

## The Role of the Free Nutritious Meal Program (MBG) in Optimizing the Nutritional Needs of Beginner Karate Athletes in Central Lombok Regency

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### Abstract

This study aims to analyze the role of the Free Nutritious Meal Program (MBG) in optimizing the nutritional needs of beginner karate athletes in Central Lombok Regency. The research hypothesis states that there are significant differences in the indicators of athletes' nutritional needs before and after participating in the MBG program. The main problem behind this study is that the fulfillment of energy intake and body status of novice athletes is not optimal, even though the initial coaching phase requires adequate nutritional support to support training, recovery, growth, and performance readiness. This study uses a quantitative approach with a quasi-experimental one-group pretest-posttest design. The research subjects consisted of 30 beginner karate athletes who participated in the MBG program. Measurements were made through anthropometry to calculate Body Mass Index (BMI), a 24-hour dietary recall method for two non-consecutive days, namely weekdays and weekends, to estimate energy and nutrient intake, as well as a food consumption frequency questionnaire to see the athlete's diet. Data were analyzed using descriptive statistics, normality test, paired sample t-test, and Wilcoxon nonparametric test. The results showed that the average BMI increased from 17,270 in the pre-test to 17,880 in the post-test. The average energy intake also increased from 1702.67 kcal to 2270.00 kcal after the program. The results of the paired sample t-test showed a significant difference in BMI and energy with a p value of  $< 0.001$ . The Wilcoxon test also strengthened the findings with a p value of  $< 0.001$ . Thus, the research hypothesis is accepted. The MBG program has proven to play a positive role in improving the indicators of nutritional needs of beginner karate athletes, especially in terms of body status and energy adequacy. This program can be a supporting strategy for beginner sports coaching that is oriented towards health, training readiness, and long-term performance development.

**Keywords:** free nutritious meal program; nutritional needs; beginner karate athletes; energy intake; body mass index.

### INTRODUCTION

Karate is a martial sport that requires physical, technical, tactical, and psychological readiness in an integrated manner. In beginner athletes, the initial phase of coaching is an important period because the basics of motor skills, physical fitness, body composition, training discipline, and healthy living habits begin to be formed. Various studies show that karate practice can make a positive contribution to the development of motor skills, physical fitness, body control, balance, core strength, and technical performance, especially in children, adolescents, and athletes of developmental age (Arslan et al., 2024; Kabadayı et al., 2022; Martinez-De-Quel et al., 2021; Rutkowski & Chwałczyńska, 2025; Stamenković et al., 2022). In addition to technical aspects, karate performance is also related to anthropometric characteristics, aerobic-anaerobic capacity, muscle strength, agility, reaction speed, and body composition in accordance with the demands of the match (Cinarli et al., 2025; Franchini, 2023; Korkmaz et al., 2025; Nema et al., 2024; Przybylski et al., 2021). Therefore, it is not enough to coach beginner karate athletes to be directed only to mastering basic techniques, but also to pay attention to adequate nutritional support so that the process of training adaptation, growth, recovery, and performance readiness can take place optimally.

The problem that often arises in the development of beginner athletes is the lack of balance

between physical-technique training and the fulfillment of nutritional needs. Athletes of coaching age are still in their growth period, so they need sufficient energy, protein, carbohydrates, fats, vitamins, minerals, and fluids to support daily activities and training loads. Mismatches in nutritional intake can have an impact on low energy during exercise, decreased concentration, slow recovery, increased risk of injury, and imbalance in body composition. Studies on martial arts athletes show that body mass index, body composition, diet, and nutritional knowledge are related to physical condition and readiness for athletes' performance (Amawi et al., 2022; Herrero Barceló et al., 2026a; Mohammadian et al., 2025a; Simanjuntak et al., 2022). In martial arts, nutritional problems can also become more complex because some athletes tend to manage their weight inappropriately, restrict eating, or lack a understanding of energy needs according to the training phase (Barley & Harms, 2025; Dobkowska-Szefer et al., 2025; Martínez-Rodríguez et al., 2021a). These conditions show the importance of safe, targeted, and contextual nutrition interventions from the beginner level.

