

Family-Based Education for Prevention and Management of Injuries in Vulnerable Populations

Arifin Triyanto^{1*}, Suis Galischa Wati², Dluha Maf'ula², Partini³, Anisah Umami⁴

¹Department of Medical Surgical Nursing, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

²Department of Basic and Emergency Nursing, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

³Universitas Gadjah Mada Academic Hospital, Yogyakarta, Indonesia

⁴Godean II Public Health Center, Sleman, Yogyakarta, Indonesia

Submitted: April 05th 2024; Revised: November 27th 2024; Accepted: December 02nd 2024

Keywords:

Education
Falls
Family
Injury
Vulnerable population

Abstract Injuries contribute to disability and morbidity in countries around the world. Among the elderly, falls are the most common type of injury, with an incidence rate of approximately 2.3–7% per 1,000 individuals. Injuries can lead to physical impairments, including reduced limb function. In the elderly population, particularly those aged 65 years and older, injuries are associated with a high risk of mortality and severe disability. Preventing injuries and falls is a critical public health concern. Families serve as essential support systems for addressing injury-related issues within households and the surrounding environment. This activity aimed to provide families with education on preventing and managing injuries in vulnerable populations. Health education sessions were delivered to health cadres and community members through lectures, discussions, and expert-led question-and-answer sessions. Educational materials included PowerPoint presentations and pocketbooks. At the conclusion of the sessions, a group demonstration was conducted on the management of splints in community settings. Knowledge was assessed using a questionnaire developed based on the health education materials. Fall risk screening was conducted using the First Time Injury Falls (FIT) instrument. The results revealed that among the 27 respondents, knowledge levels significantly improved after the educational sessions (p -value < 0.05). Fall risk screening outcomes indicated that 20 respondents (74.1%) were at low risk for falls, 5 respondents (18.5%) were at moderate risk, and 2 respondents (7.4%) were at high risk. Based on these findings, it can be concluded that health education is effective in enhancing family knowledge about injury prevention and management in vulnerable populations.

1. INTRODUCTION

Injury and trauma are prevalent and often unavoidable occurrences that contribute significantly to disability and morbidity in many countries (Saadati et al., 2020). Injuries are a major contributing factor to 90% of deaths in developing countries. Even in developed nations, the incidence of injuries remains relatively high. In Europe and the Americas, the annual number of injury-related deaths continues to rise. In New Zealand, it has been reported that

injuries have incurred costs of 9 million dollars annually to address associated issues (Cole et al., 2022).

Basic Health Research in Indonesia regarding injuries shows that injuries can occur in more than one part (multiple). The majority of body parts are the head, chest, back, stomach, upper limbs and lower limbs. Meanwhile, in terms of the types of injuries include abrasions, lacerations, sprains, fractures, internal organ injuries, burns and others.

ISSN 2460-9447 (print), ISSN 2541-5883 (online)

*Corresponding author: Arifin Triyanto

Department of Medical Surgical Nursing, Faculty of Medicine Public Health and Nursing, Universitas Gadjah Mada, Jl. Farmako, Sekip Utara, Yogyakarta 55281, Indonesia

Email: arifintriyanto@mail.ugm.ac.id

The location of the injury can occur anywhere. Based on the location of the injury, the home and environment are the most frequent places where injuries occur with a proportion of 44.7% (Kemenkes RI, 2018). The house and surrounding environment are places that are often used by many people for activities. However, this place is also a threat to cause injury if not managed properly (Saadati et al., 2020).

Injuries are not limited to the elderly population but can occur across various age groups, from children to adults (Bhaumik et al., 2018). Within the vulnerable elderly population, the increasing proportion of older adults each year raises significant concerns. The incidence of falls, a leading cause of injury in this group, is approximately 2.3–7% per 1,000 individuals, with outcomes ranging from minor to severe injuries. These incidents can be influenced by a range of factors, including intrinsic, extrinsic, and situational elements (Ramlis, 2018). Intrinsic factors may include impairments in bodily function, the effects of therapy or medication, while extrinsic factors are often related to environmental hazards. Situational factors can involve variations in activities performed (Vaishya & Vaish, 2020).

