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Substance Use and Misuse Among Slovenian Table Tennis Players

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Substance use and misuse (SU&M) is regularly studied in sports, but we have found no such data for table tennis. We have studied SU&M in athletes competing at the Slovenian Nationals 2008–2009 (responding rate was 100%; 50 males and 29 females; aged 18 years or older). The anonymous questionnaire for studying SU&M and corresponding educational, socio-demographic, and sport factors was used. More than 90% of all the athletes included in our study do not rely on coaches' and/or physicians' opinion regarding nutritional supplements and doping. Chi-square test revealed higher prevalence of binge drinking, cigarette smoking, and potential doping behavior in males. In both genders, with the advancement of the sport status, the probability for potential doping behavior increases. In conclusion, we strongly suggest permanent SU&M educational programs for table tennis athletes as well as for their coaches and physicians.

Keywords ping pong; nutritional supplements; doping habits; tobacco smoking; binging

Introduction

Table tennis is one of the most popular sports in the world today and has been an Olympic discipline since 1988. It is assumed that 300 million people are currently engaged in some kind of table tennis practice (e.g., regular recreational and/or competitive table tennis training), with more than 250 million officially registered athletes. Professional table tennis annual contracts in Europe reach up to 70,000 and 100,000 USD for females and males, respectively, exclusive of sponsoring, funding, and tournament prize money. With an average of 15 to 20 tournaments per year, each consisting of 5–10 matches lasting approximately 30 min on average, there is no doubt that professional and semiprofessional table tennis is a physically and psychologically highly demanding activity, where one's achievement

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and success are directly related to physical performance, concentration, and specific mental strength (Aune, Ingvaldsen, and Ettema, 2008; Zagatto, Papoti, and Gobatto, 2008).

Substance use and misuse (SU&M) are noted and frequently interpreted as a health-threatening behavior in different professions where one's achievement is dependent on physical capacities and performance (e.g., athletes and/or dancers) (Sekulic, Kostic, and Miletic, 2008; Striegel et al., 2006). In such cases, SU&M practice is discussed as a way of dealing with the characteristic physical, mental, and psychological stress; performance enhancement; improving physical appearance; and increasing energy levels (Augé II and Augé, 1999; McDuff and Baron, 2005; Miller et al., 2005; Peters Jr. et al., 2005). Although regularly studied in various sports as a potential health problem (Dickinson et al., 2005; McDuff and Baron, 2005), SU&M is scarcely reported about table tennis (Petroczi and Norton, 2008). Moreover, in strategies of prevention and control of SU&M in sport, different social, demographic, educational, and/or sport factors are frequently studied in selected samples (Backhouse, Mc Kenna, Robinson, and Atkin, 2007), but we found no data of such kind for table tennis.

Thus, the present study aimed to examine SU&M and study some social, cultural, educational, and sport-related factors potentially associated to SU&M among table tennis players. More precisely, we sampled and studied SU&M in all athletes who competed during the season 2008–2009 on the top-level national competition in Slovenia.

Methods

This study sampled all table tennis players who were included in the National Premier League Competition in Slovenia during the season 2008–2009, comprising 29 females and 50 males, all 18 years and older. General data about the examinees are presented in Table 1.

Substance use and misuse, as well as the corresponding educational, socio-demographic, and sport factors as predictors, were investigated using the previously developed and validated questionnaire for studying SU&M criteria (for details see Sekulic et al., 2008 and Sekulic, Kostic, Rodek, Damjanovic, and Ostojic, 2009). All of the subjects were informed about the purpose and aim of the study and voluntarily participated in it. The questioning was strictly anonymous; no personal data were asked (e.g., date of birth, city of residence, occupation), and multiple-choice answers were offered for all the questions. Furthermore, all of the subjects were informed that they can refuse to participate and/or withdraw from the study at any time with no explanation. A somewhat shortened version of the questionnaire is presented in the Tables in the Results section, and the authors of the study are available for clarifying any further details of the testing design.

Counts (frequencies) and proportions were calculated for all the data. Chi-square test was applied to establish differences between the females and the males in each of the observed variables. Pearson's rank-order correlation was calculated between ordinal predictors and SU&M criteria. The statistical significance level of 95% ($p < .05$) was applied.

