

Research Article

Research on Dietary Nutrition Supplement of Taekwondo Players

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Abstract: To comprehend the characteristics of Taekwondo and the problems lying in the nutrient and dietary structure of Taekwondo players through this study and then formulate a scientific and reasonable structure in nutrient and dietary for Taekwondo players, in order to improve their athletic ability in the meantime of improving their physical quality. To comprehend energy consumption characteristics of Taekwondo and current situation of nutrient and dietary structure of Taekwondo players through methods of literature collection and comparative research and then come up with a scientific and reasonable structure in nutrient and dietary. A reasonable nutrient and dietary structure can not only improve physical function and guarantee a normal internal metabolism of Taekwondo players, but also can effectively improve their athletic ability and improve their performance in competition.

Keywords: Dietary structure, problem solution, Taekwondo player

INTRODUCTION

The promotion in athletic ability of Taekwondo players does not only rely on daily strict training and good physical quality, but also depend on a scientific and reasonable supplement in dietary nutrition to a large extent. Speed, flexibility and explosive power are basic qualities of Taekwondo players in competition and in training; characteristics of competition events require long-time and high-intensity aerobic exercise capacity and short-time and high-intensity anaerobic capacity in energy supply (Li and He, 2013); it also requires athletes to accomplish technical movements in high-speed and intense confrontation with high quality, however if Taekwondo players cannot obtain timely supplement of dietary nutrition, their athletic ability will be affected to a large extent. Therefore, Taekwondo training center must formulate a scientific and reasonable structure of dietary nutrition according to characteristics of energy consumption of Taekwondo and physical quality of Taekwondo players, to supply carbohydrate, protein, water, vitamin and inorganic salt in time and only in this way can it effectively guarantee a normal metabolism of Taekwondo players and improve their athletic ability (Yongjin, 2014).

RESEARCH OBJECTS AND METHODS

Research objects: Twelve Taekwondo players from a Taekwondo club are selected as research objects, with an average age of 22.35 and an average weight of 75.5 kg and there is no distinct difference in physical quality among these 12 players.

Research methods:

Literature research method: By means of literature in characteristics of Taekwondo and characteristics of energy consumption of Taekwondo players collected from library, internet and readers' center, to analyze and summarize the problems in dietary nutrition supplement of Taekwondo players of our country and to put forward relevant solutions based on those problems, providing a reliable theoretical foundation for this study.

Comparative research method: To summarize daily intake of various food and nutrient of Taekwondo players through eight-week field investigation of research objects and compare these results with standards of athletes and then analyze and summarize current situation of dietary nutrition of Taekwondo players.

RESULTS

Ratio table of intake of thermal energy and thermal nutrition and energy supply in three meals (Table 1).

It is can be observed from the data above that proportion of carbohydrate, fat and protein in Taekwondo players' diet is 49.1, 28.7 and 22.2%, respectively while standard proportion of carbohydrate, fat and protein in Taekwondo players' diet in our country is 50-5, 30-35 and 13-15%, respectively. Proportion of protein in Taekwondo players' diet is on the high side and proportions of fat and protein are on the low side. While energy supply standards of three

Table 1: Ratio table of intake of thermal energy and thermal nutrition and energy supply in three meals of Taekwondo players

Carbohydrate	Fat	Protein
Proportion of three major nutrients (%)		
49.1	28.7	22.2
Breakfast		
Proportion of energy supply in three meals (%)		
20	36	44

Table 2: Daily intake of inorganic salt of Taekwondo players and athletes' standard

Inorganic salt	Intake (mg)	Athletes' standard (mg)
Sodium	5503	6000
Potassium	2358	3000-4000
Ferrum	36.8	25-30
Calcium	548.3	1000-2000
Magnesium	406	400-500
Phosphorus	1720	2000-5000

Table 3: Daily intake of vitamin of Taekwondo players and athletes' standard

Vitamin	Daily intake (mg)	Athletes' standard (mg)
Vitamin C	72.50	150-200
Vitamin B1	1.20	3-6
Vitamin B2	1.44	2.5

meals of Taekwondo players in our country are breakfast 35%, lunch 40% and dinner 25% and currently there are certain deviations in energy supply proportion of three meals of Taekwondo players. The reasons for this phenomenon is that Daily intake of inorganic salt of Taekwondo players (Table 2).

From the Table 3 above it can be observed that in daily diet of Taekwondo players, daily intake of inorganic salt such as sodium, potassium, calcium and phosphorus are lower than standard of athletes, which has affected the athletic ability of Taekwondo players to a large extent. It may be connected with Daily intake of vitamin of Taekwondo players (Table 3).

