

# Evaluation of the Use of Nutrition Support Products in Taekwondo Athletes

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## Abstract

The purpose of this study was to determine the use of nutrition support products by male and female athletes who are involved in taekwondo and their level of knowledge in this respect. The sample group was formed with male and female (n=300) athletes who are actively involved in taekwondo. 300 of the collected questionnaires, which were determined to have been filled in correctly, were evaluated. Of the questionnaires evaluated, 108 belonged to female taekwondo athletes and 192 belonged to male taekwondo athletes. The arithmetic average, standard deviation and percent frequency (%) distributions of the obtained data were calculated. It was stated that 47.4% of male athletes and 41.7% of female athletes use the nutrition support products and the most preferred products by male athletes are protein powder (38%); amino acid (18.2%); vitamin (13.5%); mineral 8.9%; creatine (9.4%) and other nutrition support products (%12). It was found that female athletes also use the same products and these products are protein powder (30.6%); amino acid (15.7%); vitamin (18.5%); mineral 13%; creatine (8.3%) and other nutrition support products (13.9%). It was determined that the use of nutrition support products in male athletes was provided through doctor (20.8%), pharmacist (10.9%), friends (10.4%) and neighbors (3.6%), and in female athletes, through doctor (23.1%), pharmacist (16.7%), friends (6.5%) and neighbors (2.8%). Reasons for taekwondo athletes to use nutrition support products were to improve their athletic performance for 65.1% of males and 67.6% of females, and to cope with the fatigue for 17.2% of males and 17.6% of females. Our study results show that athletes who are involved in taekwondo use nutrition support products at a high level in order to increase their athletic performances. It is important for athletes using nutrition support products to use these products under the supervision of an expert for their health.

**Keywords:** nutrition support products, taekwondo, nutrition

## 1. Introduction

It is known that there are a great number of studies on the effects of nutrition on athletic performance and success. American College of Sports Medicine, American Dietetic Association, and Dietitians of Canadian reported that physical activity, performance and post-exercise recovery were improved by optimal nutrition (Rodriguez, Di Marco, & Langley, 2009). The athletes should consider nutritional requirements, adequate calorie intake, adequate fluid intake and meal timing to achieve the desired success and performance (Cotugna, Vickery, & McBee, 2005). Younger athletes, who need more energy after training and competition, seek different nutritional requirements to improve growth and durability, and to provide health protection and higher performance gains (Petroczi et al., 2008). Athletes who are aware of this, use extra nutritional supplements in order to be successful and to meet the nutritional elements they need. Nutritional supplements known and widely used by athletes are known to be used by athletes to maintain healthy lifestyles, regulate malnutrition, strengthen, immune system, increase performance and energy (Sobal & Marquart, 1994; McDowall, 2007; Aljaloud & Ibrahim, 2013; Bailey et al., 2013).

It is known that athletes commonly use support products such as antioxidants, caffeine, ephedrine, protein, amino acid, creatine, Beta-Hydroxy and Beta-Methylbutyrate today (Juhn, 2003). In 1994, the Dietary Supplement and Health and Education Act defined nutrition support products as products consumed to supplement the nutrition of a person, and defined vitamins, minerals, amino acids, enzymes, organ tissues, glandules, metabolites, extracts or concentrates in the form of tablets, capsules, liquids, powders, sticks, soft gels

or gel caps as nutrition support products that the athletes receive from the outside (<http://www.fda.gov/Food/DietarySupplements/ConsumerInformation>, 2009).

Despite the high interest of the athletes on nutrition, they do not provide adequate nutrition knowledge to meet performance needs. While the lack of nutrition knowledge is seen at high school level in the studies conducted, athletes do not hesitate to try various sources for nutrition guidance. In general, the recommendations made by teammates, competitors, and influential people (coaches, friends or family members) to improve performance or prevent illness were identified as the most important factors in directing athletes towards the use of nutrition support products. The lack of knowledge of the athlete's protein, fluid, vitamin and minerals needs due to the incomplete and inadequate information provided by family, teammates and coaches negatively affects the performance of the athlete (Shiflett, Timm, & Kahanaov, 2002; Sobal & Marquart, 1994). The adequate nutrition of taekwondo athletes is crucial for their ability to cope with the stressful situations they may experience physically, physiologically and mentally during challenging trainings and competitions, and to exhibit high athletic performance. There are very few studies in the literature regarding the use of support products in addition to their normal eating habits in order to achieve this.

