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IMPROVING PUBLIC HEALTH THROUGH EARLY DETECTION OF NUTRITIONAL STATUS AND UTILIZATION OF LOCAL FOOD IN MASANGAN KULON SIDOARJO

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ABSTRACT

Nutritional problems in Indonesia among others undernutrition, overweight/obesity, and non-communicable diseases that can occur across all age groups. Masangan Kulon Village, Sukodono District, Sidoarjo Regency, faces similar challenges with suboptimal utilization of local food resources. Therefore, there is a need for early detection programs for nutritional status and education on the use of local food ingredients for adolescents, adults, and the elderly. Activities were conducted on June 19, 2025, for adults (32 people) and the elderly (22 people), and on July 17, 2025, for adolescents (83 people). Examinations included anthropometry, blood pressure, blood sugar, and nutrition education, accompanied by cooking demonstrations featuring catfish tekwan and corn pudding. The results indicated a variety of nutritional statuses, including central obesity, hypertension, and pre-diabetes in several participants. This program improved nutrition knowledge, skills in processing local foods, and awareness of the importance of preventing non-communicable diseases. The activity has the potential to become an intervention model.

Keywords: Adolescents, Noncommunicable Disease, Nutrition Disorders, Nutritional Status

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INTRODUCTION

Nutritional problems in Indonesia remain a complex public health challenge to this day. Data from the 2023 Indonesian Health Survey (SKI), which integrates the Basic Health Research (Riskesdas), show the presence of a tripple burden of malnutrition. Micronutrient deficiencies are still found in vulnerable groups such as adolescents, while on the other hand, overnutrition and non-communicable diseases (NCDs) are increasing among adults and the elderly. Among adolescents aged 11–13 years, the prevalence of anemia is still relatively high and negatively impacts cognitive development, work capacity, and long-term productivity (Winurini, 2025). In addition to anemia, many teenagers also face other nutritional problems, such as malnutrition, undernutrition, overweight, and obesity, which overall can affect their health and quality of life in the future (Sari *et al.,* 2022). Meanwhile, in the adult group, the shift in consumption patterns towards high-energy but nutrient-poor processed foods, combined with low physical activity, contributes to the increasing prevalence of overweight, obesity, hypertension, and diabetes (Retiaty *et al.,* 2025). This condition even places Indonesia among the countries with the highest diabetes burden in the world (Wahidin *et al.,* 2024). The elderly face various specific nutritional problems, such as sarcopenia, osteoporosis, and micronutrient deficiencies, which are influenced by biological changes, limited access to food, and social factors (Setiati *et al.,* 2025). In addition, many elderly individuals experience obesity and have a history of chronic diseases such as hypertension and diabetes, requiring special attention in their nutritional fulfillment and health management (Sudikno *et al.,* 2021).

This challenge is becoming increasingly apparent at the community level, including in Masangan Kulon Village, Sukodono District, Sidoarjo Regency. Observations from the local community show a low utilization of local food potentials such as vegetables, tubers, legumes, and spices as sources of nutritious food that can meet the needs of all age groups. Low nutritional knowledge and skills in processing local ingredients into healthy dishes, combined with increasingly easy access to modern processed food products, contribute to worsening the public's nutritional situation. Community-based interventions, particularly those that combine nutrition education with culinary training such as cooking demonstrations, are effective in enhancing knowledge, cooking skills, and the ability to choose healthy food ingredients. Nevertheless, the long-term impact on anthropometric indicators and nutritional biomarkers still shows variation between studies, indicating the need for more contextual intervention designs (Hasan *et al.,* 2019). Therefore, the community service program in Masangan Kulon Village is expected to serve as a model for contextual, practical

interventions that utilize local potential and have the potential to be replicated in other rural areas.

OBJECTIVES

General Purpose

The general purpose of this activity is to improve health status and prevent nutritional problems in the community.

Special Purpose

The specific purposes of this community service activity are:

1. Conducting nutritional status screening using anthropometric methods.
2. Improving public knowledge by providing nutrition education to adolescents, adults, and the elderly.
3. Improving community skills in preparing nutritious foods based on local ingredients.

PLAN OF ACTION

Strategy Plan

1. The activity began with a focus group discussion (FGD) with stakeholders in Masangan Kulon Village.
2. Approaching the community to promote nutritional status screening activities
3. Conducting training in processing nutritious food based on local food.

Implementation

1. Conducting focus group discussions (FGDs) with stakeholders in Masangan Kulon Village.
2. Collecting baseline data directly using provided anthropometric forms, which were completed by community service students.
3. Implementing the program through education and training on nutritious food processing based on local foods..

Setting

Community service activities were carried out in Masangan Kulon Village, Sidoarjo. The implementation was conducted in 2 stages. The first stage was held on June 19, 2025,

Target

The targets for this activity were teenagers, adults, and the elderly. Based on the results of the activity, the targets were 32 adults, 22 elderly people, and 83 teenagers.

