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Education on the Management and Efficiency of Electrical Energy Use for Households in Kampung Tambak Asri Morokrembangan Surabaya

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ABSTRACT

Objective: *The use of electrical energy by housewives is often less efficient due to their habit of leaving appliances connected and low awareness of managing energy. This has an impact on increasing electricity costs to be paid and energy waste. This community service activity aims to increase the understanding of housewives in the correct and efficient use of electrical energy.* ***Method:*** *The activity was held at the Tambak Asri 204 Al Islam Mosque in Surabaya which was attended by 35 housewives who were members of the Ta'lim At-Taubah Assembly. The method of implementing service includes making and distributing energy-saving educational posters, interactive counseling on electricity use habits, and energy-efficient household appliances simulations.* ***Results:*** *The results of the activity showed an increase in participants' knowledge about the importance of unplugging electrical equipment after use, turning off lights when not in use, and choosing energy-saving electrical devices such as Light Emitting Diode (LED) lamps.* ***Novelty:*** *Thus, this activity is able to foster collective awareness in reducing electricity waste while supporting household cost savings and environmental sustainability.*

INTRODUCTION

Morokrembangan Village, especially the Tambakasri Village area**,** is a densely populated area with the majority of its residents working in the informal sector. In daily life, the people of Tambakasri village are very dependent on electrical energy, both for lighting and the use of household appliances such as rice cookers, irons, fans, and dispensers. However, the high demand for electricity is not balanced by an adequate understanding of the safe and efficient use of electrical equipment [1], [2].

In the Tambakasri village environment, there are still many habits of housewives and people who are wasteful and negligent in the use of electrical energy. For example, leaving the television on even when not watching, charging the mobile phone overnight, and turning on the fan or air conditioner non-stop. In addition, using a rice cooker only as a place to store rice throughout the day, leaving the iron on when not in use, and using the washing machine repeatedly for small amounts of clothes further aggravates the waste of electricity. The use of electrical energy for lighting in various rooms needs to adjust to the lighting level standards that have been set in the SNI. According to the Indonesian National Standard (SNI), the recommended light intensity is 120–250 lux for the bedroom, 250 lux for the bathroom, 120–250 lux for the dining room, and 250 lux for the kitchen [3].

Other electrical appliances such as refrigerators that are crowded and often opened, hot water dispensers that are left on continuously, and household lights that stay on during the day are also contributors to high energy consumption. These practices not only cause electricity bills to swell, but also increase the risk of equipment damage and fire hazards due to short circuits [4], [5].

Seeing these conditions, real efforts are needed to increase the awareness and skills of the community, especially the housewives of the At-Taubah Taklim Council, so that they can use electrical equipment properly, correctly, safely, and energy-efficiently. Through community service activities in the form of counseling, hands-on practice, interactive discussions, and the creation of educational posters, it is hoped that participants can gain practical knowledge that is easy to apply in daily life and be able to create a safer and more energy-efficient household.

RESEARCH METHOD

Implementation Method

The implementation of this community service activity is designed systematically so that the goals can be achieved properly. Considering that the main target is housewives in the Taklim At-Taubah Council, Morokrembangan Village, Tambak Asri Village, the method used must be adjusted to the social conditions, education level, and daily patterns of the participants. Therefore, the activity does not only focus on delivering material theoretically, but also prioritizes a participatory approach through direct practice, discussions, and the provision of educational media in the form of posters.

This activity method was prepared to ensure effective knowledge transfer, skill improvement of participants, and behavioral changes in the use of electrical equipment in households. In addition, the activity is also equipped with an evaluation so that the results can be measured objectively and become the basis for the sustainability of the program in the future.

A. Activity Approach

This community service activity uses a participatory-educational approach, where participants (housewives of the At-Taubah Taklim Council) not only receive material in one direction, but also actively engage in discussions, direct practices, and the use of educational media in the form of posters. This approach was chosen to make knowledge transfer more effective, in accordance with the characteristics of the community in Morokrembangan Village, Kampung Tambak Asri, which tends to be easier to understand the material through real practice and examples.

B. Stages of Implementation

The method of the activity is carried out through several systematic stages, namely:

1. **Activity Planning**

In the planning stage, the team compiled counseling materials that were simple, communicative, and in accordance with the needs of the community so that they were easy to understand by housewives. In addition, the team also prepared various equipment for the demonstration, such as irons, rice cookers, dispensers, fans, and

miniature washing machines that are often used in daily life. As a support, the team also designed educational posters about the good, safe, and energy-efficient use of electricity so that messages can be conveyed more clearly and sustainably [6].

