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Case Study of Standardized Nutrition Care Process in Taekwondo Kyorugi Athletes 49 kg

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Abstrak

Taekwondo is a fighting sport that is part of international sports competitions. The existence of a weight-based class system aims to ensure a balance of strength, body size and range of motion between athletes who will compete. The class system based on body weight causes athletes to try to achieve the appropriate weight for the competition class before the match. An extreme and not adequately monitored weight loss program can affect an athlete's performance and even endanger the athlete's health. This case study aims to see the impact of providing nutritional intervention in the PON preparation period on changes in athletes' weight. The process of standardized nutrition care to help taekwondo athletes achieve body weight according to competing classes is gradual, safe and minimizes risk. The method used in this research is a case study with several subjects, as many as one athlete. Based on the results of this case study, it is known that giving a low-calorie diet for ten days of intervention showed an effect on the weight loss of athletes. At the end of the intervention period, there was a weight loss of 1.5 kg.

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INTRODUCTION

Taekwondo is a martial sport originating from Korea, which has now spread to various countries in the world and has been part of the Olympics since the 2000 Sydney Olympic Games (Arazi et al., 2016; MinJoon, 2016). Taekwondo has a dynamic character in combining movement, flexibility, speed, and endurance (MinJoon, 2016; Kuswari., 2021). The movements and techniques require enormous explosive power, characterized by a swift movement with maximum power in kicking movements (Kavvoura et al., 2018). This unit of strength and speed is influenced by several factors, including strength and

muscle mass (Kavvoura et al., 2018; Kuswari 2019). This makes the anthropometry of athletes one of the things that need to be considered in this sport. Increased muscle mass relative to total body mass affects athlete performance; athletes with higher muscle mass can produce higher movement strength (Arazi et al., 2016; Bridge et al., 2014).

Furthermore, the existence of a weight class system in this sport means that taekwondo athletes must be able to achieve a body weight according to their competition class when they want to compete. Weight control and athlete performance are influenced by many factors, including nutrient intake (Ben-El Berkovich et al. ., 2019; Haddad, 2014). Weight loss that is too fast and without considering the adequacy of nutritional needs to support the ability to train, recover and maintain general health status can cause decreased performance during matches, increase the risk of injury, or endanger the athlete's life (Ben-El Berkovich et al., 2019). In this case study, a standardized nutritional care process was carried out for female taekwondo athletes in the Kyorugi class who were in the intensive preparation phase for the Papua PON competition to gradually achieve body weight according to the competition class without disrupting a performance or causing complications.

METHODS

This case study was conducted in July-August 2021 online with the DKI Jakarta KONI (Ramadan & Juniarti, 2020). The selection of research subjects was carried out subjectively (Surahman et al., 2016) with a reference from the KONI. The subject is a female taekwondo athlete aged 22 years in the kyorugi class under 49 kg at the Cilacap training centre. The number of samples in this case study is 1 (one) athlete. The research method used in this research is a case study. The standardized nutrition care process includes nutritional assessment, nutrition diagnosis, nutrition intervention, and monitoring evaluation. The assessment includes personal history, dietary history, and anthropometry. The nutritional interventions provided are diet therapy and daily consultations through online conversations. Monitoring is carried out in the form of food records of athletes' daily Intake and monitoring of body weight at the end of the observation, which is on the sixth day.

FINDINGS AND DISCUSSION

Findings

Athlete's personal history

One of the factors that need to be studied in carrying out a standardized nutritional care process is a personal history, including a history of training as an athlete and non-athlete activities; this aims to be able to provide an overview of the nutritional needs of athletes based on their activities (Rofifah, 2020).

Table 1 Athlete History

Data atlet	
Name	No. D PAL
Date of birth	Jakarta, May 13, 1999
Age (years)	22
Gender	Woman
Work	Student
Religion	Islam
Sports	Taekwondo
	Kyourigi under 49Kg

Based on the data, it is known that in addition to her activities as an athlete, Ms DPAL is a moderate activity level student. Currently, the activities of Ms DPAL are practising intensively at the training centre to prepare for the PON match. The training schedule is divided into two types, namely training days and recovery days, with details of the activities shown in the table below.

