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Adherence to Sports Nutrition Guidelines by Tennis Athletes Team Representing the University of Limpopo; Limpopo Province, South Africa

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Abstrak

Tennis sport is gaining popularity among students at the University of Limpopo. However, compliance with sports nutrition guidelines by these athletes remains unknown. To evaluate the adherence of tennis athletes to sports nutrition guidelines. A purposive sampling technique was used to recruit 30 affiliated tennis athletes representing the University team. Ethical approval was obtained from TREC while consent was signed in written form by the athletes. Nutrients intake was collected using a 24-hour-recall questionnaire on three different days, validated with FFQ. Weight and height were collected to calculate nutritional requirements. Dietary data were analysed using SAMRC FoodFinder (v3) and averages were exported into the SPSS (v28). Descriptive statistics were used to establish compliance. Males predominate (53%) over females. Athletes were aged 20.3(±1.1) yrs. Half of athletes (50%) participated in tennis sport for ≤ 1 year. Most athletes attended tennis 3 – 6 times a week, once a day, for 2 – 3 hours. Most athletes relied on social media for nutrition information. The BMI was optimal (21.8±2.8 kg/m^2 versus 21.1±1.8 kg/m^2 for females and males respectively). Males consumed energy of 27±9.0 kcal/kg/day compared to females (24±8.0 kcal/kg/day). CHO (3.2 g/kg/day females and 3.6 g/kg/day males) and protein (0.7 g/kg/day females and 1.0 g/kg/day males) intakes were also consumed. Fat consumption was optimal for both females (0.6 g/kg/day) and males (0.7 g/kg/day). The dietary practices of the tennis athletes at the University of Limpopo are not in compliance with the sports nutrition guidelines.

Keywords: *Tennis, Macronutrients, BMI, Fluids, And Guidelines*

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A. Introduction

Tennis is a global sport usually played with short rest intervals for a duration of 1.5 – 3 hours(Fleming et al. 2021). Athletes in this sport are required to have well-developed body structures and adequate energy consumption to improve accuracy and power during sports (Mountjoy et al. 2018). Adequate energy is required to meet the demands during training (König et al. 2019) Carbohydrates (CHO) such as bread and cereals, should also form the basis of an athlete's diet to support exercise and strengthen the immune system (Ranchordas et al. 2013). Additional to CHO are protein needed for repairing muscle tissue, ligaments, and tendons (König et al. 2020). Fat is another macronutrient of importance to maintain athletes' nervous system and cell membranes. Fat can also be a good source of calories for athletes with higher energy needs (König et al. 2019). Lastly, fluid intake is essential for athletes to prevent dehydration (Anderson et al. 2017). Body weight and/or composition among athletes is important in several sports (Siders, Bolonchuk, and Lukaski 1991). In tennis sport, anthropometric status is a major factor in achievements and reaching optimal performance (Nepocatych, Balilionis, and O'Neal 2017). Tennis is among other sporting codes such as rugby and cricket that are infrequently participated (2%) in South Africa, particularly Limpopo Province. It is possible that majority or part of this 2 % of athletes participating in tennis are students registered within the four Universities of Limpopo; University of Limpopo (UL), University of South Africa (UNISA) [Polokwane campus], Tshwane University of Technology (TUT) [Polokwane campus] and University of Venda (UNIVEN). It is noted that Tennis South Africa has established a governing body responsible for promoting tennis sport at the University level. However, there seem to be absence or lack of developed nutrition guidelines for these tennis athletes; which may eventually drive athletes to follow self-designed nutrition strategies or those recommended by their teammates, coaches, and/or media during sports engagement. Some of these nutrition information sources may bear weak scientific support resulting in athletes deviating from guidelines. The latter might be the case for UL tennis team athletes who were identified by the researchers to often attend training and competition sessions without consumption of nutrients before, during, and after sports engagements. These athletes often complained of early fatigue during their training and competition sessions. It is possible that the practices of these athletes deviate from recommendations. Athletes should consume optimal nutrients and fluids when

engaging in training to minimise episodes of fatigue and further replace damaged muscles. It is concern that the nutrients consumption, timing, dosing of nutrients and fluids during training; and the anthropometric status of these athletes at UL remains unknown. Dietary practices that deviate from guidelines may generally pose health risks such as nutrient deficiencies or excess, bone and kidney problems sooner or later. Having identified these hitches, this study intended to highlight the importance of optimal nutrition, promote a healthy lifestyle, and encourage healthier diets for these imminent UL and other young athletes.