Results

Table 1 presents the subjects' demographic characteristics. Most of the table tennis players were included in the premier Slovenian National league are younger than 22 years, with the male players being older than the female players. The females are evidently advanced in their educational status than the males. Significant differences in self-declared religiousness

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Table 1
General data and sport factors in Slovenian female and male table tennis players (*n*—counts;%—percentage), and chi-square differences between males and females

	Females		Males	
	n	%	*n*	%
Age (years)[a]				
19–21 (1)	14	48.3	23	46
22–24 (2)	6	20.7	10	20
25–28 (3)	5	17.2	5	10
> 28 (4)	4	13.8	12	24
Religiousness (self-declared)[a]				
Nonreligious	18	62.1	22	44
Religious	11	37.9	28	56
Education level[a]				
Elementary school (1)	2	6.9	13	26
High school (2)	9	31.0	17	34
Student (3)	9	31.0	13	26
College level (4)	7	31.0	7	14
Sport experience (table tennis exclusively)				
< 5 years (5)	0	0.0	1	2
5–10 (2)	4	14.8	7	14
10–15 (3)	12	44.4	20	40
15 > years (4)	11	40.7	22	44
Sport status in table tennis[a]				
Amateur (1)	15	51.7	14	28
Semiprofessional (2)	13	44.8	28	56
Professional (3)	1	3.4	8	16
Sport achievement (sport success) in table tennis				
National level competition (1)	4	13.8	5	10
National success (2)	4	13.8	12	24
International competition (3)	14	48.3	22	44
International success (4)	7	24.0	11	22

Legend: [a]Denotes significant differences comparing male vs. female table tennis players; numbers in parenthesis denote numerical values for each ordinal variable.

indicate that males as more religious than their female peers. Both sexes are involved in table tennis for the same period, but the females are more likely to be amateurs than the males, although no significant differences are found in their sport achievement (sport success).

The gender analysis (Table 2) indicates that the males binge and smoke cigarettes more frequently than the females. Analgesics are used only rarely, with an expected higher prevalence among the females, most probably because of the menstrual pains (30% vs. 12%). Nutritional supplements are equally consumed by both males and females. Eighty-three percent of the females and 94% of the males decided to consume nutritional supplements while not being advised by coach and/or physician to do so (Table 3). Females are more likely to believe that doping behaviors are present in table tennis sport, although most of

Table 2
Substance use in Slovenian female and male table tennis players (*n*—counts;%—percentage), and chi-square differences between males and females

	Females		Males	
	n	%	*n*	%
Cigarette smoking[a]				
Don't smoke (1)	23	79.3	34	68
From time to time (2)	3	10.3	3	6
Less than 10 per day (3)	3	10.3	4	8
10–20 cigarettes per day (4)	0	0.0	5	10
1–2 packs per day (5)	0	0.0	2	4
More than 2 packs per day (6)	0	0.0	2	4
Binge drinking[a]				
Don't drink alcohol (1)	7	24.1	3	6
Rarely (2)	6	20.7	13	26
Few times a year (3)	7	24.1	6	12
Once o month (4)	6	20.7	10	20
Once a week (5)	3	10.3	8	16
Few time a week (6)	0	0.0	8	16
Missing	0	0.0	2	4
Narcotics[a,b]				
Users: marihuana and hashish (rarely)	7		4	
Users: party—recreational drugs (rarely)	1		1	
Users: heroin (rarely)	1		1	
Users: cocaine (rarely)	0		1	
Nonusers	21	72.4	45	90
Analgetics[a]				
Users: rarely	8	27.6	8	16
Nonusers	21	72.4	42	84

Legend: [a]Denotes significant differences comparing male vs. female table tennis players; [b]Denotes variables where differences were calculated for the categories of users and nonusers; numbers in parenthesis denote numerical values for each ordinal variable.

them think that doping is rarely used. One of five males will use doping if such behavior will assure them sport success, in most cases, if convinced that doping practice will not be a health hazard, whereas more than half of all the examinees do not rely on the coaches'/physicians' opinion about doping issues.

