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Strengthening Food Safety among Community Cadres to Improve Understanding of Balanced Nutrition

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ABSTRACT

Background: Food security and balanced nutrition are essential foundations for improving public health. Low levels of food safety literacy and understanding of balanced nutrition at the household level remain major issues contributing to various nutritional issues, such as stunting, wasting, underweight, and overweight.

Purpose of the Study: This Community Service (PKM) activity aims to improve public knowledge, attitudes, and awareness regarding the importance of food safety and the implementation of balanced nutrition in daily life. The PKM was implemented using an educational and participatory approach based on community empowerment, involving 30 participants consisting of PKK cadres, Posyandu (Integrated Service Post) members, and representatives of community organizations in Situsari Village, Cileungsi District, Bogor Regency.

Methods: Implementation methods include counseling, interactive discussions, pretests and posttests, and the development of follow-up action plans. The materials provided cover the five keys to food safety, the CEK KLIK principle, and the concept of balanced and diverse nutrition.

Results: The results of the activity showed a significant increase in participants' knowledge and attitudes after participating, as demonstrated by a comparison of pretest and posttest results. The average pretest score of 30 participants was 64.3, categorized as fair, and increased to 87.2 in the posttest, categorized as very good. This indicates an improvement of 22.9 points or 35.6% after the educational activity. Furthermore, participants demonstrated a commitment to implementing and disseminating food safety and balanced nutrition practices in their respective communities. This activity demonstrates that an integrated educational-participatory approach to food safety and balanced nutrition is effective in improving community food literacy and has the potential to create sustainable behavioral change.

Keywords

Food Security; Balanced Nutrition; Community Empowerment

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Introduction

Food safety is the conditions and efforts necessary to prevent food from potential biological, chemical, and other contaminants that could disrupt, harm, or endanger human health. Food safety relates not only to the consumption stage but also to the entire food production chain, from farming, processing, distribution, and serving. Meanwhile, a balanced diet contains nutrients in the types and amounts appropriate to the body's needs, while taking into account the principles of dietary diversity, physical activity, healthy living behaviors, and maintaining a normal body weight (Panjaitan et al., 2022).

Food safety and balanced nutrition are two fundamental aspects in maintaining and improving public health. Safe food means free from physical, chemical, and biological contamination that can harm health. On the other hand, balanced nutrition refers to adequate macronutrient and micronutrient intake according to the body's needs. Unfortunately, based on Riskesdas data, the frequency of household food poisoning and malnutrition remains relatively high in various regions, especially in areas with limited access to health information and services (Arif et al., 2020; Kemenkes RI, 2018).

The frequency of stunting based on the results of the 2024 Indonesian Nutritional Status Survey (SSGI) decreased by 1.7% from 21.5% in 2023 to 19.8% in 2024 (a decrease in stunted toddlers of 357,705 toddlers). Wasting decreased by 1.1% from 8.5% in 2023 to 7.4% in 2024. Underweight increased by 0.9% from 15.9% in 2023 to 16.8% in 2024. Overweight decreased by 0.8% from 4.2% in 2023 to 3.4% in 2024. Based on the results of the latest survey released by the Ministry of Health, there is a need to strengthen preventive measures to build public awareness so that the numbers of stunting, wasting, underweight, and overweight can be reduced to zero (Kementrian kesehatan Republik Indonesia, 2022).

The public still faces challenges of low awareness and knowledge regarding food safety and balanced nutrition. Many families lack understanding of how to safely prepare, store, and serve food. Furthermore, limited information and unequal access to nutrition education contribute to the prevalence of unhealthy food consumption practices, particularly among marginalized households. This indicates that many people remain uneducated about the five keys to food safety, which should serve as a benchmark for managing healthy food (Wahongan et al., 2021).

This problem is exacerbated by low nutritional literacy and food safety at the household level. Households are the primary source and spearhead for reducing stunting, wasting, underweight, and overweight in children. Research (Nurassiyah & Prasodjo, 2025). found that more than 60% of housewives do not understand the basic principles of food safety, and only 40% can prepare a balanced, nutritious daily menu. This indicates a gap between knowledge and practice that can jeopardize long-term family food security. Furthermore, public understanding of the importance of a diverse diet to meet nutritional needs and seeking food sources that are not necessarily far from the environment has not yet become a habit (nutritious food does not have to be expensive) (Picauly et al., 2023).

