

Occupational Safety and Health Training on the Use of Electrical Equipment and Home Electrical Installations at Ciparay District

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ABSTRACT

The use of electrical equipment and residential electrical installations requires compliance with safety procedures and standards to prevent electrical accidents. Limited public awareness regarding electrical hazards and safe electrical practices may increase the risk of electric shock, short circuits, and residential fires. This community outreach activity aimed to improve public understanding of occupational safety and health (OSH) principles related to the use of electrical equipment and residential electrical installations. The program was conducted in Pakutandang Village, Ciparay District, through presentations, demonstrations, discussions, and question-and-answer sessions involving 15 community participants. A satisfaction survey was administered to evaluate participant responses to the activity. The survey results indicated a positive response, with overall satisfaction reaching 95%, while the perceived benefits of the activity and increased knowledge of electrical safety both achieved 97%. These findings suggest that the outreach activity was effective in increasing community awareness of electrical safety and the importance of using standard-compliant residential electrical installations.

Keywords: Occupational Safety and Health (OSH), electrical safety, electrical equipment, residential electrical installations, community outreach, Pakutandang Village.

1. INTRODUCTION

Most residential fires are caused by electrical installations that do not comply with the General Requirements for Electrical Installations (PUIL), overloaded circuits, and inadequate maintenance of cables and outlets. Previous studies indicate that public education and awareness programs can reduce the risk of electrical fires (Afandi, 2020).

(PUIL, 2020) emphasizes that electrical installations must be designed, installed, and maintained in such a way as to protect people, livestock, and property from the dangers of electric shock, thermal effects, overcurrent, and the risk of fire that can be caused by electrical installations that do not meet safety requirements.

In addition to electrical installations, the daily use of electrical equipment also presents significant risks when used improperly. Electrical hazards may arise from user negligence, such as touching exposed wires, operating electrical equipment with wet hands, or using overloaded power strips (**Andrawadi, 2024**). Outreach programs using presentations, audiovisual media, and illustrations have proven effective in increasing public knowledge regarding electrical hazards and safe electrical equipment usage (**Zondra, 2020**).

Limited public awareness is reflected in the large number of home electrical installations that do not meet standards due to improper cable installation, the use of non-standard components, and insufficient understanding of PUIL. Outreach activities are conducted to increase public awareness regarding the importance of safe and reliable electrical installations in preventing electrical accidents (**Hadiyanto, 2025**).

According to **Ridwan (2023)**, the low level of public knowledge regarding proper electrical equipment operating procedures is one of the primary causes of household electrical accidents. Outreach activities have a positive impact on increasing public awareness in implementing OSH principles in household electricity use.

Public understanding of residential electrical installation standards is also an important concern. Electrical installations must comply with PUIL standards to ensure safety. The use of non-standard cable connections and excessive loads on a single outlet can increase the risk of fire and damage to electrical equipment (**Taryana, 2022**).

Training and community empowerment activities have also proven effective in improving the community's ability to identify potential electrical hazards. **Wibowo et al. (2025)** state that training in the use of electrical measuring devices, such as clamp meters, can help the community understand the condition of the electrical current being used, thereby enabling them to detect overloading or current leakage that could potentially cause electrical accidents.

Based on preliminary observations conducted in Pakutandang Village, several residents demonstrated limited understanding regarding the safe use of electrical equipment and the importance of standard-compliant electrical installations. In addition, improper practices such as excessive use of extension cords and lack of awareness of electrical hazards were still observed. Therefore, the village was selected as the target location for the outreach activity.

In addition, this activity aims to improve public knowledge in handling electrical accidents, such as short circuits, electric shocks, and minor electrical fires, enabling residents to take appropriate and safe initial actions before professional assistance is available. It also seeks to increase public participation and interest in electrical OSH education through communicative, interactive, and easily understood delivery methods.

2. METHODOLOGY

2.1 Research Method

Figure 1 illustrates the research flowchart for the study entitled 'Occupational Safety and Health Training on the Use of Electrical Equipment and Home Electrical Installations'.

