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 exists 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, Dziewaltowski, 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

Frequency, Percentage, mean and standard deviation are presented in Table 1, which shows the overall results of the respondents' profile. The profile of the respondents described the ethnics, gender, age, level of performance and type of sports taken part. There are 73 male and 39 female athletes participated in this study.

Table 1. Profile of the respondents

Variables	Frequency	Percentage	Mean	SD
Ethnics				
Malay	64	57.14		
Chinese	31	27.68		
Indian	17	15.18		
Gender				
Male	73	65.18		
Female	39	34.82		
Age				
Male			22.17	2.25
Female			22.42	1.90
Overall			21.78	1.69
Types of Sport				
Track and Field	25	22.33		
Football	21	18.75		
Silat	17	15.17		
Swimming	15	13.39		
Takraw	13	11.61		
Basketball	11	9.82		
Hockey	10	8.93		
Level of Performance				
University	35	31.26		
State	33	29.46		
District	23	20.53		
National	21	18.75		

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).

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

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.

Table 3. Level of Cognitive Anxiety According to the Skills

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

** $p = .01$

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

* $p = .05$

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.

Table 5. The Relationship between the Level of Cognitive Anxiety and Sport Performance

Subject	Sport Performance
The Level of Cognitive Anxiety	-0.011** (0.000)

** $p = .01$

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 6. Level of Somatic Anxiety According to the Skills

Skills of Athletes	Mean	F-Value	P-Value
National	17.2157	14.4171**	0.000
State	20.2214		
Distict	24.4131		
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	Distict	University	N
National		*(2.512)	*(2.105)	*(2.891)	21
State					33
Distict					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 Anxiety	-0.016** (0.000)

** $p=.01$

5. Dissscussion

5.1. Level of Cognitive Anxiety

The result showed that athletes representing their university exhibited higher cognitive anxiety level than those in state and district categories, whereas national athletes showed the lowest level of cognitive 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 ethnics 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 there is a positive relationship between salt and somatic anxiety. Some people are genetically susceptible to sodium and will develop high blood pressure when they ingest too much of it. As a known fact that Malaysian foods are much saltier compared with any other country. Besides that, saltier food will reduce the level of water in our body. Research of Ganioa, Armstronga, Casaa, McDermotta, Leea, Yamamotoa, Marzanao, Lopeza, Jimeneza, Bellegoa, Chevillottea and Liebermana (2011), showed low level of the water in our body has the tendency to increase the anxiety

and tension. Furthermore, Malaysians are famous of drinking tea compared with any other country. Tea, contain theobromine and theophylline, which are sympathomimetics. These substance increase metabolism, make one high alert, and result in the release of stress hormones, which elevate the heart rate and blood pressure (Greenberg, 1999).

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 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.

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.

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.

REFERENCES

- [1] Ampofo-Boateng, K. 2009. Understanding Sport Psychology. Selangor, Malaysia: UPENA.
- [2] Anshel, M.H. 1991. Causes for drug abuse in sport: A survey of intercollegiate athletes. *Journal of Sport Behavior* 14: 283-307.
- [3] Anshel, M.H. 2003. Sport psychology: from theory to practice. New York: Benjamin Cummings.
- [4] Anshel, M.H. 2011. Sport psychology: from theory to practice. New York: Benjamin Cummings.
- [5] Bacon, V.L. & Russell, P.J. 2004. Addiction and the college athlete: The Multiple Addictive Behaviors Questionnaire (MABQ) with college athletes. *Sport Journal* 7. (<http://www.thesportjournal.org/2004Journal/Vol7-No2/BaconRussell.asp>).
- [6] Baumert, P. W., Henderson, J. M., & Thompson, N. J. (1998). Health risk behaviors of adolescent participants in organized sports. *Journal of Adolescent Health*, 22, 460-465.
- [7] Canino, G. (2004). Are somatic symptoms and related distress more prevalent in Hispanic/Latino youth? Some methodological considerations. *Journal of Clinical Child and Adolescent Psychology*, 33:2, 272-275.
- [8] Cashmore, E. 2002. Sport Psychology. London: Routledge.
- [9] Caruso, C. M., Dziewaltowski, D. A., Gill, D. L., & McElroy, M. A. 1990. Psychological and physiological changes in competitive state anxiety during noncompetitive and competitive success and failure. *Journal of Sport and Exercise Psychology* 12; 6-20.
- [10] Claudio & Laura 2003. Intensity, idiosyncratic content and functional impact of performance-related emotions in athletes. *Journal of Sports Sciences* 21 (3): 171-189.
- [11] Cox, R. H. 2011. Sport Psychology, concepts and applications (6th ed.). New York: McGraw-Hill.
- [12] Dale, G.A. 2000. Distractions and coping strategies of elite decathletes during their most memorable performances. *The Sport Psychologist* 14: 17-41.
- [13] Duda, J.L. 1995. Level of competitive trait anxiety and sources of stress among members of the 1993 Top Team. *Technique* 16: 10-13.

