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The Use of Dietary Supplements, Stimulants, Medications and Associated Factors among Paddle Tennis Players

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Abstract

Background: Medications for pain and inflammation have increased lately, and dietary supplements and stimulants have increasingly been used to maximize sports performance. They can be harmful to health if they are unnecessary or misused.
Objectives: The aim of this study was to estimate the prevalence and associated factors of the use of dietary supplements, stimulants, and medications among paddle tennis players in a southern Brazilian city.
Methods: A cross-sectional study was conducted on 162 paddle players in Tubarão, state of Santa Catarina, Brazil. Estimates of prevalence ratio, Chi-square test, Fisher's exact and modified Poisson regression for data analysis were performed, at a 95% significance level.
Results: The prevalence of use of dietary supplements, stimulants and medications was 69.1%, 21% and 63.6%, respectively. Statistically significant associations were found between dietary supplements and age ($P = 0.029$), and dietary supplements and alcohol abuse ($P \leq 0.001$), between medication use and alcohol abuse ($P \leq 0.001$), and medication use and smoker ($P = 0.030$).
Conclusions: The study concluded that paddle players showed a high prevalence of use of dietary supplements and medications. Educational programs with information about the efficacy of supplements and medications should be implemented in sites where sports are practiced.

Keywords: Medications Use, Dietary Supplements, Stimulants, Paddle Tennis, Injury

1. Background

Paddle tennis, or "padel" in a Spanish spelling, is a sports modality created in 1962 in the city of Acapulco, Mexico. It consists of a racquet sport played between doubles in a court 10 m wide and 20 m long, delimited by walls, with a net in the middle (1, 2). Paddle differentiates from other racket sports by interacting with the walls, which makes it dynamic, attracting fans around the world and experimenting a large increase in the last years (1-3). Currently, paddle is practiced in 78 countries and has over 12 million active players worldwide. It is represented by 34 national federations with more than 300000 federated players (1).

The large number of people taking up paddle sports brings some concerns. Because of its novelty, few studies have investigated its characteristics so far. Studies have shown that the sport resembles tennis in relation to the body composition of the practitioners and the physiological characteristics (4, 5). It has an aerobic feature with anaerobic peaks, and more active time than tennis (3, 4), with a different match duration and number of points to complete a set (4, 6, 7).

The great physical demand of the sport, coupled to the need for better competitive results and an often inadequate preparation, results in high injury rates (8), which leads many practitioners to use dietary supplements, stimulants, and medications. However, it is worth mentioning that improper or unnecessary use of these substances may be detrimental to human health (9).

The use of dietary supplements, stimulants, and medications has been extensively studied in various sports (10-17), but no study addressing paddle players was found. This study was intended to fill in the gaps in the literature and serve as an important tool to identify problems related to paddle players, particularly with regard to self-medication and the use of stimulants and dietary supplements.

2. Objectives

The aim of this study was to identify the prevalence and factors associated to the use of dietary supplements, stimulants, and medications among the paddle players.

3. Methods

A cross-sectional, observational study was conducted to evaluate the use of dietary supplements, stimulants, and medications by paddle players who participated in competitions held at the city of Tubarão, Santa Catarina, Brazil, in 2013.

3.1. Study Population

The study population consisted of 181 paddle tennis players of both genders, aged 14 - 67 years, who practiced the sport at least four times a month. Parental permission and child assent were obtained for minors (< 18 years), and free and informed consent was obtained from the participants aged 18 years and over.

3.2. Procedure

Through previous contact with the coordinators of the paddle activities in the city of Tubarão, the researchers requested the calendar of events that would occur in the city during the year 2013. The researchers were present in all the competitions held at the city that year, which occurred from April to December. During those events, the researchers made an invitation to the players, clarifying all doubts about the completion of the study. After being accepted to participate in this study, the athletes were invited to fill out a questionnaire for later anthropometric assessment. This study was approved by the ethics committee of the University of Southern Santa Catarina (opinion No. 252,992), and was conducted in accordance with the declaration of Helsinki for human studies. Only consenting players participated in the study.

