Pre-competition anxiety score among Elite Boy Swimmers in Iran

Asghar Nikseresht (1)  
Amir-Abbas Yabande (2)  
Karamatollah Rahmanian (3)  
Abdolreza Sotoodeh Jahromi (4)

(1) Department of Sport Physiology, Islamic Azad University, Jahrom Branch, Jahrom, Iran  
(2) Student of Sport Physiology, Jahrom Azad University, Jahrom, Iran  
(3) Research Center for Social Determinants of Health, Jahrom University of Medical Sciences, Jahrom, Iran.  
(4) Research Center for Non-communicable Diseases, Jahrom University of Medical Sciences, Jahrom, Iran.

Correspondence:  
Karamatollah Rahmanian, Research Center for Non-communicable Diseases, Jahrom University of Medical Sciences, Jahrom, Iran  
Tel: +98 791 3331570; Fax: +98 791 3341509  
Email: rahmaniank47@yahoo.com

Abstract

Introduction: The present study was performed to measure the precompetitive anxiety and its two subcomponents (somatic and cognitive) and its relationship with age, weight, height and body mass index. Methods: This is a descriptive study performed using a demographic questionnaire and sport competition anxiety test (SCAT) designed by Martens consisting of 15 questions. The study population consisted of 14 elite boy swimmers. The questionnaires were filled out by swimmers 30 minutes before competition. The data were analyzed by SPSS software, using pair t-test, student t-test and linear regression test. Results: The mean score of precompetitive, somatic and cognitive anxiety was 17.93±3.25, 14.71±2.95, 3.21±0.97, respectively. The percent of somatic and cognitive competitive anxiety was not significantly different. The results showed no significant relationship between precompetitive, somatic and cognitive anxiety with age, weight, height and body mass index of swimmers (p>0.05). Conclusions: Our study suggests that the swimming competition equally effects on somatic and cognitive components of anxiety.

Key words: precompetitive anxiety, cognitive, somatic, male, swimmer

Introduction

Anxiety is defined as a significant negative effect (1) and is a common fact of everyday life that plays an important role in human life. Anxiety in athletes is common and is a physiological response to a real or imagined threat. According to Murphy over 50 percent of consultations in athletes at an Olympic festival were related to stress (2). The findings of Katkat in male Judo, Karate and Taekwondo athletes (3), Raglan et al in high school swimmers (4), Parnabas and Yahaya in Malaysian athletes (5), Serhat and Yildiz in Turkey elders wrestling national team (6), Matsumoto et al in male elite judo athletes (7), Singh et al among male inter-collegiate badminton players (8), Mottaghi et al in the futsal players (9) and Esfahani and Softlu among volleyball players (10) suggest the existence of sport anxiety in athletes.

Anxiety includes two subcomponent, cognitive and somatic (11, 12). The somatic component is often accompanied by physiological aspect, which is related to negative symptoms such as nervousness, elevated blood pressure, dry throat and mouth, muscle tension, rapid heart rate and sweaty palms (11-13). This type of anxiety had no role in decreasing the performance (11, 14). But, the mental component of anxiety is cognitive which is characteristic of fears about performance, failure image, failure to concentrate and disturbed consideration (11, 12).

The mean score of cognitive anxiety among runners of different skills were 12.41 for national, 14.73 for state, 17.39 for district and 21.45 for university (15). The results of a study showed that cognitive and somatic anxiety score were 16.6 ± 3.7 and 15.4 ± 3.2 in 18 elite male basketball
players, respectively (16). According to Cooper, the somatic and cognitive anxiety level was 14.08±3.87 and 17.95±4.16 among 37 youth classic soccer players with CSAI-2 questionnaire (17).

A positive amount of anxiety is required to achieve a desirable task. Higher level of anxiety physically inhibits performance by causing muscular tension and disturbing coordination of the movements.

Recent research has shown that athletes suffer stress which significantly affects mental health (18). Nowadays one of the most challenging tasks for athletes is how they improve psychological behavior and performance in competitive sports. It has been previously accepted that psycho-physiological conditioning programs and traditionally skill practices are of fundamental prominence in high-level competitive sports, which highly affects an athlete’s performance. Researchers showed a significantly negative correlation between anxiety scores and sport performance, that higher anxiety levels impair sporting performance (15, 19, 20). Also, competition anxiety is negatively correlated with sport experience, sport ability and general physical competence (21).

