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A Study on Physiological Reactions of Sportsmen

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Abstract – There are many factors which enhance the learning in the field of sports and there are many other such factors which slow down the process of learning. These factors are generally involved in the physiological or mental conditions of the individuals like anxiety, time of day, temperature, effect of drugs etc. If these factors are not properly controlled, these can affect the performance in a negative way. But, if these are properly managed then they become helpful elements in learning. So, it is necessary to understand their effect on the performance and learning process.

Games and Sports are becoming important day by day. Now – a- days, these are taking the shape of a profession. So, it has become necessary to investigate the factors that affect the sports performance.

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INTRODUCTION:-

Some physiological reactions such as sweating, drying of the mouth , rapid shallow breathing and dizziness , increased heart- beat and mental tension are associated with anxiety . Anxiety is considered as a block to sports activities. A person who suffers from anxiety may not be able to devote his full energy in the performance of sports. It is, therefore, considered by means scholars that anxiety interferes in sports performance. This notion is however, based on an errorneour understanding of the role of anxiety. In fact, anxiety might deter learning or performance or might also stimulate it.

Anxiety has been defined in a variety of ways, such as “A distributed state of the body” (Johnson, 1951); “Emotional reactivity” (Hardman and Johnson, 1952); “Unrealistic and unpleasant state of body and mind” (Pikunar, 1969); “Nervousness” (Ekegami, 1970).

In medical terminology, anxiety is defined as “appreciation of danger accompanied by restlessness and a family of appression in the epigastrium”.

REVIEW OF LITERATURE

Knowledge of the physiological demands in sports is important to improve procedures for both training prescription and organization (Bouhlel, et al., 2012; Degoutte, Jouanel & Filaire, 2013).

Brazilian jiu-jitsu is a sport that has gained much popularity throughout the world. However, there have been only a few studies on the physiological aspects of this sport (Andreato, et al., 2012; Moreira, et al., 2012; Vidal-Andreato, et al., 2011; Franchini, Bezerra, Oliveira, Souza, & Oliveira, 2005a; Franchini, Takito, & Pereira, 2003). Because of the duration and temporality of the fights and the moderate blood lactate concentrations (LAC) (10.2±1.5 mmol/L) observed in fighters post-fight (Del Vecchio, Bianchi, Hirata, & Chacon-Mikahili, 2007), Brazilian jiu-jitsu can be considered a predominantly aerobic sport, as the black belt combats last ten minutes, with a moderate activation of the glycolytic system.

However, this fact is debatable because there have not been adequate studies conducted on all of the energy systems involved in the physiology of those engaged in this sport. Thus, the physiological variables for study should be those that are relevant to the sport (Franchini, Matsushigue, Vecchio, & Artioli, 2011), and indirect markers of stress should be measured, such as LAC, heart rate (HR) and rate of perceived exertion (RPE).

In fact, in combat sports, the measurement of physiological responses for gas analysis during the combat itself has been performed only in sports that involve percussive actions such as karate (Beneke, Beyer, Jachner, Erasmus, & Hutler, 2012), kickboxing (Crisafulli, et al., 2009) and taekwondo (Campos, Bertuzzi, Dourado, Santos, & Franchini, 2012).

In contrast, in combat sports such as judo and wrestling, where grappling actions are important, measures for indirect markers have been taken after a fight, or at specific times of combat (Barbas, et al.,

2011; Degoutte, et al., 2003; Franchini, Bertuzzi, Takito 2009; Kraemer, et al., 2001).

In an investigation by Degoutte et al. (2003), for instance, the researchers obtained blood samples in judo combats simulations to determine the energy demands during a judo match, and concluded that judo combats resulted in glycolytic pathway activation, but also induced both the protein and lipid metabolism.

For example, when time-motion is considered, Brazilian jiu-jitsu (170 seconds of activity – groundwork: 146±119 seconds, standing combat: 25±17 seconds – followed by 13±6 seconds intervals; Del Vecchio et al., 2007) has more longer combat phases than judo (30±33 seconds of activity separated by 11±10 seconds long intervals; Miarka et al., 2012) and wrestling (37±10 seconds of activity separated by 14±6 seconds long intervals; Nilsson, Csergo, Gullstrand, Tveit, & Refsenes, 2012). This fact can promote distinct physiological responses that should be investigated.

Thus, it is necessary to conduct specific studies involving Brazilian jiu-jitsu and it is essential to evaluate the energy demands, the changes in cardiovascular markers, and the rate of perceived exertion, which can be useful to improve training quality.