Energy

Energy balance is important for athletes (Bytomski 2018). Athletes' diets should be sufficient in energy to maintain the energy balance in individuals engaging in physical activity (Kreider et al. 2010). Athletes are discouraged to practice dieting (Mountjoy et al. 2018), however, consume a diet adequate in energy to maintain body weight and health during training (Thomas, Erdman, and Burke 2016). To overcome a negative energy balance, the focus should be on the intake of 4 – 6 meals per day. In tennis sport where athletes are engaging in training for 30 – 40 minutes per day, energy amount 25 – 35 kcal/kg is recommended (Kerksick et al. 2018).

1.1. Carbohydrates

An optimal CHO intake enhances recovery and optimizes glycogen stores for the next training session. Common complaints during endurance events include muscle fatigue and hypoglycaemia, often because of low muscle glycogen stores. Carbohydrates are the key energy factor for both aerobic and anaerobic pathways of metabolism. The degree of use and depletion of CHO largely depends on the duration and intensity of the training process (Anon 2011a). Depending on the level of physical exercise activity, the total demand for CHO may increase significantly (Rollo et al. 2020). For athletes involved in tennis sport, the daily CHO requirement of 5 – 8 g/kg should be sufficient (Kerksick et al. 2018; Thomas et al. 2016). The timing of CHO consumption before, during, and after exercise represents an effective strategy to provide an exogenous fuel source to the muscle and central nervous system (Kerksick et al. 2018). Athletes are encouraged to consume 1 – 4 g/kg of CHO 2 – 3 hours before training, 6 – 8% of total CHO amount as fluids during training (Kerksick et al. 2018), and 1 – 1.5 g/kg immediately after the training (Coyle et al. 1985). Gastrointestinal distress concerns may be

experienced when larger CHO solution amounts of >8% are consumed during training (Rollo et al. 2020). Consumption of CHO immediately after training is thought to increase the rate of muscle glycogen resynthesis resulting in greater endurance capacity during subsequent exercise (Jeukendrup and Killer 2010). The type of CHO in the recovery diet also has an influence on endurance capacity the following day (Coyle et al. 1985).

1.2. Protein

Dietary protein requirements are slightly higher for athletes (Anon 2011b) to support muscle protein synthesis, reduce muscle protein breakdown, and repair muscle damage. Depending on the individual's exercise duration, protein should be included with CHO in the pre-event meal (Anon 2011a; Kerksick et al. 2018). This can be achieved by including 0.3 g/kg of protein 3 – 5 hours (Moore et al. 2020) before the training. For tennis athletes, 1.2 – 2.0 g/kg distributed every 3 – 4 hours per day through a whole diet is recommended (Kerksick et al. 2018). Recommended protein sources include, and are not limited to, eggs, fish, lean meats and cheese (Bytomski 2018). It is important to control not only the suboptimal protein intake from the diet but also its excess as may lead to osteoporosis and impaired renal function (Bytomski 2018).

1.3. Dietary fat

Adequate consumption of fat maintains cell membrane structure, optimal intake of essential fatty acids and absorption of fat-soluble vitamins, as well as replenishing intramuscular triacylglycerol stores (Kerksick et al. 2018). Fat requirements for athletes are generally similar to those for non-athletes and depend largely on the training status and goals of the athletes (Kerksick et al. 2018). Therefore, individuals involved in sports should consume 20 – 35% of TE/day or .5 – 1 g/kg/day as fat. Healthy sources can be obtained from nuts, avocados, and olive oil (Bytomski 2018). Restricted chronic fat intakes of below 20% of TE intake often predispose athletes to decreased consumption of fat-soluble vitamins and essential fatty acids (Kerksick et al. 2018; Moore et al. 2020). On the other hand, high-fat diets are associated with undesired health outcomes (Costill et al. 1977) and gastrointestinal challenges during sports (Kerksick et al. 2018).