Thus, the urgency of this community service program lies in the need for an educational strategy that is not only informative but also empowering. Communities need to be facilitated to become active actors in creating a safe and healthy food environment. This cannot be separated from efforts to address structural problems and the marginalization of knowledge, which have so far focused solely on formal institutions. Collaboration from all stakeholders is crucial and must be maintained to achieve Indonesia Emas 2045.

The Community Service (PKM) activity entitled "Strengthening Food Security for the Community to Understand Balanced Nutrition" was implemented in response to these issues. This activity was designed to provide participatory and applicable education to the community, especially PKK cadres, Posyandu, and community organizations, so that they can become agents

of change in their respective environments. Through this activity, it is hoped that there will be an increase in community knowledge, attitudes, and awareness regarding the importance of food security and the implementation of balanced nutrition in daily life. Community service activities that actively involve the community, utilize local food potential, and are supported by local cadres and community leaders are considered capable of creating more sustainable behavioral changes (World Health Organization, 2024). This approach is in line with national preventive efforts to improve the quality of public health and support the achievement of superior human resource development (Picauly et al., 2023).

Method

This Community Service activity was implemented using an educational-participatory approach based on community empowerment to increase community understanding and skills in implementing the principles of food safety and balanced nutrition. This approach positions the community as an active subject in the learning process and follow-up planning, thereby encouraging program sustainability at the family and community level. The target group for this activity was 30 community members consisting of PKK administrators, Posyandu cadres, and representatives of community and youth organizations, such as Fatayat NU, Muslimat NU, GP Ansor, IPNU, and IPPNU, most of whom were women. Participants were selected because of their strategic role as agents of change in the family and community environment. The activity was carried out by a community service team with the support of the village government and community leaders. The service location was at the Situsari Village Hall, Cileungsi District, Bogor Regency, West Java. The activity was carried out for one day, namely on December 3, 2025.

The community service program is implemented through three stages: preparation, implementation, and evaluation. The preparation stage includes coordination with partners, preparation of educational materials, and preparation of pretest and posttest instruments. The implementation stage includes the delivery of food safety and balanced nutrition materials, interactive discussions, and the development of follow-up plans by participants. The evaluation stage is carried out through posttests, activity reflections, and documentation collection. The community service process uses counseling and interactive discussion methods. Counseling focuses on the concept of food safety, the five keys to food safety, the CEK KLIK principle, and the implementation of balanced nutrition in families. Interactive discussions are used to explore participants' experiences, identify contextual problems, and formulate applicable solutions according to community conditions.

Data analysis was conducted descriptively by comparing pretest and posttest results, supported by observations and documentation of the activities. Indicators of program success include increased participant knowledge about food safety and balanced nutrition, active participant participation during the activities, and the development of a follow-up plan as a commitment to implementing and disseminating knowledge in their respective environments. The activity design can be seen in Figure 1 below:

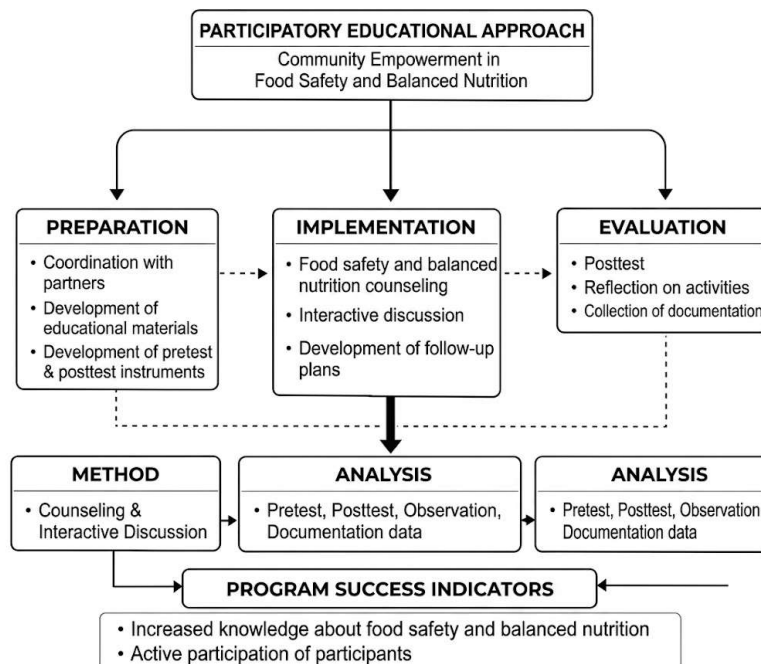


Figure 1. Community Service Activity Design

Result

General Overview of Community Service Activities Implementation

The Community Service (PKM) activity entitled Strengthening Food Security for the Community to Understand Balanced Nutrition was held offline, at Situsari Village, Cileungsi District, Bogor Regency, West Java. This activity was attended by community representatives from various community organizations, including PKK administrators, Posyandu cadres, Fatayat NU, Muslimat NU, GP Ansor, IPNU, and IPPNU. The total number of participants was 30 people. The diverse backgrounds of the participants provided a rich discussion dynamic and reflected the real conditions of the target community.

