Relationship between pre-competition anxiety and performance levels in inter-university women football teams

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Abstract
Introduction: One of the psychology factor that is believed to have an effect on athletic performance is the level of anxiety experienced prior to an athletic contest. This is referred to in the literature as pre-competitive anxiety (PCA). PCA has both positive as well as negative role in performance.

Objective: The aim of this study was to see the relation between performance and PCA level in inter-university women football team.

Methodology: Study design: Present study was a cross-sectional study and correlational design. Sample size: 273. Sex: Female. Number of teams: 16 amongst total 20 teams.

Results: All teams had moderate level of anxiety (mean SCAT score >17) expect two teams. There was a high correlation between pre-competitive anxiety (PCA) and performance (rho 0.904). This level of correlation decreased when individual SCAT score based on rank and SCAT score based on position (rho 0.904).

Conclusion: The present study supports that within moderate PCA level, the performance increases as the PCA level decreases amongst national level inter-university football teams.

Keywords: Athletic performance; Football; Youth sport; Test anxiety scale; Universities; Survey and questionnaires

1. Introduction

Team sports like football, individual player’s physiological and psychological factors play a significant role on performance [1, 2]. Many studies from western countries show the role of psychological factors on sports performance [3]. Players experience anxious thoughts just before the important games and tournaments due to the expectation from team management, fans, financial rewards (motivation) etc. [4, 5]. These thoughts can influence the on-field performance either positively or negatively depending on the personality type of players, experience [6], mental skill [7], strength of opponent team [8], strength of own team [9] etc. [10]. Anxiety can be defined as the tensions or worries due to stress (i.e) team sports important matches. Even though many literatures described anxiety as negative factor, it may improve or decrease the performance depending on the factors mentioned above. There are two forms of anxiety trait and state. Trait anxiety is a personality of an individual who respond to the situations in a same manner over the period of time and is stable. Whereas state anxiety is situation-specific which occurs just before the situation (i.e) situations the player thinks important or significant to their career. Among the two types, state anxiety plays a significant role on performance especially in important tournaments, games. Literature describes this as pre-competition anxiety (PCA). PCA has both positive as well as negative role on performance of individual players which translates into team performance. Another classification of anxiety is somatic anxiety and cognitive anxiety.
Somatic anxiety depends on physical/physiological state of player whereas cognitive anxiety depends on mental state of the players. Performance of players improves with increasing anxiety, literature describes this as arousal, level up to the extent\[11, 12\]. If the anxiety crosses certain limits, the player will lose the control and their performance started to decrease\[13, 14\]. Players cannot perform at their best like they usually do because of anxiety. This is called inverted ‘U’ theory which was first described by Yerkes and Dodson\[15\]. This individual player’s performance collectively may influence the team’s success or failure in the tournament\[16\]. Many researchers conducted experiments to see the association between anxiety and performance\[17, 18\].

Most of the literature supports that high level of PCA will decrease the players performance in important tournaments\[14, 19\]. During the 1980s and thereafter, sport-specific trait anxiety has frequently been assessed using the Sport Competition Anxiety Test (SCAT)\[20\], a uni-dimensional measure that does not distinguish between or measure differences in somatic and cognitive anxiety. The aim of this study is to see the relation between performance and PCA level in inter-university women football team players.

2. Methodology

2.1 Study design: Present study was a cross-sectional study and correlation design.

2.2 Sample size: All players who participated (n=365) all-India inter-university tournament held at GJUST, Hisar in the months of December 2013-January 2014, were invited to join this study by explaining the purpose. 273 (response rate 74.8%) women football players were agreed to participate. Prior to contacting players, permission was requested from coaches. Written informed consent was taken from every player who volunteered to the study.

