

DIETARY SUPPLEMENT INTAKE AND PERCEPTION ASSESSMENT AMONG ADOLESCENT ATHLETES

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ABSTRACT

Introduction: Studies have shown that athletes often have inadequate micronutrient intakes, and the use of dietary supplements can help address these deficiencies. However, most of the dietary supplement studies were focusing on adult and elite athletes. Thus, this study aimed to identify the prevalence and perception of dietary supplement intake among adolescent athletes in Kuantan, Pahang. **Method:** The study was conducted using a cross-sectional design among 106 athletics and team sports athletes (72.6% male; 14.6 ± 1.4 years old) The respondents were asked to complete a Dietary Supplement Prevalence and Perception Assessment Questionnaire (DSPAQ) which consisted of items on their demographic information, dietary supplement intake and perception. The prevalence dietary supplement intake between athletics and team sports was statistically analysed and the significance was ascertained using Chi-square test. **Result:** The overall prevalence of dietary supplements intake among athletes was 9.4 % with protein supplements being the predominant supplement (71%). The main reasons for the consumption of dietary supplements were to improve muscle strength, performance and maintain health. However, the prevalence was not associated to the type of sports. The adolescent athletes had a perception that they need more supplement information and believe supplement can enhances their performance. In addition, the main reason for not taking dietary supplements was related to the cost. **Conclusion:** In conclusion, adolescent athletes in this study are prone to not taking dietary supplements with the perception of needing more information about the supplement.

KEYWORDS: Dietary Supplement, Adolescent Athletes, Perception, Prevalence

INTRODUCTION

Athletes are always looking for strategies to enhance their performance, which can be achieved by optimising their diets. It is commonly known that the majority of athletes use dietary supplements to boost their performance and make their diets more nutrient-dense (Roy et al., 2021). The usage of supplements is relatively widespread in several countries. Statistics show that between 20 - 34% of young children and adolescents in the United States, Europe and Asia use dietary supplements, with multivitamins being the most common type (Sien et al., 2014). Besides, few studies found that the top five reasons for using dietary supplements were to maintain good health, increase energy, recover from exercise, build or retain muscle mass, and improve immunity. Nevertheless, these reasons varied by gender and competitive event in Kobayashi et al. (2017); Lun et al. (2012); Yazid et al., (2021). Additionally, studies have shown that athletes often have inadequate micronutrient intakes, and the use of dietary supplements can help address these deficiencies (Wardenaar et al., 2017).

In Malaysia, the use of dietary supplements is common practice but there is limited research available on this topic especially among young athletes (Balaravi et al., 2017 and Nor Azizam et al., 2022). Most of the dietary supplement studies are focusing on adult and elite athletes (Sien et al., 2014). Furthermore, considering the involvement of adolescent athletes in major sports events such as Sukan Malaysia (SUKMA), it is important to understand the patterns of dietary supplement intake among them. This study will facilitate the development education program that aims to prevent unnecessary supplement use. Moreover, it is also important to avoid unintentional doping due to the lack of knowledge about dietary supplements usage and will create awareness regarding dietary supplements consumption (Balaravi et al., 2017). Thus, the current study aims to identify the prevalence and perception of dietary supplement intake among adolescent athletes with involved in different types of sports in Kuantan, Pahang.

MATERIALS AND METHOD

Study Design and Population

A cross-sectional study design was conducted among adolescent's athletes from Kuantan, Pahang. Athletes age between 13 - 18 years old that participated in all levels of competition were included in this study. Meanwhile, athletes with injuries or diseases were excluded. To recruit the participants, purposive sampling was used. Informed consent was obtained from their sport dietitian and coaches before athletes participated in this study.