The series of activities began with an official opening that included the recitation of verses from the Quran, singing the Indonesian national anthem, remarks from the Village Head, remarks from the Chief Executive, and a joint prayer. Following the opening, the event continued with keynote presentations by the speakers. The first session discussed the five keys to food safety at the household level, emphasizing the importance of cleanliness, separating raw and cooked food, proper cooking, storing food at appropriate temperatures, and using safe raw materials. The second session discussed the CEK KLIK principle (Check Packaging, Check Label, Check Distribution Permit, and Check Expiration Date) as a practical step in selecting safe processed food. The third session focused on developing a Follow-Up Action Plan to ensure the continuity of food safety and balanced nutrition education in the community.

The discussion and Q&A session were interactive. Participants actively shared their experiences regarding snack purchasing habits, the lack of reading food labels, and the challenges of implementing food safety principles in their local communities. The results of this discussion enriched the community service team's understanding of the social and cultural context of the community and served as a reflection for the pretest and posttest results.

Participants' Knowledge Pretest Results

A pretest was conducted before the presentation of the material as an initial instrument to measure participants' knowledge, attitudes, and understanding of the concepts of food safety and balanced nutrition. The pretest included cognitive questions regarding food hazards, temperature danger zones, the five key concepts of food safety, the CEK KLIK principle, and attitude statements regarding food safety practices at the household level.

Table 1: Pretest Result

Indicator	Average
Food Safety Hazards	65.0
Five Keys to Food Safety	62.7
CEK KLIK Principle	60.3
Food Safety Attitudes and Behaviors	69.0
Overall Average	64.3

The pretest results show that participants had a moderate initial understanding of food safety and balanced nutrition, with an overall average score of 64.3. The highest score was in Food Safety Attitudes and Behaviors (69.0), while the lowest was in the CEK KLIK Principle (60.3), indicating that participants still needed stronger knowledge of checking food packaging, labels, distribution permits, and expiration dates.

The pretest results showed that participants generally had basic knowledge of food safety, but this understanding was still partial and not yet integrated into daily practice. The average pretest score was in the adequate category, with quite wide variation in scores between participants. This indicates a gap in understanding between participants who were accustomed to participating in public health activities and those who had not received similar education. In terms of cognitive knowledge, some participants were able to identify biological hazards and the importance of hygiene in food processing. However, there were still errors in understanding food temperature danger zones, how to store raw and cooked food, and the appropriate actions to take when encountering signs of unsafe food. In terms of attitudes, most participants stated that they often or always maintain kitchen cleanliness and wash their hands before preparing food, but were not consistent in reading food labels and checking distribution permits for processed products.

This finding aligns with the initial discussion recorded in the activity minutes, where participants acknowledged that reading labels and checking distribution permits was often neglected due to practical reasons, time constraints, or the assumption that food sold locally was definitely safe. This situation indicates that participants' initial knowledge still needs strengthening, particularly on critical and preventive aspects of food safety.

Participants' Knowledge Posttest Results

The posttest was administered after the entire series of materials and discussions was completed, using the same instrument as the pretest. The purpose of the posttest was to measure changes in participants' knowledge and attitudes after participating in the community service activities. The posttest results showed a significant increase in participants' knowledge scores. The majority of participants scored higher than their pretest scores, with a more even distribution of scores. This improvement indicates that the material presented was well understood by the participants and addressed previously unmet information needs.

Table 2: Pretest Result

Indicator	Average
Food Safety Hazards	86.7
Five Keys to Food Safety	88.3
CEK KLIK Principle	85.0
Food Safety Attitudes and Behaviors	88.7
Overall Average	87.2

The posttest results show a substantial improvement in participants' understanding after the educational activity, with an overall average score of 87.2. The highest score was found in Food Safety Attitudes and Behaviors (88.7), followed by the Five Keys to Food Safety (88.3), indicating that participants were able to better understand and apply food safety principles and balanced nutrition practices in daily life.

