Genius Journal Of Public Health
An International Peer-Reviewed Journal
Published by Genius Publishing
https://geniusjournal.net/
geniuspublichealth@gmail.com

E-ISSN: xxxx-xxxx (Online)
Volume 1, Issue 1, 2026, pp. 22–28
https://doi.org/___

ORIGINAL ARTICLE

The Effect of Health Education on Head Injury on the Knowledge Level of Teachers and Staff at an Integrated Islamic School in Bondowoso

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ARTICLE INFORMATION

Article history:
Received: 2025-12-29
Revised : 2026-01-20
Accepted: 2026-02-29

Keywords:
Health Education; Head Injury; Knowledge Level; Teachers; School Staff

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ABSTRACT

Introduction: Head injury is a pathophysiological condition resulting from trauma to the head that may involve the scalp, skull, brain tissue, or a combination of these structures. Limited knowledge among school personnel regarding the management of head injuries may increase the risk of improper handling in emergency situations.

Objectives: This study aimed to analyze the effect of health education on head injury on the knowledge levels of teachers and school staff.

Methods: This study employed a pre-experimental design with a one-group pretest–posttest approach. The population consisted of all teachers and staff at an Integrated Islamic School in Bondowoso, with a total sample of 25 respondents selected using a total sampling technique. Data were collected using structured questionnaires and analyzed using the Wilcoxon Signed Rank Test with a significance level of $p < 0.05$.

Results: The results showed that prior to the intervention, most respondents had a moderate level of knowledge (14; 56%). After the health education intervention, the majority of respondents demonstrated a good level of knowledge (24; 96%). Statistical analysis revealed a significant improvement in knowledge levels, with a p-value of 0.000 ($p < 0.05$), indicating a significant effect of health education on participants' knowledge.

Conclusions: Health education on head injury significantly improved the knowledge levels of teachers and school staff. Providing regular education and basic skills training on head injury management is recommended to enhance preparedness in handling emergency situations in school settings.

A. Introduction

Head injury is a pathophysiological condition resulting from trauma to the head, which may involve the scalp, skull, brain tissue, or a combination of these structures (Carney et al., 2017; Menon et al., 2010). It remains a major global public health concern due to its substantial contribution to morbidity, mortality, and long-term disability. Globally, traumatic brain injury (TBI) affects more than 50 million individuals each year and represents one of the leading causes of death and disability, particularly in low- and middle-income countries (Dewan et al., 2018; Maas et al., 2017). The burden of TBI is expected to increase due to population growth and rising exposure to injury risk factors, emphasizing the need for effective prevention and early management strategies.

Improper initial management of head injuries can lead to serious complications, including increased intracranial pressure, secondary brain injury, neurological deterioration, and even death (Carney et al., 2017). Early recognition and timely first aid intervention are therefore essential in minimizing complications and improving patient outcomes. Evidence suggests that appropriate early management significantly reduces the risk of long-term disability and mortality among individuals with head trauma (Maas et al., 2017; Hawryluk et al., 2020).

Head injuries frequently occur in everyday environments, including schools, where children are exposed to various risks such as falls, collisions, and sports-related injuries (Stewart et al., 2020; Babl et al., 2017). In school settings, teachers and staff often serve as the first responders in emergency situations before professional medical care is available. However, inadequate knowledge and lack of first aid skills among school personnel remain a critical issue, potentially leading to delayed or inappropriate management that may worsen injury outcomes (Al-Khatib et al., 2021; Zayapragassarazan & Kumar, 2020).

Knowledge is a key determinant of individual behavior, particularly in emergency response situations. According to health behavior theory, knowledge influences attitudes and practices, ultimately shaping how individuals respond to health-related problems (Glanz et al., 2015). Individuals with adequate knowledge are more likely to perform appropriate actions, while those with insufficient knowledge may engage in incorrect or harmful practices (Rosenstock et al., 2019). This highlights the importance of improving knowledge as a foundation for effective behavioral change.

Health education is a systematic and structured process designed to improve knowledge, attitudes, and health-related behaviors (Glanz et al., 2015). It equips individuals with the necessary information and skills to make appropriate decisions and respond effectively in emergency situations. Previous studies have demonstrated that educational interventions significantly improve first aid knowledge, confidence, and response skills among non-medical personnel, including teachers (Miller et al., 2020; Banfai et al., 2017).

Furthermore, structured training programs have been shown to enhance teachers' preparedness in managing school-related emergencies, including head injuries (Al-Khatib et al., 2021; Choudhary & Choudhary, 2024). Educational approaches that integrate theoretical knowledge with practical demonstrations are particularly effective in improving retention and application of skills (Miller et al., 2020; Banfai et al., 2017).

