

Comprehensive Analysis of School-Related Injuries: A Global Perspective

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ABSTRACT

Background: Injuries among school children globally pose significant concerns, attributed to a myriad of factors including gender differences, environmental risks, and behavioural patterns. This comparative analysis delves into the prevalence of school-related injuries across nations, highlighting disparities and underscoring the necessity for tailored safety measures. Notably, boys exhibit higher vulnerability due to their propensity for active behaviour and engagement in physical activities, with common injury sites identified as playgrounds and classrooms.

Methods: The research methodology employed a meticulous approach, selecting pertinent articles from databases such as IIUM, Proquest, Pubmed, ResearchGate, and Science Direct. From an initial pool of 879 articles, 14 were identified through systematic screening, focusing on aspects related to the knowledge, attitude, and practice of first aid. This selection process ensured a targeted exploration of relevant literature, providing insights into injury management strategies within school settings.

Results: Findings reveal the urgent need for enhanced safety protocols within schools, particularly in regions like Malaysia where injuries rank as a leading cause of morbidity and mortality among children. The comparative analysis across low- and middle-income countries further elucidates variations in hospital admission rates for addressing unintentional injuries in children, highlighting the importance of context-specific interventions.

Conclusion: In conclusion, safeguarding the well-being of school children necessitates a holistic approach that addresses both individual behavior and environmental factors. Robust safety measures, informed by comprehensive research and tailored to specific contexts, are imperative for creating safer learning environments during the critical developmental years of children. Through proactive initiatives and collaboration between educators, policymakers, and healthcare professionals, the goal of mitigating injury incidence and promoting overall child health and well-being can be achieved.

Keywords: School safety; Injury prevention; Risk factor; Child development; School environment

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INTRODUCTION

Kindergarten serves as an early childhood education program designed for children aged four to six, providing a crucial environment for both educational and intellectual development. However, the extended time spent at school unfortunately increases the likelihood of injuries. In a worldwide comparative analysis involving low- and middle-income nations, the likelihood of hospital admission to address unintentional injuries in children was substantially lower in Colombia, Egypt, and Pakistan, with percentages of 95%, 87%, and 83%, respectively, compared to Malaysia [1,2].

Boys are more likely to get injured than girls, mainly due to their active behavior, tendency to take risks, and participation in school games where they might not be fully aware of potential dangers [3]. In the school setting, teachers, as primary caregivers, play a pivotal role in overseeing student welfare, especially during free play, when school-age children are most susceptible to unintentional injuries [4].

Research in various countries, including Turkey and Malaysia, underscores the prevalence of injuries within school environments. Turkey's findings highlight specific locations where accidents commonly occur, such as playgrounds, stairs, classrooms, roads, gyms, and break times. The studies reveal behavioural traits in children, such as unthinking behaviour, a desire to move around, and age-specific characteristics, influencing their vulnerability to injuries.

In Malaysia, injuries rank among the top causes of death and hospitalization, with a significant percentage of reported accidents occurring within the school context [1]. Outdoor activities and falls emerge as prominent factors contributing to injuries, with different age groups exhibiting varying patterns of injury occurrence. In Kedah, for instance, falls are the most common injury, particularly among children aged 1-4 years, while studies in Perak and Terengganu shed light on the prevalence of outdoor-related injuries and variations in injury rates among school-going adolescents, respectively. Therefore, a literature review was conducted to gain a better understanding of injuries among school children.

METHOD

An extensive search was conducted to gather relevant studies and literature for the present study. Research papers were selected based on their availability in the IIUM Database, accessible through the online IIUM library website. The search encompassed electronic databases such as Proquest, Pubmed, ResearchGate, and Science Direct. Keywords including 'Injury', 'School children', 'Incidence', and 'Factor' were utilized individually or in various combinations to retrieve pertinent literature. Full-text articles were sought, resulting in a total of 879 articles found from an online database. These were then systematically narrowed down by analysing them based on the study's problem statement. After thorough screening and analysis, full-text articles focusing on the knowledge, attitude, and practice of first aid were selected, totalling 14 for review. Figure 1 provides a summary of the article search criteria.

Figure 1: Summary of the article search

Online Database	: Proquest, Pubmed, ResearchGate, and Science Direct.
Keywords	: Knowledge first aid, Attitude first aid, Practice first aid, First aid and Kindergarten teachers
Inclusion criteria	: 2017 to 2023, English language, full text journal and scholarly articles
Exclusion criteria	: Thesis

RESULT

In the context of ensuring school safety and promoting student welfare, the importance of acquiring proficiency in first aid cannot be overstated. The capacity to offer immediate aid during instances of injury or illness is not merely a practical skill but also a crucial element in upholding the security of individuals within school premises. Consequently, it becomes essential to grasp the factors associated with injury incidence in school settings. By delving into these factors, which encompass environmental elements and behavioural patterns, educators and administrators can gain a deeper understanding of the underlying hazards and

implement effective preventive actions. This introduction underscores the incidence of injury in the school compound, the significance of acquiring first aid skills and investigates the diverse factors that contribute to injuries within school grounds, emphasizing the necessity for proactive measures to safeguard students' well-being.