Questionnaire

This study used Dietary Supplement Prevalence and Perception Assessment Questionnaire (DSPAQ) to identify the prevalence and perception of dietary supplement intake among adolescent athletes in Kuantan, Pahang. DSPAQ was adapted from Lockie et al., (2015) ; Mohamad Shalan et al., (2018) and undergoes back-to-back translation into Malay language, content validation and face validation. The content validation involved by four dietetics lecturers, one sport nutrition lecturer, one sport & exercise sciences lecturer and one sports nutritionist from National Sport Institute (ISN). The content validity index (CVI) for this questionnaire was 0.976 which indicated that the items were relevant to the domain, clear, and comprehensible to the target participants. Additionally, the face validation index (FVI) was 0.994 which indicated high scale of clarity for all items in the questionnaire. All the processes can be viewed in Figure 1.

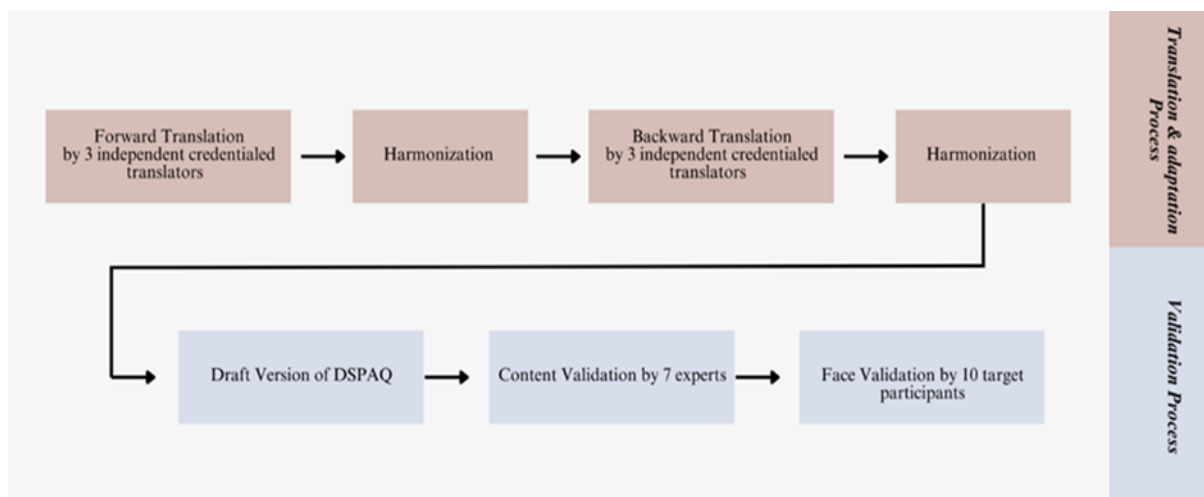


Figure 1 The flow of translation, adaptation, and validation process for the Dietary Supplement Prevalence and Perception Assessment Questionnaire (DSAPQ)

The DSAPQ comprises of 18 questions, divided into 4 main parts. The first part collected demographic and personal information on the study respondents: age, gender, ethnicity and sports that in which they are competing. The second part obtained information on their anthropometry: weight(kg), height(m) and body fat percentage. The third part identify their dietary supplements intake which include type of supplement intake. Lastly the fourth part investigate the athlete's perception on dietary supplements. The respondents required to answer each of the items by ticking one best answer.

Procedure

The data collection was immediately started after obtaining permission from International Islamic University Malaysia Research Ethical Committee (IREC), Ministry of Education (MOE) under Educational Research Application System (ERAS 2.0), 'Bahagian Sukan Kokurikulum dan Kesenian (BSKK)' and the Headmaster of Sekolah Sukan Malaysia Pahang. The school dietitian and coaches were contacted and introduced to the study in order to recruit athletes. Then school dietitian provides the researcher with athlete's appointment schedule. The questionnaires were distributed to respondents according to the schedule. The data collection was conducted face to face, thus any discrepancies or inquiries were solved during the session. All answer booklets were check by the researcher to make sure all questions were answered.