Despite the proven effectiveness of educational interventions, gaps in knowledge and practice remain evident in many settings. Teachers and school staff often lack adequate training in emergency management, particularly in developing countries, where access to formal first aid education is limited (Peden et al., 2019). This gap may lead to suboptimal responses during emergencies, increasing the risk of complications among injured children.

Preliminary observations at Sekolah Islam Terpadu Mutiara Hati Bondowoso indicated that several teachers and staff had limited knowledge regarding the management of head injuries. This condition highlights the urgent need for targeted health education interventions to improve their knowledge and preparedness.

Therefore, this study aimed to analyze the effect of health education on head injury on the knowledge levels of teachers and school staff at Sekolah Islam Terpadu Mutiara Hati Bondowoso.

B. Methods

This study employed a pre-experimental design using a one-group pretest–posttest approach to evaluate the effect of health education on head injury on the knowledge levels of teachers and school staff. This design allowed the assessment of changes in knowledge before and after the intervention without the use of a control group.

The study was conducted at an Integrated Islamic School in Bondowoso, Indonesia. The target population consisted of all teachers and staff working at the institution. A total of 25 participants were included in the study using a total sampling technique, in which all members of the population who met the inclusion criteria were selected as respondents.

The inclusion criteria were all teachers and school staff who were willing to participate in the study and present during data collection. Participants who were absent, ill, or unwilling to participate were excluded from the study.

The independent variable in this study was health education on head injury, defined as a structured educational intervention providing information about the definition, causes, signs and symptoms, classification, and basic management of head injury. The dependent variable was the level of knowledge of teachers and staff regarding head injury and its management.

Data were collected using structured questionnaires. Questionnaire A was used to obtain demographic characteristics of the respondents, including age, education, and occupation. Questionnaire B consisted of 14 validated items used to assess participants' knowledge of head injury and its management. The validity test indicated that 14 out of 15 items were valid and used in the study.

Knowledge levels were measured based on the percentage of correct answers and categorized into three levels: good (>76%), moderate (56–75%), and poor (<56%).

Data collection was conducted in two stages. First, a pretest was administered to assess baseline knowledge. This was followed by the delivery of a health education session on head injury. After the intervention, a posttest was conducted using the same questionnaire to evaluate changes in knowledge levels.

Data analysis was performed using descriptive and inferential statistics. Univariate analysis was used to describe respondent characteristics and knowledge levels using frequency and percentage. Bivariate analysis was conducted using the Wilcoxon Signed Rank Test to determine differences in knowledge levels before and after the intervention, with a significance level of $p < 0.05$.

Ethical considerations were maintained throughout the study. Informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity were ensured by not including participants' names in the data collection process, and all information obtained was used solely for research purposes.

C. Results

A total of 25 respondents participated in this study, consisting of teachers and school staff. The characteristics of respondents are presented based on age, education level, and occupation, followed by the distribution of knowledge levels before and after the intervention.

Most respondents were aged above 26 years (14; 56.0%), while 11 respondents (44.0%) were aged 25 years. In terms of education, the majority held a bachelor's degree (20; 80.0%), followed by senior high school (3; 12.0%) and diploma level (2; 8.0%). Regarding occupation, most respondents were classroom assistant teachers and homeroom teachers (each 9; 36.0%), followed by administrative staff (3; 12.0%), art teachers (2; 8.0%), and principals (2; 8.0%).

Table 1. Characteristics of Respondents (n = 25)

Variable	Category	n	%
Age	25 years	11	44.0
	>26 years	14	56.0
Education	Senior High School	3	12.0
	Diploma	2	8.0
	Bachelor's Degree	20	80.0
Occupation	Homeroom Teacher	9	36.0
	Assistant Teacher	9	36.0
	Art Teacher	2	8.0
	Administrative Staff	3	12.0
	Principal	2	8.0

Prior to the intervention, most respondents had a moderate level of knowledge regarding head injury (14; 56.0%), while 11 respondents (44.0%) had good knowledge. No respondents were categorized as having poor knowledge.

After the health education intervention, a significant improvement in knowledge levels was observed. The majority of respondents demonstrated a good level of knowledge (24; 96.0%), while only 1 respondent (4.0%) remained in the moderate category. No respondents were categorized as having poor knowledge.

Table 2. Knowledge Levels Before and After Intervention (n = 25)

Knowledge Level	Pre-test n (%)	Post-test n (%)
Good	11 (44.0)	24 (96.0)
Moderate	14 (56.0)	1 (4.0)
Poor	0 (0.0)	0 (0.0)

The effectiveness of the intervention was further analyzed using the Wilcoxon Signed Rank Test. The results indicated a statistically significant difference between pre-test and post-test knowledge levels ($p = 0.000$; $p < 0.05$), demonstrating that health education had a significant effect on improving respondents' knowledge.