Hydration

Hydration during sports regulate body temperature and minimise metabolic strains (Bytomski 2018). Due to loss of fluids most notably through sweating, urination, and respiration, athletes should

start training in a well-hydrated state (Mountjoy et al. 2018). Athletes should avoid relying on thirst as an indicator of hydration (Bytomski 2018). Therefore, considerations should be made when training at altitudes where the air can be cold and dry. Amounts equivalent to 5 – 10 ml/kg is recommended 2 – 4 hours before training to maintain fluid balance (Thomas et al. 2016). Other than this, hydration can be measured in several ways. Weighing athletes before and after exercise is a quick method to assess fluid balance and can be used in training and competition, although it does have limitations. During recovery, every 1kg of weight that is lost in exercise should be replaced by 1500mls (Casa, Clarkson, and Roberts 2005). The summary of energy and macronutrients recommendations is presented in Table 1.

Table 1. Energy And Macronutrients Recommendations

Macronutrient	Recommendation	Pre-training	During Training	After Training
		Per kg/day		
Energy (kJ/kg)	105 – 147	Not specified	Not specified	Not specified
CHO (g/kg)	5 – 8	1 – 4	6 – 8%	1 – 1.5
Protein (g/kg)	1.2 – 2.0	0.15 – 0.25	0.1 – 0.2	0.2 – 0.5
Fat (g/kg)	0.5 – 1	Avoid intake	Not specified	Not specified

B. Methods

B.1. Data collection

A descriptive cross-sectional study was carried out to purposively obtain 30 registered UL tennis team athletes. Ethical approval was obtained from Turfloop Research and Ethics Committee (TREC) (TREC/485/2022:UG). Permission to collect data was obtained from UL Sports Management while consent to participate was signed in written form by the athletes. Data were collected at the UL sports grounds in the afternoons. Dietary intake information for macronutrients was collected using a 24-hour-recall questionnaire on three different days. Two records were during weekdays, Wednesday and Friday and the other over the weekend, Monday. Athletes were requested to recall all food and fluid items consumed in the previous 24 hours. The frequency of food item consumption as appearing on the 24-hour recalls was validated using the food frequency questionnaire (FFQ). Nutrient intakes and timing before, during and after the training were also recorded. Weight and height were collected using an electronic flat scale (Seca 813) and portable stadiometer (Seca 213) from Seca

respectively to calculate BMI. Weight was collected to determine the recommendations relative to body mass. In measuring weight, the scale was placed on a flat surface, calibrated, and zeroed. Athletes were requested to void and remained barefooted in their lighted clothing before the weight was measured. Athletes stood at the center of the scale with weight evenly distributed in both legs and measurement was obtained. Three measurements were conducted and the mean was considered. In obtaining height, athletes stood upright with their arms relaxed to their side and maintained a Frankfurt plane. Measurements of height were taken at full inspiration by the athletes. All readings for weight and height were recorded to the nearest 0.1 kg and 0.1 cm respectively. Dietary data were first analysed using SAMRC food finder (v3) to determine macronutrient values. All the data was then loaded onto the SPSS (v28) for further analysis. Descriptive statistics using percentages, mean and standard deviation values; and a one-way ANOVA test were used to describe the practices and correlate practices of athletes to the anthropometric status of the same athletes respectively. A p-value of <0.05 was a criterion on which variables were considered significant to each other.

C. Result and Discussion

Result

Results for the anthropometric status and dietary practices of the athletes are presented in Tables 2 – 10. The ages of the athletes ranged from 17 – 24 years with mean ages of 20.3±1.1 and 20.2±2.0 years for males and females respectively.