2.3 Instrument used: Competition related anxiety of the athletes was measured using Sport Competition Anxiety Test (SCAT) developed by Rainer Martens in 1977 \[20\]. All 273 players were provided with SCAT questionnaire and they were asked to give their opinion strictly independent manner. SCAT contains 15 items, which include 5 spurious items, 8 positive items and 2 negative items. Each item had three possible responses i.e. (a) Rarely (b) Sometimes (c) Often. 10 measure (item 2, 3, 5, 6, 8, 9, 11, 12, 14, 15) symptoms associated with anxiety. The five items (1, 4, 7, 10, 13) that are not scored, are included to reduce bias. We modified the SCAT form to meet our requirements (i.e) standard instructions of the SCAT ask respondents to indicate how they “usually feel when competing in sports and games”; however, to make the instruments more relevant to the players in this study, the phrase “sports and games” was replaced with the word “football” etc. The lowest possible score is 10 on this test and the highest possible score is 30. A low score indicates low anxiety and a high score indicates high anxiety.

2.4 Protocol: Before administering the SCAT test, the procedure and the purpose was briefly explained to all the subjects for better understanding and to increase the motivation level. All participants completed SCAT form approximately 2 hours before the scheduled match time to allow the proper preparation of individual team. The SCAT form used for this study was in English and examiner translated to Hindi if player not able to understand. Help of other player with English knowledge was used to translate it to the players who mother tongue was not Hindi and unable to understand English. It took approximately 5 minutes to complete the form. Since the tournament contained both league (round-robin) and knock-out stage, SCAT was administered only once during league stage by three of the authors (VS and both SP). The teams were ranked according to their final position in the tournament.

2.5 Data analysis: Data was analyzed using IBM SPSS (version 21.0) software. Spearman rank correlation test was used to measure the correlation between PCA and performance.

3. Results

All 273 players were from 5 different zones (3-4 universities from each zone) of the country (55 players from central zone, 46 from north zone, 51 from east zone, 50 from west zone and 68 from south zone). All teams had moderate level of PCA (SCAT score between 17.3 and 21.17) expect two teams which had low level (team 6 and 16). Mean SCAT score 18.7 fell within the lower end of moderate anxiety level. Spearman rank correlation test showed that there was a moderate negative correlation between mean team PCA and performance based on final ranking after tournament (rho - 0.554) (Table 1).

Table 1: Descriptive statistics and spearman’s correlation of team SCAT score and rank based on final performance (individual n=273; team n=16)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Team Code (n)</th>
<th>Zone</th>
<th>Rank</th>
<th>SCAT Mean±SD</th>
<th>Low Score</th>
<th>High Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team 1 (19)</td>
<td>Central</td>
<td>7</td>
<td>19.53±2.82</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>Team 2 (18)</td>
<td>Central</td>
<td>8</td>
<td>17.67±3.16</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Team 3 (18)</td>
<td>Central</td>
<td>16</td>
<td>19.78±1.17</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>Team 4 (18)</td>
<td>North</td>
<td>1</td>
<td>17.39±4.03</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>Team 5 (12)</td>
<td>North</td>
<td>11</td>
<td>21.17±2.08</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>Team 6 (16)</td>
<td>North</td>
<td>6</td>
<td>14.81±2.14</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>7</td>
<td>Team 7 (16)</td>
<td>East</td>
<td>10</td>
<td>20.06±1.98</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>8</td>
<td>Team 8 (16)</td>
<td>East</td>
<td>13</td>
<td>18.69±1.66</td>
<td>16</td>
<td>21</td>
</tr>
<tr>
<td>9</td>
<td>Team 9 (20)</td>
<td>East</td>
<td>5</td>
<td>17.30±1.34</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>Team 10 (17)</td>
<td>West</td>
<td>15</td>
<td>19.53±4.26</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>11</td>
<td>Team 11 (16)</td>
<td>West</td>
<td>14</td>
<td>19.44±2.42</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>12</td>
<td>Team 12 (18)</td>
<td>West</td>
<td>12</td>
<td>20.83±4.31</td>
<td>14</td>
<td>27</td>
</tr>
<tr>
<td>13</td>
<td>Team 13 (13)</td>
<td>South</td>
<td>3</td>
<td>18.38±1.71</td>
<td>16</td>
<td>22</td>
</tr>
<tr>
<td>14</td>
<td>Team 14 (18)</td>
<td>South</td>
<td>9</td>
<td>19.67±2.17</td>
<td>17</td>
<td>24</td>
</tr>
<tr>
<td>15</td>
<td>Team 15 (18)</td>
<td>South</td>
<td>4</td>
<td>19.78±2.86</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>16</td>
<td>Team 16 (20)</td>
<td>South</td>
<td>2</td>
<td>16.10±2.88</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Grand Total (273)</td>
<td></td>
<td></td>
<td>18.70±3.16</td>
<td>10</td>
<td>27</td>
</tr>
</tbody>
</table>
When the analysis was done based on best level of play during the tournament, both the mean SCAT score as well as correlation were similar to that of previous table (Table 2). The negative correlation between PCA and performance was decreased to mild when we analyzed individual SCAT score instead on team SCAT score (rho -0.326 versus -0.554). Results also showed excellent positive correlation between SCAT score based on team’s final performance rank and SCAT score based on team’s best level of play (rho 0.904).

