

Knowledge, Attitudes, and Behaviours Regarding Hydration among Sub-elite Combat Sports Athletes

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Abstract: Loss of body fluids or dehydration can reduce athletes' performance and lead to health problems such as heat illness. The purpose of this study was to determine the level of knowledge, attitudes, and behaviours regarding hydration among Indonesian sub-elite combat sports athletes. A questionnaire containing questions pertaining to knowledge, attitudes, and behaviours on hydration was distributed to the Indonesian sub-elite combat athletes during their training. Twenty-six subjects from six martial arts including Taekwondo, Wushu, Judo, Kempo, Pencak Silat, and Tarung Derajat participated in this study (mean age 21.73 + 4.14 years old; weight 62.12 + 11.71 kg; height 1.67 + 0.09 m). The mean score for knowledge, attitudes, and behaviours was 12.54 +2.14; 11.62 +1.86; 12.65 +2.26 out of a maximum of 17. No perfect score was achieved by the subjects. Majority of athletes knew that dehydration could decrease performance, and they understood that urine colour monitoring could be used to determine the dehydration. Unfortunately, the majority of them still using thirst as the best indicator of dehydration. The results of this study indicate that the level of knowledge, attitudes, and behaviours of Indonesian sub-elite combat sports athletes are good. Dehydration prevention program can be developed based on questionnaire with low score answer.

1 INTRODUCTION

Combat sports refer to a class of contact sports where the athletes engage in one on one combat that can involve striking techniques such as punches, kicks, grappling, or combines of it (Barley et al., 2019). Combat sports are high-intense activities, which characteristic tends to lose body fluid through a high rate of sweating or dehydration (Barley et al., 2019). Dehydration gives impact to performance, decreases cognitive skill, and leads to other serious health problems, such as heat stroke and heat illnesses, particularly if body fluid loss more than 2% (Ghaemi et al., 2014; Moghaddami et al., 2016). Cognitive impairs due to dehydration during practice can cause injury through technical incorrect or slower response. The effects of dehydration in contact sports with a high incidence of injury, such as combat sports, need to be thoroughly evaluated. (Lystad, 2015; Del Vecchio et al., 2018).

Combat sports competition or match is commonly performed in bodyweight class. Fluid restriction is a common method used by athletes to reduce their weight for a competition in lower weight classes (Brito et al., 2012). Combination of high-intense

exercise with fluid restriction method in combat sports can increase the risk of dehydration and health complication among athletes.

American College of Sports Medicine (ACSM) and National Athletic Trainer Association (NATA) provide the guidelines of fluid replacement during exercise to prevent dehydration (Sawka et al., 2007; Mcdermott et al., 2017). Although the recommendation was published, combat sports athletes still lack of knowledge to maintain their body fluid and prevent dehydration. Research showed that weight class sports athletes have a low level of knowledge regarding hydration (Esa et al., 2015). Knowledge is related to routine behaviours. Thus, it is important to improve athletes' knowledge to prevent dehydration, particularly in weight class sports category.

Sub-elite athletes are those who are trained to compete in the districts or provinces sports events. Unlike amateur or recreational athletes, they have routine training schedule as intensive as elite athletes do but in limited sources. In contrast to the elite athletes who have a complete official team, including sports medicine personal, i.e., nutritionist and medical doctor, sub-elite athletes do not have private

medical professional support. This situation leads sub-elite athletes to have limited knowledge due to lack of information and professional education. The number of sub-elite athletes is more than elite-athletes, so this population needs attention.

Level of knowledge, attitudes, and behaviours measurement are important because they are basic steps to develop an education strategy to prevent dehydration. The objective of this study was to determine the level of knowledge, attitudes, and behaviours regarding hydration among Indonesian sub-elite combat sports athletes.