According to Table 2, all (100%) athletes were single, unemployed, and still completing their degrees at the University.

Table 2. Demography Of Athletes

Marital status	**Males**	**Females**
	n (%)	**n (%)**
Single	16(100%)	14(100%)
Employment	**n (%)**	**n (%)**
Unemployed	16(100%)	14(100%)
Educational level	**n (%)**	**n (%)**
Degree	16(100%)	14(100%)

Table 3 shows the training experience of athletes. Half or more of the males (n=7; 50%) and females (n=9; 56%) were involved in tennis sport for 1 – 2 years followed by those who participated for <1 year (males, 36% and females ,19%) while at the University. Most athletes, 36% of females and 38% of males trained 5 – 6

times per week while half of the females (n=7; 50%) and almost all males (n=15; 94%) trained for 1 – 2 hours per day.

Table 3. Training Experience Of Athletes

Years in tennis	**Female**	**Male**
	n (%)	**n (%)**
< 1 year	5(36%)	3(19%)
>1 – 2 years	7(50%)	9(56%)
3 – 4 years	1(7%)	2(13%)
>4 years	1(7%)	2 (12%)
Training Frequency per week	**n (%)**	**n (%)**
1 – 2 times	1 (7%)	1(6%)
3 – 4 times	5(36%)	4(25%)
5 – 6 times	5(36%)	6(38%)
Daily	3(21%)	5(31%)
Frequency per day	**n (%)**	**n (%)**
Once	12(86%)	10(62%)
Twice	2(14%)	6(37%)
Duration during training	**n (%)**	**n (%)**
<1hour	1(7%)	1(6%)
1 – 2 hours	7(50%)	15(94%)
2 – 3 hours	6(43%)	0

Table 4 illustrates that most females (n=7; 50%) and males (n=8; 50%), relied on social media followed by a coach (females, 43% and males, 44%) for nutrition information during their training.

Table 4. Information Sources Of Athletes

Source of information	**Female**	**Male**
	n (%)	**n (%)**
Coach	6(43%)	7(44%)
Teammates	1 (7%)	1 (6%)
Social media	7(50%)	8(50%)
Dietitian	0 (0%)	0 (0%)
Internet	0 (0%)	0 (0%)

Table 5 illustrates that most females (n=6; 43%) consumed other solutions than pure water compared to males (n=10; 62%) before the training. However, more than two-thirds majority of females (n=10; 71%) and almost all males (n=15; 94%) consumed pure water during the training. In addition, all athletes (N=30; 100%) consumed pure water after the training.

Table 5. Types Of Fluids Consumed

Before training	**Female (%)** **n (%)**	**Male (%)** **n (%)**
Water	5(36%)	10(62%)
Fruit juice	1(7%)	2(13%)
Juice	2(7%)	1(6%)
Other solutions	6(43%)	1(6%)
During training	**n (%)**	**n (%)**
Water	10(71%)	15(94%)
Juice	4(29%)	1(6%)
After training	**n (%)**	**n (%)**
Water	14(100%)	16(100%)

Table 6 illustrates the timing of fluids by athletes. Female athletes (n=10; 71%) consumed fluids every 15 – 30 minutes compared to 20 – 25 minutes by males (n=5; 31%). During training, majority of female athletes (n=5; 36%) consumed fluids every 25 – 30 minutes while male athletes (n=6; 38%) consumed fluids every 25 – 30 minutes. The majority of females (n=6,43%) and males (n=7; 44%) consumed pure water 35 minutes or more after the training.

