



Optimizing Public Health through Nutritional Status Assessment and Nutrition Education during Car Free Day in Padang City

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ABSTRACT

Public health is one of the key aspects of sustainable development. This community service activity aims to improve public health through nutritional status assessments conducted during the Car Free Day (CFD) event in Padang City. The methods used include nutritional status measurement, nutrition education, and the promotion of healthy lifestyles. Health measurements included assessments of body weight, height, fat mass, muscle mass, blood pressure, blood sugar levels, uric acid levels, and hemoglobin levels. Education was delivered through interactive sessions and the distribution of leaflets on healthy eating patterns and clean living behaviors. The impact of the education was evaluated qualitatively through testimonials from participants who took part in both the health check and educational sessions. Participants shared their experiences regarding changes in their dietary habits and healthy lifestyle practices after participating in the program. Several participants stated that they had begun adopting healthier lifestyles, such as paying more attention to food intake, increasing physical activity, and feeling the benefits of a fitter body. Based on these testimonials, this activity demonstrated an increase in awareness and the adoption of healthy living behaviors among the community. Therefore, interventions through health assessments and nutrition education have been proven to contribute to encouraging positive behavioral changes within the community.

Keywords: car free day, healthy living behavior, nutrition education, nutritional status, public health

INTRODUCTION

Health and community well-being are essential components in achieving sustainable national development (Syan et al., 2021). A healthy population tends to be more productive, as individuals with good physical and mental health possess stronger immunity and can contribute optimally to positive activities (Sulistiarini and Hargono, 2018). However, various health problems frequently arise due to unhealthy eating habits, low levels of physical activity, and limited awareness of the importance of adopting clean and healthy lifestyles (Manios et al., 2020; Fitri Kurniawati and Puspowati, 2022).

As one of the major cities in Indonesia, Padang faces high population density along with various challenges in maintaining public health. Data from the Padang City Health Office indicate persistent issues related to unhealthy dietary patterns, low levels of physical

activity, and limited awareness regarding the importance of practicing clean and healthy lifestyles among community members (Dinas Kesehatan Kota Padang, 2024). These conditions contribute to an increasing burden of non-communicable diseases (NCDs), such as obesity, cardiovascular disorders, and diabetes.

Unhealthy dietary behavior remains one of the key problems. Many residents frequently consume foods high in saturated fats, sugar, and sodium, which increases the risk of obesity, cardiovascular diseases, and diabetes. In addition, low intake of fruits, vegetables, and other nutrient-dense foods may lead to inadequate nutritional status and related health issues (Neuhouser, 2020).

Low levels of physical activity also contribute to health problems. Although Padang has several public spaces that support recreational activities, community participation remains limited. This situation reflects national survey findings, which show that only about 33.5% of Indonesians meet the recommended level of physical activity (Kementerian Kesehatan RI, 2018). This suggests that insufficient physical activity may also be prevalent among residents of Padang. Awareness and implementation of clean and healthy living practices also remain suboptimal. Challenges such as poor waste segregation, limited sanitation awareness, and inconsistent participation in community clean-up activities indicate that environmental hygiene has not yet become a routine practice. These behaviors can increase susceptibility to infectious diseases and negatively affect community well being.

Considering these challenges unhealthy diets, insufficient physical activity, and inadequate hygiene practices, public health interventions are necessary to improve community health literacy and lifestyle behaviors. Community service activities focusing on nutritional status assessment, nutrition education, and the promotion of clean and healthy living are therefore important. These interventions aim to increase knowledge and encourage healthy practices among participants in Car Free Day (CFD) activities in Padang. Through these efforts, it is expected that community awareness will improve regarding the importance of balanced nutrition, regular physical activity, and environmental hygiene to maintain health and prevent disease.