Statistical Analysis

The statistical analysis was carried out using the SPSS Statistics version 26. The descriptive analysis was performed to identify the percentage, mean and standard deviation of the socio-demographic data. Besides that, chi-square test was used to compare the frequency of dietary supplements intakes and perception.

RESULT

Respondents Demographic and Anthropometry Information

The Table 1 shows demographic data collected from 106 respondents aged between 13 - 18 years old with majority of male athletes (72.6%). Sixty-six respondents were categorised in team sports, while the remaining 40 were in athletics. The team sports comprise of rugby and basketball athletes. Meanwhile athletics comprise of running, jumping, walking, throwing, and hurdling athletes. As for ethnicity, most of the respondents were Malay (82.1%) followed by Chinese (13.2%) and Indian (0.9%) players. The remaining 2.8% of athletes were from various ethnic origins such as Kadazan, Iban, Bugis and Siamese. Next for anthropometric measurement, most respondents (66%) had normal BMI followed by 25.5% were underweight, 4.7% were overweight and only 3.8% were Obese Class I. Furthermore, in terms of fat percentage, the majority of respondents exhibited a healthy fat percentage with 87% among males and 48.3% among females.

Table 1 Demographics and athletes details ($n=106$)

	n	%	Mean Score (SD)
Age			14.6 (1.4)
Gender			
Male	77	72.6	
Female	29	27.4	
Height (cm)			1.7 (0.8)
Weight (kg)			57.5 (12.9)
BMI Status (kg/m²)			
All			17.1 (3.4)
Underweight	27	25.5	
Normal	70	66.0	
Overweight	5	4.7	
Obese Class I	4	3.8	
Fat Percentage^a			
All			18.728 (14.97)
Male			16.0 (15.3)
Under fat	3	3.9	
Healthy	67	87.0	
Overfat	4	5.2	
Obese	3	3.9	
Female			25.92 (11.4)
Under fat	9	31.0	
Healthy	14	48.3	
Overfat	1	3.4	
Obese	5	17.2	
Education Level			
Secondary School	106	100	
Race			
Malay	87	82.1	
Chinese	14	13.2	
Indian	1	0.9	
Others	4	3.8	
Sports Category			
Team	40	37.7	
Basketball	15	14.2	
Rugby	25	23.6	
Athletics	66	62.3	

Sprinter	27	25.5
Jumper	12	11.3
Walker	14	13.2
Thrower	5	4.7
Hurdle	8	7.5
Current Training		
Preparation	99	93.4
Competition	7	6.6

^a Tanita (2020)

Dietary Supplement Prevalence among adolescents athletes

The result found that only 10 out of the 106 respondents in the study reported taking dietary supplements. Among the respondents who reported taking dietary supplements, 9 individuals (8.5%) were athletes involved in athletic sports, while only 1 individual (0.9%) was involved in team sports. A chi-square test was conducted to identify the association between types of sports and dietary supplement intake. The test indicated that no statistically significant association ($p=0.118$) was found between types of sport and dietary supplement intake.

Type Of Dietary Supplement

From the 10 respondents who reported taking the dietary supplement, only 7 provided information about the specific type of supplements they were taking. Out of 7 respondents, 4 (57%) of them consumed whey protein, 2 respondents (29%) consumed lean gain protein and 1 respondent (14%) consumed vitamin C.

Reasons For Taking Supplement

As presented in Figure 2, adolescent athletes provide various reasons for taking supplements. The primary reasons were to improve muscle strength, followed by maintaining health, improve energy and improve performance, reduce fatigue, boost immunity and incorporating it into a dietary routine.

