Journal of Vocational Applied Research and Studies

Journal homepage: https://journal.uny.ac.id/v3/jvars/index
e-ISSN: 3048-1864

Improving Safety in Rural Tourism: Evaluation of the Effectiveness of Community-Based Injury Prevention Training in Flory Village, Sleman

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ARTICLE INFO

Article history:
Received: 26 August 2025
Received in revised form: 29 August 2025
Accepted: 5 November 2025
Available online: 31 December 2025

Keywords:
Flory Village; Safety; Rural Community; Training; Injury Prevention; Knowledge

ABSTRACT

This study aims to evaluate the effectiveness of injury prevention training in improving employee and community knowledge in Kampung Flory, Sleman, Yogyakarta. Using a descriptive quantitative research method, data were collected through a questionnaire. pre-test and post-test involving 31 participants. Data analysis showed a significant increase in knowledge scores from pre-test the post-test with an average score pre-test 147.71 and score post-test 169.00. The results of the paired t-test confirmed this significant difference (p-value < 0.05) while the effect size Cohen's d A value of 0.978 indicates a large effect size. This finding indicates that the training provided was effective in improving participants' knowledge regarding injury prevention. This study highlights the importance of community-based safety education programs for improving well-being and safety in rural tourism destinations. Further research is recommended to evaluate the long-term effectiveness of these programs and develop additional strategies to improve community safety.

1. Introduction

Tourist safety is a crucial aspect that service providers must prioritize, especially in the context of nature-based tourism and outdoor recreation activities. When someone decides to visit a destination, safety is often a primary consideration. This applies to both tourists visiting the location and recreation providers offering on-site services. The importance of visitor safety has been the focus of numerous studies, including those addressing injury prevention strategies in outdoor recreation, including analysis of injury incident data, identification of risk factors, and evaluation of successful interventions in reducing the frequency and severity of injuries [1]. In the context of recreational tourism, service providers have a significant responsibility to protect tourists from various risks. This protection includes efforts to prevent injuries, accidents, and even financial losses that may arise from unforeseen events during tourism activities. The most effective injury prevention strategies include the use of appropriate safety equipment, proper training and education for tourists, and the development of strict safety policies [1]. These measures aim not only to minimize the risk of injury but also to increase the sense of safety and comfort for visitors involved in outdoor activities. Sleman Regency in the Special Region of

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https://doi.org/10.37934/jvars.v2i2.2528

Yogyakarta is a destination rich in diverse natural resources, including mountains, rivers, cliffs, hills, and tourist villages. Nature-based tourism in this area is very attractive to tourists because it offers beautiful scenery, cool air, and opportunities for various physical activities. One popular nature-based tourism destination in Sleman is Kampung Flory. This village is known for offering refreshing recreational experiences through various outdoor activities such as outbound adventures and river trekking along the Bedog River.

While Kampung Flory offers beautiful and refreshing natural scenery, this destination also carries a significant risk of physical injury for both tourists and management staff. Activities such as outbound activities, which involve a lot of physical movement and interaction with the surrounding environment, pose a potential risk of injury ranging from minor cuts and bruises to dislocations and fractures. These risks are exacerbated when tourists are careless or fail to understand proper safety procedures. Furthermore, these risks can also arise when management fails to provide adequate safety systems. One of the main challenges faced by nature-based tourism managers, such as those in Kampung Flory, is the lack of systematic injury documentation. Injury documentation is crucial because historical data can help management identify injury patterns and implement more effective preventative measures. Systematic injury documentation can also serve as a benchmark for improving tourism facilities and services to enhance visitor safety in the future. Furthermore, injury records demonstrate management's commitment to ensuring tourist safety and well-being. First aid in the event of an injury at a tourist location plays a crucial role. First aid is the initial treatment given to save lives, prevent injuries from getting worse, and speed up recovery. First aid has three main goals: first, to save lives and ensure the victim can be transported to a medical facility in better condition; second, to prevent injuries from getting worse, such as stopping bleeding or moving the victim from a dangerous location; and third, to aid recovery by providing appropriate initial care such as covering minor wounds with bandages [2].