3.3. Questionnaires

The data collection instrument was developed from questionnaires with validated questions, as well as questions asked by the authors to identify sociodemographic and economic data, the profile of paddle practice, lifestyle, injuries, and consumption of medications, dietary supplements and stimulants. To detect alcohol-related issues, the CAGE instrument was used. It consists of a questionnaire composed of four questions, which has two affirmative questions as a cut-off point, indicating that the surveyed subjects have alcohol dependence (18). The World Health Organization (WHO) recommendation was adopted to assess smoking. According to the WHO, smokers are those who smoke or have smoked 100 cigarettes or more during their lifetime (19). The evaluation of lesion frequency was made by administering the Nordic questionnaire, which consists of an instrument of multiple or binary choices regarding the occurrence of symptoms in the various anatomical regions. The occurrence of the symptoms is checked within a twelve-month period, and considering the 7 days preceding the interview, as well as withdrawal from daily activities in the past year (20).

All participants were asked to take the prescriptions and medication packs they had used in the last 12 months prior to the interview. This information was used to identify the drugs they had taken. After identification, the drugs were classified according to the first level of the anatomical therapeutic chemical index (ATC/DDD Index), developed by the World Health Organization Collaborating Center for Drug Statistics Methodology (21).

3.4. Anthropometric Measurements

The weight was measured (kg) using portable digital scales (TANITA® BF 680, Tokyo, Japan) to the nearest 0.1 kg and height was measured (cm) using a vertical stadiometer (TONELLI® E150 A, Criciúma, Brazil) to the nearest 0.1 cm. From those measurements, BMI was obtained by calculating the ratio of weight to height squared (kg/m^2). BMI values were analyzed according to data from the WHO (22, 23). The WHO considers obese adult subjects who have a BMI $\geq$ 30 (22), and adolescents who have a BMI value greater than two standard deviations above the median BMI, according to the WHO reference for growth (23). Skinfolds were measured by the same researcher using a scientific plicometer (CESCORF®, Porto Alegre, Brazil) with the precision of 0.1 mm, in the right side of the body. The protocol proposed by Jackson and Pollock (24) was used to estimate the percentage of body fat, using chest, abdomen, and thigh skinfold measurements for men, and triceps, suprailiac and thigh measurements for women.

3.5. Statistical Analysis

The collected data were entered into EpiData software version 3.1 (EpiData Association, Odense, Denmark) and analyzed using the statistical package for the social sciences for Windows version 20.0 (SPSS for Windows 20 Chicago, IL, USA). The quantitative variables were described as measures of central tendency (mean) and dispersion (SD). The qualitative variables were described in absolute numbers

and proportions. Pearson's Chi-square test and Fisher's exact test were used to evaluate the association between the dependent variables and the participants' age and gender. Prevalence ratios were calculated by using modified Poisson regression test with a robust adjustment for variance, with 95% confidence interval and an alpha error of 5%. Pearson's correlation coefficient was used to verify the correlation between the variables of interest, whereas Poisson regression with a robust estimator for crude and adjusted analysis was used to test the independence of association between the use of dietary supplements, stimulants, medications and the independent variables. Variables with $P < 0.20$ in the chi-square test were included in the analysis adjusted for sociodemographic data, economic status, lifestyle, overweight, and injuries, as shown in Table 1. $P < 0.05$ was considered statistically significant.

4. Results

The study included 162 paddle players, of whom 135 (83.3%) were male. The non-response rate was 10.5%. The mean age of participants was 34.7 ± 11.6 years. The prevalence of medication and dietary supplement use by paddle players was 63.6% (n = 103) and 69.1% (n = 112), respectively, whereas the prevalence of stimulant use was 21% (n = 34).

Sociodemographic characteristics of paddle players indicated that there was a predominance of males, aged between 30 to 39 years, with an income less than or equal to 10 minimum wages per month, 12 years or more of schooling, Whites, and living as a couple.

The mean body fat percentage of paddle players was 18.3% (SD 6.6). Mean percentage of body fat was 17.4% (SD 6.5) for men and 23% (SD 5.6) for women. Of the participants, 21.6% were ranked in the fourth category, who played for two hours (71.6%), twice a week (41.6%), and had been practicing paddle for at least three years (62.7%). Those who had additional fitness training accounted for 47.5%; and 90.1% participated in tournaments. More than half reported practicing sports other than paddle (59.9%), and the majority (80.2%) reported that they stretched out before the games. Table 1 shows the prevalence ratio of the use of medications, dietary supplements, and stimulants and associated variables among paddle players in the last 12 months.