In both genders, with the advancement of the sport status, the probability for potential doping behavior increases (Table 4). In females, both binge drinking and the belief that doping exists in their sport decrease with educational level. More experienced female athletes tend to deny the existence of the doping practice in table tennis.

Discussion

In most research where SU&M was studied in athletes from different sports, investigators could observe only those subjects who responded to its call for participation, and the proportion of the tested subjects ranged from 18% (Özdemir et al., 2005) to 25% (Waddington,

Table 3
Data regarding nutritional supplementation and doping behaviors and beliefs in Slovenian female and male table tennis players (*n*—counts;%—percentage), and chi-square differences between genders

	Females		Males	
	n	%	*n*	%
Nutritional supplements consumption[b]				
Users: isotonics and vitamins	10		13	
Users: proteins	2		5	
Users: carbohydrates	0		4	
Users: other	4		3	
Nonusers: don't use	18	66.7	36	72
Nutritional supplements recommended by (users only)				
Coach	0	0.0	1	6.25
Medic	2	16.7	0	0
Friend	5	41.7	3	18.75
Myself	5	41.7	12	75
Opinion about doping behaviors in table tennis[a]				
Not at all (1)	8	27.6	11	22
Don't know (2)	8	27.6	20	40
Rarely (3)	11	37.9	15	30
Often (4)	2	6.9	4	8
I'll use doping . . . [a]				
Never (1)	21	72.4	33	66
Not sure (2)	5	17.2	7	14
If it will help me to achieve the goal with no health hazard (3)	1	3.4	7	14
If it will surely help me no matter to consequences (4)	1	3.4	3	6
Regarding doping issues I trust . . .[a]				
Coach	7	24.1	6	12
Medic	7	24.1	10	20
Friend	7	24.1	2	4
No one (my self)	8	27.6	32	64

[a]Denotes significant differences comparing male vs. female table tennis players;
[b]Denotes variables where differences were calculated for the categories of users and nonusers; numbers in parenthesis denote numerical values for each ordinal variable.

Malcolm, Roderick, and Naik, 2005), and reached higher proportion of the respondents against nonrespondents when studying some exclusive team and/or group—like the National Team (Nieper, 2005). Therefore, we are of the opinion that our results, although collected on the relatively small sample of only 79 athletes are to be considered relevant since we practically studied all of the members of a specific population (e.g., all Slovenian table tennis players involved in the National Championship).

Table 4
Correlation analysis between ordinal predictors and substance use and misuse criteria
([a]denotes significant correlation)

Females	Binge drinking	Cigarette smoking	Doping in table tennis	Doping likelihood
Age	−0.33	−0.34	−0.29	−0.03
Education level	−0.43[a]	−0.10	−0.42[a]	0.05
Sport experience	−0.24	−0.12	−0.39[a]	0.14
Sport status	0.11	0.16	−0.12	0.44[a]
Sport achievement	0.07	0.17	0.09	0.15
Males				
Age	0.07	0.08	0.26	−0.12
Education level	−0.11	−0.21	0.01	−0.14
Sport experience	0.05	0.16	0.21	−0.13
Sport status	0.01	0.03	0.10	0.32[a]
Sport achievement	0.08	−0.02	0.18	−0.09

Note: Age refers to the four categories of subjects' age; Education level, level of education; Sport experience—time of the involvement in table tennis; Sport status, amateur, semiprofessional, or professional status; Sport achievement, highest level of the subject's result in table tennis; Binge drinking, binge alcohol consumption; cigarettes, cigarette smoking; Doping in table tennis, subject's opinion about the incidence of doping in table tennis; Doping likelihood, possibility of the subject's doping use.

It is encouraging that only 10% of women and 25% of men can be considered to be smokers, which shows a lower incidence of tobacco smoking than the one which is recently observed in Slovenia (23% in overall population). Binge drinking of more than once a week in 10% of women and 30% of men is unquestionably directly influenced by a high incidence of alcohol consumption in Slovenia. Briefly, according to Sesok (2004), more than 14 L of pure alcohol per capita puts Slovenia among EU countries with the highest alcohol consumption. However, knowing that Slovenia is regularly observed as manifesting the "Mediterranean style of drinking," which is characterized by an almost daily alcohol consumption, frequent drinking of wine with meals, and a lack of social acceptance of public drunkenness (Popova, Rehm, Patra, and Zatonski, 2007), high incidence of binges in active athletes should be considered as alarming.