Table 2 Schedule of activities on practice days

Hour	Activity
04.30 - 05.20	Wake up, pray, & get ready for a morning walk
05.20 - 05.50	Breakfast
05.50- 06.00	Departure (easy walk)
06.00 - 08.00	Physical training
08.00-08.10	Way back to the mess
08.10 - 08.20	Drinking milk
08.20- 08.35	Shower
08.35 - 09.00	Dress up
09.00 - 10.00	Rest
10.00- 10.30	Getting Ready and Departing (easy walk)
10.30-12.30	Technical training
12.30-12.45	Way back to the mess
12.45 - 13.00	Prayer
13.00- 13.30	Have lunch
13.30 - 14.30	Rest
14.30 - 15.00	pray and get ready
15.00 - 15.30	Departure (easy walk)
15.30-18.00	Technical training

Hour	Activity
18.00 - 18.15	Prayer
18.15 - 18.30	Way back to the mess
18.30 - 19.00	Dinner
19.00-19.30	Get ready and go
19.30-20.30	Technical training
20.30-20.45	Way back to the mess
	Shower
21.15-21.30	Dress up
21.30- 04.30	Sleep

Diet History

The athlete's dietary history was carried out to determine the athlete's eating habits that influenced his nutritional status and as a reference in the preparation of the athlete's diet. Based on the study, it is known that the athlete has no history of food allergies or taboos, with the habit of consuming supplements, namely multivitamins, boosters, sangobion and Herbalife shake mix. The use of protein supplements in female taekwondo athletes is every day, aiming to improve performance (Seyhan, 2018). A 24-hour recall of food intake was carried out to get an idea of the athlete's nutritional intake adequacy. Based on the recall results, it is known that the nutritional adequacy of athletes is 30.6% for energy, 25% protein, 10.4% fat, and 44.3 carbohydrates. This adequacy percentage is still classified in the less category (Guidelines-Service-Nutrition-RS-PGRS-2013, 2013).

Table 3 Schedule of activities on rest days

Hour	Activity
04.30 - 05.20	Wake up, pray, & get ready for a morning walk
05.20 - 05.50	Breakfast
05.50- 06.00	Departure (easy walk)
06.00 - 08.00	Morning walk around TNI headquarters
08.00-08.10	Way back to the mess
08.10 - 08.20	Drinking milk
08.20- 08.35	shower
08.35 - 09.00	Dress up
09.00 - 12.00	Rest
12.30 - 12.45	Prayer
12.45 - 13.30	Have lunch

Hour	Activity
13.30 - 15.00	Rest
15.00 - 15.30	Prayer
15.30 - 18.00	Rest
18.00 - 18.15	Prayer
18.15 - 19.30	Dinner
19.30 - 04.30	Rest

Anthropometry

Anthropometric measurements that can be done are weight and height, namely 52 kg and 170 cm. Measurement of muscle mass and percentage of fat mass cannot be done because of the pandemic and PPKM conditions that make it impossible to hold meetings offline.

Nutritional Diagnosis		
Nutrition Intake (NI)	NI	2.1
	PES	Recall results characterize inadequate oral Intake related to low daily food intake
Nutrition Behaviour (NB)	NB	1.5
	PES	Eating disorders are related to an inaccurate understanding of nutritional Intake and weight management, marked by recall results and a history of eating habits.

Discussion

Based on assessing the athlete's history, including personal history, daily activity history, diet history and measurements of the athlete's body size, a nutritional diagnosis can be determined as a reference for preparing nutritional interventions given to athletes. The nutritional diagnosis that is enforced includes two domains: Intake, which is based on a history of the athlete's eating habits and Intake, and the behavioural domain, which is based on the athlete's behaviour pattern.

The athlete, in this case, will compete in the class under 49kg. In fighting sports such as taekwondo, there is a division of classes according to body weight which aims to reduce differences in strength, range of motion, and body size between athletes (Reale et al., 2017). Theoretically, there is a tendency to lose weight before the match weight loss. This body weight is significantly different compared to the body weight in the athlete's daily condition (Reale et al., 2017). Based on the study results, the nutritional intervention given was aimed at reducing body weight gradually to reach the competition class without causing complications or worsening conditions.