After adjusted analysis, alcohol abuse (OR = 1.66 (1.44 - 1.90), $P \leq 0.001$) and smoking (OR = 0.76 (0.59 - 0.97), P = 0.030) were significantly associated with the use of medications. These results demonstrated that paddle players who consume alcohol have a 66% higher prevalence of medication use than those who do not consume alcohol. The prevalence of medication use is 76% lower among non-smokers than among smokers, as shown in Table 2.

It is noteworthy that statistically significant differences were found between men and women in relation to the intake of medications directed to the nervous and anti-infectious systems, in addition to the consumption of isotonic beverages (Table 3). Statistically significant differences were also found between players aged ≤ 35 years and > 35 years in relation to the consumption of medicines for the respiratory and cardiovascular systems, in addition to the consumption of general dietary supplements, energy drinks, protein blends, carbohydrates, and caffeine (Table 4).

With regard to self-medication, of the 177 drugs used, 40% (n = 69) were prescription medicines, and out of the 17 individuals who have used antibiotics, only 11.8% had a medical prescription for the drug. The amount of medications was correlated with the amount of injuries among paddle players, and for each injury, drug use increased by 0.173 (P = 0.029). The use of medications aimed at the musculoskeletal system was associated to the fact that the player had suffered joint dislocation in the last 12 months, had problems related to hip, thigh, or knee in the last 12 months, and had hip or thigh pain in the last 7 days. The use of medications directed to the nervous system was associated with wrist and hand-related problems in the past 12 months, and had experienced pain in the wrists, hands, and knees in the last 7 days. The use of drugs targeted to the anti-infective system was associated with having suffered a bone fracture and having had neck pain in the last 12 months. The use of medications targeted to the cardiovascular system was associated with having tendonitis, hip and thigh problems in the past 12 months, having sought medical care for knee problems in the past 12 months, and having had knee pain in the past 7 days. Lastly, the use of drugs for the alimentary and metabolic tract was associated to the fact that the player had suffered a muscle strain, and had sought medical attention in the last 12 months because of neck pain.

The use of dietary supplements was significantly associated with alcohol consumption (PR = 1:32 (1:15 - 1:50), $P \leq 0.001$) and with age ≤ 35 years (PR = 1.30 (1.02 - 1.66), P = 0.029), as shown in Table 2. There was no correlation between the number of injuries and the amount of supplements (P = 0.403). In assessing whether there was an indication for the use of dietary supplements, the results revealed that there was the influence of coaches/teachers (18.7%), physicians (17.3%), and nutritionists (14.7%). Self-

Table 1. Gross Prevalence Ratio of the Use of Medications, Dietary Supplements and Stimulants Among Paddle Players in the Past 12 Months and Associated Variables

Variables	No. (%)	Use of Medications	Use of Dietary Supplements (95% CI)	Use of Stimulants
Gender				
Male	135 (83.3)	0.94 (0.70 - 1.27)	1.29 (0.91 - 1.84)	0.65 (0.33 - 1.28)
Female	27 (16.7)	1.0	1.0	1.0
P value		0.715	0.094	0.227
Age				
≤ 35 years	88 (54.3)	1.08 (0.85 - 1.37)	1.25 (1.01 - 1.56)	1.20 (0.65 - 2.21)
> 35 years	74 (45.7)	1.0	1.0	1.0
P value		0.502	0.035	0.553
Marital status				
Leaving as a couple	94 (58.0)	1.05 (0.82 - 1.33)	0.89 (0.73 - 1.10)	0.64 (0.35 - 1.16)
No steady partner	68 (42.0)	1.0	1.0	1.0
P value		0.685	0.295	0.147
Years of schooling				
< 12 years	40 (26.3)	1.06 (0.82 - 1.37)	1.21 (0.63 - 2.32)	0.84 (0.63 - 1.11)
> 12 years	112 (73.7)	1.0	1.0	1.0
P value		0.632	0.552	0.220
Income				
< 10 MW	81 (57.5)	0.86 (0.68 - 1.08)	0.98 (0.79 - 1.23)	0.74 (0.40 - 1.36)
> 10 MW	60 (42.5)	1.0	1.0	1.0
P value		0.211	0.912	0.333
Alcohol abuse				
Yes	4 (2.5)	1.57 (1.41 - 1.79)	1.45 (1.31 - 1.61)	2.45 (0.88 - 6.85)
No	157 (97.5)	1.00	1.00	1.00
P value		0.164	0.230	0.196
Smoker				
No	138 (85.2)	1.30 (1.02 - 1.66)	0.96 (0.71 - 1.30)	1.77 (0.91 - 3.43)
Yes		1.00	1.00	1.00
P value	24 (14.8)	0.086	0.777	0.108
Obesity				
Yes	21 (13.0)	1.14 (0.84 - 1.54)	1.12 (0.86 - 1.46)	1.44 (0.68 - 3.05)
No	141 (87.0)	1.00	1.00	1.00
P value		0.423	0.453	0.257
Injuries				
Yes	83 (51.2)	1.18 (0.93 - 1.49)	1.08 (0.86 - 1.35)	1.74 (0.92 - 3.28)
No	79 (48.8)	1.00	1.00	1.00
P value		0.167	0.501	0.077