In this study, which examines the increasing use of nutrition support products in recent years, it was tried to determine which nutrition support products the elite taekwondo athletes' use, usage frequency, usage intentions and consciousness levels. In the light of the information obtained, taekwondo athletes can be provided with sufficient knowledge about the nutrition support products and the adversities that may result from unconscious use of these products can be prevented.

## 2. Method

In order to determine the use of nutrition support products by the taekwondo athletes, the sample group consisted of athletes who were actively involved in taekwondo sports, who were not heavyweight athletes and who lost weight before the competition. 302 of the collected questionnaires, which were determined to have been filled in correctly, were evaluated. Of the questionnaires evaluated, 107 belonged to female participants and 195 belonged to male participants. The questionnaire, which was created by experts on the subjects and which had also been applied by Yazar et al., is composed of three parts: personal information in the first part, questions about the knowledge and use of the nutrition support products in the second part, and questions about nutrition knowledge of the athletes in the third part (Yazar, Gokdemir, & Ozdemir, 2011).

SPSS 21 program was used for the statistical analysis in this study. The data obtained as a result of the questionnaire applied to participants, participants' descriptive characteristics, weight loss history, arithmetic average (X), standard deviations (SS), percent frequency (%) distributions were analyzed.

## 3. Findings

Table 1. Descriptive statistics of taekwondo athletes

	Male (n=192)+ ss	Female (n=108) + ss
Gender (%)	64	36
Age (year)	21.97±4.64	21.33±3.83
Education (%)		
Primary education	2.1	-
High school	40.6	38.0
University	50.5	57.4
Postgraduate	6.8	4.6
Body Weight (kg)	72.89 ±12.13	59.03±13.07
Body Length (cm)	180.93±8.064	169.42 ±6.48

Kg: Kilogram, cm: Centimeter.

Of the 300 athletes who participated in the study, 64% were male and 36% were female taekwondo. The average age of the athletes is 21.97±4.64 in males and 21.33±3.83 in females. The educational status of taekwondo athletes involved in this study is 2.1% primary education, 40.6% high school, 50.5% university, 6.8% postgraduate for males, and 38% high school graduates, 57.4% university and 4.6% postgraduate for females. The average body weight is 72.89 ±12.13 for males and 59.03±13.07 for females, the body length was 180.93±8.064 cm and 169.42 ±6.48 cm respectively.

Table 2. Use of nutrition support products by taekwondo athletes

		Male %(n=192)	Female%(n=108)
Use of Nutrition Support Products	Yes	47.4	41.7
	No	52.6	58.3

When Table 2 is examined, it can be seen whether taekwondo athletes who participated in the study use nutrition support products. According to the results, it is seen that 47.4% of male taekwondo athletes and 41.7% of female taekwondo athletes use nutrition support products.

Table 3. Most preferred products by taekwondo athletes

	Male %(n=192)	Female %(n=108)
Protein powder	38	30.6
Amino acid	18.2	15.7
Creatine	9.4	8.3
Vitamin	13.5	18.5
Mineral	8.9	13
Other	12	13.9

In the Table 3, which shows the responses of the most preferred nutrition support products by male and female taekwondo athletes, it is seen that male athletes use protein powder (38%); amino acid (18.2%); vitamin (13.5%); mineral 8.9%; creatine (9.4%) and other nutrition support products (12%) while female male athletes use protein powder (30.6%); amino acid (15.7%); vitamin (18.5%); mineral (13%); creatine (8.3%) and other nutrition support products (13.9%).

Table 4. Information sources of taekwondo athletes on nutrition support products

	Male % (n=192)	Female % (n=108)
Doctor	20.8	23.1
Pharmacist	10.9	16.7
Neighbor	3.6	2.8
Friend	10.4	6.5
Other	54.2	50.9

It was determined that the use of nutrition support products in male athletes was provided through doctor (20.8%), pharmacist (10.9%), friends (10.4%) and neighbors (3.6%), and in female athletes, through doctor (23.1%), pharmacist (16.7%), friends (6.5%) and neighbors (2.8%).

