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Original Article

Analysis of foods habits in squash players

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Abstract:
Background: Squash is one of the four most popular racquet sports, practiced by 20 million people worldwide. It is a sport that has been scarcely researched in the area of nutrition, and even less so regarding the dietary habits of its players. The objective of this work is to perform a descriptive and comparative analysis of dietary habits in squash players at the national and international levels. Methodology: A total of 14 international and 28 national players answered a validated food consumption frequency questionnaire. We used a Student´s t-test for independent samples and a $\chi 2$ test in the comparative analysis of players of different levels. Results: The results show that there were statistically significant differences between the two groups of players in the consumption of bread ($p = 0.016$) and nuts ($p = 0.008$), with a tendency towards statistical significance for eggs ($p = 0.064$), blue fish ($p = 0.057$), and white meat ($p = 0.069$), which the international players consumed with a higher frequency. There were no significant differences in the consumption of fruits, vegetables, or pulses. The two groups had a similar consumption of potatoes, pasta, rice, juices and soft drinks, sweets and snacks, white fish, and red meat. Conclusions: Although it was not possible to estimate the intake and percentage of macronutrients, a possible deficit of carbohydrates and an excess of proteins can be deduced in both groups. In addition, these players do not usually seek advice from dieticians-nutritionists, so the involvement of these professionals in the coaching staff of squash players could improve athletic performance.
KeyWords*:* sport nutrition; food intake; racquet sports, sport performance

Introduction

Squash is a sport that requires multiple strokes and sprints, so the predominant metabolic pathway is that of high-energy phosphagens (Romer, Barrington, &Jeukendrup, 2001), alternating with the glycolytic pathway (Girard et al., 2007). Squash players need a high aerobic strength, because the average oxygen consumption during a game is 86-92% of the maximum oxygen consumption (VO2max) (Girard et al., 2007). During a match, there is progressive exhaustion of the phosphocreatine reserves together with an increase in the glycolytic pathway that can decrease the pH (Hughes, Maynard, Lees, & Reilly, 2002). These metabolic demands translate into high requirements of aerobic and anaerobic metabolism, muscle strength and hand grip strength, speed of movement, change of direction and reaction, agility, acceleration, and flexibility (Girard et al., 2007; Hughes et al., 2002; Schoeman et al., 2014). Therefore, nutrition adapted to the specific characteristics of the sport, as well as to the objectives and situation of the athlete, is a key aspect to improve sports performance (Beck, Thomson, Swift, & von Hurst, 2015). For adequate dietetic-nutritional planning, it is necessary to take into account the habits and customs of the athlete, together with the general and specific nutritional requirements before, during, and after training/competition (Beck et al., 2015).

This sport has been studied in the areas of physiology, biomechanics, medicine, engineering, and psychology, as well as nutrition, although this latter area has not been fully analyzed. In recent years some reviews have been published that included different aspects of the sport (Raman, Macdermid, Mundel, Mann, &Stannard, 2014), but there is still a large knowledge gap in terms of energy-nutritional demands and eating habits in top-level squash players (Burke, 2009).

Nutrition is one of the keys to sports performance, but studies on food and nutrition have focused mainly on tennis, as the top racquet sport, and those that have been performed for squash, have focused on the effects of carbohydrates (CH) intake (Baker, Rollo, Stein, &Jeukendrup, 2015; Bottoms, Hunter, & Galloway, 2006; Raman et al., 2014). However, there is currently no work that has analyzed the characteristics of the squash player's diet and its adequacy with regard to the characteristics of the sport. The present work is a descriptive and comparative analysis of dietary habits in squash players at the national and international levels.

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Material & methods

Design
A descriptive and non-experimental comparative study of dietary habits in Spanish squash players performing at the national and international levels.

Participants
Forty-two players of the highest squash category (29 men and 13 women) voluntarily participated in the present study, 28 being national level players (20 men and 8 women) and 14 being international level (10 men and 4 women). The selected sample constitutes 100% of the Spanish players competing at an international level, including all the members of the Spanish Absolute Selection of Male and Female Squash and all the players that compete on the professional world circuit licensed by the PSA. The research study was approved by a local ethics committee.