Although previous studies regularly found more religious subjects (and/or subsamples of subjects) tended to be less involved in the different SU&M practices (Sekulic et al., 2009), we have found males to indicate that they are more religious, while being more leaned toward binge drinking, cigarette smoking, and potential doping behavior. Most probably, more frequent binge drinking and cigarette smoking in males should be explained in the light of regularly established higher prevalence of such behaviors among males in Slovenia (Caks and Kos, 2009; Sesok, 2004). On the other hand, the explanation of the significant differences between males and females in the potential doping habits is that there are more semi and full professional males involved in Slovenian table tennis (see Results). In short, because the future of their sport status depends on their sport achievement, the probability of any behavior (including doping behavior), which could possibly lead them to advanced sport achievement, is logically more pronounced in those athletes who partially and/or fully make a living from sport (see significant correlation between sports status

and potential doping behavior in both sexes). Unlike the data collected so far for other sports and ethnicities (e.g., Rodek, Sekulic, and Pasalic, 2008, studied weightlifters from Bosnia and Herzegovina), where potential and current doping users were mostly worried about ethics of their (doping) behavior, those who will use doping in table tennis are not concerned about moral scruples but of possible doping-related health problem.

One of the most important facts which we have found in the data relates to an athletes' trust about doping issues. In almost half of the females, and two thirds of the males, there is evident mistrust of coaches' and/or medics' opinions about doping (significant differences between sexes), which was logically followed by negligible number of nutritional supplement users who were formally advised by coach/physician/dietitian to do so. Because studies performed so far showed similar—evidently negative—athletes' beliefs about coaches' and physicians' expertise on the topics of nutritional supplements and doping (Rodek et al., 2008; Sekulic et al., 2008, 2009), at this point in time, we think that this problem should be considered and detected as being one of the most important issues of SU&M among athletes in this territory (e.g., former Yugoslav republics). Briefly, when trying to identify the origin of the problem more specifically, we have found only one reasonable explanation—an existing deficiency in the permanent education about nutritional supplements and doping within sport medicine and sport science professions in this region.

We could not compare the type of the nutritional supplements used by table tennis players because some athletes use two or more types of the supplements at the same time. Therefore, our calculations relied only on the differences between "users" and "nonusers" in males and females where we have found no significant differences. Data showed that the prevalence was slightly but not significantly higher in the females than in the males, and therefore, data should be interpreted as expected because previous studies offered dissimilar findings in nutritional supplement practice in athletes when considering differences between sexes. In some investigations, the prevalence was higher in males (Özdemir et al., 2005), whereas in others, females used nutritional supplements more often than males (Nieper, 2005; Petroczi and Norton, 2009; Sobal and Marquart, 1994). The later findings of other authors are mostly explained by a relative susceptibility to advertising, awareness of increased nutritional needs in sport, and having more real need for supplements in females (e.g., consumption of extra minerals because of menstrual loss). Knowing the recent problems of its contamination with doping agents (De Hon and Coumans, 2007), it would be interesting to precisely study reasons why athletes of both sexes do and/or do not consume nutritional supplements as part of their training regimen.

Conclusion

Although our investigation was performed on a small sample of subjects, because of the fact that we have studied all top-level table tennis players from one country, the results document some specific SU&M problems associated with this sport.

- The athletes whom we have studied, so far, generally do not trust their coaches' and/or physicians' expertise about doping in sport. We believe that such a situation necessitates intervention through compulsory, permanent education in sport science and sport medicine professions.
- Table tennis players are evidently mostly concerned about health-related problems of doping usage and consumption. Consequently, authorities should specifically target health-threatening issues when developing any antidoping educational programs for this sport.

- Finally, it is evident that in each sport subpopulation (e.g., athletes from different sports, different countries, religions), different patterns of SU&M exists. Consequently, every generalization of the findings regarding SU&M behaviors and problems should be considered as being speculative to some extent. Therefore, any future investigation regarding the SU&M in sport should be designed specifically, while minimizing non-respondents of the studied population.