Table 6. Timing Of Fluids

Before	**Females**	**Males**
	n (%)	**n (%)**
Every 10mins	0	1(6%)
Every 15-20mins	5(36%)	6(38%)
Every 25-30mins	5(36%)	5(31%)
More than 35mins	4(28%)	4(25%)
During	**n (%)**	**n (%)**
Every 10mins	1(7%)	1(6%)
Every 15-20mins	4(28%)	3(19%)
Every 25-30mins	5(36%)	6(37%)
More than 35mins	4(29%)	6(37%)
After	**n (%)**	**n (%)**
Every 10mins	1(7%)	1(6%)
Every 15-20mins	2(14%)	3(19%)
Every 25-30mins	5(36%)	3(19%)
More than 35mins	6(43%)	8(50%)

Table 7 illustrates the average amount of CHO consumed before the training was 0.7±0.0 g/kg and 0.2±0.0 g/kg for females and males respectively; while the protein intake was insignificant 0.0(±0.0) for both genders. Both female and male athletes consumed CHO (0.1±0.0 g/kg and 0.0±0.0 g/kg respectively) suboptimally during

training.

Table 7. Macronutrients Dosing Of The Participants Before, During And After Training.

Macronutrients Before (g/kg)	Females Means(±SD)	Males Means(±SD)
CHO	0.7(±0.0)	0.2(±0.0)
Protein	0.0(±0.0)	0.0(±0.0)
During	**n (%)**	**n (%)**
CHO	0.1(±0.0)	0.0(±0.0)
Protein	0.0(±0.0)	0.0(±0.0)
Post	**n (%)**	**n (%)**
CHO	0.0(±0.0)	0.0(±0.0)
Protein	0.0(±0.0)	0.0(±0.0)

Table 8 below shows that the average weight of athletes was 56.3±6.2 kg and 59.1±8.2 kg for females and males respectively, while the height was 1.59±0.06 m for females and 1.68±0.08m for males. The average BMI of the athletes was 21.8±2.8 kg/m² and 21.06±1.8 kg/m² for females and males respectively.

Table 8. BMI Status Of Athletes

Variables	Mean±SD (per gender)	
	Female	Male
Weight (kg)	56.3±6.2	59.1±8.2
Height (m)	1.6±0.06	1.7±0.08
BMI (kg/m²)	21.8±2.8	21.0±1.8

Table 9 illustrates the energy and macronutrients consumed by athletes. According to this Table, males consumed adequate energy (27.0 kcal/kg) compared to females (24.0 kcal/kg) per day. CHO (3.2 g/kg females and 3.6 g/kg males) and protein intakes (0.7 g/kg females and 1.0 g/kg) per day were also suboptimal. The fat intakes were adequate for both female (0.6g/kg) and male (0.7g/kg) athletes.

Table 9. Macronutrients Intake Of Athletes.

Macronutrients	Female Mean (±SD)	Male Mean (±SD)
Energy (kcal/kg/day)	24.0±8.0	27.0±9.0
CHO (g/kg/day)	3.2±1.3	3.6±1.0
Protein (g/kg/day)	0.7±0.7	1.0±0.6
Fat (g/kg/day)	0.6±0.6	0.7±0.5
Fluids (ml/day)	1838.2±500.1	1493.3±450.3

Table 10 below indicates the associations between dietary practices during training and nutritional information sources. According to this Table, no associations were found between the nutrition information sources used and the dietary practices of the athletes during training.

Table 10. Association Of Practice To Nutrition Information Sources

Type of fluid	Social Media	Internet	Coaches
	P-values		
Before	0.562	0.049	0.817
During	0.022	0.873	0.364
After	0.215	0.141	0.567
Timing of fluids	**Social Media**	**Internet**	**Print Media**
Before	0.175	0.614	0.911
During	0.182	0.597	0.910
After	0.549	0.292	0.746
Amount of fluids	**Social Media**	**Internet**	**Print Media**
Before	0.693	0.704	0.752
During	0.755	0.188	0.548
After	0.581	0.150	0.543

Discussion

The number of tennis athletes in this study was 30. This number is low, which indicates that tennis at the University of Limpopo is not popular. The majority of athletes were males, aged 20 years, and trained for 1.5 years. It is not surprising that most athletes in our study were young adults. Similar findings of athletes of the same age category participated during research in Limpopo. In another study conducted among Bulgarians, the lower mean age of 17 years compared to that of athletes was reported. Athletes in our

research have youth age and are unemployed possibly as the majority of them were still at university completing their degrees. Additional to the Bulgarian study, males were the most participating group in tennis sport than their counterparts. This was, however, not the case in our study as near equal gender distribution of gender was found. To the best of our knowledge, no previous research has investigated the macronutrients intake and body composition of tennis athletes in Limpopo. Therefore, the following macronutrients discussions may provide interesting and helpful insight for athletes, coaches, and trainers of this collegiate sport.