METHOD

In the implementation of community service program, which involved nutritional status assessment and health education, various materials and instruments were utilized. The medical equipment included a digital scale, stadiometer, body fat analyzer, sphygmomanometer, glucometer, uric acid meter, and hemoglobin meter. Educational materials consisted of leaflets designed to provide information on balanced nutrition and healthy lifestyle practices. The program was conducted in several stages, beginning with brief preparatory activities, which included obtaining permits from relevant authorities and organizing team logistics. Permissions were secured from the Youth and Sports Agency of West Sumatra Province and the Health Departement of Padang City, followed by final coordination with involved parties to ensure smooth implementation.

The program began with health screenings, which involved measurements of body weight, height, body fat mass, muscle mass, mid-upper arm circumference, blood pressure, blood glucose, uric acid, and hemoglobin levels. A total of approximately 128 participants joined the consultation event. Participants were individuals attending the Car Free Day (CFD) activities who voluntarily visited the health screening booth. There were no specific inclusion or exclusion criteria; all community members present at the CFD venue were eligible to participate.

Nutritional education was delivered through short interactive sessions with approximately 5–10 participants per session. Each session lasted 10-15 minutes provided key information on balanced dietary patterns, portion control, physical activity, and hygienic lifestyle practices. Participants also received leaflets summarizing these key messages. In addition, individual health consultations were provided to participants, particularly those with abnormal screening results. Data collected from the health screenings were analyzed using statistical software to assess the distribution of nutritional status, blood pressure, blood glucose levels, and other health related parameters.

RESULTS AND DISCUSSION

This community service activity was conducted on May 30, 2024, in the Car-Free Day (CFD) area of Padang City, specifically in front of the Office of the Youth and Sports Agency of West Sumatra Province. A team consisting of lecturers and students from the Faculty of Public Health, Andalas University, carried out health screening and nutrition education to raise public awareness and promote healthy lifestyles among attendees.

1. Health Screening

Approximately 128 CFD visitors voluntarily participated in the health assessment. There were no specific inclusion or exclusion criteria; adults and adolescents who visited the booth and expressed willingness to participate were included. Measurements included body weight, height, body fat mass, muscle mass, mid-upper arm circumference (MUAC), blood pressure, blood glucose, uric acid, and hemoglobin levels. All measurements were conducted using calibrated instruments by trained team members. Body weight and height were measured to calculate Body Mass Index (BMI), which was then used to determine participants' nutritional status.



Figure 1 Height measurement

These measurements were used to determine the nutritional status of individuals through the calculation of Body Mass Index (BMI). BMI was calculated by dividing body weight (in kilograms) by the square of height (in meters). Nutritional status was classified into categories such as undernutrition, normal, overweight, and obesity (Zamzami, 2021).

Body fat mass and muscle mass were measured using a Bioelectrical Impedance Analysis (BIA) device. This instrument provides essential information on body composition, which is important for further assessment of nutritional status (Branco et al.,

2023). The measurements were performed by placing participants in a standing position on a calibrated BIA device, which estimated body composition based on the resistance of low-level electrical currents transmitted through body tissues. The device generated outputs including total body fat percentage, visceral fat level, and skeletal muscle mass, enabling the classification of participants into categories such as normal, overweight, or obese. Individuals identified with elevated body fat or low muscle mass were considered at greater risk for metabolic problems and subsequently received personalized recommendations focusing on diet, physical activity, and healthy weight management.



Figure 2 Body fat mass and muscle mass measurement

Blood pressure, blood glucose, uric acid, and hemoglobin levels were also recorded as part of the clinical assessment. Blood pressure was measured using a calibrated digital sphygmomanometer with participants in a seated and rested position. The results were categorized based on standard clinical classifications (normal, elevated, hypertension stages 1 and 2) to facilitate early detection of individuals at risk of cardiovascular disease (Schmidt et al., 2020). Blood glucose levels were assessed through capillary sampling using a glucometer and interpreted according to fasting and random blood glucose criteria to screen for potential prediabetes or diabetes mellitus (Bhowmik et al., 2025). Uric acid concentration was measured using a point-of-care uric acid meter to identify hyperuricemia, a condition associated with gout and metabolic disorders (Setiawan, Mustafida and Juliani, 2025). Hemoglobin levels were evaluated using a portable hemoglobinometer to screen for anemia, particularly among women of reproductive age and older adults (Amrutha et al., 2024). Individuals with abnormal findings in any parameter received tailored counseling, including recommendations for dietary modification, increased physical activity, and referrals to nearby healthcare facilities for further diagnostic evaluation. Subsequent screening outcomes showed that several participants presented with overweight or obesity and or elevated blood pressure, blood glucose, or uric acid levels, which served as the basis for individualized health recommendations.



