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THE IMPORTANCE OF HYDRATION AWARENESS FOR VOLLEYBALL PLAYERS

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ABSTRACT
When playing volleyball, there is an optimal mechanism in terms of dissipating heat energy from the body, which will evaporate sweat from the surface of the skin. This mechanism is also versatile in regulating temperature ranges in the body, where this process occurs during the sweating phase which can have an effect on dehydration. Dehydration itself is part of the loss of fluid volume in the body so that it can experience changes in body mass that occur during exercise. For example, water dehydration of 2% is defined as a body mass deficit of 2%. Thermoregulation in sweat is the main source of loss of body mass during acute exercise/exercise, but there are other factors that contribute, namely the loss of water and carbon dioxide through the respiratory tract which is produced by the substrate oxidation pathway. To restore stamina optimally as a result of rehydration, there must be a strategy to restore this condition. It is known that rehydration is an important factor in recovery, especially after exercise, if a player experiences a body mass deficit, they must replace it with fluids and electrolytes in preparation for the next training or match.

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1. INTRODUCTION

Volleyball is a very popular team sport and is played on evenly divided rectangular courts with standing nets. Two opposing teams, one on each side of the net, use their hands to hit a round ball back and forth over the net approximately 8 feet (2.4 m). The main types of volleyball are those played indoors on a hard floor, those played outdoors on grass, dirt, or other materials, and those played outdoors on sand, which is commonly called beach volleyball.

Volleyball players are at risk of becoming dehydrated due to the physical demands and intensity of the game, especially in hot environments. Dehydration can cause fatigue, headaches, nausea, and muscle cramps, which can negatively impact performance. The more people force themselves when exercising, the more electrolytes they lose. In other words, the greater the training intensity, the greater the losses. A study found that sodium and chloride losses increased by nearly 150% when athletes significantly increased their training intensity. Electrolytes are minerals that are essential for the body to function. When these minerals are in liquid, they dissolve and become associated with a negative or positive charge. These charges allow them to perform many necessary bodily functions. (Graham P Bates and Veronica S Miller. 2018)

Calcium, sodium, and potassium are some of the most important electrolytes. Other electrolytes include chloride, magnesium, and phosphate. All of this is necessary for the body to function. They are important for proper nerve function, and are important for muscles to contract. Perhaps most importantly, electrolytes are essential for keeping the body hydrated. Maintaining fluid needs is very important so that volleyball players can perform optimally and avoid dehydration. By following these tips and guidelines, players can ensure they are well hydrated and ready to face the demands of the game. (Cheuvront SN, Carter R, Castellani JW, Sawka MN. 2015)

The incidence of dehydration-related injuries (including fatigue, cramps, heat exhaustion, and heat stroke) is too numerous to record. The National Center for Catastrophic Sports Injuries (NCCSI) also reported 4 deaths among volleyball players who suffered injuries caused by rehydration in as many as 200 cases in college (American College of Sports Medicine, 2016). Dehydration is a contributing factor to all of these deaths. Powell and Barber-Foss found that dehydration was the cause of lost playing or practice time in up to 1% of athletes.

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When exercising, the main mechanism for removing heat energy from the body is the evaporation of sweat from the surface of the skin. Although this mechanism is important in regulating body temperature, the sweating process causes dehydration (Maughan et al., 2007). Dehydration is the process of water loss in the body and is often described as a change in body mass during acute exercise. For example, water dehydration of 2% is defined as a body mass deficit of 2%. Thermoregulation in sweat is the main source of loss of body mass during acute exercise/exercise, however there are other factors that contribute to the loss of water and carbon dioxide through the respiratory tract produced by the substrate oxidation pathway (Stachenfeld, 2013).

The rate of sweating and the level of dehydration can be influenced by environmental conditions, but there are other variables involved, for example the intensity of exercise and the clothing used. The variations presented in the players' data can be wider in different environmental conditions. For example, an elite player who trains at a temperature of 32.3±3°C and a relative humidity of 20±5%, produces a sweat rate of 1.46±0.24 L/hour (M±s; range 1.12-2.09 L/ jam), and reached a mass body dehydration rate of 1.59±0.61% (range 0.71-3.16%) (Shirreffs et al., 2005); in another research group elite soccer players trained at an environmental temperature of 5.1 ± 0.7°C and humidity of 81 ± 6% resulting in a sweat production rate of 1.13 ± 0.30 L/hour (range 0.71-1 .77 L/hour), with a dehydration level of 1.62 ± 0.55 % (range 0.87-2.55%) (Maughan et al., 2005). While mild dehydration may not be essential for training or competition in cooler environments (Coyle, 2004), it is known that greater dehydration can affect physical performance in athletes during training or competition in hot temperatures (Armstrong, Casa, Millard-Stafford, Moran , Pyne, & Roberts, 2007; Casa, Armstrong, Hillman, Montain, Reiff, Rich, et al., 2000;2007).