Nutritional intervention	
Diet	Low-calorie diet
Consistency	Normal

Frequency	Three main meals and one snack after exercise
Administration route	Oral
Destination	Gradually reach the weight according to the sparring class Provide adequate nutritional Intake to support the athlete's performance and recovery process without causing discomfort in the digestive tract
Condition (Cho et al., 2013; Rofifah, 2020)	Meet the nutritional needs of athletes by the calculation of nutritional needs, namely: Energy according to the client's basal needs and activities Protein is 20% of the total daily energy requirement Fat 30% of the total daily energy requirement Carbohydrates 50% of the total daily energy requirement Food is given in moderate portions with frequent frequency to ensure constant availability of nutrients Does not stimulate the gastrointestinal tract so as not to interfere with the exercise process Sufficient fluid as needed 1 ml/kcal daily energy needs

Several factors affect the performance of athletes in the sport of taekwondo, one of which is the Intake of athletes' nutrients affects the performance and recovery of athletes; therefore, the Intake of nutrients should be balanced and adjusted for energy training, recovery and daily activities (Cho et al., 2013). Nutrient intake also influences athletes' composition and body mass, both of which significantly affect their ability to train and compete in athletes. (Cho et al., 2013). So that the weight loss that will be carried out should be gradual and still meet the nutritional needs of athletes. Excessive weight loss can cause decreased metabolic rate, bone density, constipation, colonic cataracts, and impaired kidney function (Ben-El Berkovich et al., 2019), mainly if weight loss methods are carried out in a short time, such as using diuretics, vomiting food again, excessive exercise and consumption of harmful substances (Rhyu & Cho, 2014). In this case, the reduction in energy provided is 30% and not less than the basal energy requirement because the reduction in energy below the basal energy can have a dangerous metabolic impact and, of course, affect the athlete's performance (Kathleen L, 2008; Rhyu & Cho, 2014). Weight loss of 5-8% can still be tolerated, but it must also be ensured that the athlete has adequate nutritional needs and is not dehydrated (Reale et al., 2017).

Calculation of nutritional needs

a. Practice Day

Energy	
Weight (kg)	52
Height (cm)	170
Age (years)	22
Gender	**Women**
BMR (kcal/day)	1198

9.7(BB (Kg)) + 694 (Oxford- Henry, 2005) BMR kcal/day)	1263	
8.18(BB (kg)) + 502 (TB (m))- 11.6 Formula Oxford(Henry, 2005)		
AF (Fao & Consultation, 2005)	2.5	
SDA	316	
Total Energy (Cal/day)	3312	
Correct (reduce by -30%)	**2318**	
Protein		
Requirement (% TE)		20%
Needs (g/day)		**116**
Fat		
Requirement (% TE)		30%
Needs (g/day)		**77**
Carbohydrate		
Requirement (% TE)		50%
Needs (g/day)		**290**
Fluid		
Basic needs (1 ml/kcal)		**2318**

In this case, the protein is given a little high to maintain the athlete's muscle mass. Diets low in energy and high in protein can maintain muscle mass in people who regularly exercise muscle (Siska et al., 2019). Muscle mass needs to be maintained and even increased because it has a relationship with the expected explosive power of athletes (Kavvoura et al., 2018). Korean elite taekwondo athletes perform a high-protein diet to maintain muscle mass without causing weight gain; the daily protein intake of this group of athletes is in the range of 1.4 g/kg body weight (Cho et al., 2013)

b. Rest Day

Energy	
Weight (kg)	52
Height (cm)	170
Age (years)	22
Gender	**Women**
BMR (kcal/day)	1198
9.7(BB (Kg)) + 694 formula oxford (Henry, 2005) BMR (kcal/day)	1263
8.18(BB (kg)) + 502 (TB (m))- 11.6	

AF (Fao & Consultation, 2005)	1.4
SDA	177
SF	1
Total Energy (Cal/day)	1855
Correct (reduce by -30%)	**1298**
Protein	
Requirement (% TE)	20%
Needs (g/day)	**65**
Fat	
Requirement (% TE)	30%
Needs (g/day)	**43**
Carbohydrate	
Requirement (% TE)	50%
Needs (g/day)	**162**
Guild	
Basic needs (1 ml/kcal)	**1298**

Carbohydrates as the primary energy source need to be fulfilled because the excessive reduction in carbohydrate intake can affect glycogen stores in athletes, as it is known that muscle glycogen reserves affect muscle contraction and strength (Haddad, 2014; Thomas et al., 2016)

Fat intake is given enough but at the upper limit. Which is 30% of the total daily energy needs. Increased fat intake is related to increasing the body's ability to use fat as an energy source to extend the duration of exercise (Haddad, 2014; Rhyu & Cho, 2014). The carbohydrate intake of elite Korean taekwondo athletes is 5.4 g/kg body weight (Cho et al., 2013; Pramono et al., 2020).