Remco et al detected that cognitive state anxiety but not somatic state anxiety was associated with swimming performance in child swimmers during competition (22). Also, Parnabas et al showed that higher cognitive anxiety lowered the sport performance (23). Even, Hatzigeorgiadis and Chromi et al showed that intensity of cognitive anxiety had low to moderate negative correlations with approach coping strategies (24). Also, Vosloo et al showed that compatible groups of swimmers had a more facilitative clarification of somatic anxiety and high levels of self-confidence (25). Cognitive anxiety had a linear relationship with performance, and somatic anxiety had an inverted-U relationship with performance (26).

The aim of the study was to measure sport anxiety and to examine the difference of subcomponents of sport anxiety. Also the present study aimed to determine the relationship of competitive anxiety (cognitive and somatic) between some variables (age, weight, height and Body Mass Index) among elite boy swimmers.

**Methods and Materials**

The subjects for the present study included 14 elite boy swimmers with ages ranging from 10 to 13 years. A questionnaire to record some data such as age, weight and height was used by the researcher. The investigator used the Sport Competition Anxiety Test (SCAT) questionnaire for assessing sport competition anxiety approximately 30 minutes before competition. The SCAT questionnaire consists of fifteen items of which five items, including first, fourth, seventh, tenth and thirteenth items are neutral questions and are not scored. All items are rated on 3-points Likert-type scale that varies from 1 (hardly ever), 2 (sometimes) and 3 (often). The items number 6 and 11 are scoring reversed, 1 (often), 2 (sometimes) and 3 (hardly ever). The competitive anxiety score is computed by summing ten items with 10 for low anxiety and 30 for high anxiety. The questions 2, 6, 8, 9, 11, 12, 14, and 15 were related to evaluation of physical or somatic competitive anxiety level, and questions 3 and 5 were for cognitive competitive anxiety evaluation (27). To compare the cognitive and physical anxiety scores, the score obtained was expressed as a percentage. The competitive score less than 17 said low level of, 17-24 an average level of and more than 24 a high level of anxiety. The SCAT has also been extensively used in sports research and shown to be both reliable and valid (28, 29).

The athletes who met the selection criteria were included and convinced that the information provided by himself would be kept confidential and would be used for research purposes only. All the participants were informed of the study objectives and how to complete the questionnaires. Before the interview, written informed consent was obtained from all of their parents, who were assured that the information would remain private, and they were told that they would be allowed to leave the study at any stage if they did not wish to continue. The athletes were asked to read all instructions carefully and give the answer of questions as exactly as possible. All data were collected 30 minutes before competition.

Subjects diagnosed with systemic diseases and who had performed any intense exercise or consumed alcohol for two weeks before competition were excluded from the study.

The present study was approved by the Ethics Committee of Jahrom University of Medical Sciences. The participants received oral information about the study.

The data were analyzed by SPSS for Windows (version 15; SPSS Inc., Chicago, IL., USA), and distribution of data was expressed in mean and standard deviation. Pair (dependent) t statistical test was used to examine difference of cognitive and somatic score and student (independent) t test was used for difference of anxiety subcomponents and age, weight, height and BMI groups. Linear regression test was used for relationship anxiety components with age, weight, height and BMI. Statistical significance was set at P < 0.05 for all comparisons.

**Results**

Fourteen young elite male swimmers participated in our study. Table 1 provides some data of participants such as age, height, and weight and body mass index.

The majority of the boys were 12 years old (50.0%) and age varied from 10-13 years with mean age of 11.71±0.82 years. The result showed that 57.1% participants had BMI ≥19.5.

The response of subjects to Sport Competition Anxiety Test is shown in Table 2.
Table 1: Demographic data of youth swimmer players

<table>
<thead>
<tr>
<th>Data</th>
<th>Number (n=14)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>7.1</td>
</tr>
<tr>
<td>11</td>
<td>4</td>
<td>28.6</td>
</tr>
<tr>
<td>12</td>
<td>7</td>
<td>50.0</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>14.3</td>
</tr>
<tr>
<td>Height (cm), &lt;155</td>
<td>7</td>
<td>50.0</td>
</tr>
<tr>
<td>≥155</td>
<td>7</td>
<td>50.0</td>
</tr>
<tr>
<td>Weight (kg), ≤45</td>
<td>7</td>
<td>50.0</td>
</tr>
<tr>
<td>&gt;45</td>
<td>7</td>
<td>50.0</td>
</tr>
<tr>
<td>Body Mass Index, &lt;19.5</td>
<td>8</td>
<td>57.1</td>
</tr>
<tr>
<td>≥19.5</td>
<td>6</td>
<td>42.9</td>
</tr>
<tr>
<td>Continues variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>11.71</td>
<td>0.82</td>
</tr>
<tr>
<td>Mean of age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height (cm)</td>
<td>155.64</td>
<td>8.09</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>47.00</td>
<td>6.66</td>
</tr>
<tr>
<td>Body Mass Index</td>
<td>19.55</td>
<td>1.29</td>
</tr>
</tbody>
</table>