Figure 3 Blood pressure measurement

Results from the screening indicated that several participants were overweight or obese and/or had elevated blood pressure, glucose, or uric acid levels. These findings became the basis for individualized health recommendations.

2. Nutrition Consultation and Education

Nutrition education was delivered through short interactive sessions consisting of approximately 5-10 people per group, with a total of around 128 participants attending throughout the event. Each session lasted about 10-15 minutes and focused on practical information regarding balanced dietary patterns, appropriate portion control, regular physical activity, and the adoption of clean and healthy lifestyle habits.



Figure 4 Nutrition consultation based on screening result

3. Leaflet Distribution

Participants received leaflets containing practical messages about balanced nutrition and healthy lifestyles to reinforce the health counseling messages. The leaflet content is attached as supporting material.



Figure 5 Leaflet distribution

The leaflets were designed to be easily understood and accessible to the general public, featuring illustrations and explanations that were simple yet informative. The purpose of distributing the leaflets was to increase community knowledge about the importance of healthy eating patterns and how to apply the principles of balanced nutrition in daily life. The following figure presents the leaflet distributed to participants who had undergone health measurements and nutrition consultations.



Figure 6 Front page of the “Balance Nutrition Leaflet”

The front page of the “Balanced Nutrition” leaflet contains the following sections:

a. Definition of Balanced Nutrition

Balanced nutrition is defined as a daily dietary pattern that contains nutrients in both type and amount appropriate to the body’s needs. Emphasis is placed on dietary diversity to ensure that all nutritional requirements are met. This concept includes three key components: adequate food intake, regular physical activity, and maintenance of normal body weight. These components must remain in balance to prevent nutritional problems, including undernutrition and overnutrition (Ministry of Health, 2014).

b. Types of Nutrients

1) Energy-Yielding Nutrients

Carbohydrates, fats, and proteins serve as the primary sources of energy required for optimal physiological function. Carbohydrates are typically the main source, followed by fats and proteins.

2) Body-Building Nutrients

Proteins support the development and repair of body tissues such as muscles, skin, and internal organs. They also play an essential role in growth and cellular regeneration.

3) Regulatory Nutrients

Vitamins and minerals regulate various physiological processes, including metabolism, immune function, and other biological activities. For example, vitamin C supports skin health and immunity, while calcium contributes to bone strength.

c. Principles of Balanced Nutrition

Four main principles should be adopted to implement balanced nutrition in daily life:

- 1) Consume a variety of foods to ensure adequate nutrient intake since no single food provides all essential nutrients.
- 2) Practice clean and healthy living behaviors, such as washing hands before eating, to prevent infections that may affect nutritional status.
- 3) Engage in regular physical activity to maintain cardiovascular health, enhance metabolism, and support overall energy balance.
- 4) Maintain and monitor normal body weight to prevent chronic diseases such as diabetes and hypertension.

d. Ten Messages of Balanced Nutrition

- 1) Consume a wide variety of foods to ensure balanced nutrient intake.
- 2) Eat vegetables and fruits daily as they provide fiber, vitamins, and minerals; at least five servings are recommended.
- 3) Obtain high-quality protein from meat, fish, eggs, and plant-based sources such as legumes.
- 4) Consume staple foods such as rice, bread, or potatoes as the main source of energy.

- 5) Limit excessive intake of sugar, salt, and fat to prevent obesity, hypertension, and cardiovascular disease.
- 6) Eat breakfast to supply the energy needed for daily activities.
- 7) Maintain adequate hydration; drinking eight glasses of water per day is recommended.
- 8) Engage in regular physical activity to support both physical and mental health and to help maintain a healthy weight.
- 9) Practice hygiene to prevent the spread of disease.
- 10) Monitor your weight regularly to ensure that calorie intake and physical activity are balanced.