Process
To select the sample, the Royal Spanish Squash Federation and the four regional federations (of Catalonia, the Canary Islands, Galicia, and Asturias) sent an email informing about the execution of this study and inviting the players to collaborate. To find out the patterns of food consumption, the players received an online survey that they had to complete. The food consumption frequency questionnaire (FCFQ) used was an adaptation of one previously validated by Fallaize et al., 2014. To this were added questions about foods of great importance to athletes. Previously, our sample was evaluated about the pattern of nutrition supplements consumption, but these outcomes was published in another research (Ventura Comes, Sánchez-Oliver, Martínez-Sanz, &Domínguez, 2018).

Study variables
- Age.
- Basic anthropometric data: weight, height, and body mass index.
- Number of training sessions per week.
- Type of diet followed: none, Mediterranean, paleo, flexible, vegetarian, and alkaline.
- Dietary advice: dietician-nutritionist, coach, internet.
- FCFQ: this collated the consumption in the last week of several food and beverage groups: fruits, vegetables, pulses, white fish, blue fish, white meat, red meat, soft drinks and juices, sweets and 'snacks', 'fast food', and alcohol (beer, wine, high-alcohol beverages etc.). This questionnaire was completed with four food groups used in similar questionnaires and which have great relevance due to their use by athletes: eggs, potatoes, pasta, rice, bread and nuts (Fallaize et al., 2014).

Statistical analysis
The data of the participants and the quantitative data are presented as the mean ± the standard deviation (SD), while for the rest of the variables the frequencies and percentages are used. To make a comparison of the quantitative variables between the players of international level and those of national level, a Student´s t-test for independent samples was used, after checking the normality by the Shapiro-Wilk test. To compare the differences in frequencies between players of different levels (international vs. national) a $\chi 2$ test was used. The level of statistical significance was set at $p<0.05$. All the statistical analyses were carried out using the SPSS statistical package (version 18.0).

Results

In Table 1, which shows the descriptive values and training frequency of the sample, it can be seen that international players were younger than those who competed at the national level (p=0.011) and that they performed 43.2% more than training sessions per week (p=0.001).

Table 1. Descriptive values of international and national level players.

Variable	International	National	*t*	*p*
Age (years)*	25.00 ± 6.22	35.61 ± 14.20	-2.656	0.011
Weight (kg)	72.07 ± 10.11	68.25 ± 11.37	1.064	0.294
Height (m)	1.78 ± 0.10	1.73 ± 0.07	1.602	0.126
BMI (kg/m^2)	22.53 ± 1.27	22.49 ± 2.63	0.059	0.953
Weekly training sessions*	5.57 ± 1.16	3.89 ± 1.57	3.536	0.001

Data presented as mean ± SD.BMI=Body Mass Index

* Statistically significant differences between groups ($p<0.05$)

Table 2 shows the type of diet followed by the population studied: 64.3% of the international players said they were currently following a certain diet, while only 25% (p=0.013) of the national level players followed some kind of diet.

Table 2. Type of diet followed by international and national level players

Type of diet	International		National	
	n	%	n	%
None	5	35.7	21	75.0
Mediterranean	4	28.6	5	17.9
Flexible	3	21.4	0	0
Paleo	1	7.1	1	3.6
Vegetarian	1	7.1	0	0
Alkaline	0	0	1	3.6

When asked about the reason for following the diet, 64.3% of the international level players did so to improve their performance and the national level players did so to improve their level of health (p=0.003).

Regarding the advice taken by the players in relation to the diets followed, statistically significant differences were found between the two groups (p=0.003), the personal trainers (28.6%) and dieticians-nutritionists (21.4) being the main prescribers for the international level players. By contrast, 55.6% of the national level players who followed a diet affirmed that nobody advised them, while the rest resorted to a dietician-nutritionist (22.2%) or to the Internet (22.2%).

The results for the frequency of food consumption are shown in Table 3, grouped by the food groups and the categories of consumption frequencies. When comparing the players of international and national level, statistically significant differences were observed in the consumption of bread (p=0.016) and nuts (p=0.008). The consumption of bread was lower in international players; 50% of the players in this group reported that they ate bread less than 2 times per week, whereas 71.4% of the national level players claimed to eat bread at least 5-6 times per week.