* Standard Deviation

Table 2: Participants response to the Sport Competition Anxiety Test

<table>
<thead>
<tr>
<th>Item</th>
<th>Hardly ever, No (%)</th>
<th>Sometme No (%)</th>
<th>Often No (%)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Before I compete I feel uneasy</td>
<td>0 (0.0)</td>
<td>6 (42.9)</td>
<td>8 (57.1)</td>
<td>2.57</td>
<td>3</td>
<td>0.51</td>
</tr>
<tr>
<td>3. Before I compete I worry about not performing well</td>
<td>5 (35.7)</td>
<td>4 (28.6)</td>
<td>5 (35.7)</td>
<td>2</td>
<td>2</td>
<td>0.88</td>
</tr>
<tr>
<td>5. When I compete, I worry about making mistakes</td>
<td>11 (78.6)</td>
<td>3 (21.4)</td>
<td>0 (0.0)</td>
<td>1.21</td>
<td>1</td>
<td>0.43</td>
</tr>
<tr>
<td>6. Before I compete I am calm</td>
<td>3 (21.4)</td>
<td>7 (50.0)</td>
<td>4 (28.6)</td>
<td>2.07</td>
<td>2</td>
<td>0.73</td>
</tr>
<tr>
<td>8. Before I compete I get a queasy feeling in my stomach</td>
<td>9 (64.3)</td>
<td>4 (28.6)</td>
<td>1 (7.1)</td>
<td>1.43</td>
<td>1</td>
<td>0.65</td>
</tr>
<tr>
<td>9. Just before competing, I notice my heart beats faster than usual</td>
<td>5 (35.7)</td>
<td>6 (42.9)</td>
<td>3 (21.4)</td>
<td>1.86</td>
<td>2</td>
<td>0.77</td>
</tr>
<tr>
<td>11. Before I compete I feel relaxed</td>
<td>1 (7.1)</td>
<td>7 (50.0)</td>
<td>6 (42.9)</td>
<td>2.36</td>
<td>2</td>
<td>0.63</td>
</tr>
<tr>
<td>12. Before I compete I am nervous</td>
<td>9 (64.3)</td>
<td>2 (14.3)</td>
<td>3 (21.4)</td>
<td>1.57</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>14. I get nervous wanting to start the game</td>
<td>9 (64.3)</td>
<td>2 (14.3)</td>
<td>3 (21.4)</td>
<td>1.57</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>15. Before I compete I usually get uptight</td>
<td>12 (85.7)</td>
<td>0 (0.0)</td>
<td>2 (14.3)</td>
<td>1.29</td>
<td>1</td>
<td>0.73</td>
</tr>
</tbody>
</table>
With regard to the cognitive subscale, high-percentage responses were identified when participants were asked specific questions related to experiencing cognitive anxiety previous to a competition. When responding to “Before I compete I worry about not performing well” 35.7% and 28.6% of the participants responded hardly ever or sometimes. Near 79% of participants responded hardly ever or sometimes to the item “When I compete, I worry about making mistakes.”

With regard to the somatic subscale, high-percentage responses were identified when participants were asked particular questions related to experiencing somatic anxiety before competition. When responding “Before I compete I usually get uptight” about 86% of participants stated hardly ever. When responding to “Before I compete I am nervous” approximately 64% responded hardly ever. Over 64% participants responded hardly ever to the item “I get nervous wanting to start the game”. Also, over 85% participants responded hardly ever to the item “Before I compete, I usually get uptight”.

The overall mean score of sport anxiety was 17.93±3.25 among swimmers, that was higher than 50% of total score (30 score). According to classification of anxiety, 35.7% (5), 57.1% (8) and 7.1% (1) of elite boy swimmers had low, average and high level of sport anxiety 30 minutes before competition, respectively.

Our result showed that the percentage of somatic sport anxiety (61.31±12.28) is not significantly different to cognitive component (53.51±16.25) among male elite swimmers (Table 3). Also, our results revealed that the average somatic and cognitive anxiety score was not significantly different for the boy swimmers aged 10-11 years over boys aged 12-13 years, with a difference of 2.30 (p=0.081). Our results revealed that, although the average somatic anxiety score appeared to be slightly higher for the participants with height less than 155 cm, weight ≤45kg and BMI<19.5 over than other groups, height ≥155 cm, weight >45 kg and BMI≥19.5, scores between the two groups were not significantly different. Based on the results we found no significant differences between the cognitive anxiety with age, height, weight and BMI groups.