The front page also includes illustrations with the following meanings:

a. Exercise Illustration

Depicts an individual exercising in a park, symbolizing the importance of physical activity as part of balanced nutrition. Physical activity supports metabolism and helps maintain ideal body weight.

b. Colorful Fruits Illustration

Represents fresh and nutritious foods rich in essential vitamins and minerals. The diverse colors emphasize dietary variety.



Figure 7. Back page of the "Balance Nutrition" leaflet

The back page of the leaflet summarizes the recommended distribution of food portions per plate:

- a. Vegetables: two-thirds of one half of the plate, indicating they should constitute the largest portion of daily meals.
- b. Staple foods: two-thirds of the other half of the plate, representing complex carbohydrates such as rice, bread, or potatoes.
- c. Protein-rich side dishes: one-third of one half of the plate, including meat, fish, or legumes.
- d. Fruits: one-third of the remaining section to fulfill vitamin and mineral requirements.



Figure 8. Front page of the “Healthy Living with Balanced Nutrition” leaflet

This leaflet explains the concept of balanced nutrition and the importance of a balanced diet for health. Information includes:

a. Definition of Balanced Nutrition

Balanced nutrition is a dietary pattern that provides all nutrients in amounts appropriate to the body's needs. It emphasizes dietary diversity, maintaining ideal body weight, exercising, and practicing clean living habits.

b. History of Balanced Nutrition

The balanced nutrition concept in Indonesia has existed since 1955, replacing the earlier “4 Healthy 5 Perfect” slogan to reflect a more comprehensive nutrition framework aligned with international standards.

c. Four Pillars of Balanced Nutrition

- 1) Leading an active lifestyle and exercising.
- 2) Maintaining an ideal body weight.
- 3) Consuming a diverse range of foods.
- 4) Practicing clean and healthy living habits.

d. Benefits of Balanced Nutrition

Balanced nutrition maintains health, supports optimal growth (especially in children), prevents degenerative diseases, and enhances productivity.

e. How to Calculate Nutritional Status (BMI)

The leaflet provides guidance on calculating Body Mass Index (BMI) to classify nutritional status as underweight, normal weight, overweight, or obese. A BMI chart is included for self-assessment.

f. Why Practice Balanced Nutrition?

Adopting balanced nutrition helps prevent disease, improve health, and support productivity and economic well-being in Indonesia.

Overall, the leaflet aims to provide practical guidance to help communities apply balanced dietary principles to achieve optimal health.



Figure 9. Back page of the “Healthy Living with Balanced Nutrition” leaflet

The back page presents information on essential nutrients, recommended portion distribution, and examples of balanced meals.

CONCLUSION

This community service activity was successfully implemented in accordance with its objectives. The program produced tangible outcomes based on on-site health assessments, including measurements of body weight, height, body fat, muscle mass, blood pressure, blood glucose, uric acid, and hemoglobin levels. These screening results enabled

participants to better understand their health status, identify potential risks, and receive personalized recommendations.

An increase in knowledge, skills, and awareness was identified informally through brief discussions and testimonials collected after counseling sessions. Participants reported that the information provided helped them recognize unhealthy dietary patterns and motivated them to adopt healthier habits, such as reducing sugar intake, increasing fruit and vegetable consumption, and engaging in regular physical activity. Some participants also indicated that they applied the recommendations in daily life and experienced benefits, such as feeling more energetic or reducing high-calorie food intake.

Although no structured pre- and post-test assessment was conducted, these testimonials and participants' ability to restate key educational messages served as indicators of increased knowledge and awareness of healthy lifestyles. Collaboration among the service team, local government, and community members facilitated the smooth implementation of the activity. The active participation of community members demonstrated the program's relevance to local needs.

Despite the absence of formal quantitative evaluation of knowledge and skills, the activity achieved its intended outcomes by providing health status information, facilitating personalized education, and promoting positive lifestyle changes among the public.

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