In terms of cognitive aspects, participants demonstrated a better understanding of the five keys to food safety, temperature danger zones, and the CEK KLIK steps. Participants were also able to re-explain the importance of separating raw and cooked food and the health impacts that can arise from unsafe food. In terms of attitudes, there was a shift in responses to the "always" category for statements related to reading food labels, checking expiration dates, and paying attention to the cleanliness of food vendors. These results were reinforced by the post-lesson discussion recorded in the minutes, where participants began to realize that many long-standing habits needed to be changed to protect family health. Several participants even expressed a commitment to educating family members and the surrounding community about the importance of food safety and balanced nutrition.

Comparison of Pretest and Posttest Results

A comparison of pretest and posttest results shows a consistent increase in participants' knowledge and attitudes. The difference in pretest and posttest scores indicates a positive learning gain, both for participants with low initial abilities and those with moderate initial abilities. In general, the average posttest score was higher than the average pretest score. Furthermore, the variation in scores between participants was smaller, indicating that participants' understanding became more evenly distributed after participating in the community service activities. The comparison graph of pretest and posttest scores shows a clear upward trend, indicating the effectiveness of the educational-participatory approach used.

Table 3: Pretest and Posttest Results

Test Type	N	Average Score	Category
Pretest	30	64,3	Fair
Posttest	30	87,2	Very Good

Based on the pretest and posttest results, participants' understanding increased after participating in the food safety and balanced nutrition education program. Among the 30 participants, the average pretest score was 64.3, categorized as fair, and increased to 87.2 in the posttest, categorized as very good. This increase of 22.9 points indicates that the educational-participatory approach, implemented through counseling and interactive discussions, was effective in strengthening participants' understanding of food safety, the CEK KLIK principle, the five keys

to food safety, and the application of balanced nutrition in daily life.

This improvement reflects not only increased knowledge but also changes in participants' attitudes and awareness. This is evident in the responses to the attitude statements, which indicate a stronger commitment to implementing food safety practices in daily life. Thus, this community service activity impacts not only the cognitive aspects but also the affective aspects of the participants.

Follow-up Action Plan Results

Participants demonstrated that PKM activities do not stop at increasing knowledge, but are directed towards sustainable, concrete actions at the family and community levels. The follow-up action plan was developed in a participatory manner, dividing participants into five heterogeneous groups representing various social and organizational backgrounds. This approach encouraged participants to formulate follow-up actions that were realistic, contextual, and aligned with the potential of their respective environments. Overall, all groups shared a shared awareness of the importance of participants' roles as agents of change in achieving food security and balanced nutrition. The follow-up action plan included ongoing educational activities, community outreach, and the integration of food safety materials into routine community organization activities. Despite having similar goals, each group developed a different focus of activities to meet the needs of their target groups.

Group I emphasized empowering mothers through social forums such as the Family Welfare Movement (PKK), integrated health posts (Posyandu), and religious activities, with a hands-on approach to healthy food processing using natural ingredients and the use of family medicinal plants. Group II focused on increasing community awareness about safe food processing and storage through direct interaction and simple education in daily life. Group III developed an educational strategy based on training and communication media, including social media, with an emphasis on food hygiene, cross-contamination prevention, and food label literacy. Group IV designed a structured outreach program through neighborhood institutions such as neighborhood associations (RT) and community associations (RW), accompanied by systematic time-bound planning for surveys, training, and ongoing mentoring. Meanwhile, Group V emphasized internalizing values and changing participants' attitudes, with a commitment to consistently applying knowledge in family, work, and community life.

Overall, the follow-up action plan results indicate that the PKM activities were able to drive changes in the cognitive, affective, and behavioral aspects of the participants. The follow-up action plan not only reflected an understanding of the material but also the participants' readiness to play an active role in disseminating sustainable food safety and balanced nutrition practices in their respective communities.

Discussion

Pretest and posttest results showed that this community service activity significantly contributed to improving participants' knowledge, attitudes, and awareness regarding food safety and balanced nutrition. This finding supports the argument that community-based educational interventions are effective in improving food literacy, especially when the material is presented in a contextual and participatory manner (Setyaningsih & Sulistiadi, 2025). The increase in post-activity scores confirms that the material provided is relevant to community needs and able to address practical issues in household food management.