Daily food distribution

a. Practice Day

Eating time	**Foodstuffs Group**	**Exchanger**
Breakfast	Carbohydrate	0.5
	Animal protein	1
	Vegetable protein	0
	Vegetables goal 1	2
	Vegetables goal 2	3
	Fruit	4
	Sugar	2
	Milk	2
	Fat	3
Post Workout	Shake mix Herbalife	1
	Fruit	3
Lunch	Carbohydrate	1.5

Eating time	Foodstuffs Group	Exchanger
	Animal protein	3
	Vegetable protein	3
	Vegetables goal 1	3
	Vegetables goal 2	3
	Fruit	3
	Sugar	2
	Milk	0
	Fat	1
Dinner	Carbohydrate	0.5
	Animal protein	1
	Vegetable protein	2
	Vegetables goal 1	2
	Vegetables goal 2	4
	Fruit	3
	Sugar	2
	Milk	0
	Fat	3

Based on the results of food records conducted for six days of observation, it can be seen that the percentage of macronutrient adequacy varies from day to day, while the percentage of water adequacy is well fulfilled. An athlete's hydration status is critical; athletes with dehydration conditions can experience decreased performance and even injury (Pettersson & Berg, 2014; Reale et al., 2017). The percentage of the adequacy of macronutrients below 80% can be categorized as lacking (Guidelines-Service-Nutrition-RS-PGRS-2013, 2013).

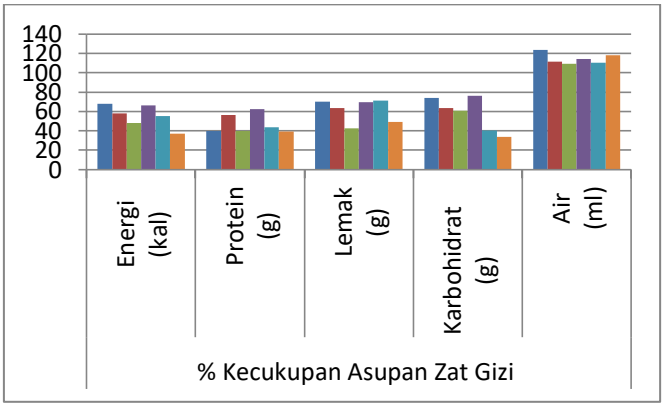
b. Rest Day

Eating time	Foodstuffs Group	Exchanger
Breakfast	Carbohydrate	0.5
	Animal protein	0.5
	Vegetable protein	0
	Vegetables goal 1	2
	Vegetables goal 2	1
	Fruit	1
	Sugar	1
	Milk	1
	Fat	1.5
Post Workout	Shake mix Herbalife	1
	Fruit	1
Lunch	Carbohydrate	1
	Animal protein	1
	Vegetable protein	1
	Vegetables goal 1	3
	Vegetables goal 2	2
	Fruit	1

Eating time	Foodstuffs Group	Exchanger
	Sugar	1
	Milk	0
	Fat	1
Dinner	Carbohydrate	0.5
	Animal protein	1
	Vegetable protein	1
	Vegetables goal 1	2
	Vegetables goal 2	2
	Fruit	1
	Sugar	1
	Milk	0
	Fat	1

What can cause this to happen is a longstanding trend among athletes who have weight criteria in their matches, such as taekwondo (Ben-El Berkovich et al., 2019). Even though they have received exposure to nutrition education about the importance of fulfilling nutritional needs and their relation to training ability and performance, the formed perception causes this tendency to occur. This perception is formed from the complexity of the information received by athletes from their environment (Ben-El Berkovich et al., 2019; Kuswari et al., 2021). Compared to intake data before the nutritional intervention, there was a significant increase after athletes received exposure to nutritional education about the importance of nutrient intake, so there is potential for improvement if time is extended and exposure is continuous.

Monitoring and Evaluation



Body weight measurement was again carried out at the end of the intervention period, namely on the tenth day; based on measurements, it was known that body weight decreased by 1.5 Kg to 50.2 Kg, so it was still in a tolerable and safe ratio (Silva Santos et al., 2016).

CONCLUSION

Taekwondo is a branch of martial arts originating from Korea and is part of an international championship. A weight class applies intending to control the balance between body weight, strength, size, and range of motion between the two athletes who will be fighting. Weight classification causes athletes to adjust their weight according to their class before the match; losing too much and too fast weight in too fast can pose a health risk and affect the ability to train, compete and recover. In this case, a standardized nutritional care process was carried out to gradually help athletes achieve weight according to the competition class without causing complications. The preparation of diet therapy is adjusted to the actual condition of the athlete. A 30% reduction in energy from the daily requirement can help athletes lose 1.5 kg in 10 days of intervention.

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