D. Discussion

The findings of this study demonstrated a significant improvement in knowledge levels among teachers and school staff following the health education intervention on head injury. Prior to the intervention, most respondents had a moderate level of knowledge, whereas after the intervention, the majority achieved a good level of knowledge. The statistical analysis confirmed

that this improvement was significant, indicating that health education is an effective strategy for enhancing knowledge in non-medical populations.

The increase in knowledge observed in this study can be explained by the role of structured educational interventions in facilitating cognitive learning processes. Health education provides individuals with new information, reinforces existing knowledge, and improves understanding through systematic delivery methods. According to behavioral theories, knowledge acquisition is a fundamental step in shaping attitudes and practices, particularly in health-related behaviors (Glanz et al., 2015; Rosenstock et al., 2019). Individuals who receive appropriate education are more likely to understand, retain, and apply the information in real-life situations.

These findings are consistent with previous studies demonstrating that educational interventions significantly improve first aid knowledge among teachers and non-medical personnel. Research has shown that structured training programs can enhance both knowledge and confidence in responding to emergency situations, including head injuries (Al-Khatib et al., 2021; Zayapragassarazan & Kumar, 2020). Similarly, systematic reviews have reported that educational interventions effectively improve first aid knowledge and skills, particularly when they include both theoretical and practical components (Miller et al., 2020).

The substantial increase in the proportion of respondents with good knowledge after the intervention suggests that the educational approach used in this study was effective. This may be attributed to the use of appropriate teaching methods, such as lectures supported by visual media and interactive discussions, which can enhance comprehension and knowledge retention. Educational strategies that engage multiple sensory modalities, including visual and auditory inputs, are known to improve learning outcomes and memory recall.

In addition, the characteristics of respondents may have contributed to the observed improvement. Most participants had a higher educational background (bachelor's degree), which may facilitate better understanding and faster assimilation of new information. Educational level has been widely recognized as an important factor influencing knowledge acquisition and learning capacity. Individuals with higher educational attainment tend to have better cognitive skills and are more receptive to educational interventions.

Despite the significant improvement, it is important to note that a small proportion of respondents remained at a moderate level of knowledge after the intervention. This may be influenced by individual differences in learning ability, motivation, or attention during the educational session. It also suggests that a single educational intervention may not be sufficient for all individuals, and repeated or continuous training may be necessary to achieve optimal outcomes.

From a practical perspective, the results of this study highlight the importance of integrating health education programs into school settings. Teachers and school staff play a critical role as first responders in emergency situations involving children. Therefore, improving their knowledge and preparedness is essential to ensure timely and appropriate management of head injuries. Early and correct first aid management can significantly reduce the risk of complications and improve patient outcomes (Carney et al., 2017; Maas et al., 2017).

Furthermore, these findings have important implications for public health and nursing practice. Health professionals, particularly nurses, should actively participate in delivering educational programs aimed at improving emergency preparedness among school personnel. Collaboration between healthcare providers and educational institutions is necessary to develop sustainable training programs that can enhance knowledge and skills in first aid and injury management.

This study has several limitations. First, the use of a pre-experimental design without a control group limits the ability to establish causal relationships. Second, the relatively small sample size

may affect the generalizability of the findings. Third, the study only assessed knowledge outcomes without evaluating actual skills or behavioral changes in managing head injuries. Future research is recommended to use experimental designs with control groups, include larger samples, and assess practical skills to provide a more comprehensive evaluation of intervention effectiveness.

E. Conclusion

This study demonstrated that health education on head injury significantly improved the knowledge levels of teachers and school staff. Following the intervention, most participants achieved a good level of knowledge, indicating that structured educational programs are effective in enhancing understanding of emergency management among non-medical personnel.

These findings emphasize the importance of implementing health education initiatives in school settings to improve preparedness in handling head injury cases. Strengthening knowledge among teachers and staff is essential to ensure appropriate first aid responses, which may help reduce the risk of complications and improve outcomes for injured individuals.

F. Recommendations

Based on the findings of this study, several recommendations can be proposed. First, schools are encouraged to implement regular health education and training programs on head injury and first aid management for teachers and staff. Continuous and structured training is necessary to ensure sustained knowledge retention and improved readiness in handling emergency situations.

Second, healthcare professionals, particularly nurses, should collaborate with educational institutions to design and deliver evidence-based educational interventions that combine theoretical knowledge with practical demonstrations. This approach is expected to enhance both understanding and the application of first aid skills in real-life situations.

Third, school management should establish standard operating procedures (SOPs) for emergency response, including clear guidelines for the initial management of head injuries. The availability of first aid kits and emergency response protocols should also be ensured to support timely and appropriate action.

Finally, future research is recommended to use more rigorous study designs, such as randomized controlled trials, to evaluate the effectiveness of health education interventions. Further studies should also assess not only knowledge outcomes but also practical skills and behavioral changes to provide a more comprehensive understanding of intervention impact.

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