The literature shows that optimizing the performance of martial arts athletes requires a multidimensional approach, namely strengthening physical exercise, mastering techniques, monitoring body composition, nutrition education, and recovery support. Core, strength, plyometric, HIIT, and technique-specific training programs have been proven to improve the fitness and performance of karate athletes if implemented in a planned manner (Bouguezzi et al., 2024; Cid-Calfucura et al., 2023, 2023; Ojeda-Aravena et al., 2021; Zhang et al., 2025). However, this increase in performance will be more optimal if supported by nutritional adequacy, because energy and nutrients play a role in providing training fuel, improving tissues, maintaining body composition, and supporting physiological adaptation. Research on the nutritional preparation of karate and martial arts athletes emphasizes the importance of monitoring food intake, energy needs, hydration, as well as safe and supervised weight management (García-De Frutos et al., 2025a; Martinez-Rodriguez et al., 2025; Yerzhanova et al., 2022). In addition, coaches have a strategic role in building athletes' training habits and lifestyles, although some studies have found that there is still a gap in trainers' knowledge regarding physical training modalities and performance support aspects (Dăncescu & Iorga, 2024; Hammad et al., 2024; Tabben et al., 2023).

In the Indonesian context, the Free Nutritious Meal Program (MBG) can be positioned as one of the strategic supports to help meet the nutritional needs of students and beginner athletes. For beginner karate athletes, the existence of nutritious food has the potential to support energy adequacy, improve the quality of intake, and help the body's readiness to participate in training. However, scientific studies that specifically link nutritious eating programs to the nutritional needs of beginner karate athletes are still limited. Most of the available studies deal more with elite athletes, professional athletes, physical characteristics, training programs, injuries, or weight regulation in martial arts (Aziz et al., 2025; Gawel, Drozd, & Zajac, 2025; Gürsoy & Canli, 2021; Herrero Barceló et al., 2026; Silva et al., 2025). The study of beginner athletes at the regional level, especially in Central Lombok Regency, still needs attention because social characteristics, diet, access to coaching, and training culture can be different from the context of elite athletes or national training centers. Thus, there is a research gap in the aspect of utilizing the MBG program as nutritional support in fostering beginner karate based on the local context.

Based on this description, this study aims to analyze the role of the Free Nutritious Meal Program (MBG) in optimizing the nutritional needs of beginner karate athletes in Central Lombok

Regency. The novelty of this research lies in the study of MBG not only as a meal fulfillment program, but as a support for beginner sports coaching that is associated with nutritional needs, training readiness, and basic performance development of karate athletes. The scope of the research is focused on beginner karate athletes with attention to the adequacy of intake, body condition, readiness to participate in training, and the relevance of the MBG program to the sports coaching process at the regional level. The results of this study are expected to make an academic contribution to the development of sports education and sports nutrition, as well as provide practical input for coaches, schools, parents, and policy makers in designing a healthier, more directed, and sustainable development of beginner athletes.

## **METHODS**

### **Research Design**

This study uses a quantitative approach with a quasi-experimental one-group pretest-posttest design. This design was chosen because the study aimed to analyze changes in the nutritional needs indicators of beginner karate athletes before and after the implementation of the Free Nutritious Eating Program (MBG). In the context of sports coaching, the pretest-posttest design is widely used to evaluate the effectiveness of the intervention because it can compare the condition of participants at two different measurement times, namely before and after the program is given. This design is relevant to martial arts research that assesses changes in physical condition, anthropometry, fitness, and athlete performance readiness after specific training interventions or performance support support (Bouguezzi et al., 2024; Kabadayı et al., 2022; Ojeda-Aravena et al., 2021; Rutkowski & Chwałczyńska, 2025).