From the table above it can be observed that in daily diet of Taekwondo players, daily intake of vitamin is lower than standard of athletes, which may be caused by traditional cooking habit of our country, because lots of vitamin is destroyed during the process of processing vegetable and other food, or it may be caused by closed training since Taekwondo players cannot go out and buy fruit, plus there is basically no supplement of fruit or raw vegetable, leading to a insufficient intake of vitamin as a result of less fruit (Yongjin, 2014).

Characteristics of taekwondo and analysis of energy consumption of taekwondo:

Characteristics of taekwondo: Taekwondo is a group activity of offensive and defensive confrontation which surrounded by rebound and shoot, also an event with rapid change of offense and defense in physical ability and technical ability in the type of speed and power and strong confrontation. All of these indicate that Taekwondo is not only a sports event of technical ability, but also a sports event with high requirements in physical ability. According to regulations of FIBA, shoot clock of Taekwondo is 24 sec in a Taekwondo

game; therefore basically players have to complete a physical confrontation within 24 sec. In the meantime, players may run back and forth about 150 times in Taekwondo field during an intense competition and maximum times can be about 200 times, total distance of which could be around 5000-6000 m. Secondly, players may complete 160 times of jump within 48 min during a competition and some high-level players may complete 80 times of scurry with a distance of 10 m and sometimes over 15 m. It can be observed that there are characteristics of high intensity, high density and long time, with high requirements of physical ability of players.

Analysis on energy consumption of taekwondo: It can be concluded from the characteristics of Taekwondo that Taekwondo is a sports event requiring mixture energy supply, which takes intermittent anaerobic energy-supply as primary. During an intense Taekwondo game, energy mainly comes from anaerobic metabolism which takes phosphagen system and glycolysis system as primary. Under general conditions, time limit of a Taekwondo game is 48 minutes, which is relatively long and during the exercise process there are frequently explosive jump and throw. During this time main energy substance consumed by players are carbohydrate, fat and protein, primary of which is muscle glycogen consumption. It is showed according to related information that there is a direct relation between tiredness and diminishment of muscle glycogen reserve: when blood-sugar content is on the low side, energy supply cannot meet the need for muscular activity, which will lead to a diminishment in athletic ability of Taekwondo players. In the meantime of exercise, some metabolites will be generated from energy metabolism inside the body. Although human body can eliminate those metabolites, there will be massive accumulation of metabolites which cannot be eliminated in time during a high-intensity Taekwondo game, which will cause destruction in environmental balance in the body, leading to a diminishment in athletic ability. For instance, Taekwondo players often need to do explosive scurry and scam, leading to the accumulation of creatine in muscle and diminishment of PH value in muscle, causing a diminishment of muscle function and affecting athletic ability of players. In conclusion, energy consumed by players includes both the energy provided by anaerobic metabolism and the energy provided by aerobic metabolism, primary of which is the energy provided by anaerobic metabolism of phosphagen-glycolysis (Xin, 2011).

Requirements of dietary nutrition of taekwondo: Since Taekwondo is a sports event of high intensity and high energy consumption, Taekwondo players have relatively high requirements towards dietary nutrition (Song, 2014).

Carbohydrate: Carbohydrate is the uppermost energy substance in human body and two thirds of heat is

provided by carbohydrate, so it is very important for Taekwondo players to scientifically and reasonably take supplement of carbohydrate. Therefore, Taekwondo players shall increase reserve of muscle glycogen in a scientific and reasonable way before the game. During an intense Taekwondo game, players shall timely supply carbohydrate with low tension and low osmotic pressure, in order to effectively improve their athletic ability and relieve tiredness.

Fat: Fat accounts for 25-30% of total heat in human body, which has the function of protecting each tissue and organ, heat preservation and alleviating impact force. During a Taekwondo activity, metabolic exhaustion of carbohydrate will diminish after strengthening fat metabolism of Taekwondo players, which in turn will effectively improve their endurance. Therefore, training center shall further strengthen the supplement of fat since fat is an essential nutrient substance for Taekwondo players.

Protein: The energy provided by protein accounts for approximately 15% of total energy of Taekwondo players and it is involved in the restoration and reconstruction of bad body tissue and protein is related to the muscle contraction and the excitability transportation of nervous system. Therefore, protein is an essential nutrient substance for Taekwondo players and training center shall further strengthen the supplement of protein.

Water: Water is an essential substance of sustaining life and there is a close connection between the metabolism and transportation of various kinds of energy substance and water. During intense competitions or training, it will cause dehydration if there is no timely supplement of water after massive perspiration of Taekwondo players. It is showed according to relevant research that it is mild dehydration when dehydration reaches 2% of body weight, which will cause thirsty feeling and will influence athletic ability of Taekwondo players to certain extent. And when dehydration reaches approximately 5% of body weight, it will cause a distinct diminishment in athletic ability of Taekwondo players. Therefore, Taekwondo players must pay attention to the supplement of water during intense Taekwondo activity.