RESULTS AND DISCUSSION

This community service activity was carried out in Masangan Kulon Village, Sidoarjo, where its implementation was conducted in 2 stages in the form of anthropometric measurements to determine the nutritional status of the target groups. The first stage was carried out on June 19, 2025, targeting 32 adults and 22 elderly individuals, while the second stage was conducted on July 17, 2025, targeting 83 adolescents.

In the elderly group, the examinations carried out include anthropometric measurements (weight, height, blood pressure, waist circumference, body mass index (BMI), and blood sugar tests). In the adult group, the examinations conducted include body weight, height, blood pressure, blood sugar test, BMI, and waist circumference. In the adolescent group, measurements include body weight, height, blood pressure, waist circumference, and BMI-for-age. In addition to anthropometric measurements, there are also brief educational sessions and cooking demonstration activities for

the elderly using local food ingredients. The selected menu was catfish tekwan and corn pudding. The main local food ingredients used were catfish and corn, both chosen because they are easily available in the Sidoarjo area. Catfish was selected based on its abundant availability, as the region is one of the areas that cultivate catfish, while corn was chosen because it is a local agricultural product rich in fiber and vitamins.

In this activity, the participants showed very high enthusiasm, evident from their active participation in the cooking process and discussions about the benefits of local food ingredients. Some participants also tried processing the ingredients themselves and asked about recipe variations that can be used for PMT (Supplementary Feeding) for the elderly.

The implementation of this Community Service aims to determine the nutritional status of adolescents, adults, and the elderly, as well as provide knowledge related to the utilization of local food ingredients. The results of this screening are expected to serve as evaluation material and motivation for the community to better understand and become aware of their current health conditions, thereby encouraging efforts in the early prevention of nutritional problems and non-communicable diseases (Nabila *et al.,* 2025). In addition, practical cooking interventions using local food resources are expected to improve confidence and healthy eating behaviors in the elderly (Noerper *et al*., 2025). The results of the nutritional status screening conducted on adolescents, adults, and the elderly are as follows:

Table 1. Results of adolescent nutritional status screening

Indicator	N (%)
Nutritional Status (BMI/Age)	
Severe underweight	4.8
Underweight	13.3
Normal	51.8
Overweight	16.9
Obesity	13.3
Waist circumference	
Normal	94.0
Central obesity	6.0
Blood Pressure	
Low	1.2
Normal	91.6
Hipertention	7.0

Screening results in the adolescent group showed that 51.8% of teenagers had normal nutritional status. Furthermore, the prevalence of overweight among adolescents was 16.9%, obesity 13.3%, undernutrition 13.3%, and severe malnutrition reached 4.8%. These conditions depict the existence of the double burden of malnutrition, which includes both undernutrition and overnutrition, a situation that often occurs in developing countries. Waist circumference measurements indicate that the majority of adolescents are in the normal category (94.0%), while 6.0% of adolescents experience central obesity. Although the results show that central obesity in adolescents is relatively low, it still needs to be monitored because it has the potential to become a risk factor for metabolic syndrome in adulthood. In the blood pressure measurements of adolescents, the majority were in the normal category, although many fall into the normal range, they still need to be monitored.

Table 2. Results of adult nutritional status screening

Indicator	N (%)
Nutritional Status (BMI)	
Underweight	6.3
Normal	6.3
Overweight	9.4
Obesity	78.1
Waist Circumference	
Normal	12.5
Central Obesity	87.5
Blood Pressure	
Low	46.9
Pre-Hipertention	12.5
Hipertention	40.6
Blood Sugar Level	
Normal	75.0
Pre-Diabetes	15.6
Diabetes	9.4

The results of the adult group measurement screening showed a very high prevalence of obesity (78.1%), followed by overweight (9.4%), normal nutrition (6.3%), and undernutrition (6.3%). Central obesity was experienced by 87.5% of individuals, indicating a significant cardiometabolic risk. Low blood pressure was found in 46.9% of adults, hypertension in 40.6%, and pre-hypertension in 12.5%. Meanwhile, 75.0% had normal blood glucose, but 15.6% had pre-diabetes and 9.4% had diabetes, requiring early intervention to prevent complications.

Table 3. Results of eldery nutritional status screening

Indicator	N (%)
Nutritional Status (IMT)	
Underweight	4.5
Normal	22.7
Overweight	18.2
Obesitas	54.4
Waist Circumference	
Normal	9.1
Central Obesity	90.9
Blood Pressure	
Low	4.5
Pre-Hipertention	36.4
Hipertention	59.1
Blood Sugar Level	
Normal	33.3%
Pre-Diabetes	38.1%
Diabetes	28.6%

Based on the screening results from the elderly group, it was found that almost 50% of the elderly were obese (54.4%), while only 22.7% had normal nutritional status, 18.2% were overweight, and 4.5% were undernourished. Central obesity was found in 90.0% of the elderly, indicating a high risk of cardiovascular and metabolic diseases. As many as 59.1% of the elderly were classified as hypertensive, 36.4% as pre-hypertensive, and 4.5% had low blood pressure. Blood sugar measurements revealed 38.1% pre-diabetes, 28.6% diabetes, and only 33.3% normal, indicating the need for consistent management of diet and physical activity.