The increased risk of injury in the elderly is also a consequence of the decreased ability of the organs, functions and body systems of the elderly. This is also in line with the data that the causes of injuries in elderly are internal factors such as sensory disorders, cognitive disorders, nervous system disorders which cause balance impairment, decreased muscle strength and flexibility. Unsafe environmental factors also contribute to the occurrence of injuries in the home environment (Prabowo & Condrowati, 2022).

Injuries can result in physical symptoms such as partial loss or lack of function of a limb as a result of the injury (Kemenkes RI, 2018). Injuries in the elderly population, especially those aged 65 years, have a high risk of death and serious disability. More than 20% of elderly people over 65 years old need intensive care due to injuries. In the medical care setting, injuries to the elderly often cause fractures in the long bones, such as fractures in femur, tibia, humerus and radius ulnar. This has a lot of impact on elderly mobility, independence and quality of life (Llompert-Pou et al., 2017).

Preventive efforts are prioritized over curative measures in cases of injury. Preventing injuries and falls are not only important in hospital clinical settings, but this has also become an important issue in community considering the frequency of falls and the resulting consequences which significantly affect life. Several strategies can be used to prevent injuries. Health education, environmental assessment, interventions to increase individual functional capacity, and awareness of drug can be carried out (Hill & Schwarz, 2014; Vaishya & Vaish, 2020).

Even though preventive efforts are often taken, injuries often occur due to various existing factors. For this reason, management efforts for injury cases also need to be improved. Accuracy in initial management of injury can minimize the occurrence of further injuries and

complications that can arise (Šparovec et al., 2022). The people in the community must be the first person in initial management in injury. However, people often prefer not to take any action, assume that injuries are normal and will heal by themselves or delay taking them to existing health facilities. This can occur due to a lack of public knowledge about the importance of early management in injury cases, lack of awareness or fear of liability (Stevens et al., 2018).

Sidokarto Village is located in the Godean sub-district. The demographic profile of the Sidokarto population indicates that approximately 45% of the residents are pre-elderly or elderly. Based on the findings from previous community service activities, health cadres reported several incidents of accidents, falls, and slips among the elderly in this area. These incidents predominantly involved the elderly, who represent a vulnerable population. Educational programs for family members serving as caregivers are an effective intervention. Training caregivers in fall prevention techniques and creating a safe environment is crucial. Implementing programs that utilize a train-the-trainer model to educate family members has demonstrated positive outcomes in improving knowledge and fostering behavioral changes (Swanson & Robinson, 2020). The family is a strong support system in health maintenance. Closeness, presence, togetherness and intense interaction can be the basic capital for dealing with injury problems that occur in the household and surrounding environment (Huda et al., 2005). Family involvement in health care is not a new concept. The family can act as a caregiver who monitors symptoms and ongoing treatment, provides direct care and emotional support. Families are considered to be able to have a big influence in improving the health status of vulnerable groups such as the elderly, both physically, psychologically and socially (Schulz et al., 2020). This activity/program aimed to provide education for family about preventing and treating injuries to vulnerable populations.

2. METHOD

This community service program was carried out in three stages: preparation, implementation, and evaluation. The preparation phase involved developing educational materials and a pocketbook (Figure 1). These materials included information on the incidence of injuries in high-risk populations, environmental management for injury and fall prevention, nutritional management for maintaining fitness and physical strength in the elderly, and the management and rehabilitation processes following injury or trauma. The team also coordinated and communicated with the village head and a staff member from the Godean Primary Health Center. Once the preparation was completed, the program was implemented in the community. The activity took place in one of the areas in Sidokarto Village, Godean District, Sleman Regency, Yogyakarta. This location was chosen based on demographic data indicating that most of the population in the area were elderly and that several incidents of accidents or falls had been reported. Participants were selected based

on inclusion and exclusion criteria. The inclusion criteria included individuals with vulnerable family members, the ability to communicate fluently, no severe hearing or vision impairments, and willingness to participate in the activities. Exclusion criteria included cognitive limitations or impairments and the inability to participate in the activity.