The focus of this study is to test the role of the MBG Program in optimizing the nutritional needs of beginner karate athletes in Central Lombok Regency. The main variables observed include Body Mass Index (BMI) as an indicator of body status and energy intake as an indicator of nutritional adequacy. The selection of the two indicators is based on their relevance to the basic needs of martial artists, since body status and energy adequacy are related to the readiness of exercise, physiological adaptation, recovery, as well as physical performance of athletes (García-De Frutos et al., 2025a; Herrero Barceló et al., 2026; Marques, 2021; Mohammadian et al., 2025).

### **Participants**

The subjects of the study were 30 beginner karate athletes in Central Lombok Regency. The selection of subjects was carried out using the purposive sampling technique, which is the selection of participants based on certain criteria that are in accordance with the research objectives. Inclusion criteria include athletes who actively participate in karate training, are in the beginner category, participate in a series of MBG programs during the research period, are willing to take pre-test and post-test measurements, and obtain permission from the coach or responsible party. Exclusion criteria include athletes who do not follow the measurements completely, have health conditions that hinder training, or do not follow the program consistently.

The use of novice athletes as research subjects is based on the consideration that the early stages of coaching are an important period in the formation of exercise habits, body status, and healthy consumption patterns. Previous studies have shown that coaching-age athletes and young athletes need special attention to anthropometric characteristics, physical fitness, body composition, and energy adequacy because these factors influence the development of long-term sports performance (Mercê et al., 2021; Pham & Dao, 2025; Simanjuntak et al., 2022; Yerzhanova et al.,

2022).

### **Instruments and Variables**

The measurements in this study were carried out using several instruments, namely anthropometric measurements, the 24-hour dietary recall method, and a questionnaire on the frequency of food consumption. The instrument was used to obtain more comprehensive data on body status, estimated energy and nutrient intake, and diet of beginner karate athletes. The use of a combination of anthropometric measurements and food consumption assessments is relevant in the study of martial arts because body status, body composition, energy adequacy, and food consumption patterns are important factors related to athletes' training readiness, recovery, and performance (García-De Frutos et al., 2025; Herrero Barceló et al., 2026; Mohammadian et al., 2025).

Body status variables are measured through Body Mass Index (BMI). BMI data is obtained from measurements of body weight and height. Weight is measured using a body scale in kilograms, while height is measured using a height measuring device in meters. The BMI value is calculated by the formula weight in kilograms divided by the square of height in meters. BMI is used as an early indicator to look at the body status of athletes, although its interpretation still needs to be done with caution because athletes can have different muscle mass characteristics, body composition, and exercise adaptations than the general population. In martial arts, monitoring of body status and anthropometric characteristics is important because it relates to weight categories, physical readiness, movement efficiency, and long-term performance development (Cavedon et al., 2023; Herrero Barceló et al., 2026; Pham & Dao, 2025).

Estimation of energy and nutrient intake was carried out using the 24-hour dietary recall method for two non-consecutive days, namely one day on weekdays and one day on weekends. The selection of two non-consecutive days aims to obtain a more representative picture of consumption as athletes' diets can differ between training/school days and weekends. Through this method, respondents were asked to remember and report all foods and drinks consumed during the last 24 hours, including the type of food, number of servings, consumption time, method of processing, and additional foods or snacks. Consumption data is then converted into energy and nutrient units to obtain an estimate of athletes' daily intake. This approach is important because the adequacy of energy, carbohydrates, proteins, fats, vitamins, minerals, and fluids plays a role in supporting exercise activities, tissue recovery, physiological adaptation, and fatigue prevention in martial arts athletes (Amawi et al., 2022; Martínez-Rodríguez et al., 2021; Yerzhanova et al., 2022).