2 METHODS

2.1 Participants

Twenty-seven sub-elite combat sports athletes who are registered as Yogyakarta province athletes for National Sports Games (Pekan Olahraga Nasional) in Papua 2020 were recruited in this study. These subjects have not become the Indonesia National athletes for participating in the International event. These subjects were actively trained and joined training centre program for six martial arts including Taekwondo, Wushu, Judo, Kempo, Pencak Silat, and Tarung Derajat. Pencak silat and Tarung Derajat. These are traditional combat sports that are held in the National Sports Event. Pencak Silat has even been competed in SEA-Games and has also been competed in ASIAN GAMES 2018 for the first time.

2.2 Assessment of Knowledge, Attitudes and Behaviours Regarding Hydration

The subjects answered the questionnaire to determine their knowledge, attitudes, and behaviours on hydration. The questionnaire was developed from the previous research and was adapted to Indonesian language (Nichols et al., 2005). The language validation was conducted using experts and a small group of collegiate athletes from Faculty of Sports Science, Universitas Negeri Yogyakarta, Indonesia.

The questionnaire consists of 3 parts, namely part A for knowledge's assessment, part B for attitudes assessment, and part C for behaviours assessment. Each part comprised of 17 questions in the form of true or false statement in part A, five-point Likert scale (strongly agree to strongly disagree) in part B and yes or no question in part C. Scoring "0" and "1" point was applied in each part of the questionnaire. In part A, score "1" was given for every correct answer

and "0" for the wrong answer. In part B, Positive statement was scored "1" if subjects answered "strongly agree", "agree", otherwise it was scored "0" for "neutral", and "strongly disagree", "disagree". On the other hand, a negative statement was scored "1" if subjects answered "strongly disagree", "disagree", otherwise it was scored "0" for "neutral" and "strongly agree", "agree". In part C, score "1" was given to answer based on proper behaviour and score "0" was given for poor behaviour.

2.3 Data Collection and Analysis

The collected data were tabulated and presented using SPSS 25 software. Descriptive data were presented in the mean and standard deviation. Normality test was performed using Shapiro Wilk (total subjects < 50). Pearson test was conducted to determine the relationships between knowledge, attitudes, and behaviours on hydration of the subjects. Spearman (non-parametric) test was performed as an alternative for the Pearson test when the data were not normally distributed. The significant levels were set to 0.05 ($p < 0.05$).

3 RESULT

Twenty-six subjects from 6 martial arts participated in this study including Taekwondo ($n = 10$), Wushu ($n = 4$), Judo ($n = 2$), Kempo ($n = 3$), Pencak Silat ($n = 6$) and Tarung Derajat ($n = 1$). Subjects' ages range from 15 to 33 years old. Their heights and weights were 1.45 to 1.87 meter and 48 to 95 kg, respectively. Characteristics of the subjects are shown in Table 1.

A total score of questionnaires for each part ranged from 0 to 17, with a higher score representing better knowledge, attitudes, and behaviours regarding hydration compared to the lower score. No perfect score was achieved by the subjects. Result of the questionnaire showed in Table 2.

Table 1: Subject's Characteristics

No	Characteristics (n=26)	Mean \pm SD
1	Age (years)	21.73 \pm 4.14
	Male (n = 17)	22.88 \pm 4.46
	Female (n = 9)	19.56 \pm 3.61
2	Height (m)	1.67 \pm 0.09
3	Weight (kg)	62.12 \pm 11.71

Table 2: Score of the Questionnaire Regarding Hydration

No	Part	Score (mean ± SD)	Minimum score	Max Score
1	Knowledge	12.54 ±2.14	6	15
2	Attitudes	11.62 ±1.86	8	15
3	Behaviors	12.65 ±2.26	8	16

3.1 Knowledge Regarding Hydration

The mean knowledge scores among all subjects were 12.54 ±2.14. Nine subjects (34.6%) had good knowledge (total score 14 or higher), sixteen subjects (61.5%) had moderate knowledge (total score between 9 to 13), and one subject (3.8%) had poor knowledge (total score below 9). General dehydration statement such as dehydration decreases sports performance and excessive sweating, thirsty, and cramping are signs of dehydration were answered correctly by 26 (100%) subjects. All (100%) subjects also knew that monitoring colour urine could be used as dehydration judgment.