Declaration of Interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of this paper.

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RÉSUMÉ

Utilisation et abus de substances interdites chez les joueurs de tennis de table slovènes

Des recherches sur l'utilisation et l'abus de substances interdites dans le domaine du sport sont menées régulièrement, mais nous n'avons pas trouvé de données concernant le tennis de table. Nous avons procédé à une recherche auprès des sportifs ayant participé à la ligue slovène 2008/2009 (le pourcentage de ceux qui répondaient aux critères était de 100%; 50 hommes et 29 femmes, âgés de 18 ans et plus). Nous avons utilisé un questionnaire anonyme sur l'utilisation et l'abus de substances interdites et des facteurs de formation, sociodémographiques et sportifs appropriés. Plus de 90% des sportifs, inclus dans notre recherche, ne se réfèrent pas à l'avis des entraîneurs et/ou à celui des médecins sur les compléments alimentaires et le dopage. Le test Chi-square a révélé qu'il arrivait plus souvent aux hommes de boire, de fumer occasionnellement et de se doper potentiellement. Pour les deux sexes, la possibilité d'un comportement potentiellement favorable à l'utilisation de substances dopantes croît proportionnellement avec l'élévation du statut du sportif. Enfin, nous recommandons vivement des programmes de formation continue en matière d'utilisation et d'abus de substances interdites pour les joueurs de tennis de table ainsi que pour leurs entraîneurs et médecins.

RESUMEN

Uso y abuso de sustancias prohibidas en jugadores de tenis de mesa de Eslovenia

El uso y el abuso de sustancias prohibidas (SU&M) ha sido frecuentemente investigado en el ámbito deportivo, sin embargo, en el campo del tenis de mesa, no existen datos en este sentido. Hemos analizado el SU&M entre aquellos deportistas que compitieron en la liga eslovena durante la temporada 2008–2009 (fueron encuestados el 100% de los participantes: 50 hombres y 29 mujeres, con una edad mínima de 18 años). Se utilizó un cuestionario anónimo para investigar el SU&M, aunque también se tuvieron en cuenta otros factores como los educativos, sociodemográficos y deportivos. Más de un 90% de todos los deportistas encuestados no confían en la opinión de los entrenadores y/o médicos en lo relacionado con los suplementos nutricionales y el dopaje. La prueba χ^2 puso de manifiesto que es mas frecuente consumir alcohol, fumar y doparse entre los hombres que entre las mujeres. En ambos sexos, según se incrementa el nivel de profesionalidad entre los deportistas, la probabilidad en potencia de doparse es también mayor. En conclusión,

se recomienda el uso de programas educativos permanentes que aborden el SU&M en los deportistas de tenis de mesa así como en sus entrenadores y médicos.

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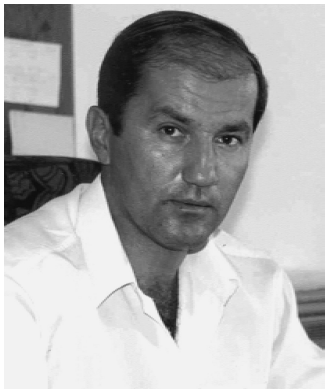

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Glossary

Binge drinking: Defined as drinking alcoholic beverages with the primary intention of becoming intoxicated by "heavy consumption" of alcohol over a short period of time

Doping: Occurrence of one or more anti-doping code violations, mostly observable by use of prohibited substances and the consequent presence of the prohibited substance and/or their metabolites or markers in the athletes' specimens

Nutritional supplement: A preparation intended to provide nutrients, such as vitamins, minerals, fiber, fatty acids or amino acids, that are missing or are not consumed in sufficient quantity in a person's diet. Some countries define dietary supplements as foods, while in others they are defined as drugs.

Table tennis: Game played, usually indoors, by two or four players; it is more or less a miniature form of lawn tennis. It is also called Ping-Pong, after the trade name that a manufacturer adopted (c.1900) for the equipment.

References

Augé II, W. K., Augé, S. M. (1999). Naturalistic observation of athletic drug-use patterns and behavior in professional-caliber bodybuilders. *Substance Use and Misuse*, 34:217–249.