2. **Implementation of Activities**
   - **Interactive counseling**: provides a basic understanding of electrical safety, energy-wasting equipment, and power-saving tips.
   - **Live demonstration**: In this session, participants were introduced to the use of LED (Light Emitting Diode) lights as an alternative to incandescent and fluorescent lamps. LED lights were chosen because they are able to produce light with a high level of brightness (lumen) despite their relatively low power consumption [7], [8], [9], [10]. This makes LEDs more energy-efficient and economical than conventional lights. Some of the drawbacks of LEDs, such as the dimming potential due to the buildup of black powder in the tubes [11], [12], [13], [14], [15], were also discussed so that participants understood the aspects of their advantages and limitations. With this simulation, it is hoped that mothers can get used to the energy-saving culture through the selection of the right type of lamp in the household.
   - **Discussion and Q&A**: discussing real cases faced by participants related to electricity use at home.
   - **Posters & Distribution**: posters containing educational messages are pasted at the Taklim Assembly and distributed to participants as a reminder medium at home.

RESULTS AND DISCUSSION

The community service activity with the theme "Education on the Management and Efficiency of the Use of Electrical Energy for Housewives in Kampung Tambak Asri Morokrembangan Surabaya" has been carried out well and received high enthusiasm from the participants. The number of participants who attended was 35 housewives from Morokrembangan Tambakasri Village. The explanation of the results of community service activities is divided into 3 stages, namely:

A. Educational Poster Making

The implementation of community service activities began by designing and producing educational posters about the management and efficiency of electrical energy for households. The poster is made with a simple, communicative design, and uses illustrations that are easy for housewives to understand. The content of the poster contains key messages regarding energy-saving behavior, the use of standard-compliant equipment, and practical tips for reducing energy waste, as shown in Figure 1.

Figure 1. Electric Energy Saving Education Poster.

The posters were distributed to all participants so that they could be a reminder in their respective homes. As a result, participants felt helped because they had visual media that could be viewed again after the activity.

B. **Interactive Counseling**

The counseling activity was carried out face-to-face at the Al Islam Mosque in Tambakasri, attended by 35 housewives who are members of the Ta'lim At-Taubah Council. The delivery of material is carried out in an interactive method through lectures, discussions, and questions and answers. Key materials include the importance of managing the use of electrical energy, identifying energy-wasting equipment, as well as simple steps to reduce household electricity costs, as shown in Figure 2.

Figure 2. Education on the importance of Saving Electrical Energy.

From the results of the discussion, participants admitted that they gained a new understanding of energy-saving practices that were previously underappreciated, such as unplugging when not in use and setting a schedule for using household appliances.

C. Demonstration of Energy-Efficient Equipment

In addition to counseling, participants were also introduced to the use of LED lights as an alternative to energy-efficient lamps compared to incandescent and fluorescent lamps. Participants can see firsthand the difference in brightness, power efficiency, and the advantages of LEDs that are able to convert almost all electrical energy into light. From this demonstration, all participants were given LED lights to use in their respective homes, so as to reduce the burden of electricity consumption costs.

Figure 3. Mother's Demonstration on the Readiness to Use LED Lights.

CONCLUSION

Fundamental Finding : The community service activity with the theme "Education on the Management and Efficiency of the Use of Electrical Energy for Housewives of Kampung Tambak Asri Morokrembangan Surabaya" has been carried out well and received a positive response from the participants. Through counseling, the practice of using electrical equipment, discussions, and the distribution of educational posters, participants gained a broader understanding of the importance of electrical safety, the dangers of using electrical equipment carelessly, and how to save electrical energy in households. The results of the activity showed an increase in participants' understanding as seen from the participants' ability to identify energy-consuming household appliances and mention simple steps to save electricity consumption. **Implication :** The posters about the procedures for using electricity that were distributed had a positive impact because they functioned as a continuous learning medium that could be pasted in each other's homes. Overall, this activity succeeded in achieving the main goal, which is to

improve the understanding and skills of housewives in using electrical equipment safely, correctly, and energy-efficiently. With the availability of materials, hands-on practice, interactive discussions, as well as poster media and tables on how to use electricity, it is easier for participants to understand practical steps that can be applied daily. **Limitation :** In addition, there is an increase in participants' awareness to reduce wasteful habits and commit to implementing energy-saving behavior in their respective homes, so that it is expected to create a safer, more efficient, and prosperous household environment. However, the activity is limited to the context of a single community, which means the findings may not yet be generalized to broader populations without further evidence. **Future Research :** Future research should expand the scope of participants to include different demographic groups and regions, so that the effectiveness of such community service activities can be compared across various social contexts. Further studies are also needed to evaluate the long-term behavioral changes of participants after the intervention, ensuring whether the knowledge and practices gained are sustained and contribute to a lasting culture of energy efficiency.

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