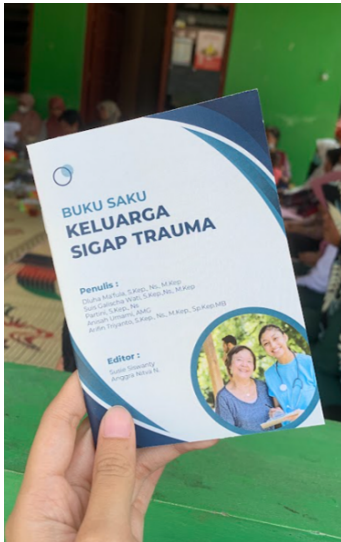


Figure 1 . Pocketbook



Figure 2 . Classical/lecture session by the speakers in a large group



Figure 3 . A practical session with participants

Health counseling and education were provided directly to health cadres and the community to address the prevention and management of injuries in vulnerable groups. These sessions employed lecture and discussion

methods, along with question-and-answer interactions with the resource persons. The activity was divided into two sessions. In the first session, participants received education in a large group setting (Figure 2). In the second session, they were divided into three smaller groups for demonstrations and practical activities (Figure 3). The educational materials included PowerPoint presentations and pocketbooks. At the end of the session, group demonstrations were conducted to teach splint management within the community. After the facilitators demonstrated the techniques, all participants practiced splint management under guidance.

This community service activity also measured knowledge regarding the prevention and treatment of injuries in vulnerable groups, as well as screened participants for fall risk. Knowledge was assessed using a questionnaire containing 20 questions, developed based on the four topics presented by the speakers. Fall risk screening was conducted using the First Time Injury Falls (FIF) instrument, a tool designed to predict the risk of first-time injurious falls among community-dwelling older adults (Ek et al., 2019). This activity received ethical approval from the Ethics Committee of the Faculty of Medicine, Public Health, and Nursing under approval number KE/FK/1125/EC/2023.

3. RESULT AND DISCUSSION

The community service was carried out in September 2023. The activity was attended by 27 respondents consisting of health cadres and members of the community. The characteristics of participants can be seen in Table 1.

Based on Table 1, the majority of participants were female, predominantly within the age groups of 45–59 years and 60–74 years. Most participants had attained a senior high school level of education. Additionally, the majority had previously received information related to injury or trauma, with television media being the most common source of this information. Regarding their experiences, most participants reported having prior experience in treating injuries.

As part of this activity, injury risk screening was conducted using the First Time Injurious Fall questionnaire. The majority of participants were found to be at low risk for falls, with 20 participants (74.1%) categorized in this group. The overall results are presented in Table 2.

All respondents were at some level of risk for falls and injuries, even if categorized as low risk. Falls and injuries in the community have a high prevalence, affecting approximately 45% of the elderly population. These incidents are strongly associated with increasing age (Arulmohi et al., 2017). Among the respondents in this activity, the majority were aged between 45 and 74 years, which corresponded to a low risk of falls and injury for most participants. However, as age increases, the risk of falls and injuries also rises. In addition to age, other contributing factors include demographic characteristics, lifestyle, health status, and the presence of chronic diseases (Lin et al., 2023).