Abbreviations: CI = confidence interval; MW = minimum wage, PR = prevalence ratio.

selection of dietary supplements was performed by 39.3% of paddle players.

Data analysis indicated no statistically significant difference between the use of stimulant drugs and other study variables. Analysis of gender-related differences revealed that there was an association between the use of stimulant drugs and injury among male athletes (P = 0.045).

When asked about the occurrence of injury due to the practice of paddle, 51.2% of the athletes reported that they had suffered some kind of injury. The most common types of reported injuries were stretching (35%), tendinitis (24.1%), contusion (16.9%), and dislocation (16.9%).

5. Discussion

The findings from this study showed a high prevalence of medication use among paddle players (63.6%), ap-

Table 2. Prevalence Ratios Adjusted for Hierarchical Analysis of the use of Medications, Dietary Supplements and Stimulants Among Paddle Players in the Past 12 Months and Associated Variables

Variables	Use of Medications	Use of Dietary Supplements (95% CI)	Use of Stimulants
Gender			
Male	0.96 (0.71 - 1.29)	1.34 (0.93 - 1.92)	0.69 (0.35 - 1.36)
Female	1.0	1.0	1.0
P value	0.794	0.111	0.291
Age			
≤ 35 years	1.08 (0.83 - 1.40)	1.30 (1.02 - 1.66)	0.84 (0.41 - 1.75)
> 35 years	1.0	1.0	1.0
P value	0.538	0.029	0.658
Marital status			
Leaving as a couple	1.12 (0.86–1.46)	0.99 (0.79–1.25)	0.59 (0.30 - 1.17)
No steady partner	1.0	1.0	1.0
P value	0.378	0.975	0.137
Years of schooling			
< 12 years	1.05 (0.81 - 1.37)	0.77 (0.58 - 1.02)	1.20 (0.61 - 2.36)
> 12 years	1.0	1.0	1.0
P value	0.672	0.074	0.596
Income			
<10 MW	0.86 (0.68 - 1.08)	0.96 (0.77 - 1.20)[b]	0.74 (0.40 - 1.36)
> 10 MW	1.0	1.0	1.0
P value	0.211	0.767	0.333
Alcohol abuse			
Yes	1.66 (1.44 - 1.90)	1.32 (1.15 - 1.50)[b]	2.77 (0.97 - 7.87)
No	1.0	1.0	1.0
P value	< 0.001	< 0.001	0.05
Smoker			
No	0.76 (0.59 - 0.97)	1.05 (0.78 - 1.43)[b]	0.54 (0.27 - 1.06)
Yes	1.0	1.0	1.0
P value	0.030	0.707	0.07
Obesity			
Yes	0.89 (0.66 - 1.19)[a]	0.90 (0.69 - 1.17)[b]	0.69 (0.32 - 1.47)
No	1.0	1.0	1.0
P value	0.438	0.447	0.344
Injuries			
Yes	0.87 (0.69 - 1.10)[a]	0.93 (0.76 - 1.15)[c]	0.57 (0.30 - 1.07)
No	1.0	1.0	1.0
P value	0.264	0.531	0.084

Abbreviations: PR = prevalence ratio; CI = confidence interval; MW = minimum wage.
[a] Adjusted for smoking and alcohol abuse.
[b] Adjusted for age.
[c] Adjusted for age and alcohol abuse.

proaching and even exceeding the results of prevalence among elite athletes, for whom physical requirements and degree of performance are higher as compared to paddle players (9, 25).

