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The Effect of Education on Improving Knowledge and Skills in Assisting Fracture Patients on Arbes Street, Batu Merah Village, Ambon City

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Abstract

Background: Fracture is a common musculoskeletal injury that may lead to serious complications if not properly managed during the initial phase. **Objective**: First aid plays a crucial role in stabilizing patients, minimizing tissue damage, and improving recovery outcomes. Lack of knowledge among the community, especially youth, often results in incorrect handling of fracture cases. **Method**: This study aimed to analyze the effect of education on improving youth knowledge and skills in providing first aid for fractures. A quasi-experimental one-group pretest-posttest design was employed involving 38 youths in Arbes Street, Batu Merah Village. The instruments consisted of a knowledge questionnaire and a skills observation sheet. **Results**: The results indicated a significant improvement in both knowledge and skills after the educational intervention (p = 0.000). **Discussion**: The intervention was conducted using educational video media and direct demonstration. **Conclusion**: Educational video media proved effective in enhancing youth preparedness and ability to provide proper first aid for fracture cases.

Keywords: education, first aid, fracture, knowledge, skills

INTRODUCTION

Fracture is a musculoskeletal emergency that requires immediate, accurate, and responsive management to prevent disability and mortality [1]. Fracture occurs when the continuity of bone is disrupted due to excessive external force, trauma, or underlying pathological conditions that weaken bone structure [2]. Failure to provide proper early management may lead to severe complications such as bleeding, deformity, neurovascular injury, prolonged healing, or permanent functional impairment [3]. The ability of communities especially young adults who are often present at accident sitesto perform correct first aid plays a critical role in stabilizing patients before professional medical help arrives [4].

Fractures commonly occur as a result of traffic accidents, falls, sports injuries, and high-risk behaviors [5]. Young people, in particular, have a higher likelihood of experiencing fractures due to their activity levels and tendency to engage in risky driving practices [6]. Several contributing factors, such as high-speed vehicle use, poor road conditions, and inadequate safety awareness, further increase the incidence of fractures [7]. Therefore, efforts to improve public preparedness through first-aid training are essential in

minimizing the severity of injuries [8]. One effective non-pharmacological intervention is first-aid education that teaches immobilization techniques, stabilization methods, and safe transport procedures for fracture victims [9]. First-aid education enhances knowledge, improves technical skills, and prepares individuals to respond effectively during emergencies [10]. Numerous studies have demonstrated that structured first-aid education significantly increases self-efficacy and enables communities to act appropriately when facing trauma situations [6].

Despite its proven benefits, the practice of proper first aid for fractures remains low in many communities, particularly in areas with limited access to health information and emergency training. Lack of knowledge, limited health education programs, and low awareness contribute to improper handling of fracture victims, which can worsen the condition [11]. Health education is therefore essential to improve public understanding and encourage appropriate responses during emergencies, thereby reducing complications and improving patient outcomes [12].

Globally, the World Health Organization (WHO) reported more than 13 million fracture cases in 2020, with a prevalence of 2.7%, and estimates suggest the number may continue to rise with increasing mobility and traffic density [13]. In 2019, approximately 15 million cases of fractures were recorded with a prevalence of 3.2%, while in 2018 there were 21 million cases with a prevalence of 3.8%, most commonly caused by road traffic accidents [14]. In Indonesia, the Ministry of Health (2020) reported around 8 million cases of fractures nationwide. According to the 2023 Indonesian Health Survey (SKI), fractures of the extremities accounted for 48.6% of all fracture cases and represented a major cause of long-term disability, with 45% of fracture patients experiencing permanent physical limitations [15].