Table 1 . Characteristics of community service participants (n=27)

Characteristics	n	%
Gender		
Man	1	3.7
Woman	26	96.3
Age		
<45 years	3	11.1
45 – 59 years old	10	37.0
60 – 74 years old	11	40.8
>75 years	3	11.1
Education		
Elementary school	6	22.3
Junior High School	7	25.9
Senior High School	12	44.4
Diploma	2	7.4
Access information about previous injuries		
Yes	14	51.9
No	13	48.1
Source of injury information		
Internet	1	3.7
TV	9	33.3
Book	2	7.4
Chat Group	0	0
Other	2	7.4
Experience on Injury Management		
Once	11	40.7
No	16	59.3

Table 2 . Results of injury risk screening (n=27)

Risk category	n	%
Low Risk	20	74.1
Medium Risk	5	18.5
High risk	2	7.4

The community service activity was conducted as health education, delivered through lectures and demonstrations. Participants' knowledge was measured both before and after the educational sessions. The health education sessions were facilitated by all speakers, including staff from the Godean Public Health Center, who served as a partner in this program. At the end of each session, a discussion was held where participants could ask questions about the topics presented. The results of the knowledge measurements are shown in Table 3.

Based on Table 3, the knowledge measurement before and after the educational sessions showed a mean difference of 1.44, with a p-value of 0.001 ($p < 0.05$). This indicates a significant increase in knowledge among community service participants after receiving health education related to injury and trauma. Although this measurement reflects short-term outcomes, the results demonstrate an improvement in participants' knowledge. Some participants in this activity were health cadres, who are expected to serve as role models and disseminate the information they received to the broader community, amplifying the positive impact of the program. Interventions in community settings are a key strategy

to reduce the incidence of falls and injuries. Effective interventions may include single strategies or a combination of various approaches to address this issue comprehensively (Stevens et al., 2018).

Table 3 . Results of measuring knowledge of community service participants (n=27)

Measurement	Mean \pm SD	Delta Mean	p
Before (pretest)	11.2 \pm 3.7		
After (post)	12.6 \pm 3.5	1.44 \pm 2.6	0.001

Note: The statistical analysis was done using paired t-test

Public awareness needs to be enhanced and aligned with the latest guidelines, with a focus on vulnerable populations (Šparovec et al., 2022). Awareness of fall prevention must be instilled in these populations. Previous studies have shown a lack of confidence in recognizing the potential for falls within the surrounding environment, leading to a poor perception of the importance of fall risk prevention (Stevens et al., 2018). The awareness of the importance of prevention and first aid is significantly influenced by individual knowledge and sense of responsibility. Individuals with certain comorbid conditions often demonstrate better knowledge of first aid compared to those without comorbid conditions. However, this is also heavily influenced by the level of exposure to educational programs they have received (Šparovec et al., 2022).

The incidence of falls in the elderly population is associated with multifactorial causes and requires a multidisciplinary approach. Extrinsic, intrinsic, and environmental factors all contribute to the occurrence of falls and injuries (Vaishya & Vaish, 2020). Among the various risk factors for injury, one of the most significant is difficulty walking. Other contributing factors include a lack of knowledge about one's own condition, dementia in elderly individuals, being female, and a person's level of education (Srivastava & Muhammad, 2022).

Knowledge and perceptions about falls and injuries enable elderly individuals to better understand and improve their health status. Research shows that older adults are generally aware of biological, environmental, and behavioral factors that can increase the risk of injury. Among the elderly population, 18% were found to have poor knowledge, 61% had moderate knowledge, and 21% demonstrated good knowledge (Gamage et al., 2018). Effective strategies to reduce falls and injuries involve addressing individual risk factors through interventions across various domains. Health workers play a crucial role in enhancing individuals' confidence, attitudes, and priorities in injury prevention and management. One of the recommended approaches is community-based intervention, which begins with an assessment of existing risk factors. Interventions can be tailored to specific populations and implemented as single measures or as a combination of multiple interventions and settings (Montero-odasso et al., 2022).