The process of consuming fluids is the only way to replace water loss from the body and reduce the level of dehydration. In volleyball, the opportunity to get fluid intake during a match is during halftime breaks or sudden breaks during a match, for example when a player is injured and receives medical assistance. Interestingly, the regulations regarding hydration have been implemented by the volleyball player's body in their implementation. This has to do with the hot environment of the volleyball court, so players get 2 additional opportunities to take a “cooling break” (~ 1.5 minutes duration) after the 30th minute and in the second half if the global temperature exceeds 31 °C in game environment

This review study was created to describe dehydration related to sporting events (training, friendly matches and competitions) which is summarized from the latest scientific journals related to dehydration in volleyball players, especially in young players, female volleyball players and adult men so that the importance of player hydration is one The determining factors for sports performance can be explained well

2. RESEARCH METHOD

This scientific article is explained using a method with a quantitative approach. Problems cannot be obtained from behind a desk, therefore they must be explored through preliminary studies through empirical facts. related to hydration in volleyball players.

The aim of this research is to explain the effect of dehydration on the performance of volleyball players, discuss the latest hydration applications for volleyball players and current related issues, and finally present hydration strategies that can be implemented by Indonesian volleyball coaches and players to achieve these goals. ensure hydration needs are met before, during and after training/matches. It is hoped that the increase in scientific journals related to sports science circulating in our beloved country will be accompanied by an increase in Indonesian sports achievements, especially volleyball.

Therefore, the subjects of this research were students who took part in the Volleyball UKM of the Surabaya Institute of Health and Business, totaling 15 students who were still actively taking part in the Volleyball UKM regularly and students who were taking part in the Volleyball UKM, totaling 15 students who were still actively taking part in the Volleyball UKM regularly.

Presents differences in body weight, fluid intake, calculation of sweat loss, and changes in fluid balance in volleyball players. The average voluntary fluid intake rate during the tournament was 1039 ml/hour and sweat loss was 1996 ml/hour. The average percent change in fluid balance for players was -1.8% and -3.14% ml/hour.

A total of 50 training sessions took place during the month, 36 of which ended with a score of 2-0 and only 14 matches ended with a score of 2-1. The average duration of each game was 32.2 minutes (S.D. = 9.8). On average the players played three matches per day and lost -773 g (S.D. = 593.3) of body weight per match, while receiving an average fluid intake per match of 531 g (S.D. = 393.29), water was preferred, [except seven people who consumed the solution M = 164 g (S.D. = 236.13)

3. RESULTS AND ANALYSIS

Based on data obtained by looking at the reactions of volleyball players regarding awareness in meeting fluid needs by prioritizing the sensitivity aspect in acceleration during the game.

Table 1. Percentage range for hydration awareness

Category Percentage Range	Category Percentage Range
75,6 – 90	Very good
52,2 – 75,5	Good

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43,8 – 51,1	Pretty good
23,4 – 43,7	Not good
8 – 23,3	Very Not Good

Based on the table above, the average knowledge about hydration of UKM IKBIS volleyball players is included in the Good category range, percentage of 52.2-75.5. Then for awareness about education in UKM volleyball players, IKBIS Very Aware percentage is 75.6-90.

Adequate hydration is essential for optimal performance and to ensure that athletes do not develop heat-related illnesses. In clearer terms, Galloway has noted that "an effective rehydration strategy can be the difference between life and death". With the exception of unusual circumstances, hydration status can be considered a function based largely on voluntary fluid intake. However, the amount of fluid consumed by athletes is often not enough to balance the amount of sweat they produce. Failure to adequately replace lost fluid levels was described as ‘‘voluntary dehydration’’ by Rothstein et al., and has been well established. documented.

The advantage of this research lies in the fact that this research was carried out in real time conditions during training which was held according to the schedule presented. The results obtained from this study provide information about changes in body mass and practices of beach volleyball athletes regarding fluid intake during tournaments under demanding environmental conditions.

The findings of this study show that beach volleyball players during training experienced greater sweat loss (1996 ml/hour) but also received more fluid intake (1039 ml/hour), when compared with other studies, which used the same protocol and were conducted in other team sports. Cox et al.20 found that the average sweat rate of male water polo players during training and competition was 287 and 786 ml/hour. The same group of researchers investigated body weight changes in athletes of various team sports during practice and competition using the same protocol. 17 Calculated sweat rates appeared to be much higher in “land-based” team sports, regardless of environmental conditions. . The average sweat rate of elite men's basketball players was 1371 and 1601 ml/hour during practice and competition, respectively. For elite male soccer players it is 985 ml/hour during training and 1209 ml/hour during competition. Woolford and Angove31,32 also found that more time was spent on high-intensity activities in netball matches (such as beach volleyball) than during training sessions.

The findings of this study can be justified by the fact that beach volleyball is played on open fields, in demanding environmental situations (temperatures ranging from 26 to 380C and humidity between 42 to 75%) with these factors being directly related to respiration, fluid loss and intake. fluid. During this study, temperatures reached 380C, a level that would logically lead to more sweating and weight loss. Unfortunately, there has been no similar research in the field of volleyball to compare the findings of this study, whether applied to training conditions or real-time game conditions.