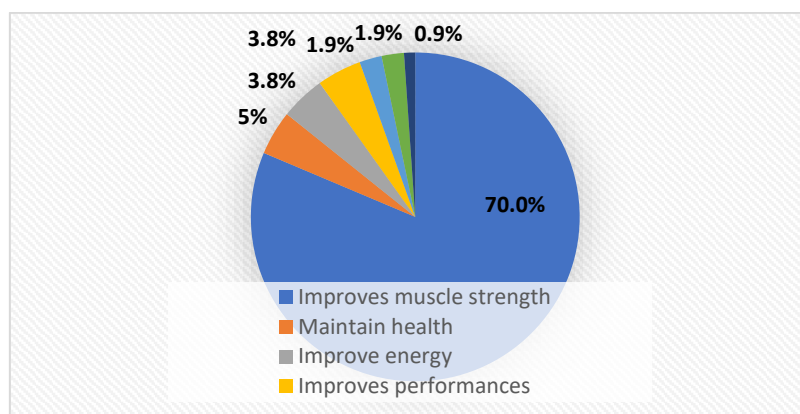


Figure 2 Reasons for taking dietary supplements by adolescent athletes (n=10)

Reasons For Not Taking Dietary Supplements

From Figure 3, it show about who did not consume dietary supplements, which the cost of supplements was the main factors influencing their decision, followed by being afraid of side effects from the supplement, and lack of information about the supplement. Other reasons were reported included the preference for relying on natural food sources for energy boosters and consumption of a balanced diet, perceived unsuitability with their body, and some of them being too lazy to consume the supplements.

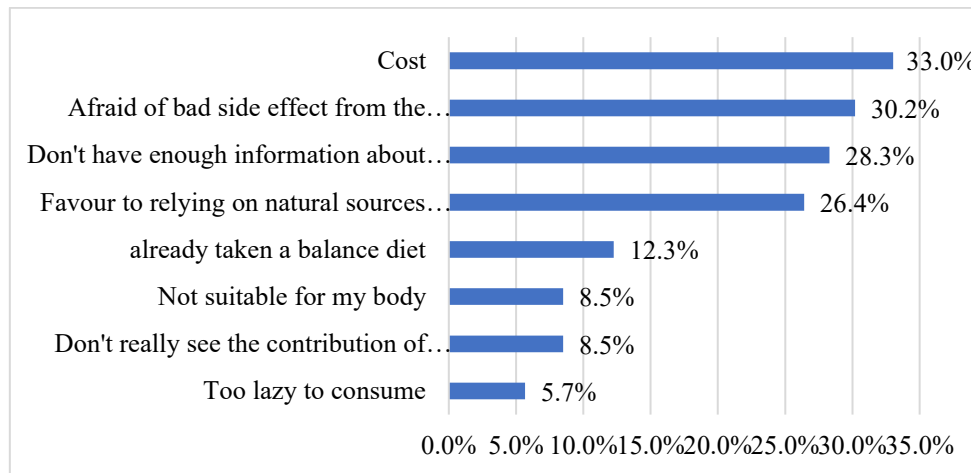


Figure 3 Reasons for not taking dietary supplements by adolescent athletes (n=96)

Perception Towards Dietary Supplement

Based on Figure 4, most of the respondents agreed that more information should be provided on the supplements. Next, athletes also had high agreement with statement that suggesting supplements can enhance their performance while a substantial respondent also agreed with the idea that exercising increases the need for supplements. Next, almost half of respondents agreed with the statement suggesting that supplements are associated with health risks. Nevertheless, there were almost half of respondents did not agree on the statement that supplements are not needed with a balanced diet. Lastly, just over half of respondents disagree on the idea that supplements can cause positive doping result.