4. Discussion

Purpose of this study was to see the relation between performance and PCA level in elite inter-university women football teams. Result of this study indicates that there was a moderate negative correlation between PCA and performance. PCA is one of the several psychological factors that are believed to have a significant affect on athletic performance [17, 21].

Mean SCAT score found in this study is similar to Indian college level volleyball players [22]; Indian university level field hockey players [23, 24]; Indian college level and academy level cricketers [25, 26].

Parnabas et al. found a moderate-to-high negative correlation in team sports like football [27], handball [28], basketball [29] and field-hockey [30] at university level. Our results also presents that there is a moderate negative correlation between performance and PCA. The importance of this study is the association is within moderate level of anxiety in all teams. Literature shows that both low as well as high anxiety will decrease the performance [11-13].

Craft et al. [17] conducted a meta-analysis on 29 studies to find out the relationship between cognitive anxiety, somatic anxiety, self-confidence subscales of and sports performance. They concluded that only self-confidence subscale showed consistent positive relationship with performance. Their subgroup analysis also showed self-confidence subscale with performance for team sports players (n=18); cognitive anxiety and self-confidence subscales with performance for college level athletes (n=16); self-confidence and somatic anxiety subscales with performance when the questionnaire administered 1-4 hours before competition (n=10). Their findings showed cognitive anxiety (very small) and self-confidence (moderate) had positive relationship with performance. Somatic anxiety had negative relationship (very small) with performance.

Football is a team game which involves not only complex and accurate motor skills but also psychological factors that differentiate the winning and losing team in major competitions. Ethiopian university level male football players scored less SCAT score (mean 16.47) than present study (mean 18.7) [31]. Similarly Indian district level male soccer players had mean SCAT score of 17.85 [32]. Generally females show more anxiety than males in different sports partly because of biological factors and societal expectations [33, 34]. A slight change in somatic anxiety between different zone players was observed during pre-competition. This may be due to difference between zones that progressed from league stage to knock-out stage (4 teams from south and 3 teams from north progressed to quarter finals. 3 teams from south progressed to 1-4 rank classification). This finding could be also due to the non-specificity of the questions in the SCAT form (i.e. the cues somatic anxiety is characterized by rapid heart rate and muscle tension which are also associated with the onset of exercise. Therefore, when subjects are asked to rate ‘my heart is racing’, the subjects could not interpret this question as exercise induced rather than anxiety induced. However, this problem was prevented by administering the SCAT two hours before the starting of the game.

The main limitation of this study is PCA was measured only once during the league stage of the tournament. It is possible that PCA might have increased as the tournament advanced especially amongst high ranked teams. This study demonstrates that PCA has negative influence on performance in university level football players. Several rehabilitation techniques such as bio-feedback, diaphragmatic breathing, relaxation technique, visualization, progressive muscle relaxation, goal-setting, positive talk, focusing on performance (meditation), mental imagery could be used to reduce PCA [21, 33]. Sports physiotherapists, psychologists and coaches who are having experience in these techniques could be employed to reduce anxiety level just before the important team sports tournaments.

5. Conclusion

Present study demonstrates moderate negative correlation between PCA and performance in elite Indian university level women football players. We recommend identifying the individual players with high anxiety level and train them through positive thinking and other mental techniques so that chances of their team’s success will be increased. Sports psychologists, coaches and sports physiotherapists may be used for this purpose.

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6. References
2002; 5:12.