Table 5. Intended use of nutrition support products by taekwondo athletes

	Male % (n=192)	Female % (n=108)
Fitness	17.2	17.6
Increasing Immunity	3.1	2.8
Prevention of Aging	-	-
Improving Performance	65.1	67.6
Relaxation	3.1	7.4
Prevention of Cancer	-	-
Body Building	3.6	-
Losing Weight	6.3	2.8
Other	1.6	1.9

Table 5 explains the reasons why male and female taekwondo athletes use nutrition support products. Reasons for taekwondo athletes to use nutrition support products was to be fit for 17.2% of males and 17.6% of females, to increase immunity for 3.1% of males and 2.8% of females, to lose weight for 6.3% of males and 2.8% of females, to improve their athletic performance for 65.1% of males and 67.6% of females, and to relax for 3.1%

of males and 7.4% of females. On the other hand, it was understood that only 3.6% of males used nutrition support products for body building and did not prefer any nutrition support product to prevent cancer and aging.

Table 6. Taekwondo athletes' knowledge levels about nutrition support products

	Male % (n=192)			Female % (n=108)		
	True	I don't know	Wrong	True	I don't know	Wrong
<b>Additional Vitamin and Mineral Use is Absolutely Necessary</b>	43.8	31.3	25.0	42.6	37.0	20.4
<b>Vitamins Gives Energy to Body</b>	38.5	37.5	24.0	37.0	37.0	25.9
<b>Antioxidants Do Not Affect the Immune System</b>	16.7	51.6	31.8	13.9	58.3	27.8
<b>Every Herbal Product Is Harmless</b>	16.7	32.3	51.0	13.0	28.7	58.3
<b>Everyone Can Use Multivitamins</b>	16.7	41.1	42.2	19.4	50.0	30.6
<b>No Need To Consult A Doctor To Use Nutrition Support Products</b>	15.1	18.8	66.1	15.7	22.2	62.0
<b>Dosage Is Not Important to Us When Using Nutrition Support Products</b>	13.0	23.4	63.5	7.4	18.5	74.1
<b>Overconsumption of Vitamins and Minerals Is Not Harmful</b>	11.5	29.7	58.9	10.2	25.9	63.9
<b>Excessive Protein Support Should Not Be Used to Increase Muscle Mass</b>	22.9	17.7	59.4	17.6	16.7	65.7

In the Table 6, which shows the assessment of the level of knowledge of male and female taekwondo athletes on nutrition support products and the percentage distribution of the athletes' responses, the percentage of male and female athletes who believe that the use of supplemental vitamins and minerals is necessary is 43.8%–42.6%, respectively. Male and female athletes responded that antioxidants have no effect on the immune system with the percentage of 51.6% and 58.3%, respectively. The percentage of athletes who think that herbal products are harmful is 51% for males and 58.3% for females, and the percentage of those who think that it is necessary to apply for a doctor to use nutrition support products is 66.1% for males and 62% for females. The percentage of athletes who responded that the dose of nutritional supplements used is important is 63.5% for males and 74.1% for females. The percentage of athletes who think that vitamins and minerals consumed more than necessary are harmful is 58.9% for males and 63.9% for females, and the percentage of those who think that excessive protein consumption to increase the muscle mass is harmful is 59.4% for male athletes and 66.7% for female athletes.