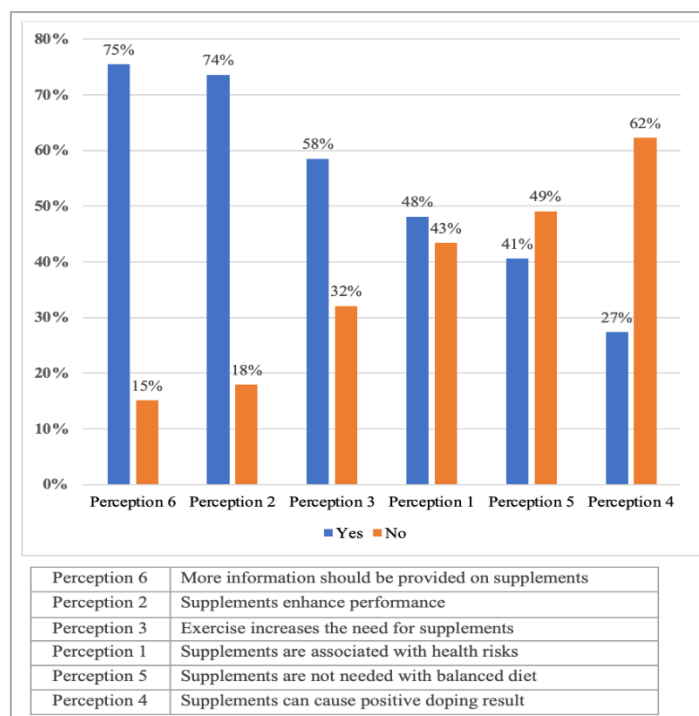


Figure 4: Bar graph of perception toward dietary supplements among adolescent athletes ($n=106$)

DISCUSSIONS

Current study dealt with the prevalence and perception of dietary supplement intakes among adolescents athletes that were in the in two categories (individual athletics and team sports) who are competing at national level.

Prevalence of dietary supplement intake

The observed prevalence of dietary supplement intake was lower in the current study compared to studies finding conducted elsewhere (Alfawaz et al., 2017; Garthe & Maughan, 2018; Jovanov et al., 2019 and Sien et al., 2014). Study conducted on a large number of young athletes in the community showed that supplements are used to enhance their athletic performance (Tawfik et al., 2016). Moreover, study by Jovanov et al., (2019), observed that 82.2% of their individuals and team sports young athletes took supplements. Higher prevalence of dietary supplement intake can also be observed in various countries such as 87.5% among Australian athletes (Dascombe et al., 2010), 77.0% among Singaporean athletes (Slater et al., 2003), 71.2% among USA adolescents (Hoffman et al., 2008), 62.0% among the British athletes (62.0%) and 45.0% among Iranian athletes (Darvishi et al., 2013). The difference of prevalence between studies might be explained by the sample size, age categories and level of competition among athletes.

Current study found that the most frequently cited reason for supplement used among adolescent's athletes was associated with improvement on muscle strength. Nevertheless, according to Wiens et al. (2014), older athletes were more likely to use supplements associated with increased muscle strength, such as creatine and protein, compared to younger athletes. Motivation for supplement use included increasing muscle strength and power. Other studies found that common reason for supplement intake among the young athletes was the improvement of athletic performance (Mohamed & Abdelaziz, 2022), staying healthy, increasing energy, supporting the immune system and aiding in recovery (Parnell et

al., 2015). Therefore, it is important for athletes to be aware of the potential benefits and risks associated with supplement use and to make informed decisions based on their individual needs and goals.

Next, current study also reveal that the most frequent reported reason for not using any dietary supplement include the cost of supplements and lack of information on evidence of benefits and potential risk. The study by Baltazar-Martins et al., (2019) found that young athletes who do not use dietary supplements did not consider supplements necessary (72% of non-users). This suggests that these athletes may believe that they can meet their nutritional needs through their regular diet and do not see the need for additional supplementation. Another factor that may effect on their decision not to use supplementation was the presence of sports dietitians who control the athletes' dietary supplement intakes. According to Sports Dietitian Australia (SDA), nutrient demands should be met through basic foods rather than supplements, as they believe that dietary supplements are often overemphasized in terms of their ability to enhance performance. However, in current study it is still unclear whether access to sports dietitian is associated with supplement intake. Therefore in overall, athletes should undergo complete nutrition assessment by sports dietitian and make informed decision about supplement use (Maughan et al., 2018).