Another relevant aspect to be studied is the cellular stress generated from the use of energy substrates and metabolites and the damage generated by mechanical stress developed especially during eccentric actions performed to control the opponent.

Muscle injury can be assessed by measuring serum levels of the muscle injury markers originating from the sarcolemma. Among the biochemical markers used to identify muscle cell damage, creatine kinase (CK) is the most commonly used (Clarkson, Nosaka, & Braun, 1992; Armstrong, 1990), but other biomarkers such as aspartate amino-transferees (AST), alanine aminotransferase (ALT), creatinine, LAC and lactate dehydrogenase (LDH) can also provide relevant data about cell damage (Bessa, et al., 2008).

OBJECTIVES OF THE STUDY

The following are the objectives of the study:

1. To study the pre competitive anxiety level of individual games and team games.

2. To compare the pre competitive anxiety level between handball players and swimmers.

3. To compare the pre competitive anxiety level between handball players and cyclists.

4. To compare the pre competitive anxiety level between softball players and swimmers.

5. To compare the pre competitive anxiety level between softball players and cyclists.

6. To compare the pre competitive anxiety level between handball players and softball players.

7. To compare the pre competitive anxiety level between swimmers and cyclists.

RESEARCH METHODOLOGY

To make comparative study of anxiety level of sportsmen of individual who participated in inter-college and tem games tournaments held at K.U.K. dated – 03.09.2012 to 21.11.2012.

60 players under 25 year's age – group were taken as sample. This sample consists of players of two team games, namely softball (15 players) and Handball (15 players) and two individual games namely Swimming (15 players) and Cyclists (15 players) for the collection of the primary data. The investigator used the sports competition anxiety test of (adult form) of Rainer martens (1977) to measure trait anxiety. This test consists of 15 statements which ask players to respond how usually they feel when they are competing in sports and games. The inventory has no time – limit, normally, 5 minutes is required for its completion. Primary data was collected. The data was collected 1 hour before each competition. They were asked to sit for 3 minutes to cool down.

Then necessary instructions were given before presenting the questionnaire to subjects. Same procedure was followed every time.

DATA ANALYSIS AND INTERPRETATION

The schedule of competition is as follows:

Schedule

Inter- College Competitions

Games	Date	Place
Handball	06.10.12 to 10.10.12	K.U. Kurukshetra
Softball	30.10.12 to 31.10.12	K.U. Kurukshetra
Cycling	5.10.12 to 6.10.12	K.U. Kurukshetra
Swimming	3.9.12 to 5.9.12	K.U. Kurukshetra

Scoring:

In a form of SCAT, all the 15 test items are rated on 3 points scale by the subjects, viz 1. Never 2. Sometimes 3. Always.

The 10 test items (2,3,5,6,8,9,11,12,14,15) are scored according to the following directions , whereas the spurious items (1,4,7,10,13) are not scored. I point for never, 2 points for sometimes, 3 points for always. Scoring for items 6 and 11 is reversed according to the following keys I point for always; 2 points for sometimes, 3 points for never.

Thus, the range of possible SCAT score extends from 10 to 30.

SCAT – A Norms

SCORES	GROUPING
25 – 30	Highly Anxious
18 – 24	Above Average
12 - 17	Average
LESS THAN 12	Less than Normal

Statistical Techniques Used:

The obtained data were analyzed by applying the statistical techniques mean standard deviation and T-ratio.

RESULTS AND FINDINGS OF ANXIETY DIFFERENCES

Table

Highlight of the level of anxiety of the players of different individual and team games

Name of games	mean anxiety	SD
Swimming	17.33	2.41
Cycling	18.60	3.18
Handball	16.87	2.28
Softball	19.28	3.02

It can be observed from Table mean pre- competition anxiety scores of swimming (individual event) is 17.33 and SD is 2.41 which generally show the anxiety level is average in swimmers of individual games. Mean score of cycling (individual event) is 18.60 with SD 3.18. In general, players of this individual event have little above to average anxiety level.

In case of Handball (team games) mean score of anxiety is 16.87 with the SD of 2.28, which again shows that level of anxiety is average. Mean anxiety of Softball (team games) is 19.28 with SD of 3.02; which shows that these players have above average anxiety level.

In general, it can be concluded that players of cycling and softball have above average anxiety level and the players of swimming and handball have average anxiety level. But, the mean value of anxiety level in the case of Softball and Cycling is very little above average.

Table

Means, SD and t-ratio between Handball players and Swimming players

GAMES	MEAN	SD	NO	SE_D	t-ratio
Swimming	17.33	2.41	15		
				0.856	0.521
Handball	17.87	2.28	15		

It is clear from the table that mean scores of swimming (individual event) and Handball (Team Game) players are found to be 17.33 and 16.87 respectively with SD of 2.41 and 2.28.