In Kampung Flory, injury management requires the involvement of various parties, including management, tourism officials, and tourists themselves. Tourism officials serve as the frontline in providing first aid because they are on-site and directly address emergency situations. Well-trained officers can handle situations quickly and appropriately, reducing the risk of more serious injuries. Furthermore, good coordination between tourism management and nearby health services is crucial in injury management, as not all injuries can be treated on-site and require support from more comprehensive medical facilities. However, a preliminary study conducted in Kampung Flory revealed weaknesses in the safety system. A systematic injury documentation process has not been established, injury prevention and management training for employees and the local community is still limited, and Standard Operating Procedures (SOPs) related to safety in outdoor activities have not been fully developed. Therefore, this study aims to provide conceptual and practical contributions to injury prevention and management in Kampung Flory. This research is expected to provide new insights for tourism managers in managing safety aspects and assist them in formulating more effective strategies to protect tourists from injury while enjoying nature-based tourism activities.

Injury prevention and management in rural communities, especially in areas frequented by tourists, is crucial to ensure the safety and well-being of both residents and visitors. Studies conducted in Nepal and Iran have emphasized the importance of community perceptions, incidence rates, and prevention practices related to unintentional injuries [3], [4], [5]. These studies highlight the need for culturally acceptable precautions, appropriate supervision, and knowledge dissemination to increase safety awareness among community members. Additionally, research from China reveals the rates of unintentional injury deaths in children in

urban and rural areas, providing insights into trends and factors influencing these incidences [6]. Understanding these patterns is crucial for developing targeted prevention strategies and effective policies to reduce injury-related deaths.

2. Method

This study used various materials to support the implementation of the training and data collection. The main materials used included questionnaires *pre-test* and *post-test* designed to measure participants' knowledge of injury prevention and treatment. Additionally, training aids such as brochures, written guides, and visual aids were used during the training sessions. Basic medical equipment such as bandages, gauze, and plasters was also provided for demonstrations of first aid techniques.

a. Sample Preparation

Sample preparation was carried out by recruiting participants from Kampung Flory employees and the surrounding community. A total of 31 participants were involved in this study. Before the training began, participants were asked to complete a questionnaire *pre-test* to assess their initial knowledge about injury prevention and treatment. The questionnaire included questions related to injury definitions, initial symptoms, and first aid techniques *pre-test* serves as a basis for evaluating knowledge increases after training.

b. Experiment Setup

Injury prevention training was held in Kampung Flory, Sleman, Yogyakarta. The training session included theoretical presentations and practical demonstrations on injury prevention and treatment techniques. The training environment was designed to facilitate interaction and active participation from participants. During the training, participants were provided with educational materials covering injury prevention techniques, the use of protective equipment, and first aid steps using the PRICER (Pricer) method. *Protection, Rest, Ice, Compression, Elevation, Referral*).

c. Parameter

The parameters measured in this study were participants' knowledge levels before and after training. Knowledge levels were measured using a questionnaire containing questions about injury definitions, risk factors, early symptoms, prevention techniques, and first aid steps as outlined in the 2019 National Injury and First Aid Manual. **Table 1**.

Table 1. Questionnaire Grid

Core Aspects	Rubric Number	Indicator
Understanding Injuries	1	Understanding the definition of injury
Symptoms and Impact of Injury	2-3	Recognizing the early signs of injury; Recognizing the impact of injury on physical activity
Injury Treatment	4	Recognizing the importance of a rapid response to injuries

Causes of Injury	5-6	Internal factors such as muscle strength that influence injuries; External factors such as field conditions that influence injuries
Training Techniques and Physical Activity	7-8	Incorrect training techniques increase the risk of injury; Understand the importance of warming up before physical activity.
Injury Prevention	9-11	Using proper techniques to prevent injury; Recognizing the importance of protective equipment in physical activity; Recognizing the importance of adequate rest to prevent injury
Post-Injury Care	12-13	Know the first aid steps for injuries; Understand the RICE technique for treating injuries
Injury Recovery	14-17	Understand the importance of rehabilitation after injury; Use physiotherapy and aids for recovery; Understand the importance of stretching and strength training during rehabilitation; Following a structured rehabilitation program

Score *pre-test* and *post-test* compared to evaluate the effectiveness of the training. Additionally, other parameters such as active participation and feedback from participants during the training sessions were also recorded to provide a comprehensive overview of the training implementation.

d. Statistical Analysis

Statistical analysis was conducted to evaluate the increase in participants' knowledge after the training. A normality test using the Shapiro-Wilk test was conducted to ensure that the data were consistent *pre-test* and *post-test* normally distributed. The paired t-test was used to compare the score s*pare-test* and *post-test* with a significance level set at a p-value < 0.05. An effect size (Cohen's d) was also calculated to determine the extent to which the training impacted participants' knowledge. The results of this analysis provide a strong basis for assessing the training's effectiveness.