Perception of Dietary Supplement Intake

In the current study, the majority of athletes believe that more information should be provided regarding dietary supplementation. Nowadays the number of supplements in the market (online or physical) are huge and the highly accessible which can cause confusion for athletes to choosing the right supplement. Moreover, according to Geyer et al., (2008), a considerable percentage of nutritional supplements on the market are contaminated with compounds prohibited by anti-doping organisations. The investigation discovered a variety of illegal drugs in nutritional supplements regularly used by athletes, including anabolic agents, stimulants, and masking agents. Similarly, Martnez-Sanz et al., (2017) discovered that nearly 15% of dietary supplements tested were positive for illegal drugs, indicating the possible hazards connected with their usage. To solve this issue, athletes must exercise prudence and acquire reliable information from credible sources. Additionally, providing athletes with reliable resources/information for evaluating the safety, purity, and efficacy of dietary supplements can help them make informed decisions and avoid potentially harmful products (Buell et al., 2013).

Next, the current study found that almost all of the respondents agreed with the perception that supplements can enhance performance and exercise increases supplement needs. Similar observations were recorded in other studies conducted by Lun et al., (2012) and Maughan et al., (2018). Creatine, caffeine, proteins and branched-chain amino acids (BCAAs) are examples of ergogenic aid and it can help in enhancing athletes' performance and health. Furthermore, half of the respondents (58%) agreed that exercise can increase the supplement needs and this was reported earlier by Rodriguez et al., (2009) where exercising can result in increased energy expenditure, muscle protein breakdown, oxidative stress, and nutritional loss. These variables might increase the need for particular nutrients, which can be difficult to supply just through diet, especially in case of intensive or extended exercise. For example, studies have demonstrated that carbohydrate-electrolytes sports beverages may aid endurance athletes during prolonged exercise by replenishing glycogen stores and maintaining hydration (Coombes & Hamilton, 2000). Furthermore, resistance training athletes have shown improved muscle protein synthesis and recovery when supplementing with protein, such as whey protein (Cermak et al., 2012). It is crucial to highlight, that dietary supplements should not be viewed as a replacement for a well-balanced and nutrient-rich diet. Nevertheless, the consumption of any supplementation should be

guided by qualified health professionals such as sports dietitian and medical practitioners (Desbrow et al., 2014).

Other than that, concerns have been raised about supplement consumption is that it affect their health. Previous study reveals prevalence rate of anabolic-androgenic steroids (AAS) misuse among Iranian athletes of 36.2%, where the misuse was higher among elite, male, and younger athletes (Selk-Ghaffari et al., 2012). The main use of AAS is for performance enhancement but the long-term usage had led to variety of health hazards including cardiovascular difficulties, hormonal imbalances, liver damage, and psychological abnormalities (Bahrke & Yesalis, 2004). Therefore, athletes should receive comprehensive education about the risks and consequences of using illegal supplements. This includes understanding the potential health risks, the importance to follow the anti-doping regulations, and the potential impact on their athletic careers.

Current study found that more than half of the respondents believe that dietary supplements do not contribute to positive doping result. However, studies identified the misuse of dietary supplements among young athletes and the potential risk of doping is of a significant concern (Eichner & Tygart, 2015 and Bloodworth et al., 2010). Studies have shown that some athletes have tested positive for doping due to the intake of dietary supplements with poor labelling or product contamination (Eichner & Tygart 2015). Therefore, enhancing athlete awareness of the risks associated with dietary supplements are important strategies to prevent doping. Again, it is crucial to ensure that athletes have access to accurate information, reputable sources, and resources to make informed decisions about supplement use and avoid unintentional doping.

CONCLUSION

This study found low prevalence of dietary supplement intake among adolescent athletes. The adolescent athletes were prone to not taking dietary supplements with the perception of needing more information on evidence of benefits and potential risk about the supplement. Thus, the result of this study can be used to develop targeted education programs and provide accurate information about the potential benefits and risks of supplementation.

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