The community service initiative played a significant role in improving knowledge about fall prevention

among older adults. Numerous studies demonstrated the effectiveness of community-based interventions and programs in enhancing fall awareness and prevention knowledge. For example, community-dwelling older adults who participated in fall prevention education programs, such as the Four Smart Steps Fall Prevention Program, exhibited increased awareness and knowledge about fall risks and prevention strategies (Minnier et al., 2019). Similarly, the use of a WeChat mini-program for health education significantly improved fall prevention knowledge among urban older adults (Ye et al., 2022). Collaborations between community organizations and services also proved effective. For instance, partnerships with Fire and Rescue Services were instrumental in identifying and mitigating fall risks, thereby enhancing the safety and well-being of older adults. Additionally, partnerships between academic institutions, government agencies, and community organizations successfully implemented falls prevention training programs, leading to improved fall efficacy among participants (Severance et al., 2022).

4. CONCLUSION

In conclusion, elderly participants were at risk of falls and injuries, with the majority classified as being at low risk, accounting for 74.1%. Community-based education had a significant impact on increasing family knowledge in preventing and managing injuries in vulnerable populations, as indicated by a p-value of 0.001.

ACKNOWLEDGMENT

We extend our gratitude to the Faculty of Medicine, Public Health, and Nursing for providing funding for this program. We also sincerely thank all facilitators and respondents for their valuable participation and contributions to this program.

CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest.

REFERENCES

- Arulmohi, M., Vinayagamoorthy, V., & R., D. A. (2017). Physical violence against doctors: A content analysis from online Indian newspapers. *Indian Journal of Community Medicine*, 42(1), 147–150.
- Bhaumik, S., Allen, C., Gupta, S., Ludolph, R., & Clarke, M. (2018). Systematic review of housing safety hazards and injuries: Report for the WHO housing and health guidelines. *WHO Housing and Health Guidelines*.
- Cole, E. O. B., Christie, S. A., Oke, R., Motwani, G., Dickson, D., Chendjou, W., Mbianyor, M., Dicker, R., Juillard, C., & Chichom-Mefire, A. (2022). Too serious to ignore: The epidemiologic and economic burden of home injuries in the Southwest Region of Cameroon-A community-based study. *PLoS ONE*, 17(9), 1–13. <https://doi.org/10.1371/journal.pone.0274686>
- Ek, S., Rizzuto, D., Calderón-Larrañaga, A., Franzén, E., Xu, W., & Welmer, A. K. (2019). Predicting first-time injurious falls in older men and women living in the community: Development of the first injurious fall screening tool. *Journal of the American Medical Directors Association*, 20(9), 1163–1168.e3. <https://doi.org/10.1016/j.jamda.2019.02.023>
- Gamage, N., Rathnayake, N., & Alwis, G. (2018). Knowledge and perception of falls among community dwelling elderly: A study from Southern Sri Lanka. *Current Gerontology and Geriatrics Research*, 2018. <https://doi.org/10.1155/2018/7653469>
- Hill, K., & Schwarz, J. (2014). Assessment and management of falls in older people. *Internal Medicine Journal*, 34(9–10), 557–564. <https://doi.org/10.1111/j.1445-5994.2004.00668.x>
- Huda, N., Toha, M., & Sujawadi, M. (2019). Upaya keluarga tentang pencegahan resiko cedera pada lansia. *Jurnal Citra Keperawatan Poltekkes Kemenkes Banjarmasin*, 7(1), 23–32.
- Kemenkes RI. (2018). *Laporan nasional RISKESDAS 2018*. Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan RI.
- Lin, W. Q., Lin, L., Sun, S. Y., Yuan, L. X., Sun, M. Y., Wang, C., Chen, J. M., Li, Y. H., Zhou, Q., Wu, D., Huang, T. Y., Liang, B. H., & Liu, H. (2023). Prevalence of falls, injury from falls and associations with chronic diseases among community-dwelling older adults in Guangzhou, China: A cross-sectional study. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1251858>
- Llompert-Pou, J. A., Pérez-Bárcena, J., Chico-Fernández, M., Sánchez-Casado, M., & Raurich, J. M. (2017). Severe trauma in the geriatric population. *World Journal of Critical Care Medicine*, 6(2), 99. <https://doi.org/10.5492/wjccm.v6.i2.99>
- Minnier, W., Leggett, M., Persaud, I., & Breda, K. (2019). Four smart steps: Fall prevention for community-dwelling older adults. *Creative Nursing*, 25(2), 169–175. <https://doi.org/10.1891/1078-4535.25.2.169>
- Montero-odasso, M., Velde, N. Van Der, Martin, F. C., Petrovic, M., Tan, M. P., Ryg, J., Aguilar-navarro, S., Alexander, N. B., Becker, C., Lamb, S. E., Latham, N. K., Lipsitz, L. A., Liu-ambrose, T., & Logan, P. (2022). World guidelines for falls prevention and management for older adults: A global initiative. *Age and Aging*, 51, 1–36.
- Prabowo, E., & Condrowati. (2022). Pelatihan bagi masyarakat mengenai pertolongan pertama pada cedera orang lanjut usia di kelurahan Limo Depok. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, 5, 1511–1516.