3. Results and Discussion

Based on the findings of this study, statistical analysis showed a significant increase in participants' knowledge regarding injury prevention and management after the training. Descriptive statistics are presented in **Table 2** shows that the average score *pre-test* was 147.71 with a standard deviation of 21.76, which indicates variation in the participants' knowledge levels before the training. After the training, the average score

flat *post-test* increased to 169.00 with a standard deviation of 19.11, indicating a substantial increase in knowledge among participants.

Table 2. Statistic Description

	Mean	**Deviation Standard**	**N**
Pre-test	147.71	21.76	31
Post-test	169.00	19.11	31

The results of the normality test are presented in **Table 3** using the Shapiro-Wilk test shows that the data *pre-test* and *post-test* normally distributed. The p-value for *pre-test* is 0.057 and for *post-test* is 0.102, both greater than 0.05, which meets the normality assumption required for further statistical analysis.

Tabel 3. Normality Test

	Shapiro-Wilk Statistic	**Shapiro-Wilk Sig. (p-value)**
Pre-test	0.934	0.057
Post-test	0.943	0.102

Furthermore, the paired t-test presented in **Table 4** shows a significant difference between the scores *pre-test* and *post-test*. The average difference between the two scores was -21.29, which reflects a substantial improvement after training. The t-test value was -6.218 with *p-value* < 0.05 confirms that this increase in scores is statistically significant, proving that the training effectively improved participants' knowledge of injury prevention and management.

Tabel 4. Paired Sample Test

pairwise differences	**Mean**	**Deviation Standard**	**t**	**df**	**Signification (2-tailed)**
Pre-test - Post-test	-21.29	21.76	-6.218	30	0.000

The calculated effect size (*Cohen's d*) of 0.978 as shown in **Table 5** shows that training has a very big effect in increasing participants' knowledge. *Cohen's d* of 0.978 indicates that the average difference between the scores *pre-test* and *post-test* has a substantial impact equivalent to almost one full standard deviation.

Tabel 5. The Effect (Cohen's d)

Effect
Cohen's d = 0.978

Overall, the results of this study indicate that injury prevention and management training was highly effective in improving participants' knowledge. These findings provide empirical evidence that structured and organized training interventions can significantly contribute to improving employee and local community safety knowledge in tourist areas. These results also emphasize the importance of implementing more systematic and comprehensive safety procedures in tourist destinations, particularly in Kampung Flory. The

results of the normality test show that the data *pre-test* and *post-test* normally distributed, allowing the use of parametric statistical tests for further analysis. The paired t-test showed a significant increase in scores *post-test* compared to the score *pre-test*. This increase indicates that the training was successful in increasing participants' knowledge about injury prevention. The effect size was large (*Cohen's d* = 0.978) supports this finding, indicating that the increase in knowledge is highly significant and relevant. Previous research has emphasized the importance of education and training in improving safety awareness and injury prevention skills in rural communities and tourist destinations. Studies conducted in Nepal, Iran, and Bangladesh have highlighted the importance of culturally accepted precautions, appropriate supervision, and knowledge dissemination to improve safety awareness [4], [5]. Research in China has also shown that understanding injury incident patterns can help in developing more effective prevention strategies [6], [7].

The findings of this study have significant implications both scientifically and practically. Scientifically, these results add to the strong evidence that context-based training Communities can improve their knowledge and skills in injury prevention, which is critical to safety in rural communities and tourist destinations. Practically, this effective training can be implemented in similar communities to reduce injury incidents and improve safety. This increased knowledge and skills are expected to help reduce injury incidents and improve the well-being and safety of both local residents and tourists. Implementing evidence-based injury prevention strategies and raising awareness of the importance of safety can contribute significantly to injury prevention efforts in rural communities and other tourist destinations [8].