In adults and the elderly, increased blood pressure is an important risk factor for type II diabetes mellitus through the mechanism of insulin resistance, while body fat distribution, particularly abdominal fat accumulation, is an independent risk factor for coronary artery disease, hypertension, stroke, and type II diabetes mellitus. The higher the level of central obesity, the greater the risk of increased blood sugar levels. As in the research by Gemini & Natalia (2023),

which shows a significant relationship between blood pressure and blood sugar levels in the elderly, as well as between central obesity and blood sugar levels in the elderly.

The results of this screening indicate that the community in Masangan Kulon Village faces a double burden of malnutrition, with undernutrition still present among some teenagers, while overnutrition is the main problem among adults and the elderly. The issue of double nutrition is influenced by rapid changes in the food system, globalization, and urbanization, which promote the consumption of low-nutrition processed foods. This condition triggers unhealthy eating patterns and indicates that nutritional deficiencies early in life can increase the risk of overnutrition in adulthood (Tanziha & Diana, 2024). In line with Popkin's 2006 concept of nutrition transition, there is a shift in dietary patterns from high-fiber plant foods to high consumption of fats, sugars, and processed foods. This nutritional transition has increased the consumption of fast food and sugary drinks, which according to the WHO contributes to the rising rates of obesity and non-communicable diseases such as diabetes, cardiovascular diseases, and cancer (Hasnah, 2024).

One of the preventive and curative efforts in nutritional intervention is through education. The educational methods applied in this activity are tailored to the characteristics of the target group. For adult and elderly targets, screening and education activities are conducted on the same day. Education is delivered through a presentation method that covers material on balanced nutrition, limiting the consumption of sugar, salt, and fat, the benefits of regular physical activity, and the importance of early detection of non-communicable diseases. To reinforce the message, participants are also provided with brochures containing guidelines for balanced nutrition that they can take home for further reading.

For the teenage target group, activities were held on separate days at the Village Hall. Education was conducted before the health check-ups by showing a short animated video containing messages about balanced nutrition, the importance of breakfast, limiting fast food, and the benefits of physical activity. After the video screening, a rapid-fire quiz with five questions was held. Each correct answer received a prize, and this session received very enthusiastic responses from the students. The children were not only eager to participate but were also able to answer the questions correctly, demonstrating that delivering information through interactive audiovisual media can capture attention and enhance teenagers' understanding. Interactive media such as digital applications, educational videos, and educational games create a more dynamic and engaging learning environment, thus motivating students and increasing their enthusiasm while optimizing their understanding of the material (Safitri *et al*., 2025).

A cooking demonstration featuring catfish tekwan and corn pudding, using local ingredients (catfish and corn), has proven effective in nutrition education because it provides hands-on experience. Catfish as a local food source is a source of protein; in addition, catfish also contains important micronutrients that support the health of the elderly. Previous research has shown that catfish meat has a protein content of about 19 g per 100 g, with the proportion of essential amino acids reaching 41.8 g/100 g of protein, including lysine and leucine which are important for maintaining muscle mass

and immune function. In addition, catfish also contain minerals such as calcium, phosphorus, and iron—nutrients that are important in the prevention of osteoporosis and anemia in old age (Abdel-Mobdy et al., 2021).

The elderly appeared very enthusiastic during the activity, actively asking about recipe variations, which indicates that the hands-on approach opens up opportunities for more interactive and enjoyable learning. In the study by Alghamdi et al. (2022), it was shown that a culinary-based nutrition education program that implements interactive cooking workshops (especially for elderly individuals aged ≥51 years) creates a conducive environment for improving eating habits and nutrition literacy in older adults. This reflects that cooking demonstrations using local food ingredients are an effective educational approach. Cooking classes do not reduce cardiometabolic indicators (such as BMI, blood pressure, or cholesterol); however, interventions using this method successfully improve positive attitudes, cooking self-efficacy, and the tendency to consume healthy foods in adults. This is relevant because cooking demonstration activities can build self-confidence and the intention to adopt healthier eating patterns (Hasan et al., 2019).

This program combines multi-age health screenings with practical nutritional interventions, so the examination results are immediately followed by education and corrective measures. The community members present were actively involved, from participating in health check-ups to discussing the results of the examinations. Posyandu volunteers and housewives were trained to practice the recipes taught, ensuring the sustainability of the program. Through the implementation of this activity, it is expected that the community will gain knowledge about nutritional and health status, as well as skills in preparing healthy food. In addition, there is potential to reduce the prevalence of malnutrition in children/adolescents and control obesity in adults/elderly through a diet based on local ingredients. Screening data can be used as a reference for planning village health programs.

CONCLUSION

The community service program in Masangan Kulon Village successfully identified the problem of double malnutrition across different age groups, with undernutrition still found among adolescents, while obesity and non-communicable diseases are major issues among adults and the elderly. Interventions through early detection of nutritional status, nutrition education, and cooking demonstrations based on local foods (catfish and corn) were able to improve knowledge, skills in preparing healthy food, and public awareness of the importance of preventing non-communicable diseases. This activity has the potential to serve as a community-based intervention model that can be replicated in other areas, by adapting the local food resources to enhance community health and food security.

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