1.4. Macronutrients intake

1.4.1. Energy intake

Results in the current study showed that the consumption of energy by females was slightly lower than recommendations, but adequate (27.0±9.0 kcal/kg/day) for males. The low energy intake among female athletes may possibly reflect the disordered eating habits often reported in athletes (Melin et al. 2019). Another contributing factor to inadequate intake could possibly be concerns related to weight gain which is a trend commonly observed among young athletes (Werner et al. 2013). In another review, similar findings were reported among tennis athletes (Fleming et al. 2021). Adequate energy consumption is recommended given its significant role during sports performance (Logue et al. 2018). The prevalence of Low Energy Availability (LEA) has been suggested to be higher in females than in males, although precise differences are unknown (Kerksick et al. 2018). In most studies, the athletes presented an under-consumption of energy and carbohydrates in comparison to the current nutritional recommendations (Mountjoy et al. 2018).

1.4.2. CHO intake

The majority of the athletes consumed CHO (3.2 g/kg/day females and 3.6 g/kg/day males) suboptimally. It is uncommon that CHO consumption could be lower in areas of Limpopo Province as maize meal is one of the most consumed stable food around the Limpopo province. It is possible that athletes were trying to impress the researchers by minimising portions of starch consumed given our profession. Under-reporting is, however, common when using a 24-hour-recall questionnaire as the tool relies strictly on memory. Chronic suboptimal CHO intake may result in inadequate glycogen stores before training, which in turn may lead to fatigue (Kreider et al. 2010). Optimal intakes of energy and macronutrients can be attained through the consumption of 4–

6 meals per day, with snacks for athletes to offset energy deficits (Williams and Rollo 2015). However, in our study, the majority of the athletes (87%) consumed meals 2–3 times per day. This might explain another reason for the inadequate intake of some macronutrients. Otherwise, factors such as lack of financial resources and cultural beliefs may have also contributed (Melin et al. 2019). Athletes need to consume adequate amounts of CHO to optimize sports performance (Kerksick et al. 2018). In our study, the CHO consumption was 0.7 g/kg and 0.2 g/kg for females and males before the training and 0.1 g/kg and 0 g/kg for females and males in that order. These intakes are generally suboptimal compared to recommendations possibly explaining a reason for early fatigue that this group usually complain of during training. There was no CHO consumption for our group after the training. Athletes need to consume a combination of CHO (1 g/kg) and protein (0.5 g/kg) at least 30 minutes after training for recovery reasons (Kerksick et al. 2018).

1.4.3. Protein consumption

It was found in the current study that protein intakes (0.7 g/kg/day for females and 1.0 g/kg/day for males) were also suboptimal. The case was similar to the pre, during, and post-training periods as suboptimal intakes were found. Suboptimal protein intake can result in negative nitrogen energy, adversely affecting performance and further recovery (Kerksick et al. 2018). When athletes are in a negative nitrogen balance, they can experience muscle catabolism resulting in loss of muscle mass and a negatively affecting performance (Kreider et al. 2010). In another study conducted in Limpopo province, similar suboptimal protein intakes among athletes in different sports were reported. Contrary to these, the over-consumption of protein by athletes was reported in a review of young tennis athletes (Fleming et al. 2021). All athletes in the current research were students who were still completing their degrees at the University and unemployed, possibly explaining the reason for suboptimal protein intake due to funds channelled towards education-related needs. This may have limited them to prioritising the purchasing of adequate protein foods or supplements for their sport.

