure learning environment. The findings of this study on the implementation of the OSH (Occupational Safety and Health) school checklist can assist teachers by providing the necessary information and resources to identify potential hazards, respond effectively to emergencies, and create a safe environment conducive to teaching and learning. It empowers teachers to participate in safety planning, implementation, and the promotion of student welfare. Additionally, this study aims to offer valuable insights to school administrators, staff, and educators regarding the effectiveness of the OSH school checklist implementation. It can support schools in developing strategies to prevent hazards, conduct safety training programs, and ensure compliance with occupational safety regulations. These efforts can further involve external stakeholders such as law enforcement agencies, community organizations, and emergency responders.

Such collaboration promotes coordination and the sharing of resources and expertise to achieve a comprehensive and effective approach to both school and worker safety. By prioritizing occupational safety, the study contributes to improving the well-being and welfare of school personnel are individuals who play a vital role in the education system. Green supply chain management (GSCM) has been adopted by many manufacturing industries in Malaysia. It is a critical approach aimed at minimizing the negative environmental impacts associated with supply chain and organizational activities (Rozar et al., 2015). One model currently adopted by the manufacturing sector is the Green SCOR model. This model integrates environmentally conscious practices into the traditional SCOR (Supply Chain Operations Reference) model (Qianhan et al., 2010).

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