The Relationship between Cognitive and Somatic Anxiety on Performance of Student-Athletes of Universiti Malaysia Perlis (UNIMAP)

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Abstract Recent evidence suggests that student-athletes may experience greater levels of stress or anxiety due to the dual demands of athletics and academics placed on them. In today’s MASUM (Sport between Universities) competitive sports, a lot of pressure is placed on collegiate athletes to perform the excellence level. Sports psychologists have long believed that high levels of anxiety during competition are harmful, worsening performance and even leading to dropout. Anxiety consists of two subcomponents, cognitive and somatic anxiety, which influence performance. The cognitive is the mental component, which is characterized by negative expectations about success or self-evaluation, negative self-talk, worries about performance, images of failure, inability to concentrate, and disrupted attention. While, the somatic is the physiological element, which is related to autonomic arousals. The main purpose of this study was to examine the levels of anxiety of somatic and cognitive, before and during competition among student-athletes. The participants of this study were recruited from Universiti Malaysia Perlis (UNIMAP). The instrument used for the study comprised of a 27-item Competitive State Anxiety Inventory–2, which had been distributed during MASUM (Sport between Universities) competition to the student-athletes. The participants of this study were recruited from Universiti Malaysia Perlis (UNIMAP). The sample consisted of 112 athletes, with national athletes (N=21), state athletes (N=33), district athletes (N=23), and university athletes (N=35). The results showed that elite or national athletes exhibited lower levels of somatic and cognitive anxiety than non-elite athletes. The result also showed that the exits of negative correlation between cognitive anxiety and sport performance, and somatic anxiety and sport performance. Sport psychologists, sport counselors and coaches should use the present findings to recommend coping strategies to university and district level athletes that are appropriate for dealing with their athletes’ cognitive and somatic anxiety.

Keywords Cognitive, Somatic, Student-Athletes

Categories of Athletes

1. Introduction

The transition from high school to college can be stressful for any student (Pritchard, Wilson & Yamnitz, 2004), but recent evidence suggests that athletes may experience even greater levels of stress or anxiety due to the dual demands of athletics and academics placed on them (Wilson & Pritchard, 2005). In today’s MASUM (Sport between Universities) competitive sports, a lot of pressure is placed on collegiate athletes to perform the excellence level.

Researchers have reported that over 50 of consultations among athletes at an Olympic festival were related to stress or anxiety problems (Murphy, 1988). Anxiety, as a negative emotional, affect perceptions in sport competitions, where a large majority of athletes consider anxiety to be debilitating towards performance, which may result in decreases in performance (Weinberg & Gould, 2011; Raglin & Hanin, 2000). Hann (2000) found “sports psychologist have long believed that high levels of anxiety during competition are harmful, worsening performance and even leading to dropout.”

Many researches showed that winning in a competition depend on how an athlete can control their anxiety level (Humara, 2001). Anxiety consists of two subcomponents: cognitive and somatic anxiety, which influence performance (Martens, Vealey & Burton, 1990; Jarvis, 2002). The cognitive is the mental component, which characterized by negative expectations about success or self-evaluation, negative self-talk, worries about performance, images of failure, inability to concentrate, and disrupted attention (Martens, Vealey & Burton, 1990; Jarvis 2002). The somatic is the physiological element, which related to autonomic arousals, negative symptoms such as feelings of nervous, high blood pressure, dry throat, muscular tension, rapid heart
rate, sweaty palms and butterflies in your stomach (Martens, Vealey & Burton, 1990; Jones, 2000; Jarvis, 2002).

The level of anxiety has the tendency to change during competition by becoming higher or lower (Weinberg 1989; Weinberg & Gould, 2011; Cashmore 2002; O’Neil & Abedi 1992; O’Neil, Baker & Matsura 1992) because the cognitive and somatic component changes according to the time and situation (Caruso, Dzewaltowski, Gill & McElroy 1990).

Recent investigation found that male and female athletes suffering stresses resulted pressure to win, excessive anxiety, frustration conflict, irritation and fear, which significantly affected their mental or emotional health (Humphrey, Yow & Bow 2000). Heavy playing schedules, competition for team places, the media and fans as well as the pressure to win trophies all play a part in players developing high stress and anxiety levels (Heather 2010). Research has indicated that most successful athletes using more positive coping strategies than less successful athletes (Orlick & Partington, 1988; Gould, Eklund & Jackson, 1993). Many times athletes do not handle anxiety properly by not using coping strategies, which deteriorate their performance.