The medications most commonly used by paddle players were NSAIDs and analgesics. A study carried out on football players supported the results of this study, given that the prevalence of medication use was 92.6% for NSAID and 36% for analgesics (17). In a study conducted by Tsitsimpikou et al. (26) during the summer olympics in Athens, the prevalence of medication use was 11.1% for NSAIDs and 3.7% for analgesics, which was significantly

Table 3. Classification and Distribution of the Use of Medications, Dietary Supplements, and Stimulants, According to the Gender of the Study Participants

Variables	Total, No. (%)	Masc, No. (%)	Fem, No. (%)	P Value[a]
ATC medication classes	103 (63.6)	85 (63.0)	18 (66.7)	0.715[b]
M-Musculo-skeletal system	64 (62.1)	54 (40.0)	10 (37.0)	0.774[b]
N-Nervous system	40 (38.8)	29 (21.5)	11 (40.7)	0.034*[b]
R-Respiratory system	31 (30.1)	25 (18.5)	6 (22.2)	0.655[b]
J-Anti-infectives for systemic use	19 (18.4)	12 (8.9)	7 (25.9)	0.020*[c]
C-Cardiovascular system	12 (11.6)	12 (8.9)	0 (0.0)	0.220[c]
A-Alimentary tract and metabolism	8 (7.8)	5 (3.7)	3 (11.1)	0.130[c]
D-Dermatologicals	3 (2.9)	2 (1.5)	1 (3.7)	0.423[c]
Dietary supplements	112 (69.1)	97 (71.9)	15 (55.6)	0.094[b]
Isotonic drinks	87 (77.7)	83 (61.5)	4 (14.8)	<0.001*[b]
Energy drinks	73 (65.2)	65 (48.1)	8 (29.6)	0.077[b]
Protein blends	30 (26.8)	23 (17.0)	7 (25.9)	0.278[b]
Carbohydrates	24 (21.4)	21 (15.6)	3 (11.1)	0.768[c]
Amino acids	16 (14.3)	15 (11.1)	1 (3.7)	0.477[c]
Creatine	7 (6.2)	6 (4.4)	1 (3.7)	1.000[c]
L-Carnitine	4 (3.6)	4 (3.0)	0 (0.0)	1.000[c]
Other	4 (3.6)	4 (3.0)	0 (0.0)	1.000[c]
Stimulants	34 (21)	26 (19.3)	8 (29.6)	0.227[b]
Caffeine	26 (76.5)	21 (15.6)	5 (18.5)	0.774[c]
Ephedrine	5 (14.7)	4 (3.0)	1 (3.7)	1.000[c]
Amphetamine	2 (5.9)	1 (0.7)	1 (3.7)	0.306[c]
Anorexigens	3 (8.8)	2 (1.5)	1 (3.7)	0.423[c]
Beta-2 agonist	2 (5.9)	1 (0.7)	1 (3.7)	0.306[c]
Other	3 (8.8)	3 (2.2)	0 (0.0)	1.000[c]

[a] n = 162, * $P < 0.05$.
[b] Pearson Chi-square test.
[c] Fisher's exact test.

lower than the prevalence rates found in this study. These figures may indicate the use of medications for pain or injury caused by exercise, since the amount of drugs and the amount of injuries among paddle players were correlated, which makes us question how paddle is played and whether there is professional guidance on appropriate techniques provided by coaches or physical education teachers.

With regard to self-medication, this study showed that of the 177 medications used, only 69 were prescribed by a physician. It should be noted that medications taken without a medical prescription included antibiotics, sibutramine, diuretics and beta-blockers. These drugs should be taken under strict medical supervision, because they can be damaging to the body, and the risks of use may override the benefits. Nevertheless, not all medications mentioned require a prescription for the purchase, as is the case of NSAIDs, analgesics and anti-influenza, which may be considered important drugs for self-care. However, excessive, inappropriate and indiscriminate use of medications may compromise health and safety of users, and can cause adverse reactions or mask health problems that require medical evaluation and intervention (27).