The linear regression test revealed that the somatic and cognitive anxiety scores were not significantly related to age, weight, height and BMI.

**Discussion**

The study was designed to measure and compare the level of cognitive anxiety and somatic anxiety in a sample of 14 elite male swimmers.

Our result found that the precompetitive anxiety score was at an average level (17.93±3.25) and 59.77% of total score in swimmers. As stated by SCAT scale score (17-24), individuals have an average level of anxiety which is good in psychological terms. The precompetitive score was higher than in a study conducted by Sahu ((30) in 20 male batsmen (16.35±2.03) and 20 male bowlers (16.20±2.95), Sil (31) in 23 male basketball players (17.13±2.83), Kerketta (32) in 30 volleyball male players (18.66±2.82) and 30 soccer male players (17.85±3.74), Mottaghi et al (9) in soccer players (16.79±2.10), Schaefer et al (33) in 164 male golfers (15.57±3.96).

But the results of Saxena and Sathe (34) in 30 urban school state level male players (18.63±3.71), Kumar (35) in 30 male basketball players (20.79±0.64) and Matsumoto et al (7) in 43 male judo athletes (22.05±3.77), were higher than our result.

Precompetitive anxiety is dependent upon factors such as skill level, experience and general level of arousal in daily activities. Avramidou et al found that the competitive
environment increased the intensity of somatic anxiety and decreased the level of self-confidence in the twenty swimmers, whereas cognitive-anxiety intensity was not significantly different (36). Parnabas et al identified the negative correlation between cognitive anxiety and sport performance in swimmers (37).

Although, the percentage of somatic anxiety score was higher than percentage of cognitive score, there is no significant different. This result is similar to reports by Hallaj et al (38) and Agaoglu (39). Adversely, Mehdiipoor et al (40) suggested more cognitive anxiety score than somatic component of anxiety among college athletes. Also, Soltani et al indicated that cognitive sport anxiety was significantly higher than somatic anxiety among team sport and individual sport athletes.(41).

The cognitive anxiety score in a study conducted by Parnabas et al (37) was lower (16.34 of 36) in 15 district swimmers, than in our finding.

However, according to Drive theory, the presence of audience for low skilled athletes, during the sport competition could increase their cognitive anxiety. Cognitive anxiety is the extent to which an athlete worries or has negative thoughts, and the negative thoughts may include fear of failure, loss of self-esteem and self-confidence. It could lead to poor performance of an athlete in competition. It may start before a competition in the form of pre-competitive anxiety that might affect performance throughout the competition.

The relationship between cognitive anxiety and performance was explained best in Multidimensional Anxiety Theory. This theory explains that cognitive anxiety effects performance. The relationship between cognitive anxiety, where an athlete experiences worries, negative thoughts and fear of failure, will affect the performance (42).

According to Martens and researchers (14), somatic A-state anxiety may be classified as a common response to competition and can cause no necessary harm to performance. Unfortunately, an increase in cognitive A-state anxiety in an athlete can cause concentration and focus disruption and a mental development of worry and self-doubt. A lack of focus and concentration while participating in sports can negatively affect overall performance. Possible causes of cognitive A-state are negative verbal feedback, lack of readiness for competition, a negative attitude towards a previous poor performance, or negative expectations from other individuals such as team members, coaches, and family members.

Significant differences are not noticed between the precompetitive, somatic and cognitive anxiety with age, weight, height and BMI. Also, Schaefer et al found that the age of golfers did not effect on their competitive anxiety (33). Inversely, Modrano and Guillon (43) reported a significant relationship between age and cognitive anxiety. Also, the results of the Taner et al study (21) pointed out that age is a one of the important factors in determining competition anxiety. Das and Ghosh (44) show that middle adolescent and late adolescent players differ significantly from each other and late adolescents are found more anxious than middle adolescents. Ferreira et al (45), Agurre-loaiza and Bermudez (46) and Mottaghi et al (9) showed that there was a significant inverse (negative) relationship between the competitive anxiety levels and age. This may have been the result of the older athletes having had more experience than their younger counterparts.

### Conclusion

As a conclusion of the study, the somatic and cognitive anxiety is equal in the elite male swimmers 30 minutes before competition, and the factors of age, weight, height and body mass index have no effect on somatic and cognitive anxiety.

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