In addition to the 24-hour dietary recall, this study also used a food consumption frequency questionnaire to look at athletes' diets. This questionnaire is used to identify how often athletes consume certain food groups, such as carbohydrate sources, animal and vegetable proteins, vegetables, fruits, milk or processed products, fast food, high-sugar foods, high-fat foods, and sweetened beverages. Consumption frequency data is used as supporting information to understand athletes' eating habits in general, so that the results of the study not only describe the amount of energy and nutrients but also show the quality of food consumption patterns. In the context of beginner karate athletes, dietary information is important because consumption habits formed in the early phases of coaching can affect training readiness and long-term health (Amawi et al., 2022; Chahar et al., 2026; García-De Frutos et al., 2025; Yerzhanova et al., 2022).

### **Research Procedure**

The research procedure is carried out through several stages. The first stage is coordination with trainers, administrators, and related parties to explain the research objectives, data collection schedule, and program implementation procedures. The second stage is data collection of research subjects based on inclusion and exclusion criteria. After the subjects were declared to meet the criteria, the researcher conducted an initial or pre-test measurement of BMI and energy intake. The third stage is the implementation of the MBG Program. This program is given as support for the fulfillment of nutritious food for beginner karate athletes during the research period. The food provided is directed to help with energy sufficiency and support the athlete's training needs. During the program, the researcher monitors the subject's participation so that the data obtained reflects the participant's involvement in the program. The fourth stage is the final measurement or post-test, which is the re-measurement of BMI and energy intake after the program is given. The results of the pre-test and post-test are then compared to find out the changes that occurred.

### **Data Analysis**

The research data was analyzed using the help of the SPSS program. The first analysis was carried out through descriptive statistics to obtain the minimum, maximum, mean, standard deviation, and range of data on each variable. Descriptive statistics are used to provide an overview of changes in BMI and energy intake before and after the program. The next stage is the normality test using Kolmogorov-Smirnov and Shapiro-Wilk. The normality test is performed to determine the appropriate type of inferential analysis. If the data is distributed normally, then the difference analysis is carried out using a paired sample t-test. However, if there are data that do not meet the assumption of normality, the analysis is complemented by the nonparametric Wilcoxon signed-rank test. The use of these two approaches aims to ensure that the interpretation of the research results remains strong and in accordance with the characteristics of the data distribution. The significance level used was  $p < 0.05$ . The results of the analysis were directed to find out whether there was a significant difference between the conditions before and after the implementation of the MBG Program. Thus, the data analysis not only aims to illustrate changes in numbers, but also statistically examines the role of programs in optimizing the nutritional needs indicators of beginner karate athletes.

### **RESULTS**

The results of descriptive statistics show an increase in the average BMI value and energy intake after the implementation of the program. Based on Table 2, the average BMI score at the pre-test was 17.270 with a standard deviation of 0.7630, while the mean BMI score at the post-test increased to 17.880 with a standard deviation of 0.7049. This increase shows that after participating in the MBG program, there is a positive change in the body status of novice karate athletes. In percentage terms, the increase in BMI reached about 3.53% of the initial condition.

**Table 2.** Descriptive statistic

|                    | N  | Range | Minimum | Maximum | Mean    | Std. Deviation |
|--------------------|----|-------|---------|---------|---------|----------------|
| BMI Pre            | 30 | 2.5   | 16.1    | 18.6    | 17.270  | .7630          |
| BMI Post           | 30 | 2.2   | 16.8    | 19.0    | 17.880  | .7049          |
| Energy Pre         | 30 | 530   | 1450    | 1980    | 1702.67 | 167.866        |
| Energy Post        | 30 | 410   | 2070    | 2480    | 2270.00 | 124.651        |
| Valid N (listwise) | 30 |       |         |         |         |                |

In the energy variable, the average pre-test energy intake was 1702.67 kcal with a standard deviation of 167.866, while the average post-test increased to 2270.00 kcal with a standard deviation of 124.651. Thus, there was an increase in average energy intake of 567.33 kcal or around 33.32% after the implementation of the program. These findings suggest that MBG contributes to improving athletes' energy adequacy, which is one of the important components in supporting the training, recovery, and physical readiness activities of novice athletes. In the context of martial arts, energy adequacy and body composition status are important aspects because they are related to exercise readiness, physiological adaptation, and healthy weight control in athletes (García-De Frutos et al., 2025; Herrero Barceló et al., 2026; Marques, 2021; Mohammadian et al., 2025).