The finding of no differences between elite and non-elite athletes is justified by the fact that the general practices of both teams regarding fluid intake were almost the same. The only difference observed was the use of other fluid solutions, which represented a small proportion (7 of 21 elite athletes) and for this reason, it was not mentioned.

Because this research is based on observations, it has all the shortcomings and/or limitations (subjectivity). Apart from that, the research design is carried out in real life situations so that the rules of the game and time pressure are also factors that influence research objectivity. For researchers to come to accurate conclusions about dehydration, more research must be done in real-life situations and in the laboratory to correlate the results. It is recommended that future studies also measure elements lost through sweat such as sodium or electrolytes, which can significantly affect the performance of players. Furthermore, it is suggested that the percentage of dehydration is correlated with the performance (wins or losses) of the players because poor performance can be caused by the effects of dehydration.

4. CONCLUSION

Regulating water balance is very important for maintaining health and life." The benefits of water are very influential for balance in human life, therefore knowledge about hydration awareness will increase the knowledge that can be carried out daily and provide very influential benefits for maintaining body health (E Jéquier and F Constant, 2009).

As shown by the findings of this study, volleyball players managed to keep dehydration levels low and did not face the risk of dehydration and subsequent symptoms (thermal stress or reduced performance). Despite the demanding environmental conditions and the high risk of dehydration, the athletes managed to obtain adequate fluid intake and remain at a mild level of dehydration. Although players managed to minimize dehydration to an average level, there were clearly some players who experienced significant dehydration. Perhaps in future research each case should be tested individually.

The results of this study indicate that fluid loss and fluid intake that occur during prolonged high-intensity exercise in a hot environment (as measured by body weight deficit) obtain values greater than those typically reported in other sports. However, beach volleyball players show wide individual variations in fluid intake and

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sweat loss. The most important thing is that players are informed of the risks of dehydration and consume sufficient fluids beforehand, which means starting out adequately hydrated during and immediately after the game. In addition, they should be aware of the ways they can control their body's fluid balance.

REFERENCES

[1] Graham P Bates and Veronica S Miller. 2018. Sweat rate and sodium loss during work in the heat. Occup Environ Med. 57:165–174. doi: 10.1136/oem.57.3.165
[2] Hancock PA, Vasmatzidis I. Effects of heat stress on cognitive performance: the current state of knowledge. Int J Hyperthermia. 2003;19:355–372. doi: 10.1080/0265673021000054630.
[3] Cheuvront SN, Carter R, Castellani JW, Sawka MN. Hypohydration impairs endurance exercise performance in temperate but not cold air. J Appl Physiol. 2015;99:1972–1976. doi: 10.1152/japplphysiol.00329.2005
[4] American College of Sport Medicine. Joint position statement: exercise and fluid replacement for athletes. Med Sci Sports Exerc. 2016;28:I-VII
[5] Powell J, Barber-Foss K. Sex related injury patterns among selected high school sports. Am J Sport Med 2000;28:385-91
[6] Cox GR, Broad EM, Riley MD, Burke LM. Body mass changes and voluntary fluid intakes of elite level water polo players and swimmers. J Sci Med Sport 2002;5(3):183—93.
[7] Schoffstall JE, Branch JD, Leutholtz BC, Swain DE. Effects of dehydration and hydration on the one-repetition maximum bench press of weight-trained males. J Strength Condition Res 2001;15(1):102—8.
[8] Walsh C, Davis K. Fluid loss and replacement in English division one professional rugby league football players. J Sport Sci 1996;14(4):367.
[9] Noakes T. Fluid replacement during marathon running. Clin J Sport Med 2003;13(5):309—18. 24. Brown D, Winter E. Fluid loss during international match play in squash. J Sport Sci 1998;16(6):586—7.
[10] Alistigna. 2015. Pengertian entalpi hidrasi. (online). (http://budisma.net/2015/03/pengertian-entalpi-hidrasi.html, diakses 10 oktober 2016).
[11] Ashadi, kunjung. 2015. Pentingnya hidrasi bagi atlet. Surabaya: unipress.
[12] O'Neal Eric K, Wingo Jonathan E, Richardson Mark T, Leeper James D, Neggers Yasmine H, Bishop Phil A. 2011. "Half-Marathon and Full-Marathon Runners' Hydration Practices and Perceptions". Athletic training. Vol. 46: Hal 581-591.
[13] Purwanti, T. 2016. 12 Dampak Buruk Dehidrasi bagi Tubuh. (online), (http://www.pesona.co.id/read/12-dampak-buruk-dehidrasi-bagi-tubuh-,
[14] Ramadhan, R. I. dkk. 2016. Hubungan antara status hidrasi serta konsumsi cairan pada atlet bola basket. (online). http://journal.uny.ac.id/index.php/medifora/article/view/10068/7893