Knowledge, Attitude and Behaviors Regarding Hydration and Hydration Status among Combat Sports Athletes

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Abstract: Lack of hydration may affect athletes’ sports execution, as well as it will lead to heat illness which may put the athletes at harm. Some of weight category sports athletes; especially the combat sports athletes were reported to reduce their body weight by drastically limiting their fluid intake to ensure that they can partake in their desired weight category or even lower category than their standard weight classification. The purpose of this study was to examine the knowledge, attitudes and behaviours regarding hydration and hydration status among the university combat sports athletes (N = 14). A set of questionnaire was employed to measure knowledge, attitude and behavior regarding hydration. Percentage of body weight changes was measured to monitor the hydration status. Most of the athletes were in minimal hydration and only few of them were well hydrated. Hydration status had significantly correlated with attitude (r = -.535, p < .05) but not significant with knowledge and behavior (p > .05). There was a significant difference of hydration status between the combat sports athletes (p < .05). There was also a strong positive and significant relationship between attitude and behaviour (r = .700, p < .05). However, there was no significant relationship between knowledge and behaviour with body weight changes (p > .05). The findings of this study quantify the need for improving the university combat sports athletes’ knowledge, attitude and behavior on hydration.

Key words: Knowledge • Attitude • Behavior • Hydration • Combat sports athletes

INTRODUCTION

Body mass is a compulsory criterion for any combat sports competition. Due to this, some athletes choose a rapid weight loss (more than 5% body-mass reduction in 1 week) purposively to compete against smaller and weaker athletes [1]. However, one must be cautious in rapid weight loss, as it testified to an impairment associated with athletic performance and faced a greater risk of death [2]. Muscle strength is at stake when the loss of large amounts of body mass in a short period of time [3], the time for aerobic activities might be affected, plasma and also blood volume. Hydration is well-known is every health and sport performance; especially the combat sports [4]. The need of the fluid intake should be before, during and after the exercise to prevent dehydration and maintain the sports performance. The excessive loss of water and electrolytes could lead to the negative effect on exercise performance and also thermoregulation. In addition, drought can cause serious health complications including impaired brain function, heat stroke and cerebral edema. Studies found that during exercise, the amount of water and electrolytes that each athlete loses can vary dramatically and as a result, regular hydration for every athlete should be assessed individually [5].

Lack of hydration may hinder the athletes’ sports execution, as well as it will cause heat disorder and may put the athletes at harm. Insufficiency in nourishment may take weeks, months, or even years to get sick, however, an individual may not survive without water after a couple of days [6]. Heat disease, for example, heat spasm and heat stroke are life debilitating. A long duration vigorous and intense exercise activity may cause an athlete’s body weight lose up to 5%. The physiological base for poor performance from dehydration includes thermoregulation, hyperthermia, cardiovascular strain, increased glycogen, utilization and reduced skeletal muscle blood flow [7, 8].
Some weight classification sports athletes depend on expressed drought, in which they restrict their fluid intake to ensure they can partake in their desired weight category or reduce their actual weight classification. Thus, this leads the athletes to lose their body weight by reducing their calorie consumption, rehearsing self-actuated lack of hydration, or taking diuretics [5]. It is normally seen in weight classification games, for example, boxing, wrestling and power lifting, where the competitors have a reason in getting dried out by aiming for a specific end goal to contend in lower weight classes and they consider it to be a favourable action. Thus, there is a need to examine the understanding and knowledge regarding hydration, as well as the behaviour and attitudes of the weight category athletes so that intervention and action could be taken if there is any lacking in these areas.

**MATERIALS AND METHODS**

**Participants:** Convenience sampling technique was employed in recruiting the subjects. The sample involved weight category sports athletes from the university who registered as Muay and Taekwando athletes. These subjects actively trained and competed in their respective sports. Their range of age was from 18 to 25 years old. A total of \( N = 14 \) subjects participated in this study.

**Measurement:** The subjects were required to answer the questionnaire to obtain their demographics, knowledge, attitude and behaviour on hydration. For hydration status, the percentage of body weight changes was assessed by weighing the subjects before and after exercise by using TANITA scale.