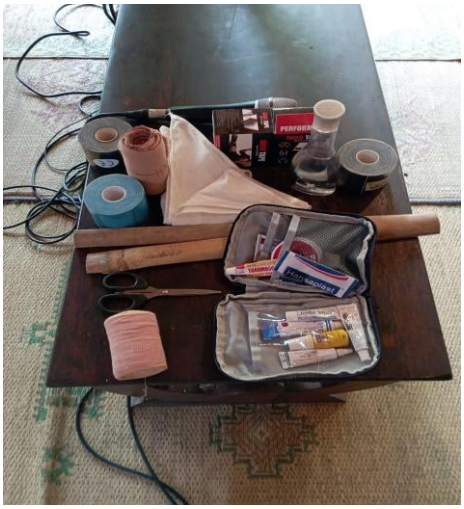

Figure 1. Tool Introduction

Figure 2. Injury Management Practices

Figure 3. Example of Instructor-Provided Therapy

Figures 1 to 3 illustrate the various aspects of the training provided to participants, covering both theoretical and practical aspects of injury prevention and management. This comprehensive approach not only increases participants' knowledge but also raises awareness of the importance of safety in the workplace and tourism environment. By integrating these principles into tourism practices, rural areas can create safer and more enjoyable environments for tourists while supporting local communities and preserving cultural heritage [9]. Improving safety in rural tourism through community-based injury prevention programs involves a comprehensive approach that combines local expertise, active community participation, and focused educational efforts. The success of these programs depends heavily on local community involvement, which fosters a sense of ownership and responsibility for ensuring safety in tourism activities. Community engagement is key to the success of rural tourism projects. Research has shown that local communities are crucial in the planning and development of sustainable tourism, as they maintain their cultural heritage and possess unique knowledge of their environment [10]. This participation not only adds authenticity to the tourist experience but also empowers local communities to lead safety efforts. For example, when community members are involved in decision-making, this has a positive impact on the sustainability of rural tourism [11]. Studies show that engaged communities are more likely to adopt effective safety protocols and injury prevention strategies. Furthermore, knowledge transfer is crucial for enhancing communities' ability to safely manage rural tourism. Strengthening residents' self-management skills through knowledge sharing significantly improves their ability to monitor tourism activities. This is crucial for injury prevention, as informed community members can better identify risks and implement preventative measures [12].

The economic impact of rural tourism further emphasizes the importance of safety training. Rural tourism plays a major role in driving local economic growth, offering income and employment opportunities [13]. However, increased tourist influx can lead to a higher risk of injury if not properly managed. Therefore, community-based injury prevention training not only protects tourists but also safeguards the economic interests of local businesses that depend on tourism [14]. A safe environment increases the attractiveness of a community as a tourist destination, contributing to long-term economic benefits. In addition, the role of local leadership in guiding these training programs is crucial. Strong leadership is needed to coordinate community efforts and ensure that safety training aligns with the broader goals of rural tourism development [15]. Leaders can pool resources, encourage collaboration among stakeholders, and promote the importance of safety in tourism, thereby increasing the overall effectiveness of injury prevention efforts.

4. Conclusions

This study shows that the injury prevention training provided to Kampung Flory employees and the surrounding community was very effective in increasing their knowledge. Significant improvements in injury prevention scores *post-test* compared to the score *pre-test* showed that this training successfully improved participants' understanding of injury prevention and management. The large effect size further underscores the importance of this intervention. The implications of these findings are broad, both scientifically and practically. Scientifically, these results provide strong evidence that community-based training programs can improve safety in rural areas and tourist destinations. Practically, the approach used in this study can be applied in other communities to reduce injury incidents and improve community well-being. Implementing evidence-based injury prevention strategies and increasing safety awareness it is very important to create a safer environment for local residents and tourists. This study also highlights the importance of culturally appropriate

education and knowledge dissemination, as demonstrated by previous research [4], [5]. Integrating these findings into local policies and practices is expected to create a safer and healthier environment for all. Further research is needed to evaluate the long-term effectiveness of this training and to develop additional strategies to improve safety in rural communities and tourist destinations.

Conflict of interest

The authors declare no conflict of interest.

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