Aune, T. K., Ingvaldsen, R. P., Ettema, G. J. C. (2008). Effect of physical fatigue on motor control at different skill levels. *Perceptual and Motor Skills*, 106:371–386.

Backhouse, S., Mc Kenna, J., Robinson, S., Atkin, A. (2007). International literature review: attitudes, behaviours, knowledge and education – drugs in sport: past, present and future. Prepared for WADA's Social Science Research Fund. Retrieved March 11, 2009, from http://www.wada-ama.org/rtecontent/document/Backhouse_et_al_Full_Report.pdf.

Caks, T., Kos, M. (2009). Body shape, body size and cigarette smoking relationships. *International Journal of Public Health*, 54:35–39.

De Hon, O., Coumans, B. (2007). The continuing story of nutritional supplements and doping infractions. *British Journal of Sports Medicine*, 41:800–805.

Dickinson, B., Goldberg, L., Elliot, D., Spratt, D., Rogol, A. D., Fish, L. H. (2005). Hormone abuse in adolescents and adults: a review of current knowledge. *Endocrinologist*, 15:115–125.

McDuff, D. R., Baron, D. (2005). Substance use in athletics: a sports psychiatry perspective. *Clinics in Sports Medicine*, 24:885–897.

Miller, K. E., Hoffman, J. H., Barnes, G. M., Sabo, D., Melnick, M. J., Farrell, M. P. (2005). Adolescent anabolic steroid use, gender, physical activity, and other problem behaviors. *Substance Use and Misuse*, 40:1637–1657.

Nieper, A. (2005). Nutritional supplement practices in UK junior national track and field athletes. *British Journal of Sports Medicine*, 39:645–649.

Özdemir, L., Nur, N., Bagcivan, I., Bulut, O., Sümer, H., Tezeren, G. (2005). Doping and performance enhancing drug use in athletes living in Sivas, mid-Anatolia: a brief report. *Journal of Sports Science and Medicine*, 4:248–252.

Peters, Jr., R. J., Adams, L. F., Barnes, J. B., Hines, L. A., Jones, D. E., Krebs, K. M. A., et al. (2005). Beliefs and social norms about ephedra onset and perceived addiction among college male and female athletes. *Substance Use and Misuse*, 40:125–135.

Petroczi, A., Naughton, D. P. (2008). The age-gender-status profile of high performing athletes in the UK taking nutritional supplements: lessons for the future. *Journal of the International Society of Sports Nutrition*, 5:2.

Popova, S., Rehm, J., Patra, J., Zatonski, W. (2007). Comparing alcohol consumption in central and eastern Europe to other European countries. *Alcohol and Alcoholism*, 42:465–473.

Rodek, J., Sekulic, D., Pasalic, E. (2008). Can we consider religiousness as a protective factor against doping behavior in sport? *Journal of Religion and Health* (e pub ahead of print).

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Sekulic, D., Kostic, R., Miletic, D. (2008). Substance use in dance sport. *Medical Problems of Performing Artists*, 23:66–71.

Sekulic, D., Kostic, R., Rodek, J., Damjanovic, V., Ostojic, Z. (2009). Religiousness as a protective factor for substance use in dance sport. *Journal of Religion and Health*, 48:269–276.

Sesok, J. (2004). Alcohol consumption and indicators of alcohol-related harm in Slovenia, 1981–2002. *Croatian Medical Journal*, 45:466–472.

Sobal, J., Marquart, L. F. (1994). Vitamin/mineral supplement use among athletes: a review of the literature. *International Journal of Sport Nutrition*, 4:320–334.

Striegel, H., Simon, P., Frisch, S., Roecker, K., Dietz, K., Dickhuth, H.-H., et al. (2006). Anabolic ergogenic substance users in fitness-sports: a distinct group supported by the health care system. *Drug and Alcohol Dependence*, 81:11–19.

Waddington, I., Malcolm, D., Roderick, M., Naik, R. (2005). Drug use in English professional football. *British Journal of Sports Medicine*, 39:e18.

Zagatto, A. M., Papoti, M., Gobatto, C. A. (2008). Anaerobic capacity may not be determined by critical power model in elite table tennis players. *Journal of Sports Science and Medicine*, 7:54–59.