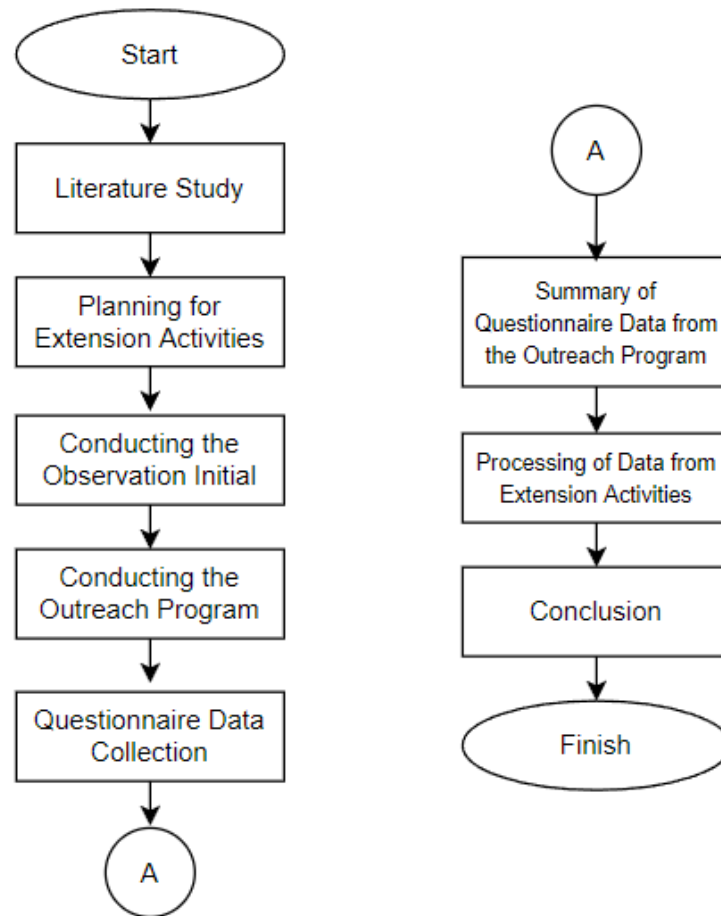


Figure 1. Research Flowchart

The methodology began with a literature review to collect references related to electrical safety, residential electrical installations, and Occupational Safety and Health (OSH) standards. Information obtained from journals, books, and relevant regulations was used as the basis for developing the outreach materials and preparing the implementation of the program. Subsequently, the outreach activities were planned by preparing presentation materials, educational media, and questionnaires for evaluating participants' responses to the program. An initial observation was also conducted to identify the condition of residential electrical installations and the community's level of awareness regarding electrical safety.

The outreach program was conducted through presentations, discussions, question-and-answer sessions, and demonstrations on the safe use of electrical equipment and residential electrical installations. Upon completion of the program, questionnaire data were collected from all participants. The collected data were then processed and analyzed using a descriptive approach to evaluate participants' perceptions of the outreach activity, including the clarity and relevance of the materials, the effectiveness of the delivery, the perceived benefits of the program, and the overall level of participant satisfaction. The results of the analysis were used to evaluate the implementation of the outreach program and to identify its contribution to promoting public awareness of electrical safety and the importance of standard-compliant residential electrical installations.

2.2 Participants

The outreach activity involved 15 community members from Pakutandang Village, Ciparay District. Participants consisted of household residents who voluntarily attended the activity.

The participants represented various age groups and educational backgrounds, allowing the outreach materials to be evaluated across a diverse community audience.

3. RESULTS AND DISCUSSION

3.1 Preparation For Implementing Activities

Initial coordination meetings were conducted by the organizing team one week prior to the outreach activity to establish the implementation timeline, prepare educational materials, organize logistics, and coordinate the technical requirements necessary for the program.

3.2 Research Location

The Ciparay Village Office, shown in Figure 2, served as the location for the outreach activity on the use of electrical equipment and home electrical installations.



Figure 2. Ciparay Village Office

3.3 Outreach Implementation

The outreach activity was conducted in Pakutandang Village with 15 local community participants. The program included presentations, discussions, question-and-answer sessions, and demonstrations of safe electrical equipment use. Topics included electrical hazards, proper use of household electrical equipment, short-circuit risks, correct outlet usage, and emergency response procedures.



Figure 3. Theme of Training Activities

3.4 Introduction to Itenas and the Electrical Engineering Study Program

Participants were given an overview of Institut Teknologi Nasional (Itenas), including its vision, mission, and academic environment, particularly focusing on the Electrical Engineering Study Program.