In Maluku, particularly Ambon City, the incidence of fractures continues to increase each year. Data from the Ambon City Statistics Bureau recorded 15,000 fracture-related cases in 2020, which rose to 21,000 cases in 2025. This upward trend is strongly associated with increasing motorcycle accidents among young people. Data from the Ambon Police Traffic Unit showed that in 2023, there were 93 traffic accidents, with 45 deaths, 56 severe injuries, and 70 minor injuries. In 2024 the figure rose to 135 accidents, and in 2025 increased further to 141 cases, indicating a persistent escalation in trauma-related incidents. These cases predominantly involved young males, suggesting that risky driving behaviors such as speeding and illegal street racing contribute significantly to the rising number of fractures in Ambon.

In Arbes Street, Batu Merah Village, the number of fractures is notably high. Based on initial observations and local health reports, many victims do not receive proper first aid immediately after the accident. Inadequate immobilization, unsafe handling of injured limbs, and delayed stabilization are common mistakes made by community members. Interviews with youths in the area revealed that most lack understanding of first-aid procedures for fractures, such as identifying signs of fractures, immobilizing affected limbs, or ensuring safe transport to health facilities.

These findings illustrate that the level of knowledge and skills among young people in Arbes regarding fracture first aid is still low, requiring targeted educational intervention. Health education becomes a crucial strategy to improve their readiness and encourage appropriate responses during emergencies, ultimately reducing severe complications and ensuring safer, faster recovery for victims.

Based on this background, the present study aims to analyze the effect of health education on the knowledge and skills of youths regarding first-aid management for fracture victims in Arbes Street, Batu Merah Village, Ambon City.

METHOD

Study design

This study employed a quasi-experimental design with a one-group pretest–posttest approach, without a control group. This design was used to determine the effect of health education on the knowledge of youth regarding first aid for fractures. The study was conducted in Arbes Street, Batu Merah Village, Sirimau District, Ambon City.

Study setting and participants

The population in this study consisted of all youth aged 17–25 years residing in the Arbes area. A total of 38 participants were selected using a purposive sampling technique based on the following criteria: willing to participate in the study, residents of Arbes Street, Batu Merah Village, able to communicate and follow instructions well, no cognitive impairments, and had never received specific training on first aid for fractures. The exclusion criteria were that the participant did not complete the study until the posttest stage and had physical limitations that hindered participation in the simulation.

Instruments

The instrument used in this study was a knowledge checklist consisting of 20 items covering the definition of fractures, causes, signs and symptoms, first aid principles, splinting techniques, and actions that should be avoided during fracture management. Knowledge assessment categories were classified as follows: Good (76–100%), Adequate (56–75%), and Poor (<56%). The instrument underwent content validity assessment by a nurse and academic supervisors to ensure its relevance and alignment with the objectives of the educational intervention.

Data Analysis

Univariate analysis was performed to describe participants' characteristics and their pretest and posttest knowledge scores. The Shapiro–Wilk test was used to assess data normality, considering that the sample size was fewer than 50 participants. A Paired Sample t-test was conducted to determine the difference in mean knowledge scores before and after the educational intervention. A significance level of $p < 0.05$ was used to determine statistical significance.

RESULTS AND DISCUSSION

The study was conducted, and all collected data were analyzed and presented in tables describing respondent characteristics including age, educational level, and employment status as well as knowledge and skill scores before and after the health education intervention regarding first aid for fractures.

Tabel 1. Characteristics of youth respondents (n= 38)

Characteristic	Frequency (n)	Percentage (%)
Age		
18-20	17	44.7
21-25	21	55.3
Education		
Junior High School	12	31.6
Senior High School	17	44.7
Bachelor's Degree	9	23.7
Employment		
Employed	25	65.8
Unemployed	13	34.2
Knowledge Level (Pre-test)		
Adequate	21	55.3
Poor	17	44.7
Knowledge Level (Post-test)		
Good	28	73.7
Adequate	10	26.3
Skill Level (Pre-test)		
Adequate	16	42.1
Poor	22	57.9
Skill Level (Post-test)		
Good	25	65.8
Adequate	13	34.2