- Ramlis, R. (2018). Faktor-faktor yang berhubungan dengan resiko jatuh pada lansia di BPPLU Kota Bengkulu Tahun 2017. *Journal of Nursing and Public Health*, 6(1), 63–67. <https://doi.org/10.37676/jnph.v6i1.498>
- Saadati, M., Js, T., Rezapour, R., & R, A. K. (2020). Home injury prevention attitude and performance: A community-based study in a designated safe community. *Journal of Injury and Violence Research*, 12(2), 145–152.
- Schulz, R., Beach, S. R., Czaja, S. J., Martire, L. M., Monin, J. K., Medicine, W. C., & Haven, N. (2020). Family caregiving for older adults. *Annu Rev Psychol*, 71, 635–659.
- Severance, J. J., Rivera, S., Cho, J., Hartos, J., Khan, A., & Knebl, J. (2022). A collaborative implementation strategy to increase falls prevention training using the age-friendly health systems approach. *International Journal of Environmental Research and Public Health*, 19(10). <https://doi.org/10.3390/ijerph19105903>
- Šparovec, E. D., Slabe, D., Eržen, I., & Kovačič, U. (2022). The importance of elderly people knowing basic first-aid measures. *BMC Emergency Medicine*, 22(1), 1–8. <https://doi.org/10.1186/s12873-022-00675-9>
- Srivastava, S., & Muhammad, T. (2022). Prevalence and risk factors of fall-related injury among older adults in India: evidence from a cross-sectional observational study. *BMC Public Health*, 22(1), 1–10. <https://doi.org/10.1186/s12889-022-12975-7>
- Stevens, J. A., Sleet, D. A., & Rubenstein, L. Z. (2018). The influence of older adults' beliefs and attitudes on adopting fall prevention behaviors. *American Journal of Lifestyle Medicine*, 12(4), 324–330. <https://doi.org/10.1177/1559827616687263>
- Swanson, R., & Robinson, K. M. (2020). Geriatric rehabilitation: Gait in the elderly, fall prevention and parkinson disease. *Medical Clinics of North America*, 104(2), 327–343. <https://doi.org/10.1016/j.mcna.2019.10.012>
- Vaishya, R., & Vaish, A. (2020). Falls in older adults are serious. *Indian Journal of Orthopaedics*, 54(1), 69–74. <https://doi.org/10.1007/s43465-019-00037-x>
- Ye, Q., Yang, Y., Yao, M., Yang, Y., & Lin, T. (2022). Effects of Teach-Back Health Education (TBHE) based on WeChat mini-programs in preventing falls at home for urban older adults in China: A randomized controlled trial. *BMC Geriatrics*, 22(1), 1–14. <https://doi.org/10.1186/s12877-022-03297-9>