So, we can say that swimming and handball players do not differ significantly in their level of anxiety. So the hypothesis that there does it.

Since the t- ratio is less than the table value against 0.98 degrees of freedom at 0.5 level of significance. The difference between mean scores is not significant.

Table

Means, SD and t-ratio between Handball Players and cycling players.

GAMES	MEAN	SD	NO.	SE_D	t-ratio
Handball	16.87	2.28	15		
				1.009	1.72
Cycling	18.6	3.18	15		

It can be observed from the table that mean scores of handball (team game) and cycling (individual games) are 16.87 and 18.6 with standard deviation of 2.28

and 3.18 respectively. The t-ratio comes out to be 1.72.

Since the t-ratio is less than the table value at 0.5 level of significance, the difference between mean scores is insignificant. Hence, the hypothesis that there does not exist a significance difference. Handball players and cycling players in the level of pre- competition anxiety is again selected.

Table

Means, SD and t-ratio between Softball Players and cycling players

GAMES	MEAN	SD	NO.	SE_D	t-ratio
Cycling	18.6	3.18	15		
				1.33	0.59
Softball	19.27	3.02	15		

From the table, it can be seen that the mean scores of cycling (team game) and handball (individual games) are 18.6 and 19.27 with standard deviation of 3.18 and 3.02 respectively. It has standard error value of 1.33 and t-ratio comes out to be 0.59.

As the t-ratio is less than the table value at 0.5 level of significance (1.96), the difference in mean scores of cycling and softball players are not significant or it cannot be said that cycling and softball players do not differ in respect of their pre-competition anxiety level.

Hence, the hypothesis that there does not exist a significance difference in anxiety level of softball players and cycling players is retained. The players irrespective of their different games have same level of anxiety level.

Table

Means: SD and t-ratio between Softball Players and Swimming players.

GAMES	MEAN	SD	NO.	SE_D	t-ratio
Softball	19.27	3.02	15		
				0.998	1.94
Swimming	17.33	2.41	15		

It can be observed from the table that mean scores of anxiety of softball (team game) and swimming (individual games) players came out to be 19.27 and 17.33 with standard deviation of 3.02 and 2.41 respectively. The t-value came out to be 1.94.

Since the t-value is less than the table value at 0.05 level of significance (1.96) , the difference in the mean anxiety is not significant. The hypothesis that Softball players and swimming players do not differ from the level of their mean anxiety is retained.

Table

Means ; SD and t-ratio between Handball Players and Softball players

GAMES	MEAN	SD	NO.	SE_D	t-ratio
Handball	16.87	2.28	15		
				0.97	2.47
Softball	19.27	3.02	15		

It can be found from the table that the mean scores of pre-competition anxiety of handball (team game) and Softball (individual games) players are 16.87 and 19.27 with standard deviation of 2.28 and 3.02 respectively.

The t-ratio for handball and softball players comes out to be 2.47. Since t-value is more than the table value of significance at 0.5 level of significance. The difference between the mean scores is significant. In other words, we can say that handball and softball players differ in respect of their pre-competition anxiety level. Hence our hypothesis that the players of both the team games do not differ in respect of their anxiety is rejected.

Table

Means : SD and t-ratio between Swimming players and Cycling Players.

GAMES	MEAN	SD	NO.	SE_D	t-ratio
Cycling	18.6	3.18	15		
				1.03	1.23
Swimming	17.33	2.41	15		

It can be seen from the table that mean scores of cycling (individual game) and swimming (individual games) players are 18.6 and 17.33 with standard deviation of 3.18 and 2.41 respectively. The t-value is 1.23.

Since the t-value is less than the table value at 0.05 level of significance, the difference in the mean scores is insignificant. Hence, the hypothesis that there does not exist a significance difference between

cycling and softball players in the level of their pre-competition anxiety is retained.

CONCLUSION

These can be summed up as under:-

1. In general, players of different games do not differ in the level of pre-competition anxiety.
2. There is not found significant difference in the level of pre-competition anxiety level between Handball and Swimming Players.
3. Handball and Cycling players do not differ in the level of their pre-competition anxiety.
4. There does not exist significant difference in level of the pre-competition anxiety between softball and swimming players.
5. Softball players and cycling players do not differ in the level of their pre-competition anxiety.
6. Handball and softball Players differ significantly in the level of pre-competition anxiety.
7. Cycling Players and swimmers of individual games also do not differ in the level of pre-competition anxiety undertaken.

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