1. Incidence Of Injury in The School Compound

Injuries constitute a substantial global cause of mortality, with child injuries raising particular concern due to their potential to significantly impede a child's development, emerging as the leading cause of death in this demographic. The research findings in Turkey [8] indicated that most school injuries took place in the autumn season (60.1%) and during recess periods (38.6%). Regarding the factors contributing to these injuries, 13.3% were attributed to environmental factors, while 86.7% were linked to behavioural causes. Specifically, the type of flooring most associated with injuries was rubber flooring, accounting for 53.6% of incidents, and the area with the highest injury occurrence was the playground-garden, constituting 64% of the total. The school environment's role in exposing children to diverse injury risks, such as faulty equipment and inadequately designed playgrounds [9]. Furthermore, Workneh et al. (4) identifies prevalent causes of accidents in school children, including bullying, slip and fall incidents, school bus and playground accidents, food poisoning, and sports activities resulting in substantial injuries. Turkish studies highlight playgrounds, stairs, and classrooms as frequent locations for school-related accidents or injuries [10].

Studies in Belgium disclose that 70% of school-related accidents involve children under 12, with fractures and bruises (27%), head and brain injuries (21%), and burns (14%) being the most prevalent types (11). Meanwhile, in Ethiopia, survey respondents reported incidents like bleeding (33.3%), fractures (23.4%), nose bleeding (18.4%), epilepsy (12.8%), and back and neck injuries necessitating first aid (10.6) [12].

2. The Significance of Acquiring First Aid Expertise

First aid denotes immediate assistance rendered to individuals facing injury or illness, fostering safety, and averting susceptibility to accidents. While it may suffice for minor injuries, in critical situations, it serves as a temporary measure until professional medical help becomes available. First aid encompasses straightforward procedures guided by common sense, whereas emergency care entails specialized, practical assistance for injuries or sudden illnesses until professional medical aid is accessible, enabling self-help during instances of injury or illness.

Possessing fundamental knowledge in first aid is pivotal for managing critical situations, potentially leading to life-saving outcomes. Faris, Alzeyadi, and Athbi [5] underscore the indispensable role of first aid in casualty situations, emphasizing its potential to save lives. First aid training is imperative, given the substantial number of injuries resulting from inadequate responses. The willingness of bystanders to help doubles the likelihood of survival, emphasizing the importance of providing basic life support while awaiting professional medical assistance. Additionally, first aid knowledge plays a crucial role in alleviating pain by preventing physiological changes in blood pressure, breathing, and pulse; simple interventions like ice packs can prove beneficial before the arrival of emergency medical services.

Moreover, proficiency in first aid significantly contributes to infection prevention. The type of first aid administered markedly affects the likelihood of infection occurrence, with improper training and treatment options exacerbating the situation. Lastly, first aid is indispensable for safeguarding children, who are more susceptible to injuries and medical emergencies [6]. Expertise in handling minor issues like burns and cuts, as well as major incidents such as seizures, is crucial for ensuring child safety, particularly when they are unsupervised and exploring their surroundings.

In conclusion, first aid knowledge is an essential skill empowering individual to respond effectively during emergencies, potentially saving lives, mitigating harm, and promoting overall well-being. Accessible first aid kits, along with trained personnel, should be available in vehicles, offices, and schools to address accidents promptly [7]. Comprehensive training and education on first aid are imperative for everyone, and teachers equipped with first aid knowledge can reduce complications and potentially save children's lives when necessary.

3. Factors Related to Incidence of Injury in The School Compound

The safety and well-being of students within school compounds are crucial, and several factors contribute to injury incidence. Addressing these factors, including physical infrastructure and student behaviour, is essential for creating an environment that fosters academic growth and ensures individual safety. A comprehensive approach, including playground safety, facility maintenance, effective supervision, and emergency response plans, is necessary to reduce risks and contribute to the development of safer educational spaces.

According to a World Report on Child Injury Prevention [13], falls from playground equipment can lead to severe injuries. Playground safety is crucial to prevent falls, as playgrounds were found to be the most common site of school injuries for all age groups, accounting for 44.2% of all other sites [9]. Playground design, equipment, and maintenance can increase the risk of falls. Regular equipment inspections can prevent broken components, while inadequate supervision can lead to rough play and pushy behaviours among children.