**Table 3.** Normality test results

|             | Kolmogorov-Smirnov <sup>a</sup> |    |                   | Shapiro-Wilk |    |      |
|-------------|---------------------------------|----|-------------------|--------------|----|------|
|             | Statistic                       | df | Sig.              | Statistic    | df | Sig. |
| BMI Pre     | .123                            | 30 | .200 <sup>*</sup> | .941         | 30 | .098 |
| BMI Post    | .138                            | 30 | .147              | .929         | 30 | .046 |
| Energy Post | .118                            | 30 | .200 <sup>*</sup> | .938         | 30 | .080 |
| Energy Post | .085                            | 30 | .200 <sup>*</sup> | .956         | 30 | .246 |

Based on Table 3, the results of the Kolmogorov-Smirnov test show that all data have a significance value greater than 0.05. In the Shapiro-Wilk test, the BMI pre-test obtained a significance value of 0.098, the energy pre-test obtained a significance value of 0.080, and the energy post-test obtained a significance value of 0.246, so that the three data can be declared to be normally distributed. However, the post-test BMI obtained a significance value of 0.046, which means it is below 0.05 and shows indications of deviation from the normal distribution.

**Table 4.** Wilcoxon signed-rank test results

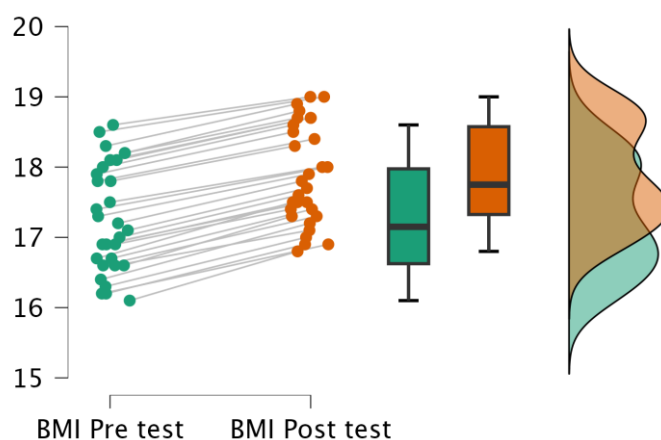
| Pre-test | Post-test | Test     | Statistic | z      | df | p      | Effect Size | SE Effect Size | 95% CI for Effect Size |        |
|----------|-----------|----------|-----------|--------|----|--------|-------------|----------------|------------------------|--------|
|          |           |          |           |        |    |        |             |                | Lower                  | Upper  |
| BMI      | BMI       | Student  | -36.203   |        | 29 | < .001 | -6.61       | 0.085          | -8.291                 | -4.877 |
|          |           | Wilcoxon | 0         | -4.782 |    | < .001 | -1          | 0.206          | -1                     | -1     |
| Energy   | Energy    | Student  | -67.872   |        | 29 | < .001 | -12.392     | 0.168          | -15.494                | -9.076 |
|          |           | Wilcoxon | 0         | -4.782 |    | < .001 | -1          | 0.206          | -1                     | -1     |

Based on the Wilcoxon nonparametric test table, there is a significant difference between the pre-test and post-test values on the BMI and Energy variables. In the BMI variable, the results of the Wilcoxon test showed a value of Statistic = 0, Z = 4.782, and  $p < 0.001$ . A significance value smaller than 0.05 indicates that there is a significant difference between BMI before and after the program. By looking at the previous descriptive data, the average BMI value increased from 17,270