This study found an association between the use of medication and alcohol consumption, a fact that was also verified in a study on students attending sports centers, which revealed that there was a higher frequency of alcohol consumption, tobacco use and medications compared with students who did not attend sports centers (28). This indicates the need to implement preventive measures among those who attend sports centers, because the risks of adverse effects that the combinations between alcohol and medication intake can generate are enormous. The interaction may minimize or enhance the medication's effect, potentially causing serious problems (29, 30).

Findings from this study revealed a high prevalence

Table 4. Classification and Distribution of the Use of Medications, Dietary Supplements, and Stimulants, According to the Age of the Study Participants

Variables	Total, No. (%)	≤35 Years, No. (%)	>35 Years, No. (%)	P Value[a]
ATC medication classes	103 (63.6)	58 (65.9)	45 (60.8)	0.502[b]
M-Musculo-skeletal system	64 (62.1)	35 (39.8)	29 (39.2)	0.940[b]
N-Nervous system	40 (38.8)	24 (27.3)	16 (21.6)	0.406[b]
R-Respiratory system	31 (30.1)	22 (25.0)	9 (12.2)	0.039*[b]
J-Anti-infectives for systemic use	19 (18.4)	13 (14.8)	6 (8.1)	0.189[b]
C-Cardiovascular system	12 (11.6)	1 (1.1)	11 (14.9)	0.001*[b]
A-Alimentary tract and metabolism	8 (7.8)	3 (3.4)	5 (6.8)	0.471[c]
D-Dermatologicals	3 (2.9)	2 (2.3)	1 (1.4)	1.000[c]
Dietary supplements	112 (69.1)	67 (76.1)	45 (60.8)	0.035*[b]
Isotonic drinks	87 (77.7)	52 (59.1)	35 (47.3)	0.134[b]
Energy drinks	73 (65.2)	48 (54.5)	25 (33.8)	0.008*[b]
Protein blends	30 (26.8)	22 (25.0)	8 (10.8)	0.021*[b]
Carbohydrates	24 (21.4)	19 (21.6)	5 (6.8)	0.008*[b]
Amino acids	16 (14.3)	11 (12.5)	5 (6.8)	0.222[b]
Creatine	7 (6.2)	4 (4.5)	3 (4.1)	1.000[c]
L- Carnitine	4 (3.6)	2 (2.3)	2 (2.7)	1.000[c]
Other	4 (3.6)	2 (2.3)	2 (2.7)	1.000[c]
Stimulants	34 (21)	20 (22.7)	14 (18.9)	0.553[b]
Caffeine	26 (76.5)	19 (21.6)	7 (9.5)	0.036*[b]
Ephedrine	5 (14.7)	3 (3.4)	2 (2.7)	1.000[c]
Amphetamine	2 (5.9)	0 (0.0)	2 (2.7)	0.207[c]
Anorexigens	3 (8.8)	1 (1.1)	2 (2.7)	0.593[c]
Beta-2 agonist	2 (5.9)	0 (0.0)	2 (2.7)	0.207[c]
Other	3 (8.8)	2 (2.3)	1 (1.4)	1.000[c]

[a] n = 162, * $p < 0.05$.
[b] Pearson Chi-square test.
[c] Fisher's exact test.

(69.1%) the use of dietary supplements among paddle players. Of those who used supplements, 77.7% reported that they had consumed sports drinks, 65.2% energy dinks, and 26.8% a protein mixture. Aljaloud and Ibrahim (31) in their study conducted on soccer players in Saudi Arabia has shown a prevalence rate of 93.3% of dietary supplements, mainly isotonic dinks (88.7%). In another study, 28% of handball athletes have reported taking protein mixtures, and 51% had used glycogen before sports activities (32). The high prevalence of sports drinks can be explained by the high intensity that paddle requires from practitioners (6, 7). Seventy percent of paddle players reported that they played between one and two hours, which involves high consumption of sports drinks. According to the Thompson (33), member of American College Sports Medicine, activities that last longer than 90 minutes require water and electrolyte replacement. However, the high sodium content in sports drinks can aggravate the high blood pressure in hypertensive individuals, and may increase the risk of kidney damage (34). Furthermore, current evidence has not fully explained the need for electrolyte replacement instead of water (35).