The majority of respondents were 21–25 years (55.3%). Most respondents were in early adulthood, which influenced perceptions and knowledge about fractures and first aid for fracture patients. The majority of respondents had a senior high school education (44.7%), followed by junior high school (31.6%) and bachelor's degree (23.7%). Education level can affect how respondents understand information about fractures and first aid management. Those with higher education tend to understand explanations more easily and are more cooperative during activities. Meanwhile, respondents with lower education levels require simpler educational approaches supported by visual demonstrations to enhance

understanding. Most respondents were employed (65.8%), while 13 respondents (34.2%) were unemployed. At this stage of development, individuals generally possess strong cognitive abilities, enabling them to receive and process new information effectively. In terms of education, the majority had completed senior high school (44.7%), indicating that they already had sufficient academic background to understand the educational material provided. Furthermore, most respondents were employed (65.8%), suggesting that they are socially active and may possess practical experiences that support the improvement of skills in assisting fracture patients [16].

Before the intervention, most respondents had an adequate level of knowledge (55.3%), followed by 17 respondents (44.7%) who had poor knowledge. This indicates that the majority had a moderate understanding, while some had a low understanding before the educational intervention. After the intervention, most respondents experienced an improvement, with 28 respondents (73.7%) reaching the good category. Ten respondents (26.3%) remained in the adequate category. This shows a significant increase in knowledge after receiving education. Before receiving video education, most respondents had poor skills (57.9%), while 42.1% had adequate skills. After the video-based education, most respondents reached the good skill category (65.8%), showing a clear improvement following the intervention [17].

Prior to the intervention, most respondents had low skill levels (57.9%). However, after receiving video-based educational materials, their skills improved significantly, with 65.8% classified as having good skills. This indicates that visual and practice-oriented educational methods are effective in helping respondents master the steps of first aid for fracture patients [18]. Audio-visual media support the learning process by offering realistic simulations, allowing respondents to feel more confident when performing the skills [19].

Bivariate analysis was conducted after performing data normality testing. Since the number of respondents was fewer than 50 ($n \leq 50$), the Shapiro–Wilk test was used [20]. If the data were normally distributed, the paired t-test was used; if not, the Wilcoxon test would be applied [21]. This analysis aimed to determine changes in youth knowledge regarding first aid for fractures [22]. In this study, the paired samples t-test was used to examine the effect of the intervention. Shapiro–Wilk test shows that post-test knowledge (0.064), pretest skills (0.231), and post-test skills (0.051) all have significance values greater than 0.05, indicating normally distributed data.

Therefore, the paired t-test was used for further analysis. The paired t-test was conducted to determine the differences between pre-test and post-test scores for both knowledge and skills [23]. The results showed that for the knowledge variable, the t-value was -33.789 with 37 degrees of freedom (df) and a p-value of 0.000, indicating a statistically significant difference between pretest and post-test knowledge scores. Similarly, for the skill variable, the t-value was –35.579 with 37 degrees of freedom (df) and a p-value of 0.000, demonstrating a significant improvement in skill levels after the intervention. The significant value for both knowledge and skill variables was $p = 0.000$ ($p < 0.05$), indicating a significant difference between pretest and post-test results. Thus, it can be concluded

that the educational intervention had a meaningful effect in increasing both knowledge and skills in providing first aid for fracture patients [24].

Overall, the study results indicate that education is an effective strategy for improving community knowledge and skills, particularly among young adults [25]. Educational videos provide positive outcomes because they combine visual and verbal elements, enhancing understanding and practical skill acquisition. Factors such as age, educational background, and employment status contribute to the success of the educational process, as respondents with secondary education and productive age tend to receive and process the material more efficiently.

CONCLUSION

The knowledge and skills of the respondents regarding first aid for fracture patients were initially categorized as adequate and poor, indicating that their baseline understanding and practical abilities were still limited. After the educational intervention was delivered, there was a substantial improvement in both knowledge and skills, with most respondents shifting into the good category. Therefore, the educational program provided in this study can be considered an effective strategy for enhancing youth knowledge and practical skills in performing first aid for fracture patients, supporting better preparedness and response in emergency situations.