Majority of subjects (92.3%) lacked in knowledge about dehydration indicator and assumed that thirst was the best indicator for dehydration. Knowledge of sports drink consumption was low. Only 14 subjects (53%) knew that an athlete should consume sports drinks after training more than one hour.

3.2 Attitudes Regarding Hydration

The mean attitudes score among all subjects was 11.62 ±1.86, which indicated a positive attitudes rate (score above 10). All subjects (100%) strongly agreed and agreed that monitoring urine colour was a way to judge the dehydration status. Twenty-five subjects (96%) also strongly agreed and agreed that the availability of fluid during practice was very important. Only one subject (3%) answered correctly in a negative statement that a thirst was the best indicator of dehydration.

3.3 Behaviours Regarding Hydration

The mean behaviours score among all subjects was 12.65 ±2.26. Twenty-five subjects (96%) prepared fluids during practice and competition. They also knew the signs of dehydration, including excessive

sweating, and muscle cramps. About 80% of subjects followed ACSM recommendation including drink 500-600 cc of water or sports drink a couple of hours before exercise and continue to drink 200 – 300 cc 10-20 minutes before competition.

Only 12 subjects (46%) consumed sports drinks while training for more than 1 hours. It may be related to other facts that only ten subjects (38%) preferred to consume sports drinks than water because it restored glycogen in the muscle. Nineteen subjects (5%) reported drinking more than alcoholic beverages the day before the competition.

Shapiro Wilk test showed that the result in part “knowledge” was not normally distributed ($p=0.03$), so the Spearman test was conducted. Spearman correlation analysis showed significant positive correlations between knowledge, attitudes, and behaviours ($p < 0.05$). Level of correlation was moderate (r -value between 0.40 to 0.60). The result of correlation test showed in Table 3.

Table 3: Spearman Correlation Coefficients Between Variables Tested

	Knowledge	Attitudes	Behaviors
Knowledge	1.00	0.41*	0.48*
Attitudes	0.41*	1.00	0.42*
Behaviors	0.48*	0.42*	1.00

*Significant at $p < 0.05$

4 DISCUSSION

This study has shown that the majority of sub-elite athletes had good score in knowledge, attitudes, and behaviours regarding hydration with mean score 73, 86, and 74 out of a maximum of 100, respectively.

The majority of athletes still used the thirst as the best indicator of dehydration. Thirst is a bad indicator because athletes who feel thirsty mean that their body has dehydration and has potential in decreasing performance (Adams et al., 2018). Periodical body fluid fulfilled without waiting to be thirsty can prevent dehydration. ACSM and NATA recommend consuming 250-300 cc of fluid every 15-20 minutes during exercise. Arnaoutis et al. (2013) show that consuming fluids when desired (*ad libitum*) still causes dehydration. Education program to improve athletes’ knowledge regarding body fluid fulfilled without waiting to be thirsty needs to be developed as a strategy to prevent dehydration.

Most of the athletes knew that dehydration could decrease performance so they could prevent losing

weight method through fluid restriction. Nutritional education regarding weight loss based on ACSM (0.5 – 1 kg /week) needs to be socialized (Jakicic et al., 2001).

These athletes also understood that urine colour monitoring could be used to determine the dehydration. This method is quite easy and applicable to maintain the hydration level of the athletes before practice or competition (Casa et al., 2000; Webb & Salandy, 2016).

5 LIMITATION

This study only involved sub-elite athletes from one province, i.e. Special Region of Yogyakarta out of 34 provinces in Indonesia. Further research involving large scale subjects need to be done to determine the level of knowledge, attitudes, and behaviours regarding hydration among Indonesian sub-elite athletes.

6 CONCLUSIONS

The results of this study have shown that the level of knowledge, attitudes, and behaviours of Indonesian sub-elite combat sports athletes are good. Dehydration prevention program can be developed based on questionnaire with low score answer.

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