With regard to the intake of nuts, while 64.3% of national level players consumed them less than 2 times per week, the same percentage (64.3%) of players of international level consumed nuts a minimum of 5 or 6 times per week.

In relation to the consumption of fruits, vegetables, and pulses, the number of international players who consumed these foods on a daily basis was superior to those of the national level, although without a statistically significant difference (p>0.05). In contrast, the consumption of potatoes, pasta and rice, juices and soft drinks, and sweets and snacks by the two groups was similar.

Considering the intake of food with a higher protein content, international athletes consumed eggs (p=0.064), blue fish (p=0.057), and white meat (p=0.069) more frequently, while the consumption of white fish and red meat was similar in the two groups.

Finally, there were no statistically significant differences in the consumption of alcohol (p=0.203), beer and wine (p=0.454), or high-strength alcoholic beverages (p=0.116) between the two groups.

Table 3. Frequency of consumption of different food groups by Spanish squash players competing at the international or national level

Foodgroup / Frequency	Never		1-2 times / week		3-4 times / week		5-6 times / week		1-2 times / day		>3 times / day		*p*value
	I	N	I	N	I	N	I	N	I	N	I	N	
Fruits	0% (0/14)	3.6% (1/28)	0% (0/14)	14.3% (4/28)	7.14% (1/14)	17.9% (5/28)	7.14% (1/14)	10.7% (3/28)	42.9% (6/14)	32.1% (9/28)	42.9% (6/14)	21.4% (6/28)	0.395
Vegetables	0% (0/14)	3.6% (1/28)	7.14% (1/14)	25% (7/28)	14.3% (2/14)	21.4% (6/28)	14.3% (2/14)	21.4% (6/28)	35.7% (5/14)	21.4% (6/28)	28.6% (4/14)	14.3% (4/28)	0.351
Pulses	14.3% (2/14)	7.1% (2/28)	50% (7/14)	67.9% (19/28)	21.4% (3/14)	57.1% (16/28)	7.14% (1/14)	3.6% (1/28)	7.14% (1/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.520
White fish	14.3% (2/14)	39.3% (11/28)	0% (0/14)	0% (0/28)	64.3% (9/14)	32.1% (9/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.317
Blue fish	21.4% (3/14)	35.7% (10/28)	35.7% (5/14)	53.6% (15/28)	42.9% (6/14)	10.7% (3/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.057
Eggs	7.14% (1/14)	3.6% (1/28)	28.6% (4/14)	42.9% (12/28)	42.9% (6/14)	7.1% (2/28)	7.14% (1/14)	7.1% (2/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.064
White meat	7.14% (1/14)	7.1% (2/28)	7.14% (1/14)	39.3% (11/28)	50% (7/14)	32.1% (9/28)	35.7% (5/14)	10.7% (3/28)	0% (0/14)	10.7% (3/28)	0% (0/14)	0% (0/28)	0.069
Red meat	21.4%	28.6%	42.9%	42.9%	35.7%	25%	0%	3.6%	0%	0%	0%	0%	0.788