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DISCLOSURE OF INTERESTS

The authors declare that there are no conflicts of interest related to the conduct of this study or the preparation of this manuscript. This research was carried out independently, without influence from any external parties, and no financial, personal, or institutional interests affected the analysis, interpretation, or presentation of the research findings.

REFFERENCES

[1] Fadhilah Yusrina Ardhi1, A. C. N. A. (2024). Nursing Care For Closed Fracture Patients: Acute Pain By Combined Interventions Of Deep Breath Relaxation And Cold Compress.

[2] Kusuma, U., Surakarta, H., Pada, N., Fraktur, P., Di, F., & Rsud, I. G. D. (2024). Penerapan Pembidaian terhadap Penurunan Intensitas 28.

[3] Mahartha, G. R. A., Maliawan, S., & Kawiyana, K. S. (2021). Manajemen Fraktur Pada Trauma Muskuloskeletal. E-Jurnal Medika Udayana, 2(3), 548–560. https://ojs.unud.ac.id/index.php/eum/article/download/4939/3729

[4] Masykur Khair1*, R Herlina R2, S. A. (2025). Pengabdian Kepada Masyarakat Pentingnya Meningkatkan Bantuan Hidup Dasar Melalui Penyuluhan dan Pelatihan Kegawatdaruratan Di Kp Kadu Gede Rt.02 dan Rt.05 Desa Cilember. 1(2), 102–108.

[5] Sahabuddin, N., Arman Bausat, Evi Silviani Gusnah, Fadil Mula Putra, & Rahmawati. (2024). Gambaran Faktor Risiko Kejadian Fraktur Terbuka Tertutup Os Tibia. Fakumi Medical Journal: Jurnal Mahasiswa Kedokteran, 4(3), 204–210. https://doi.org/10.33096/fmj.v4i3.404

[6] Talibo, N. A., Katuuk, H. M., Riu, S. D. M., & Pattinasarani, N. S. (2023). Pengaruh Edukasi Pembidaian Terhadap Pengetahuan Mahasisa Dalam Memberikan Pertolongan Pertama Pada Fraktur Tulang Panjang. Norman. Jurnal Keperawatan, 15(1), 381–388.

[7] Beti Krisnawati, Fahrun N, R (2023). Pelatihan Untuk Meningkatkan Keterampilan Penanganan Pertama Pada Korban Kecelakaan Bagi Masyarakat Awam. JMM (Jurnal Masyarakat Mandiri) http://journal.ummat.ac.id/index.php/jmm. 3173-3182 e-ISSN 2614-5758 | p-ISSN 2598-8158 : https://doi.org/10.31764/jmm.v7i4.15674

[8] Siti Qomariah A, S, Suwandi L), Rahmat H. D (2022). Pengaruh Edukasi First Aid Kegawatdaruratan Terhadap Pengetahuan Penanganan Fraktur Pada Orang Awam Atau Masyarakat Sekitar Kampus STIKes Muhammadiyah Manado. https://ejurnal.politeknikpratama.ac.id/index.php/JRIK

[9] Mohammad A, Suyanto, Betie F, Dwi Nur A. (2023). Implementation Of First Handling In Accident (Fracture) Based On Group Based On Knowledge of First Handling In Accident (Fracturing). https://ejournal.unimman.ac.id/index.php/pengabmas

[10] Norman A, Helly M. Katuuk, Silvia Dewi, Naris Safitri P. Pengaruh Edukasi Pembidaian Terhadap Pengetahuan Mahasiswa Dalam Memberikan Pertolongan Pertama Pada Fraktur Tulang Panjang. 2023. http://journal.stikeskendal.ac.id/index.php/Keperawatan

[11] Gryttha T, Sry Rumondang, Bernadetta A, R.Oktaviance S, Hetty G. Edukasi Pertolongan Pertama Kegawatdaruratan Pada Patah Tulang (Fraktur). Jurnal Pengabdian Kesehatan (JUPKes). 2024. http://ejournal.stikeselisabethmedan.ac.id:85/index.php/JUPKes

[12] Thakur AJ. The Elements of Fracture Fixation-E-Book. Elsevier Health Sciences; 2022 Dec 5.