3.5 Delivery of Materials

The training materials explained the safe use of electrical equipment and introduced the main components of residential electrical installations, including miniature circuit breakers (MCBs), electrical outlets, switches, electrical cables, and grounding systems. Participants were informed about the functions of these components and the importance of using electrical equipment that complies with safety standards to reduce the risk of electrical accidents in household environments (figure 3-4).

In addition, participants were educated about common electrical hazards caused by damaged equipment, overloaded circuits, faulty wiring, and improper electrical practices. Several examples of household electrical accidents, such as using frayed cables, overloading outlets, and operating electrical devices with wet hands, were presented and discussed interactively. Through these discussions, participants gained a better understanding of the relationship between unsafe electrical practices and the risk of accidents, thereby increasing their awareness of safe electrical behavior in daily life.



Figure 4. Delivery of Materials

3.6 Question-and-Answer Session and Discussion

An interactive session was conducted where audiences could ask questions and engage in discussions to deepen their understanding of the presented topics (figure 5).



Figure 5. Question and Answer Session

3.7 Closing and Documentation

The event concluded with closing remarks and a documentation session, including group photos and feedback collection from the participants. The training participants can be seen in Figure 6.



Figure 6. Documentation of Training Participants

3.8 Community Satisfaction Survey Data

A community satisfaction survey was conducted to evaluate participants' satisfaction with the outreach program. Questionnaires were distributed to all 15 participants after the completion of the activity. Assessment categories included Excellent, Good, Fair, and Poor as shown in table 1.

Table 1. Community Satisfaction Survey Data

No	Assessment Criteria	Very Good	Good	Fair	Poor	Satisfaction Rate
1	Clarity in Presenting the Material	9	5	1	0	93%
2	Easy-to-Understand Material	8	6	1	0	91%
3	Relevance of the Material to Community Needs	10	4	1	0	95%
4	Demonstration on the Use of Electrical Equipment	9	5	1	0	93%
5	Interaction and Communication with the Presenter	8	6	1	0	91%
6	Benefits of Outreach Activities	11	3	1	0	97%
7	Interest in Participating in Educational Activities	7	7	1	0	89%
8	Facilities and Educational Materials	7	6	2	0	87%
9	Expanding Knowledge of Electrical Safety	11	3	1	0	97%
10	Overall Satisfaction with the Activity	10	4	1	0	95%

Based on Table 1, the survey results demonstrate that participants positively evaluated almost all aspects of the outreach activity. The highest satisfaction scores were observed in the

categories of outreach benefits and knowledge enhancement, both obtaining 97%. This finding suggests that the educational materials successfully addressed the participants' needs and increased their awareness regarding electrical safety practices.

These findings are consistent with the study conducted by **(Rooroh, 2025)** which reported that educational outreach programs significantly improve public understanding of electrical hazards and safe electricity usage. Similar results were also reported by **(Sekarsari, 2020)**, who found that electrical safety outreach activities contribute positively to increasing public awareness of occupational safety and health principles.



Figure 7. Community Satisfaction Graph

Survey results indicate that most participants provided good and excellent evaluations of the outreach activity. The highest satisfaction levels were observed in the benefits of the outreach activity and the increase in knowledge regarding electrical OSH, both reaching 97% (figure 7).

Furthermore, the clarity of material delivery, demonstrations of electrical equipment use, and overall satisfaction also received high ratings. These results indicate that the outreach activity received positive responses and successfully increased awareness of electrical safety in household environments.

The high level of satisfaction regarding the expansion of knowledge on electrical safety also indicates that, prior to the activity, there was a knowledge gap among the community regarding the safe use of electricity. After attending the outreach session, participants gained new knowledge regarding the identification of potential electrical hazards, the use of installations that meet standards, and preventive measures against electrical accidents in the home.

4. CONCLUSION

Based on the results of the outreach activity conducted in Pakutandang Village, Ciparay District, the program was successfully implemented and received positive responses from the participants. The activity provided information on electrical hazards, safe use of electrical equipment, and the importance of standard-compliant residential electrical installations. The

community satisfaction survey indicated that participants considered the materials relevant, beneficial, and easy to understand, with overall satisfaction reaching a high level.

The outreach activity also contributed to increasing public awareness of electrical safety practices in household environments. Through presentations, demonstrations, and interactive discussions, participants gained a better understanding of potential electrical hazards and preventive measures that can be applied in daily life. Future activities are recommended to include pre-test and post-test assessments to quantitatively evaluate knowledge improvement and to involve a larger number of participants for broader community impact.

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