Likewise, energy drinks have also been consumed in large scale by athletes due to their stimulating property. This study found a prevalence rate of 65.2% of sports drinks. A study on American students who practiced sports at different levels found a prevalence rate of 80.1% of energy drinks (36). In Ghana, a study on 180 athletes has shown that 62.2% had used at least one energy drink a week. The reasons cited for the use of energy drinks were to help replenish body energy and fluids after workout (37). Nonetheless, there are conflicting data in the literature regarding the ergogenic effects of energy drinks. A study by Astorino and colleagues did not identify any difference between treatment and placebo (38) and Lara and colleagues found difference in favor of treatment (39). Although the

effects on performance are conflicting in the literature, adverse effects appear to be well elucidated, and the main effects include heart failure, ventricular arrhythmia, and increased blood pressure (40, 41).

In this study, the age variable ($\leq$ 35 years) was significantly associated with use of dietary supplement, with emphasis on the consumption of energy drinks, protein blends and carbohydrates. Even though Over-the-counter products are sold in shops, pharmacies or gyms, a large number of consumers use dietary supplements based on advertisements rather than scientific evidence. Complaint reports have led the National Health Surveillance Agency to ban the commercialization of some supplement brands in Brazil, because they presented carbohydrates and proteins in a different amount than that stated on the labels, which was a fraud against the consumer. An international study has assessed 634 dietary supplements, of which 14.8% tested positive for hormones not specified in the label, including testosterone and nandrolone prohormones, which can pose health risks to consumers (42).

The prevalence of stimulant medication use among paddle players was 21%, and the most widely used were manipulated caffeine (76.5%) and ephedrine (14.7%). Data on tennis players published in the International Tennis Federation website revealed that from 2003 - 2009, the prevalence of stimulant medication was 32.7%, and the most commonly used were caffeine and ephedrine (43). The use of manipulated caffeine is allowed in sports, and its effectiveness has been demonstrated in activities that require quick responses (reaction time) and reduced fatigue (39). However, unlike caffeine, ephedrine has been banned from sports due to its potential side effects, yet the use by athletes is still widespread (44).

There was an association between the use of stimulants and sports injuries in male as compared to female paddle players (P = 0.045). Stimulant medications correlated significantly positively with injuries (r = 0.151). These findings suggest that using stimulants during sports turn practitioners more susceptible to injuries by exposing themselves for longer time and greater intensity, having the perception of reduced effort due to the effects of euphoria, increased energy, and alertness (14).

The fact that this was a cross - sectional study using a self-administered questionnaire as a data collection tool was a limitation to this study. Some of the respondents may have difficulty understanding the questions, which may have interfered with the results. In addition, there may have been a lack of motivation to respond to the questionnaire. Another factor that may have influenced the results is that usually the respondents may have omitted information about the use of medications, supplements and stimulants because of their concerns about identity disclosure. As far as we know, ours is the first study among this population and should be further investigated to draw the profile of paddler players, in order to help coaches and physical education teachers detect the inappropriate use of medications, supplements and stimulants, thus preventing sports injuries and promoting good health.

5.1. Conclusions

This study concluded that paddle players showed a high prevalence of medication use, and among the most commonly used were drugs for the musculoskeletal and nervous system. Likewise, the use of supplements showed high prevalence of sports drinks, energy drinks, and protein mixtures. Furthermore, the most commonly consumed stimulants were manipulated caffeine and ephedrine. Significant associations were found between the use of medications and tobacco and alcohol consumption. The use of dietary supplements showed a significant association with the age variable ($\leq$ 35 years) and alcoholism.

5.2. Practical Implications

In order to improve the practice of sports, preliminary assessment should be performed to monitor the development of paddle players in the physical and behavioral aspects, such as the use of legal and illegal substances as shown throughout this study.

As a final consideration, professionals involved with paddle players should be aware of the behavior of these practitioners so that they can help prevent the unnecessary use of medications, supplements and stimulants that can affect health. Educational programs with information regarding the efficacy of medications and supplements should be enacted in sites where sports are practiced.

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