Analysis of field data shows that improvements occurred not only in cognitive aspects but also in attitudes and behavioral readiness. Participants demonstrated a better understanding of biological, chemical, and physical food hazards and were able to relate these to potential health risks. This indicates that delivering material based on real-world examples and everyday experiences is effective in building meaningful understanding, as emphasized in a risk-based food safety study ([Grahito Wicaksono, 2020](#)).

The increased understanding of the five keys to food safety and the CEK KLIK principles reinforces the argument that simple yet systematic education at the household level has a significant impact on preventing foodborne illness. After the activity, participants were not only able to articulate the concepts but also understood their relationship to safe food storage, processing, and selection practices. These findings align with WHO guidelines and BPOM policies that place consumer literacy as a primary instrument for protecting public health ([World Health Organization, 2020](#); [Badan Pengawas Obat dan Makanan Republik Indonesia, 2019](#)).

Furthermore, shifts in participants' attitudes and behaviors demonstrate that this community service activity does not stop at transferring knowledge but encourages the internalization of values and critical awareness. The shift from "sometimes" to "always" in food safety practices signals a potentially sustainable learning process. This reinforces the view that changing food consumption behavior requires the simultaneous strengthening of both knowledge and attitudes ([Zahariah & Yassin, 2020](#)).

The argument for the sustainability of the activity's impact is further strengthened through an analysis of participants' Follow-Up Action Plans. The follow-up action plan demonstrated participants' ability to transform knowledge into contextual and applicable action plans. The variety of approaches, from empowering housewives, interpersonal communication, utilizing social media, to engaging formal social structures, reflects the knowledge-to-action process, which is a key indicator of the success of community empowerment-based service ([Agustina, R., Al Hakim, Y. R., Irfan, M., Sigita, D. S., Setyaasih, S., Sunaryo, A., & Lukito, 2025](#); [World Health Organization, 2020](#)).

Based on the results of the group discussions, it was apparent that each group developed complementary intervention strategies, ranging from community-based empowerment, practical education, digital media utilization, and strengthening behavioral commitment. These empirical findings demonstrate that social forum-based approaches such as the Family Welfare Movement (PKK), integrated health posts (Posyandu), and neighborhood association (RT/RW) structures are effective as a means of mobilizing community participation and strengthening community capacity, as confirmed in a study that community-based health interventions are more sustainable when they utilize local social structures ([Cyril et al., 2015](#)). The emphasis on increasing knowledge related to food processing, storage, and hygiene aligns with research showing that food safety literacy contributes significantly to changes in household practices ([Medeiros et al., 2004](#)). Furthermore, the integration of social media and structured training reflects an adaptation to developments in digital health communication, which is considered effective in expanding educational reach and strengthening information retention ([Stellefson et al., 2020](#)). The focus on internalizing values and changing attitudes demonstrates an orientation toward long-term behavioral transformation, which in health behavior studies is seen as a key factor in the sustainability of safe practices at the family and community level. Thus, these field data indicate that a multidimensional approach combining structural

empowerment, literacy strengthening, and behavioral commitment formation is a relevant and contextual strategy in community-based food security programs (Chusniah Rachmawati, 2019).

Argumentatively, all of these field findings demonstrate that PKM activities not only impact individuals but also have broader social implications. Participants have the potential to act as agents of change at the family and community levels, thus encouraging collective behavioral changes in food management. Thus, this service strengthens the community-based health promotion approach, where communities are positioned as the primary stakeholders in efforts to improve food security and sustainable, balanced nutrition (Azmi et al., 2026).

Conclusion

Community Service (PKM) activities to strengthen food safety for understanding balanced nutrition have proven effective in increasing public knowledge, attitudes, and awareness regarding safe and healthy food management. Improved posttest results compared to pretests indicate that the educational-participatory approach is able to strengthen food safety literacy, particularly regarding food hazards, the five keys to food safety, and the CEK KLIK principle. These findings confirm that contextual material delivery, accompanied by discussion and collective reflection, plays a crucial role in building meaningful understanding and encouraging changes in participants' attitudes towards food safety practices at the household level.

In addition to impacting cognitive and affective aspects, this PKM activity also demonstrated the potential for sustainability through the participatory development of Follow-Up Action Plans. The follow-up action plan formulated by participants reflected the ability to transform knowledge into concrete, applicable actions that are appropriate to the community's social context. Thus, this community service not only provides short-term benefits but also strengthens the community's role as agents of change in achieving sustainable food security and balanced nutrition at the family and community levels.

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