Vitamin and inorganic salt: Micronutrient, such as vitamin and inorganic salt, has special significance in Taekwondo, among which vitamin B1 can effectively promote energy metabolism and maintain normal excitability of nervous system of Taekwondo players. Vitamin E can effectively promote synthesis of protein, improve blood circulation and then improve athletic ability of Taekwondo players. And phosphorus in

inorganic salt can synthesize phosphate, which can further strengthen phosphorization process and effectively improve athletic ability of Taekwondo players. It will influence the metabolism of muscle energy and athletic ability once there is an insufficiency of phosphorus of Taekwondo players. In the meantime, various kinds of inorganic salt cannot be synthesized in the body but can be discharged outside the body during the process of metabolism. Therefore, Taekwondo players must pay attention to the supplement of vitamin, inorganic salt and various kinds of microelements and only in this way can it improve athletic ability of Taekwondo players (Hongyan, 2012).

ADVICE ON SUPPLEMENT OF DIETARY NUTRITION OF TAEKWONDO PLAYERS

To set up dietician department and formulate scientific and reasonable diet structure: Taekwondo training center shall hire professional sports dietitian to be in charge of dietary nutrition of Taekwondo players. Firstly, sports dietitian shall formulate different structures of nutrient diet according to physical function and requirements of various kinds of nutrient elements of each Taekwondo player. Secondly, sports dietitian shall also formulate different structures of nutrient diet according to different phase of training of Taekwondo players. Only in this way can it be possible to effectively improve physical quality of Taekwondo players and improve their athletic ability. Lastly, sports dietitian shall also strengthen cooperation with coach and strengthen propaganda of rational and nutrient diet, trying to have every Taekwondo player actively accomplish rational diet.

Supplement of carbohydrate: As energy-supplying substance of Taekwondo, carbohydrate has low oxygen consumption and high energy-supplying efficiency and is the main energy substance of aerobic energy-supply and anaerobic energy-supply; therefore Taekwondo players shall further strengthen the supplement of carbohydrate. Firstly, in daily diet Taekwondo players shall eat more grain in order to increase the reserve of carbohydrate of Taekwondo players. Secondly, during competition or high-intensity training, Taekwondo players shall drink oligose carbohydrate beverage in half-time interval to avoid massive loss of body fluid and consumption of glycogen, which will effectively strengthen their athletic ability and relieve tiredness (Jianguo, 2013).

Strengthen intake of water: Taekwondo is a sports event with intense physical confrontation. After strenuous exercise, Taekwondo players will release massive sweat and shall pay attention to the supplement of water. During training or time-out, Taekwondo

players must take supplement of proper amount of fluid of 44-500 mL; do not drink until thirsty; do not drink mineral water during exercise which will quickly lower plasma osmotic pressure and increase urine volume, leading to water loss on the contrary; hypertonic beverage and carbonated beverage are even more forbidden while some beverage containing 0.9% of sodium chloride, 0.5% of glucose, certain amount of potassium chloride and magnesium aspartate will be better choice.

Supplement of vitamin and inorganic salt: During daily nutrition diet, Taekwondo players must further strengthen the supplement of vitamin and inorganic salt. Firstly, Taekwondo players shall eat more beans, nuts, lean meat, animal giblets, millet, Chinese cabbage, fermented food, rice, cucumber, eel, eggs and milk, which are rich in vitamin B1, B2, in order to effectively supply vitamin of Taekwondo players and guarantee a normal internal metabolism. Secondly, Taekwondo players shall also further strengthen the supplement of inorganic salt, such as calcium, magnesium, ferrum and zinc. For instance, Taekwondo players shall take one glass of soybean milk for breakfast and take a glass of milk for lunch and dinner and before sleep, so as to take supplement of vitamin D and magnesium in the meantime of calcium supplement, which will also improve the absorption of calcium. And during intense competitions or Taekwondo training, Taekwondo players shall drink some functional beverage rich in inorganic salt, so as to effectively take supplement of various kinds of inorganic salt in the meantime of water supplement.

CONCLUSION

Diet is the most important material basis of keeping physical capability and basic nutrition of

Taekwondo players. Only with reasonable dietary nutrition can it be possible to promote healthy development, to eliminate sports fatigue, to improve athletic ability of players and to lay a solid foundation for achieving excellent performance. Therefore, Taekwondo training center must formulate a scientific and reasonable plan of dietary nutrition according to characteristics of Taekwondo and physical function of each Taekwondo player, taking supplement of various kinds of nutrient elements in time and only in this way can it effectively improve physical quality of Taekwondo players and improve their athletic ability.

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