	(3/14)	(8/28)	(6/14)	(12/28)	(5/14)	(7/28)	(0/14)	(1/28)	(0/14)	(0/28)	(0/14)	(0/28)	
Potatoes. Pasta. Rice	7.14% (1/14)	0% (0/28)	7.14% (1/14)	46.4% (13/28)	42.9% (6/14)	57.1% (16/28)	28.6% (4/14)	17.9% (5/28)	14.3% (2/14)	14.3% (4/28)	0% (0/14)	0% (0/28)	0.560
Bread*	21.4% (3/14)	0% (0/28)	28.6% (4/14)	14.3% (4/28)	7.14% (1/14)	14.3% (4/28)	0% (0/14)	35.7% (10/28)	28.6% (4/14)	32.1% (9/28)	14.3% (2/14)	3.6% (1/28)	0.016
Nuts*	0% (0/14)	28.6% (8/28)	14.3% (2/14)	35.7% (10/28)	21.4% (3/14)	0% (0/28)	28.6% (4/14)	21.4% (6/28)	35.7% (5/14)	14.3% (4/28)	0% (0/14)	0% (0/28)	0.008
Softdrinks and juices	71.4% (10/14)	53.6% (15/28)	21.4% (3/14)	28.6% (8/28)	7.14% (1/14)	10.7% (3/28)	0% (0/14)	7.1% (2/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.613
Sweets and snacks	57.1% (8/14)	42.9% (12/28)	42.9% (6/14)	35.7% (10/28)	0% (0/14)	14.3% (4/28)	0% (0/14)	3.6% (1/28)	0% (0/14)	3.6% (1/28)	0% (0/14)	0% (0/28)	0.474
Fastfood	78.6% (11/14)	75% (21/28)	21.4% (3/14)	25% (7/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.798
Alcohol	42.9% (6/14)	25% (7/28)	57.1% (8/14)	75% (21/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.203
Beer and wine	42.9% (6/14)	28.6% (8/28)	57.1% (8/14)	50% (14/28)	0% (0/14)	10.7% (3/28)	0% (0/14)	3.6% (1/28)	0% (0/14)	7.1% (2/28)	0% (0/14)	0% (0/28)	0.454
High graduationdrinks	28.6% (4/14)	50% (14/28)	71.4% (10/14)	57.1% (16/28)	0% (0/14)	25% (7/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0% (0/14)	0% (0/28)	0.116

I = International; N = National

***** Statistically significant differences between players of international and national level ($p<0.05$)

Discussion

This research shows the dietary habits of national and international squash players in Spain. It stands out that international players followed a diet to improve their sports performance, while the main aim of the national players was to improve their health condition, these differences being statistically significant. The most frequent type of diet followed by international level players was the Mediterranean (28.6%), followed by the flexible diet (21.4%), while only 25% of national level players followed some type of diet, mainly the Mediterranean diet (17.9%). In relation to the frequency of food consumption, statistically significant differences were observed between the two groups of players for bread (p=0.016) and nuts (p=0.008). The frequency of consumption of eggs (p=0.064), blue fish (p=0.057) and white meat (p=0.069) by international players was close to being significantly higher, statistically. There were statistically insignificant differences (p>0.05) in the consumption of fruits, vegetables, and pulses. The consumption of potatoes, pasta and rice, juices and soft drinks, sweets and snacks, white fish, and red meats was also similar in the two groups of players.

These results contrast with those observed for the participants in other sports, for which the following of the Mediterranean diet, with a medium or high degree of adherence, was higher than among squash players. In a recent study by Redondo et al., in which the dietary intake of members of the badminton and basketball teams of the University of Valladolid was analyzed, an average adherence of 60% to the Mediterranean diet was found for the men in the sample (Heaney, O'Connor, Michael, Gifford, &Naughton, 2011). Among professional kayakers, a moderate or excellent adherence to the Mediterranean diet was reported (Alacid, Vaquero-Cristóbal, Sánchez-Pato, Muyor, &López-Miñarro, 2014).

The adherence to a particular type of diet by athletes depends on the professional who advises them. The results of the systematic review on the nutritional knowledge of athletes carried out by Heaney and coworkers show that although the food education of athletes is an area of underdeveloped study, the athletes use very varied sources of information to structure their diets - including coaches and dieticians-nutritionists, but also books, specialized magazines, broadcast media, and the Internet - even at elite competition levels, where they are largely guided by coaches and financial influences (Heaney et al., 2011). Hull et al. observed that when athletes have the advice of a dietician-nutritionist as the main source of nutritional information, positive effects on their eating habits are produced, such as a better understanding of the periodization of nutrients and less propensity to consume processed or ultra-processed food during team trips (Hull et al., 2016). However, given the importance for sports performance of a diet appropriate to the individual characteristics and the sporting modality, it is especially relevant that neither of the two groups of squash players studied here resorted to a dietician-nutritionist as the main nutritional prescriber.