#### 4. Discussion and Conclusion

Nowadays, it is known that many athletes use nutrition support products with the purpose of positively contributing to their athletic performances and that they do not have enough knowledge and they are misguided about using these products. For this reason, 300 taekwondo athletes participated in this study, consisting of 64% male athletes and 36% female athletes, in order to determine the nutrition support products used, usage frequency and consciousness levels of the elite athletes in the taekwondo branch. The average age of the athletes was determined to be  $21.97 \pm 4.64$  for male athletes and  $21.33 \pm 3.83$  for female athletes. When the educational levels of male and female taekwondo athletes are examined, the percentage of candidates who are studying at university or who have graduated from university is 50.5% for male athletes and 57.4% for female athletes, and the percentage of those who are studying at postgraduate programs or who have completed postgraduate programs 6.8% for male athletes and 4.6% for female athletes. It is noteworthy that the majority of the athletes participating in the study are taekwondo athletes with university and postgraduate educational levels. In addition, it is seen that among the descriptive characteristics of the athletes, the average body weight is  $72.89 \pm 12.13$  for males and  $59.03 \pm 13.07$  for females, the body length is  $180.93 \pm 8.064$  cm and  $169.42 \pm 6.48$  cm respectively. When the literature is examined, there is generally strong evidence that the use of nutrition support products increases both in elite athletes and in non-athlete individuals (Maughan, Depiesse, & Geyer, 2007). As a matter of fact, the percentage of Canadian athletes using nutrition support products in Atlanta Olympic Games is 35% in male athletes and 43% in female athletes, while in Sydney Olympic Games, this percentage is 43% in male athletes and 51% in female athletes (Huang, Johnson, & Pipe, 2006). According to the findings of this study, 47.4% of male taekwondo athletes and 41.7% of female taekwondo athletes use nutrition support products. Hirschbruch et al. stated that nutrition support products are more common among male athletes (Hirschbruch, Lajolo, & Pereira, 2003). In a similar study, Fraczek et al. (2016) reported that male athletes (50.5%) use

nutrition support products more frequently than female athletes (44.1%). Sobal and Marquart reported in their study that elite athletes use nutrition support products more frequently than college or high school athletes and that female athletes use nutrition support products more frequently than male athletes (Sobal & Marquart, 1994). In another study, it is known that 59% to 89% of athletes use nutritional supplements and the most preferred products are protein powders, vitamins and minerals (Braun et al., 2009; Tian, Ong, & Tan, 2009). The percentage of taekwondo athletes participating in this study who use nutrition support products is similar to other studies conducted in this respect.

The preference rates of protein powder and amino acid products, among the most preferred nutritional supplements by male and female athletes, by taekwondo athletes participating in this study are 38%/18.2% for male athletes and 30.6 /15.7% for female athletes. According to the findings of Brown et al., 4 days of protein powder use is shown to reduce muscle injuries in active female athletes and to be beneficial in improving muscle functions caused by exercise (Brown, Stevenson, & Howatson, 2017). Millward, noted that in addition to the benefits to the athletes, the protein powders, which are the most preferred products by the athletes and increasing in use every passing day, increase the risk of dehydration as a result of excessive consumption, they may cause calcium loss and at the same time overload the kidneys, and cause the kidneys to produce extra urea (Millward, 2004). In a study with 12 elite male runners involved in athletics, they reported that an increase was observed in endurance performance of the athletes according to the results of walking and running trainings for 5 weeks with the use of protein powder. According to this result, they suggested that protein powder could be used in aerobic exercises for better physical adaptation (Huang et al., 2017). Fraczek, et al. found that the use of protein powder among nutrition support products was 51.8% for males and 32% for females in their study on the athletes selected from 600 different sports branches (Fraczek, Warzecha, Tyrala, & Pieta, 2016). Lun stated that dietary supplements can be classified according to their effectiveness and safety and that protein powders can be regarded as apparently effective and safe supplements for muscle growth and performance improvement. At the same time, among nutrition support products, BCAA is effective in improving muscle mass and performance (Lun, Erdman, Fung, & Reimer, 2012). Our results show that taekwondo athletes use supplements, of which effectiveness and reliability have been proved, as nutrition support products.

In this study conducted with male and female taekwondo athletes, creatine use of both groups was 9.4% for males and 8.3% for females. Creatine, which is frequently used by athletes, was one of the most consumed nutritional supplements by Canadian athletes in Atlanta Olympic Games organized in 1994 with the percentage of 14% (Huang, Johnson, & Pipe, 2006). Rafael, et al. reported in their study on 10 male taekwondo athletes using creatine that there is no increase in the anaerobic performance of athletes using this product, and that taekwondo athletes may have an increase in fat mass and serum triglyceride concentration. They also warned that athletes who want to reduce their body fat ratio should be careful when using this product (Rafael et al., 2013). In a study on 28 male and female participants conducted by Dalton, et al., participants used creatine, and as a result of the study, it was stated that creatine supplement up to a dosage of 6 gr for 6 days is safe and it provides some ergogenic benefits (Dalton et al., 2017). Metzl, et al. also reported in their study on different sports branches that the most common reason for using creatine supplement (74.2%) is to improve athletic performance (Metzl et al., 2001).