1.4.4. Dietary fat consumption

In our study, both female and male athletes consumed fat optimally (0.6 g/kg/day and 0.7 g/kg/day respectively). These findings are not surprising as more than half (53%) of the athletes reported regular consumption of convenient foods which are possibly high in fats. Noting that not all fatty acids are created the same, it would be interesting to

distinguish the dietary source or type of these fats consumed by athletes (Schwingshackl et al. 2021). Nonetheless, adequate consumption of polyunsaturated fatty acids, especially omega-3 fats, has been associated with reduced muscle soreness and inflammation after sports engagement (Philpott et al. 2018; Rawson, Miles, and Larson-Meyer 2018). On the other hand, higher fat consumption can be counterproductive to an athlete's performance by delaying gastric emptying leading to nausea and/or bloating during training (Gonzales-Saji 2020). In our group, athletes did not consume any fats-containing foods or meals in the pre, during and post-training periods.

1.5. Body mass index

In general, BMI is commonly applied to screen the body composition status of an individual. Relating the same tool in the current research, the majority of athletes were classified as having normal body weights (21.8 kg/m² and 21.0 kg/m², for females and males respectively). Similar findings of normal weights by BMI classifications (22.9 kg/m²) were reported by other researchers among the majority of athletes (Abdullah et al. 2022). However, Wash et al. reported higher BMI values (30 kg/m²) among athletes of different sporting codes that included tennis (Walsh, Heazlewood, and Climstein 2018). Even though BMI may not indicate when obesity is caused by the accumulation of fatty tissue, we believe that the tool can be used to monitor weight changes in tennis sport for improved performance and training outcomes. However, in some sports such as bodybuilding, individuals may be misdiagnosed as overweight while athletes are muscular. Therefore, caution should be applied when BMI is interpreted in some sport codes.[34]

1.6. Hydration and fluids

The average amount of fluids consumed by the athletes was 1838ml for males and 1493ml for females, all of which were suboptimal. Adequate hydration is essential for good health and performance, water being the most essential nutrient (Casa et al. 2005). The volume of fluids consumed by athletes in our study was inadequate, putting the athletes at high risk of hypohydration. Minor levels of suboptimal fluid intake can have a negative effect on training and competition (Bergeron 2003). Effects of dehydration include poor concentration, coordination, and increased body temperature resulting in the risk of heat stress/exhaustion and cardiovascular strain. Individuals engaging in physical activity are encouraged to consume water or sports drinks every 10 – 15 minutes (Kerksick et al. 2018). A similar practice of

water intake among athletes in the current study was found. Almost all athletes consumed pure water in all phases of training (before, during, and after) followed by flavoured drinks such as fruit juice and energy drinks. Our findings are, however, contrary to those reported in another research where a group of school athletes consumed mostly sports drinks while engaging in sports (Rivera-Brown et al. 1999). On the hand, Coyle et al. believed that the ingestion of low carbohydrate solution did not improve performance in tennis matches under practice conditions (Coyle et al. 1985). It is, therefore, important for athletes to consume optimal fluids with a solution before, during, and after training for optimal hydration and enhancing performance.

D. Conclusion

This study investigated the adherence to sports nutrition guidelines by tennis athletes representing the University of Limpopo team at the University of Limpopo. We found that the dietary practices (daily macronutrients and fluids consumption; and nutrients timing and dosing before, during and after the training) of this team are mostly suboptimal to sports nutrition guidelines. Therefore, these athletes are not adhering to sports nutrition guidelines. This warrants the involvement of nutrition experts, for example, Dietitians for regular nutritional assessments and guidance. The inclusion of other sports practitioners such as Physiotherapists or Biokinesticists may also assist in matching the nutritional requirements of the team with the intensity of the training or competition for best individualised meal plans. Similar research using a larger sample should be conducted to better generalise the results. However, to the current research, a qualitative study at the same University should be conducted to determine an in-depth understanding of these deviating nutrition practices.

E. Acknowledgments

Tennis athletes and UL sports management at the University of Limpopo.

F. Conflict of Interest

The researchers report no competing interest in this study

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