In relation to the frequency of food consumption, on the one hand a higher consumption of foodstuffs rich in low-glycemic-index CH and with a high density of micronutrients (fruits, vegetables, and pulses) was found in international squash players, whose daily consumption of these foods was greater than that of the national level players. Despite this, less than 50% of the sample met the recommendation for the daily consumption of fruits and vegetables established for the general population (Unit, 2003). Approximately 50% of the players had the recommended intake of pulses (Senc&Diciembre 2016, 2016). On the other hand, it seems that the profile of the consumption of nutritional sources rich in CH of higher glycemic index (potatoes, pasta and rice, juices and soft drinks, and sweets and snacks) was similar for the two groups. Specifically, the consumption of bread was higher in national players (71.4% ate bread at least 5-6 times per week), while half of the international players reported an intake less than 2 times per week. Such consumption patterns - with an intake lower than the recommended daily rations for cereals, fruits, and vegetables - have been reported for badminton and basketball players at Spanish universities (Redondo del Río, 2016), adolescent Brazilian badminton players (da Silva, de Castro, & Freitas, 2007), Spanish elite female canoeists (Alacid et al., 2014),

English soccer players (Ono, Kennedy, Reeves, & Cronin, 2012), and members of Brazilian basketball, futsal, handball, and volleyball teams (Jürgensen, Daniel, Padovani, Lourenço, &Juzwiak, 2015).

In view of these data and although it is not possible to calculate the amount and percentage of intake of macronutrients from the FCFQ, it may be that without the daily consumption of foods such as bread, potatoes, pasta, and rice the requirements of CH recommended by the evidence and by scientific bodies of reference (5-12 g/kg/day depending on the athlete and their training/competition) (Kerksick et al., 2018; Thomas, Erdman, & Burke, 2016) would not be met. This has been evidenced by numerous studies where, in general, it was found that participants in different sports, such as tennis and table tennis, did not cover their CH requirements (Filaire, Massart, Hua, & Le Scanff, 2015; Nunes et al., 2018; Ramires, Prado, Fullin, Minoru, &Trevisan, 2012; Vitasovic, Ribeiro, Furlan, &Saldanha, 2009). A study on the eating behavior of 26 professional tennis players indicated that 65% of them followed some type of restriction in the choices of the foods they consumed, mainly a reduction of the contribution of CH and fats (Filaire et al., 2015).

Given the characteristics of this sport, CH should be the basis of the squash player's diet, to maintain the supply of energy from muscle glycogen, to aid recovery from exercise, and to avoid loss of body mass (Lees, 2003). This macronutrient should be ingested through food and supplements, since they positively influence athletic performance, especially when ingested 2 hours before a prolonged activity with the aim of avoiding an insulin rebound (especially at the beginning of the activity) (Moseley, Lancaster, &Jeukendrup, 2003) and keeping blood glucose stable during the activity (Wu & Williams, 2006). Previously, our sample was evaluated about the pattern of nutrition supplements consumption, where it was found that the nutritional supplements most consumed ones were energy bars and isotonic drinks (>70% of the international-level players and by half of the national-level players) (Ventura Comes et al., 2018). This consumption can provide more CH in the daily intake. It has been suggested that food and supplements intake could be responsible for increasing the availability of CH during participation in sports, probably because decreased insulin and increased catecholamines levels result in a higher lipolytic rate and lipid oxidation, avoiding episodes of hypoglycemia (Jamurtas et al., 2011; Moseley et al., 2003; Wu & Williams, 2006).

Regarding the intake of food groups with higher protein content, it seems that the group of international level athletes had a higher frequency of consumption of eggs, blue fish, and white meat, while the consumption of white fish and red meat was similar, without daily consumption, in either of the two groups. Comparing our results with those of other available studies, the Spanish squash players reported a consumption of foods of higher protein content that seems lower in comparison to the dietary patterns observed among adolescent badminton players, who consumed 2-3 daily servings of meat and eggs (da Silva et al., 2007). However, they would partially coincide with the findings of the study of university badminton and basketball players by Redondo et al., who reported a reduced consumption of fish, but an excess intake of meat (Redondo del Río, 2016). Although the caloric percentage and ingested amount of proteins in the diets of our sample are not available, the studies carried out in other racquet sports found that protein consumption provided more than 15% of the total caloric intake (Juzwiak, Amancio, Vitalle, Pinheiro, &Szejnfeld, 2008; Ramires et al., 2012; Vitasovic et al., 2009). In the same way as CH supplement intake, our squash players consume protein supplement, mainly whey protein (43% of the international-level players and by less than 30% of the national-level ones) (Ventura Comes et al., 2018). This way, the intake of a protein supplement enable to reach or excess a daily proteins recommended (Thomas et al., 2016).