Most of the previous research, focused on elite athletes, while ignoring less successful athletes. This was confirmed by Krane (1995) that research on competitive anxiety mainly focused on elite athletes. The extant literature also shows that there is a limited research comparing on competitive anxiety among athletes of state, district and school level.

2. Purpose of the Study

The main purpose of this study was to examine the levels of somatic and cognitive anxiety, during competition among student-athletes. The present research aim to determine the level of somatic and cognitive anxiety between different categories of athletes, which consists national, state, district and university level athletes. It sought to correlate the relationship between competitive anxiety and athletes of different skills (national, state, district and university levels) on performance.

3. Methods

The participants of this study were recruited from Universiti Malaysia Perlis (UNIMAP). The instrument used for the study comprised of a 27-item Competitive State Anxiety Inventory–2 (CSAI-2), which had been distributed during MASUM (Sport between Universities) competition to the student-athletes. CSAI-2 measure somatic anxiety (9 items), cognitive anxiety (9 items) and self confidence (9 items). Besides that, Sport Performance Questionnaire, (SPQ) which contain 15 items evaluated athletes’ performance based on their confident, satisfaction, enjoyment and concentration level.

The data was collected during competition. The sample consisted of 112 athletes, with national athletes (N=21), state athletes (N=33), district athletes (N=23), and university athletes (N= 35). The higher level of achievement in sport declared as their category in sport.

4. Result

Based on the ethnic, the majority of athletes belong to Malays (n= 64) since they are the majority race in Malaysia. The second largest ethnic in Malaysia are Chinese. There are 31 athletes from Chinese ethnic. Indians are the lowest ethnic in Malaysia. There are 17 athletes from Indian ethnic.

The mean age for overall respondents was 21.78 years old. The age of male varied from 18 to 28 years, where the mean age was 22.17 years old. The age of females ranged from the...
minimum of 18 to the maximum of 26 years old. The mean age for female respondents was 22.42 years old.

The variable “types of sport” is gathered through the studies. This variable is categorized into seven sports. The highest respondent involved in track and field (22.33%), followed by football (18.75%), silat (15.17%), swimming (13.39%), takraw (11.61%), basketball (9.82%) and hockey (8.93%).

Based on the level of performance, the majority of the respondents obtain the lowest performance in sport, university level (31.26%), followed by state (29.46%), district (20.53%) and national (18.75%).

4.1. Cronbach Reliability Coefficients

In this study, Cronbach alpha were found ranging from .61 to .89. Coefficients of .70 and above were considered reliable, while those around .60 not included in the interpretation of the data (Table 2).

4.2. Level of Cognitive Anxiety

Table 3 shows the mean scores for the cognitive anxiety among the athletes of different skills, F (3, 112) = 13.001, p < .01. Apparently, significant differences emerged for the athletes having different skills at competition. Overall, the mean score obtained for the national athletes was lower than those in other categories.

4.3. Level of Cognitive Anxiety and Sport Performance

The correlation coefficient of -0.011 was noted between the level of cognitive anxiety and sport performance in the evaluation of 112 UNIMAP athletes, which is significant (P < .01). In other words, the negative relationship existing between these variables is statistically significant (Table 5). Negative correlation indicates that either variables increase or decrease contradictory.

4.4. Level of Somatic Anxiety

Table 6 shows the mean scores for the cognitive anxiety among the athletes of different skills, F (3, 112) = 14.4171, p < .01. Apparently, significant differences emerged for the athletes having different skills at competition. Overall, the mean score obtained for the national athletes was lower than those in other categories.

** Table 2. Cronbach Reliability Coefficients

| Questionnaires                      | Cronbach's Alpha (n=112) |
|-------------------------------------|--------------------------|
| Competitive State Anxiety Inventory-2 (CSAI-2) |                           |
| Cognitive Anxiety                   | .8920                    |
| Somatic Anxiety                     | .8597                    |
| Self Confidence                     | .6007                    |

| Sport Performance Questionnaire (SPQ) |                           |
|--------------------------------------|--------------------------|
| Confident                            | .7731                    |
| Satisfaction                         | .8540                    |
| Enjoyment                            | .7942                    |
| Concentration                        | .7107                    |

| Skills of Athletes | Mean | F-Value | P-Value |
|--------------------|------|---------|---------|
| National           | 15.1172 | 13.001** | 0.000   |
| State              | 18.5231 |
| Distict            | 22.2447 |
| University         | 24.3412 |

Post-Hoc Tukey Test (Table 4) showed that the level of cognitive anxiety of university were higher than state (p=.05) and national (p=.05), but lower than university level athletes (p=.05). In addition, the level of cognitive anxiety of state were higher than national (p=.05), but lower than district (p=.05) and university (p=.05) level athletes. Lastly, the level of cognitive anxiety of national were lower than state (p=.05), district (p=.05) and university level athletes (p=.05).