- Knowledge, attitudes and behaviour on hydration questionnaire [9]

  Section A (Knowledge): This section comprised of 17 true or false statements, where 1 point was provided for every correct answer and 0 point for wrong answer.

  Section B (Attitude) and Section C (Behaviour): Both sections comprised of a 17 five-point Likert scale questions (strongly agree to strongly disagree) each. For positive statement, 5 marks were provided to those who answered ‘strongly agree’, 4 marks for ‘agree’, 3 marks for ‘neutral’, 2 marks for ‘disagree’ and 1 mark for ‘strongly disagree’. On the other hand, for negative statements, those who answered ‘strongly disagree’, ‘disagree’, ‘neutral’, ‘agree’ and ‘strongly agree’ were provided 5 marks, 4 marks, 3 marks, 2 marks and 1 mark respectively.

**Hydration Status:** The percentages of body weight changes were calculated using a formula by [10]:

\[
\left( \frac{\text{Post-exercise body weight} - \text{pre-exercise body weight}}{\text{Pre-exercise body weight}} \right) \times 100
\]

To determine the average of the subjects’ body weight (euhydrated), they were weighed and measured for several days.

**Statistical Analysis:** The data variables obtained and measured were presented in the mean and standard deviation (M ± SD). The Pearson correlation test was conducted to determine the relationships between knowledge, attitude and behaviour on hydration and hydration status of the subjects. The significant level was set at .05 \( (p < .05) \).

**RESULTS**

Table 1 represents the descriptive statistics of the variables measured. Total scores for knowledge and behaviour ranged from 0 to 17, with the higher score representing better hydration knowledge and behaviour than the lower ones. Meanwhile, for attitude, the scores ranged from 17 to 85, with the higher score representing the higher attitude on hydration. There were significant differences between Muay and Taekwando on knowledge (Muay = 14.167 ± 1.772, Taekwando = 10.25 ± 2.549) and attitude scores (Muay = 69.333 ± 7.659, Taekwando = 57.875 ± 3.399) \( (p < .05) \). Behaviour scores observed no significant difference between the two sports \( (p > .05) \).

The hydration status was in minimal hydration for both sports but not a significant difference \( (p > .05) \) with 1 to -1% which is considered well hydrated, -1 to -3% is minimal hydration, -3 to -5% is significant hydration and above -5% is serious hydration [11].

As shown in Table 2, all of the Muay athletes were in minimal hydration (100%), however the Taekwando athletes illustrated 62.5%, while the others were well hydrated (37.5%).

The relationships between knowledge, behaviour, attitude and hydration status were tested (Table 3). There were strong positive and significant relationships between attitude \( (r = .766) \) and behaviour \( (r = .766) \) and knowledge scores \( (p < .05) \). Attitude scores and percentage of body weight changes showed a negative and significant relationship \( (r = -.535, p < .05) \). There was also a strong positive and significant relationship between attitude and behaviour \( (r = .700, p < .05) \). However, there was no significant relationship between knowledge and behaviour with body weight changes \( (p > .05) \).
Table 1: Descriptive statistics of variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean±SD</th>
<th>Muay</th>
<th>Taekwando</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>21.00 ± 1.519</td>
<td>21.25 ± 1.549</td>
<td>20.75 ± 1.497</td>
<td>.499</td>
</tr>
<tr>
<td>Pre-exercise weight (kg)</td>
<td>62.721 ± 10.342</td>
<td>63.021 ± 10.395</td>
<td>62.421 ± 10.305</td>
<td>.279</td>
</tr>
<tr>
<td>Post-exercise weight (kg)</td>
<td>61.829 ± 10.325</td>
<td>62.129 ± 10.355</td>
<td>61.529 ± 10.315</td>
<td>.198</td>
</tr>
<tr>
<td>Attitude</td>
<td>69.333 ± 7.659</td>
<td>68.753 ± 7.679</td>
<td>70.003 ± 7.669</td>
<td>.039</td>
</tr>
<tr>
<td>Body weight changes - %</td>
<td>-1.679 ± 0.629</td>
<td>-1.759 ± 0.669</td>
<td>-1.609 ± 0.619</td>
<td>.089</td>
</tr>
</tbody>
</table>

p-value = Analysis using independent sample t-test

Table 2: Distribution of subjects according to hydration status

<table>
<thead>
<tr>
<th>Condition of hydration</th>
<th>Muay</th>
<th>Taekwando</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well hydrated</td>
<td>3 (37.5%)</td>
<td>3 (37.5%)</td>
</tr>
<tr>
<td>Minimal hydration</td>
<td>6 (100%)</td>
<td>5 (62.5%)</td>
</tr>
</tbody>
</table>