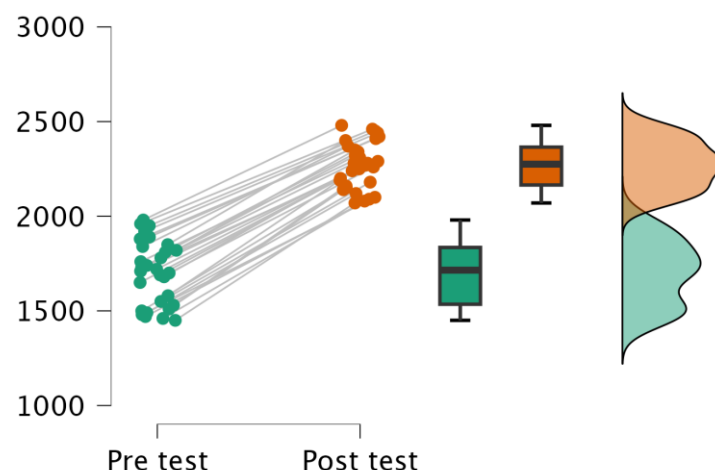
in the pre-test to 17,880 in the post-test. Thus, the increase in BMI after the implementation of the program can be statistically significant.

In the Energy variable, the results of the Wilcoxon test also showed Statistic values = 0,  $Z = 4.782$ , and  $p < 0.001$ . These results show a significant difference between pre-test and post-test energy intake. Based on descriptive data, the average energy increased from 1702.67 kcal to 2270.00 kcal after the program was given. This means that the program implemented provides a real change to the increase in energy adequacy of beginner karate athletes. The effect size value in the Wilcoxon test showed a very large influence force. Negative marks on effect size or confidence intervals do not indicate that the program has a bad impact but rather are caused by the direction of data comparison, i.e. pre-test minus post-test. Because the post-test score is higher than the pre-test, the direction of the difference is negative. Substantively, these results still show an improvement after the program.



**Figure 2.** comparison of pre and post BMI test results

Visually, almost all participants experienced an increase in BMI scores after the MBG program. The connecting line between the pre-test and post-test points showed a consistent pattern of improvement in most athletes. The distribution of post-test data also appears to be higher than that of pre-test, which reinforces the statistical results that there is an increase in BMI after the program is administered. Although an increase in BMI cannot always be directly interpreted as an increase in ideal body composition, in beginner athletes with relatively low initial BMI values, this increase may indicate an improvement in body status towards a condition that is more conducive to exercise activities.



**Figure 3.** comparison of pre and post energy test results

Figure 3 shows a more pronounced increase compared to the BMI variable. Most athletes experienced an increase in energy intake after the MBG program, with the distribution of post-test scores in a higher range and more concentrated than pre-test. This shows that the MBG program not only increases average energy intake but also helps to reduce variations in energy adequacy among participants. Practically, this increase in energy is important because karate athletes need sufficient energy availability to support technique training, physical exercise, recovery, and concentration during sports activities.

Overall, the results of the study show that the Free Nutritious Meal Program plays a positive role in optimizing the indicators of nutritional needs of beginner karate athletes in Central Lombok Regency. A significant increase in BMI and energy suggests that the program can be an important support in coaching beginner-age athletes. These findings are relevant to the literature that places nutritional support as part of sustainable sports coaching, especially in martial athletes who require a balance between body status, energy needs, physical ability, and performance readiness (Arnaoutis & Neophytou, 2025; García-De Frutos et al., 2025; Gawęł, Drozd, Maszczyk, et al., 2025; Herrero Barceló et al., 2026).

## DISCUSSION

The findings of this study show that the Free Nutritious Eating Program (MBG) makes a positive contribution to optimizing the nutritional needs indicators of beginner karate athletes. Empirically, the changes that occurred after the program showed a consistent direction, namely an improvement in indicators of body status and energy adequacy. The rationality of this finding can be explained because beginner karate athletes are in the phase of growth and formation of the basis of performance, so they need sufficient nutritional support to support training, recovery, and physical adaptation. In martial arts, energy needs are not only needed for daily training activities, but also to maintain the readiness of the metabolic system, muscle strength, balance body composition, and the ability to perform explosive movements that are characteristic of karate (Franchini, 2023; Julio & Franchini, 2021; Korkmaz et al., 2025; Tokgoz et al., 2025). Therefore, the increase in nutritional indicators after MBG administration can be understood as a logical response to the availability of a more regular and nutritious intake for beginner athletes.