- [14] Duda, J.L. & Gano-Overway, L. 1996. Anxiety in elite young gymnasts. Part II – Sources of stress. *Technique* 16: 4-5.
- [15] Ganioa, M.S., Armstronga, L.E., Casaa, D.J., McDermotta, B.P., Leea, E.C., Yamamotoa, L.M., Marzanoa, S., Lopeza, R.M., Jimenez, L., Bellegoa, L.L., Chevillottea E. & Liebermana, H.R. (2011). Mild dehydration impairs cognitive performance and mood of men. *British Journal of Nutrition*, Vol. 106 (10), 1535-1543.
- [16] Greenberg, J.S. (1999). *Stress Management*. New York: McGraw-Hill.
- [17] Gould, D., Finch, L.M. & Jackson, S. 1993. Coping strategies used by national champion figure skaters. *Research Quarterly for Exercise and Sport* 64: 453-468.
- [18] Hann, Y.L. (2000). *Emotions in sports*. Champaign, Illinois: Human Kinetics.
- [19] Heather B. 2010. *Psychology: motivation, anxiety, confidence and goal setting*. (<http://www.soccernh.org/LinkClick.aspx?fileticket=z-jKZpam25k%3D&tabid=4766>)
- [20] Humphrey, J. H., Yow, D. A. & Bowden, W. W. (2000). *Stress in college athletics: Causes, consequences, coping*. Binghamton, NY: The Haworth Half-Court Press.
- [21] Jarvis, M. 2002. *Sport Psychology*. New York: Routledge.
- [22] Jones, G. 2000. Stress and anxiety. In S.J. Bull, *Sport Psychology: A self-help Guide* (p. 31-51). Ramsbury, Marlborough: Crowood.
- [23] Klint, K.A., & Weiss, M.R. 1986. Dropping in and dropping out: Participation motives of current and former youth gymnasts. *Canadian Journal of Applied Sport Sciences* 11: 106-114.
- [24] Lavalley, L. & Flint, F. 1996. The relationship of stress, competitive anxiety, mood state, and social support to athletic injury. *Journal of Athletic Training* 31: 296-299.
- [25] Loupos, Fotini, Barkoukis & Tsorbatzoudis 2008. Psychological and Physiological Changes and Application in a Swimming Competition. *The Open Sports Medicine Journal* 2: 41-46.
- [26] Lloyd, P. & Mayes, A. 1999. *Introduction to psychology: An integrated approach*. London: Diamond books.
- [27] Martens, R., Vealey, R.S., & Burton, D. 1990. *Competitive Anxiety in Sport*. Champaign, Illinois: Human Kinetics.
- [28] Montgomery, B., & Morris, L. 1994. *Living with anxiety*. Singapore: Heinemann Asia.
- [29] Murphy, S. M. 1988. The on-site provision of sport psychology services at the 1987. U. S
- [30] Olympic Festival. *The Sport Psychologist* 2: 105-130.
- [31] O'Neil, H.F. & Abedi, J. 1992. Japanese children's trait and state worry and emotionality in a high-stakes testing environment. *Anxiety, Stress, and Coping* 5: 253-267.
- [32] O'Neil, H.F., Baker, E.L. & Matsuura, S. 1992. Reliability and validity of Japanese trait and state worry and emotionality scales. *Anxiety, Stress, and Coping* 5: 225-239.
- [33] Orlick, T., & Partington, J. 1988. Mental links to excellence. *The Sport Psychologist*, 2: 105-130.
- [34] Park, J. 2000. Coping strategies by Korean national athletes. *The Sport Psychologist* 14: 63-80.
- [35] Payne, E.K. 2003. *Competitive anxiety and coping of female collegiate soccer goalkeepers*. A thesis presented to the faculty of the Human Performance, San Jose State University.
- [36] Pragman, D. 1998. *Understanding sport psychology*. New Jersey: Prentice-Hall.
- [37] Pritchard, M. E., Wilson, G., & Yamnitz, B. (2004). What predicts adjustment among college students? A Longitudinal Panel Study. Manuscript submitted for publication.
- [38] Raglin, J.S. & Hanin, Y.L. 2000. Competitive anxiety. In Yuri, L.H., *Emotions in Sport* (p. 93-111). Champaign, IL: Human Kinetics.
- [39] Rotella, R.J. 1984. Psychological care of the injured athlete. In L. Bunker, R.J. Rotella, and A.S. Reilly (Eds.) *Sport psychology: Psychological considerations in maximizing sport performance* (p. 273-288). Ithaca, NY: Movement.
- [40] Sewell, D., & Edmondson, A. 1996. Relationships between field position and pre-match competitive state anxiety in soccer an field hockey. *International Journal of Sport Psychology* 27: 159-172.
- [41] Spielberger, C.D. 1966. *Anxiety and behavior*. New York: Academic Press.
- [42] Weinberg, R. 1989. Anxiety, arousal, and motor performance: Physiological changes and application. In Dieter Hackfort and Charles D. Spielberger, *Anxiety in sports* (p. 95-105). New York: Hemisphere.
- [43] Weinberg, R.S. & Gould, D., 2011. *Foundations of Sport and Exercise Psychology*, 2nd ed. Champaign, IL: Human Kinetics.
- [44] Weiss, M.R., Weise, D.M. & Klint, K.A. 1989. Head over heels with success: The relationship between self-efficacy and performance in competitive youth gymnastics. *Journal of Sport and Exercise Psychology* 11: 444-451.
- [45] Wilson G, & Pritchard M. 2005. Comparing sources of stress in college student athletes and non-athletes. *Athletic Insight: Online J Sport Psych.* 2005;7, no pagination specified.