To maintain the nitrogen balance, avoid protein catabolism, and promote post-exercise recovery, the protein intake must be adequate for the particular sport concerned (Kreider et al., 2010), the minimum recommended amount being between 1.4 and 2 g/kg/day and around 15% of the total caloric value (provided that more than 1,300 kcal are consumed daily) (Jäger et al., 2017). According to the International Society of Sports Nutrition, these protein requirements are equivalent to between 3 and 11 servings of chicken or fish per day, depending on the weight of the athlete, so the risk of protein malnutrition in athletes is manifest. In addition, supplementation with high quality protein is considered a safe and adequate method to complement the dietary intake of this macronutrient (Kreider et al., 2010; Maughan et al., 2018).

Concerning the consumption of fats, the main dietary sources of this macronutrient were nuts and foods of animal origin. The international players had a greater consumption of nuts (5 or 6 times per week) than the national level players (twice a week). For comparative purposes, the only study focused on racquet sports in which the consumption of nuts was analyzed was that of Redondo et al. (Redondo del Río, 2016), who reported a consumption of less than 2 servings per week, similar to that of our national players. A study of elite canoeists found that one in three did not usually eat nuts (Alacid et al., 2014).

Nut consumption by athletes is important, due to their high energy density and contents of monounsaturated fats, proteins (rich in tryptophan, leucine, and histidine), vitamins, minerals, insoluble dietary fiber, phytosterols, antioxidants and phenolic compounds (González, 2008; Yi et al., 2014). Therefore, the almost daily consumption of nuts by the international squash players participating in the present study is adequate. It has been reported that the intake of this group of foods yields improvements in the endurance of athletes due to its contribution to the reserves and utilization of CH through improvement in glucose transport to

the synthesis of skeletal muscle and glycogen, which enhances sports performance and reduces biomarkers of oxidative stress and inflammation (Yi et al., 2014).

Finally, alcohol consumption was lower in squash players of international level than in the group of players of national level. In general terms, the self-reported alcohol consumption constituted up to 5% of the total daily energy intake of elite athletes, although with high variability within the groups of athletes explained, in part due to the characteristics of each sporting discipline (Vella & Cameron-Smith, 2010). In any case, athletes should avoid alcohol consumption because of the harmful effects it has on human physiology and, especially, its impact on sports performance and recovery (Barnes, 2014; Shirreffs&Maughan, 2006; Vella & Cameron-Smith, 2010). Although the impact on performance depends on several factors - especially the dose, the habituation of the subject to alcohol intake, the exercise duration, and the environmental conditions - the function of the central nervous system is compromised by high doses, decreasing cognitive function and motor skills, effects that may persist hours after intoxication (Shirreffs&Maughan, 2006).

The present study has limitations that should be discussed. Despite having a small study population, 100% of the Spanish squash players, both national and international, were recruited. Using an FCFQ allows one to estimate the usual intake and is quick and easy to administer since it does not alter the habitual intake of the individual, it does not require trained interviewers, and it has a low administration cost. However, it should be borne in mind that it does not allow the estimation of the intakes of food types other than those on the list and it is not precise when quantifying the portions ingested or the intake of vitamins and minerals. In addition, the consumption of protein or HC from supplements were not considered. Despite this, the study has achieved its goal of describing the habits and dietary practices of squash players, which had been studied little previously.

Conclusions

The international elite squash players studied differ in their eating habits and practices from those of national level, the former following a Mediterranean or flexible diet while most national players do not usually follow a specific diet nor are they advised on this matter. The consumption of most foods (potatoes, pasta and rice, juices and soft drinks, sweets and snacks, eggs, white/blue fish, and white/red meats) is similar in the two groups of players. Fewer than half of the players studied do not comply with the recommendation of daily fruit and vegetable intake. Although the supplements consumption, quantities and percentages of the macronutrients ingested could not be estimated, an imbalance in the macronutrient content of the diet was deduced; namely, an excessive consumption of proteins and a deficit of CH. Finally, most of these squash players are not advised by dieticians-nutritionists, who could improve their dietary patterns and thus their sporting performance.

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