Table 3: Correlations between variables tested

| Knowledge | 1 |
| Attitude  | .766* | 1 |
| Behavior  | .766* | .700* | 1 |
| Body weight changes - % | -.304 | -.535* | -.307 | 1 |

% = percentage
*significant at .05 (p < .05)

DISCUSSION

The study showed that there was a significant difference of knowledge and attitude regarding hydration between Muay and Taekwando athletes (Table 1). Muay athletes had greater knowledge and attitude regarding hydration compared to Taekwando athletes. Behaviour regarding hydration and body weight changes did not imply any difference between these sports. However, in hydration status, all of Muay athletes were in minimal hydration, while their counterparts were 37.5% well hydrated and 62.5% were in minimal hydration (Table 2). This indicated that the Muay athletes acknowledged the importance and roles of fluids and sports drink in either training or competition, but when it comes to practicing it, it was contradicting. This might explain the indifference in behaviour regarding hydration in both sports. The behaviour regarding hydration is the practice of the athletes who actually bring and drink fluids during training and competition. Hence, the attitude and behaviour of the athletes towards hydration suggested should be parallel. No significant and serious dehydration among the athletes was measured. With most of the athletes fell into minimal hydration, a preventive action should be taken so that none of them fall into the significant or serious dehydration state in the future.

The relationship results observed strong positive and significant relationships between attitude and behaviour, regarding hydration and body weight changes. This illustrated that the higher the attitude of hydration is, the greater the body weight changes. In interpreting the positive relationship, the increasing body weight means a greater knowledge the athletes have in relation to hydration. This is similar to the behaviour regarding hydration. The higher the attitude regarding hydration, the greater the body weight would change. Body weight changed in incline manner with the higher attitude regarding hydration. Interestingly, attitude regarding hydration has a negative relationship with body weight changes. This means the higher the attitude is regarding hydration, the lower the body weight changes. The negative means an inverse relationship which indicates that body weight will change in declining manner with a greater attitude regarding hydration. The behaviour of the athletes on fluid drinking during training and competition does not tally with their body weight changes in which in this study indicated declining manner. Thus, the knowledge and the attitudes of the athletes are suggested to be improved due to the current ones which are not sufficient to prevent further body weight changes during training. The present study revealed that hydration during training was inconsistent with the attitude regarding hydration. Body mass loss starting at 1% has been shown to be detrimental on physiological responses and thus, may endanger performance [12, 13] if this kind of hydration is also practiced during competition.

The findings demonstrated that body weight changes were not related to knowledge and the behaviours of the athletes (p < .05). This may corresponded to the reason why most of the athletes were in minimal hydration. Again, the knowledge and behaviour regarding hydration should be improved in order to prevent further dehydration during training and competition.

Muay and Taekwando are similar in terms of the origins which are both have cultural values, however they are different in focus where Taekwando focuses on kicking techniques, while Muay centers on exchanging blows. However, based on the researchers’ observation, both sports had almost the same duration of practice which was from two to three hours. It was reported that athletes who were engaged in long duration and vigorous intensity exercise practice tend to lose at least 5% of their weight [14].
CONCLUSION

In conclusion, most of the athletes fell in the category of minimal hydration with only few were well-hydrated according to the percentage of body weight changes. Muay athletes had significant higher knowledge and attitude than Taekwando athletes. Behaviour and body weight changes observed no difference. There were positive significant relationships between attitude and behaviour and, knowledge regarding hydration. For body weight changes, it observed a negative significant relationship with attitude, but not with knowledge and behaviour. Attitude and behaviour have a positive significant relationship. This study suggests that the knowledge and behaviour regarding hydration should be parallel to ensure the practice of hydrating is fully observed and maintained during training and competition. The findings of this study quantify the need in improving the university combat sports athletes’ knowledge, attitude and behavior with regards to hydration.

REFERENCES