These findings are in line with various studies that confirm that nutritional status, body composition, and energy adequacy have an important relationship with the physical condition of martial artists. Systematic studies of combat sports athletes show that body composition and food intake are factors that need to be controlled as they relate to performance, health, and competition readiness (Chahar et al., 2026; Herrero Barceló et al., 2026; Mohammadian et al., 2025). In karate athletes, research on the physical preparation and nutrition of athletes says professionals show that a planned nutritional strategy supports the readiness of the athlete's performance and body condition (García-De Frutos et al., 2025). This is also supported by a study on the basal metabolic rate in high-achieving female karate athletes which emphasizes the importance of estimating energy needs according to the characteristics of athletes (Marques, 2021).

The findings of this study are also in line with studies of children and adolescents that show that regular exercise practice is related to body composition, aerobic capacity, and physical fitness development (Arslan et al., 2024; Mercê et al., 2021; Rutkowski & Chwałczyńska, 2025). In young karate athletes, core training, physical exercise, and systematic coaching programs have been reported to improve fitness and motor readiness ((Chau, 2021; Kabadayı et al., 2022; Marchenko, 2025). However, the results of this study provide additional emphasis that exercise support needs to be accompanied by adequate nutritional support so that exercise adaptation can run more optimally.

However, these findings also need to be read critically because some combat sports literature shows a tendency for weight control practices that are not always healthy. Several studies report that martial artists often engage in rapid weight loss strategies, eating restrictions, or fluid manipulation ahead of matches (Barley & Harms, 2025; Martínez-Rodríguez et al., 2021b; Maurício et al., 2023). In fact, the risk of eating disorders and body dissatisfaction is also found in contact athletes and elite athletes (Dobkowska-Szefer et al., 2025; Kovács et al., 2025). These differences show that increasing intake through MBG in beginner athletes should not be interpreted as an effort to gain weight alone, but as a strategy to meet nutritional needs in a healthy, controlled, and according to the growth phase. As such, MBG has a different orientation from the weight manipulation practices often found in competitive martial artists.

Theoretically, the results of this study can be explained through the concepts of energy balance and exercise adaptation. Athletes who obtain sufficient energy intake have a better chance of maintaining physiological function, recovering and responding to training loads. In karate, performance is determined by a combination of strength, speed, endurance, coordination, flexibility, and technical efficiency (Cinarli et al., 2025; Gaweł, Drozd, & Zajac, 2025; Przybylski et al., 2021; Seyed et al., 2024). Supportive body composition also plays a role in movement efficiency, stability, and power-generating ability in punch and kick techniques (Cavedon et al., 2023; Němá & Ružbarský, 2023; Pham & Dao, 2025).

In the perspective of the development of beginner athletes, nutrition serves as a biological foundation for the formation of physical and motor abilities. Beginner athletes are not yet in the peak performance phase, so coaching priorities should be directed towards healthy growth, mastery of basic techniques, general fitness, and the formation of the right training habits. Studies on young karateka show that good coaching must pay attention to motor skills, fitness, anthropometric characteristics, and physiological readiness in an integrated manner (Bahamondes-Avila et al., 2023; Korkmaz et al., 2025; Simanjuntak et al., 2022). Therefore, MBG can be positioned as a supportive intervention that strengthens the athlete's developmental base, especially when combined with regular physical exercise, technique, and monitoring of body condition. In addition, the aspect

of nutritional knowledge is also an important factor. Research on athletes and coaches shows that sports nutrition practices are still influenced by the level of knowledge, habits, and access to information (Amawi et al., 2022; Yerzhanova et al., 2022). Thus, the effectiveness of MBG will be stronger if it not only provides food, but also includes nutrition education for athletes, coaches, and parents.