** Table 4. Post Hoc Tukey Test: Level of Cognitive Anxiety According to the Skills

| Skill of Athletes | National | State | Distict | University | N  |
|-------------------|----------|-------|---------|------------|----|
| National          | * (1.311)| * (2.142)| * (2.171)| 21         |
| State             |          |       |         |            | 33 |
| Distict           |          |       |         |            | 23 |
| University        |          |       |         |            | 35 |

**p=.05

** Table 6. Level of Somatic Anxiety According to the Skills

| Skills of Athletes | Mean  | F-Value   | P-Value |
|--------------------|-------|-----------|---------|
| National           | 17.2157 |          |         |
| State              | 20.2214 |          |         |
| Distict            | 24.4131 | 14.4171** | 0.000   |
| University         | 26.1197 |          |         |

**p=.01

Post-Hoc Tukey Test (Table 7) showed that the level of
somatic anxiety of university were higher than district (p=.05), state (p=.05) and national (p=.05) level athletes. Furthermore, the level of somatic anxiety of district were higher than state (p=.05) and national (p=.05), but lower than university level athletes (p=.05). In addition, the level of somatic anxiety of state were higher than national (p=.05), but lower than district (p=.05) and university (p=.05) level athletes. Lastly, the level of somatic anxiety of national were lower than state (p=.05), district (p=.05) and university level athletes (p=.05).

Table 7. Post Hoc Tukey Test: Level of Somatic Anxiety According to the Skills

| Skill of Athletes | National | State | District | University | N  |
|-------------------|----------|-------|----------|------------|----|
| National          | * (2.512)| *     | * (2.891)|            | 21 |
| State             |          |       |          |            | 33 |
| District          | * (2.105)|       |          |            | 23 |
| University        |          |       |          |            | 35 |

*p=.05

4.5. Level of Somatic Anxiety and Sport Performance

The correlation coefficient of -0.016 was noted between the level of somatic anxiety and sport performance in the evaluation of 112 UNIMAP athletes, which is significant (P < .01). In other words, the negative relationship existing between these variables is statistically significant (Table 8). Negative correlation indicates that either variables increase or decrease contradictory.

Table 8. The Relationship between the Level of Somatic Anxiety and Sport Performance

| Subject               | Sport Performance |
|-----------------------|-------------------|
| The Level of Somatic  | -0.016**          |
| Anxiety               | (0.000)           |

* * p=.01

5. Discussion

5.1. Level of Cognitive Anxiety

The result showed that athletes representing their university exhibited higher somatic anxiety level than those in state and district categories, whereas national athletes showed the lowest level of somatic anxiety. In Malaysia, no research involving the four categories of skills has been conducted so far, therefore this research has failed to compare these with the findings of previous research.

Several researches indicated that low level of athletes easily can become ‘victim’ of sources of anxiety than elite athletes. According to Drive theory, less successful athletes or those who have not mastered their skill perfectly, tend to increase their anxiety level with an audience present (Weinberg & Gould, 2011; Anshel, 2003). The more audience appears in the sport venue, there is a tendency to increase cognitive anxiety on low skill athletes. The higher the cognitive anxiety increases the probability of making more errors and mistakes are unavoidable. More aptly, research showed elite athletes use higher number of coping strategies than less successful athletes, which reduce their cognitive anxiety (Jarvis, 2002; Dale, 2000; Jones, 2000, Park, 2000; Orlick & Parthington, 1988). Therefore, national athletes show less cognitive anxiety than low skill athletes.

5.2. Level of Somatic Anxiety

The result showed that athletes representing their university exhibited higher somatic anxiety level than those in state and district categories, whereas national athletes showed the lowest level of somatic anxiety. In Malaysia, no research involving the four categories of skills has been conducted so far, therefore this research has failed to compare these with the findings of previous research.