For users of vitamins and minerals, it can be said main reasons for the use of nutrition support products are to protect athlete health by preventing nutritional deficiencies and help recovery after exercise (Murathan et al., 2017; Heikkinen et al., 2011). In this study, the percentage of taekwondo athletes using vitamins/minerals was determined as 13.5% and 8.9%, and 18.5% and 13% for male and female athletes, respectively. Vitamins were used by 59% of Canadian male athletes and 66% of Canadian female athletes in Atlanta Olympic Games, there were used by 65% of Canadian male athletes and 58% of Canadian female athletes in Sydney Olympic Games. While the use of minerals in Atlanta was 16% for males and 45% for females, their use in Sydney was 30% for males and 21% for females (Huang, Johnson, & Pipe, 2006). In another study conducted with 292 male and female athletes from 13 different sports branches, it was reported that each of the athletes used at least 4 nutrition support products and preferred vitamin and mineral supplement products with a maximum percentage of 67% (Sousa et al., 2013). Obtained findings include the most commonly preferred nutritional supplements by male and female taekwondo athletes as well as other nutritional supplements used. The percentage of use of other nutrition support products was determined as 12% for males and 13.9% for females.

According to our findings, it was determined that the use of nutrition support products in male athletes was provided through the recommendation of doctor (20.8%), pharmacist (10.9%), friends (10.4%) and neighbors (3.6%), and in female athletes, through doctor (23.1%), pharmacist (16.7%), friends (6.5%) and neighbors (2.8%). In a study, it was reported that 45% of athletes use nutrition support products on the recommendation of

a sports physician, 40% of the athletes use them with the guidance of their own coaches and 15% of the athletes use them on the recommendation of their friends, and that 79% of them use nutrition support products with the purpose of improving their performance and 19% with the purpose of improving their health condition (Silva et al., 2010). In a study conducted by Sousa et al., most athletes indicated that they use nutrition support products to accelerate recovery (63%), increase sport performance (62%), and reduce fatigue (60%). Athletes were found to be mainly seeking support from physicians (56%) and coaches (46%) about the use of nutrition support products. (Sousa et al., 2013). This study shows that the purpose of the use of nutrition support products by taekwondo athletes is similar to previous studies in the literature. According to this, it is seen that the most common reason of using these products is to increase the athletic performances for 65.1% of males and 67.6% of females, and to cope with fatigue for 17.2% of males and 17.6% of females.

According to previous studies, there is a lot of misinformation about the use of nutrition support products among athletes (Nieper, 2005; Tian, Ong, & Tan, 2009). It is stated that this is due to inadequate knowledge of proper nutrition of them and their coaches, and for this reason, it is important that both athletes and all the responsible persons in the team have adequate knowledge and prepare suitable nutrition programs for athletes (McGehee et al., 2012). In this study, the responses of male and female taekwondo athletes about nutrition support products reveal that their knowledge level is high. In the study by Duellman et al., they stated that wrong use of protein powders supplement, one of the nutritional support products, is caused by wrong information and recommendation on its use, the coaches, the athlete's family, friends and the ones that influence the athlete and play an effective role in the decision making have a great responsibility about the protein supplement. It was stated that it would be sufficient to provide nutrition training to athletes, coaches, family members and friends together with the training of young athletes in order to eliminate the wrong misconceptions about the nutrition support products and supplements needed by the athletes (Duellman et al., 2008)

Taekwondo athletes should consider whether the nutrition support products used meet or exceed all of their calorie needs, whether they provide the shortest recovery after training and competition, and whether they contribute to maintaining their health. The athletes should be allowed to use safe and legal nutrition support products that will not put the athlete's health at risk and increase their athletic performance.

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