[13] Yakut WR, Amir H, Hidayat R. Assessment of Early Pain Management in Fracture Cases in the Emergency Department: Evidence from Clinical Practice. An Idea Nursing Journal. 2025 Oct 9;4(02):66-72.

[14] Woliński F, Kraśnik K, Bryliński Ł, Sado J, Sagan J, Brylińska K, Teresiński G, Cywka T, Karpiński R, Baj J. Fracture Patterns in Fatal Free Falls: A Systematic Review of Intrinsic and Extrinsic Risk Factors and the Role of Postmortem CT. Journal of Clinical Medicine. 2025 Sep 6;14(17):6305.

[15] Putri SN, Fauzi AR, Paramita DK, Dachlan I, Seswandhana R. Maxillofacial trauma severity effects in patients with head injury in a tertiary care center in Yogyakarta, Indonesia. European Journal of Plastic Surgery. 2022 Jun;45(3):393-8.

[16] Yakut WR, Amir H, Hidayat R. Assessment of Early Pain Management in Fracture Cases in the Emergency Department: Evidence from Clinical Practice. An Idea Nursing Journal. 2025 Oct 9;4(02):66-72.

[17] As' ad R. Improving Community Knowledge on Bone Fracture Prevention and First Aid Management. Journal of Community Innovation and Service. 2026 Feb 2;1(1):1-9.

[18] Alzahrani F, Alghamdi A, Alghamdi A, Alghamdi K, Alghamdi N, Alghamdi A, Alzahrani A, Alghamdi H, Khallufah A, Alghamdi Y. Assessing the knowledge, Awareness, and potential impact of physiotherapy in fracture rehabilitation among Al-Baha Population: A comprehensive analysis. International Journal of Physical Therapy Research & Practice. 2024 Sep 30;3(8):325-32.

[19] AlAidarous HA, Alghamdi TA, Alomari HS, Alomari AM, Alzahrani AM, Alghamdi WA, Alzahrani FJ, AlAidarous HA, ALOMARI AM, Zahrani AM, Al-Ghamdi W. The Level of Knowledge and Attitude Toward Dealing With Fractures at Accident Sites Among Al Baha Population. Cureus. 2024 Sep 12;16(9).

[20] McEntire DA. Disaster response and recovery: strategies and tactics for resilience. John Wiley & Sons; 2021 Dec 1.

[21] Muse A, Baldwin JM. Quasi-experimental research design. The encyclopedia of research methods in criminology and criminal justice. 2021 Aug 24;1:307-10.

[22] Rizaldi R, Yusuf B, Wicaksono H. The Effectiveness of Splinting Skills Education in Closed Fracture Cases Using The Seminar and Self Direct Video Methods on The Knowledge Level of Grade 12 Students of SMAN 4 Jakarta. Journal Educational of Nursing (JEN). 2026 Jan 29;9(1):95-104.

[23] Ufashingabire Minani C, Soh KL, Rosliza Abdul M, Mani KK, Ibrahim B, Mohamed Dirie A, Soh KG. Effectiveness of first-aid education in road traffic crashes on non-healthcare professionals' knowledge, attitude, and skills: a systematic review. International journal of injury control and safety promotion. 2023 Jul 3;30(3):447-54.

[24] Ndiema A, Wikarski D, Mutua G. Practice-oriented University Education in Western KenyaGoals, Results and the Way Forward. InProceedings of the First International Conference on Engineering and Deployment of Cooperative Information Systems 2021 Sep 17.

[25] Putu SW, Yona S. Educational Intervention on Self Efficacy among Postoperative Fracture: A Literature Review. International Journal of Nursing and Health Services (IJNHS). 2021 Apr 20;4(2):231-42.