Additionally, Al Zeedi et al. [9] stated that gender and age significantly influence the risk of injuries, with boys being more likely to sustain injuries than girls due to their physical activity, risk-taking behaviour, and type of school games they play. The study also revealed that 63.7% of injured students were aged one to four.

Poorly designed playground layouts, such as insufficient spacing near hard surfaces, can also contribute to falls. Environmental hazards, lack

of supervision, or equipment-related issues, providing insights into potential areas for intervention and injury prevention strategies [8]. Studies in Finland show that schoolyards and playgrounds designed for summer, not winter, lead to frequent falls due to snow and ice conditions [14]. By planning, maintaining, and adhering to safety guidelines, schools can create safer playground environments, reducing the risk of falls and providing a safer play experience for children.

Furthermore, the physical environment in the school can be a factor in school injuries due to poor maintenance and inadequate equipment. Salminen et al. [14] stated that the physical environment of a school contributes to 39.7% of all injuries. Regular inspections and maintenance of buildings, playgrounds, and sports equipment are essential to ensure children's safety and development.

Additionally, 25.7% of injuries were attributed to equipment as a contributing factor [9]. Defective educational toys, school furniture, and classroom supplies like pins, staplers, and scissors were common culprits. Proper storage and supervised use of these items can minimize the risk of injuries.

Lastly, younger students may be at a higher risk of injury due to inadequate teacher supervision. Lack of supervision can lead to unmonitored play areas, resulting in rough play and pushing among students, increasing the risk of accidents. Teachers may also struggle to monitor playground safety, leading to potential misuse of equipment and accidents.

DISCUSSION

1. Incidence of Injury in The School Compound

School environments present diverse injury risks, ranging from playground accidents to slip and fall incidents within classrooms. Studies conducted in Turkey [15], Belgium, and Ethiopia highlight the prevalence of injuries among school children, with playgrounds, stairs, and classrooms being common accident sites [16,17]. Environmental factors such as faulty equipment and inadequately designed playgrounds contribute significantly to injury occurrence, emphasizing the importance of maintaining safe infrastructure within school compounds. Understanding the seasonal and

temporal patterns of injuries, such as the higher incidence during recess periods and specific seasons like autumn, provides valuable insights for injury prevention strategies [15].

2. The Significance of Acquiring First Aid Expertise

Proficiency in first aid is paramount for mitigating the impact of injuries within school settings. Research underscores the life-saving potential of first aid interventions, particularly in casualty situations where immediate assistance can significantly improve outcomes [19]. First aid knowledge not only helps alleviate pain and prevent infection but also plays a crucial role in safeguarding children, who are more vulnerable to injuries and medical emergencies [20]. Training teachers and school staff in first aid equips them with the necessary skills to respond effectively during emergencies, potentially reducing complications and saving lives [18].

3. Factors Related to Incidence of Injury in The School Compound

Various factors contribute to injury incidence within school compounds, including environmental hazards, student behaviour, and inadequate supervision. Gender and age differences influence the risk of injuries, with boys and younger students being more susceptible due to their active behaviour and propensity for risk-taking [23]. Poorly designed playground layouts, insufficient spacing near hard surfaces, and equipment-related issues further exacerbate injury risks [21]. Addressing these factors requires a comprehensive approach, including playground safety measures, regular maintenance of school facilities, and effective supervision by teachers and staff [22].

CONCLUSION

In conclusion, the issue of injuries among schoolchildren presents a complex global concern, influenced by gender disparities, environmental factors, and behavioural aspects. Boys, often more inclined toward physical activities and risk-taking, face a higher risk of injuries. Specific areas within schools, notably playgrounds and classrooms, emerge as common accident sites. Malaysia, along with other countries, struggles with injuries as a significant cause of mortality and

hospitalization among school children, highlighting the urgent need for comprehensive safety measures. The comparative study across diverse nations emphasizes the importance of tailoring safety strategies to specific contexts. Ultimately, safeguarding the well-being of school children requires a holistic approach addressing both individual behaviour and environmental factors, ensuring a safer learning environment during their critical developmental years.

It's widely acknowledged that certain minor injuries can be effectively addressed with first aid, reducing the immediate need for medical attention. Therefore, the responsibility lies with schoolteachers to ensure the safety of students and supervise their activities, as they are the primary point of contact and accountable for any resulting injuries. Prompt delivery of first aid by trained individuals nearby is crucial, highlighting the importance for schools to prioritize injury management before considering the transfer of individuals to a medical facility.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest regarding this article's research, authorship, and publication.

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AUTHOR CONTRIBUTIONS

NFCR: drafted the manuscript and contributed to the concept development and design of the article through data collection, analysis and data interpretation for the article.

RR: revised the manuscript critically with intellectual contents and approved the final version of the manuscript.

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