The explanation for somatic anxiety is similar with cognitive anxiety. According to Drive theory, the present of audience for low skilled athletes, during the sport competition not only increase their cognitive anxiety but also the somatic anxiety. Somatic anxiety refers to athletes’ changes in their physiology, such as increased perspiration, difficulty in breathing, increased heart beat, changes in the brain wave, elevated blood pressure, increased urination, butterflies in the stomach, less saliva in the mouth and muscle tension. The sympathetic nervous system is stimulated by fear perception in the cerebral cortex, prompting an immediate stress response. Athletes, who have learned anxiety management skills, often respond to a greater degree to an anxiety symptom but return to their resting rate sooner than those athletes, who are not trained in anxiety management.

A few research indicated that cultural background or ethnic may play an important role in increasing the level of somatic anxiety. For example, cross cultural studies showed that Latin’s have higher somatic anxiety than any other ethnic groups (Canino, 2004). In this study, there are three types of ethic taken part (Malay, Chinese and Indian), most probably one or two ethnic groups contribute in the increase of somatic anxiety. Anyway, further research on ethnic and somatic anxiety can determined this.

A few research indicated, types of food, especially salty food can contribute to somatic anxiety. A little research indicated that cultural background or ethnic may play an important role in increasing the level of somatic anxiety. For example, cross cultural studies showed that Latin’s have higher somatic anxiety than any other ethnic groups (Canino, 2004). In this study, there are three types of ethic taken part (Malay, Chinese and Indian), most probably one or two ethnic groups contribute in the increase of somatic anxiety. Anyway, further research on ethnic and somatic anxiety can determined this.
Similarly, the same result exists between somatic anxiety and performance. Similar result also detected between somatic anxiety and sport performance. It means the higher the level of somatic or cognitive anxiety experience by athletes, the lower sport performance.

The relationship between somatic and cognitive anxiety was explained best in Multidimensional Anxiety Theory. This theory explains that both cognitive and somatic anxiety effect performance. The basic premise of multidimensional conceptualizations of anxiety is that the two components of anxiety are independent because they have different antecedents and consequences, particularly that they differently influence behaviour (Martens et al., 1990). If an athlete worried about competition (cognitive anxiety), his or her performance will be poor. The relationship between somatic anxiety, where an athlete experiences physiological changes, such as, increases in the levels of muscle tension, nervousness, sweating and heartbeat and performance is however, similar to the inverted-U theory (Ampofo-Boateng, 2009). When increases in somatic anxiety are recorded in an athlete, it can result in arousal at an optimal level that results in the best performance results. However, an increase in arousal beyond or below the optimal level of arousal will lead to a decrease in athletic performance.

5.3. Level of Anxiety and Sport Performance

The result revealed there exists of negative correlation between cognitive anxiety and sport performance. Similar result also detected between somatic anxiety and sport performance. It means the higher the level of somatic or cognitive anxiety experience by athletes, the lower sport performance.

The result also detected between somatic anxiety and sport performance. This study also showed that exist of negative correlation between cognitive anxiety and performance. Similarly, the same result exists between somatic anxiety and performance. Sport psychologists, sport counselors and coaches should use the present findings to recommend coping strategies to university and district level athletes that are appropriate for dealing with their athletes’ cognitive and somatic anxiety.

Future research should identify the most prevalent sources of somatic and cognitive anxiety among different skill of athletes. Initial evidence suggest among the sources of cognitive and somatic anxiety are fear of injury, presence of audience, past unpleasant experiences, fear of lose, negative evaluation, knowledge of the opposition team, uncertainty, playing at the opposition’s place, high hope, and perceived sport events as very important. Seeking sources of somatic and cognitive anxiety should be a great value to reduce the level of anxiety. Furthermore, types of coping strategies can be used to reduce the level of somatic and cognitive anxiety among athletes much depend on the sources of anxiety. For example, positive self talks are effective to apply for athletes with fear of lose and past unpleasant experiences. Whereas, imagery suitable for athletes who fear of injury, presence of audience and high hope.

6. Conclusion

The findings of the research determined that there are differences in the level of anxiety of cognitive and somatic anxiety, showed by different categories of Malaysian athletes. These differences were related to their level of skill. The results showed that elite or national athletes exhibited lower levels of somatic and cognitive anxiety than non-elite athletes. Low anxiety levels are very important in high sport performance. This study also showed that exist of negative correlation between cognitive anxiety and performance. Similarly, the same result exists between somatic anxiety and performance. Sport psychologists, sport counselors and coaches should use the present findings to recommend coping strategies to university and district level athletes that are appropriate for dealing with their athletes’ cognitive and somatic anxiety.

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