The practical implication of this study is that MBG can be used as one of the supporting strategies for coaching beginner karate athletes at the regional level. Coaches and club managers need to view nutrition as an integral part of the training program, not as a separate additional factor. Simple monitoring such as eating adequacy, body status, fitness, hydration, and athletes' response to exercise should be done regularly. This is important because karate athletes need a good combination of physical readiness, technique, and recovery to reduce the risk of injury and improve the sustainability of the practice (Arnaoutis & Neophytou, 2025; de Wet & Yelverton, 2025; Tabben et al., 2023).

For schools, clubs, and local governments, these results provide the basis that a nutritious food program can support the development of beginner sports when adjusted to the physical activity needs of athletes. The MBG menu should consider the adequacy of energy, protein, carbohydrates, healthy fats, micronutrients, and fluids. In addition, coaches need to work closely with health professionals or nutritionists to ensure that the improvement of the athlete's body status remains within healthy limits. Thus, MBG not only functions as a meal fulfillment program, but also as an instrument to strengthen the development of young athletes who are oriented towards health, physical development, and long-term performance readiness.

## CONCLUSION

Based on the results of the research, it can be concluded that the Free Nutritious Meal Program (MBG) plays a positive role in optimizing the nutritional needs of beginner karate athletes in Central Lombok Regency. The implementation of this program provides meaningful changes to the indicators of body status and energy adequacy of athletes. This can be seen from the increase in Body Mass Index (BMI) values and energy intake after athletes participate in the MBG program. Thus, the research hypothesis that there is a significant difference between the conditions before and after the program is acceptable. An increase in BMI indicates an improvement in the body status of beginner athletes towards conditions that are more supportive of training activities. Meanwhile, the increase in energy intake shows that the MBG program can help meet the basic energy needs of athletes, which are very important to support training, recovery, growth, and physical readiness. These findings confirm that the coaching of beginner karate athletes requires not only technical and physical training, but also planned and ongoing nutritional support. Practically, the MBG Program can be positioned as one of the supporting strategies in fostering beginner age sports, especially in the sport of karate. This program has the potential to help athletes obtain a more regular, nutritious, and appropriate intake for sports activities. However, the implementation of the program still needs to be accompanied by monitoring of body condition, diet, and athletes' responses to exercise so that the benefits are more optimal. The main conclusion of this study is that the MBG Program not only serves as a meal fulfillment program but can also be part of a beginner athlete coaching system that is oriented towards health, training readiness, and long-term performance development. Therefore, the involvement of coaches, schools, parents, health workers,

and policy makers is needed so that this program can be implemented more effectively in the regional sports coaching environment.

## RECOMMENDATION

Based on the results of the research, the Free Nutritious Meal Program (MBG) is recommended to continue to be developed as one of the strategies to support the development of beginner karate athletes, especially at the regional level. This program should not only be seen as an effort to fulfill food, but also as part of a sports coaching system that pays attention to the health, energy adequacy, growth, and readiness of athletes' training. Karate coaches are advised to conduct regular monitoring of the body's condition, diet, attendance at training, and athletes' responses during the program. This monitoring is important so that increasing food intake really supports the exercise process and does not cause an imbalance in the body's status. Coaches also need to provide simple education to athletes about the importance of regular eating, hydration, recovery, and nutritious food consumption habits. Schools, clubs, and regional sports managers are expected to collaborate with health workers or nutritionists in preparing menus that suit the needs of novice athletes. The MBG menu should pay attention to the adequacy of carbohydrates, proteins, healthy fats, vitamins, minerals, and fluids according to the athlete's training activities. In addition, parental involvement is also important so that a healthy diet continues outside of the training environment or school. For further studies, it is recommended that studies be conducted with a larger sample size, longer intervention duration, and control groups. Future research may also add other variables, such as body composition, physical fitness, endurance, strength, concentration, performance of karate techniques, and hydration status, so that the impact of the MBG Program on the development of beginner athletes can be analyzed more comprehensively.

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