Influence Of Aggression On The Bowling Performance Of Fast Bowlers In Cricket: A Study On College Players

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Abstract
Human aggression has a significant effect on sports performance. The study aimed to examine the influence of physical aggression, emotional aggression, anger, and hostility of fast bowlers on their bowling performance. A sample of 92 fast male bowlers was selected from the Faisalabad Division Colleges through simple random sampling. A structured instrument was utilized for data collection. Descriptive statistics, correlation, and regression analysis techniques were used to find out the relationship between study variables. The levels of physical aggression, emotional aggression, anger, and hostility of the participants were above a moderate level. The bowling strike rate of the players had a significant and positive correlation with physical aggression, emotional aggression, anger, and hostility. Emotional aggression had a positively significant while hostility had a negatively significant influence on bowling strike rate. Physical aggression and anger had non-significant but emotional aggression and hostility had a significant influence on the bowling strike rate. Physical aggression, emotional aggression, anger, and hostility had a significant effect on the economic rate. Physical aggression and anger had also significant influence on bowling average.

Keywords: Aggression, Anger, Hostility, Cricket Bowlers, Performance.

INTRODUCTION
Aggression has an open social interaction, often harmful, to cause harm to others or other unpleasant situations. It is a virtually universal behavior among human beings. It can happen without absolute or provocative. In people, frustration with blocked goals can cause aggression which leads to physical and psychological anger (Praveen, 2015). Aggression and hostile actions are sometimes considered necessary by some people and these have an effect on the way we arrange compatibility, and sometimes it is believed that attack and hostility are considered necessary by some people, and sometimes it is a method to adapt
and even sometimes influence on sports performance. The existence and duration of this behavior and potential results can be found (Krishnaveni & Ahmed, 2014). An aggressive and violent act is associated with sports that are illegal or unthinkable outside sports (Krishnaveni, Shahin, 2014).

Aggression is an energetic assault for a purpose and it is always associated with some negative emotional state and anger which is very much related to aggression. It is usually aroused by some provocation or any behavior that causes further injury or damage to humans that is promoted to prevent such treatment. Two types of aggression have been defined by sports psychologists in sports, hostile and instrumental (Cooper, 2008). Hostile aggression is where an individual deliberately harms others physically or by using abusive language whereas instrumental aggression is where the main goal is not to harm others and is used to achieve certain goals also called channeled aggression (Animesh et al., 2016).

Personality traits such as tough-mindedness and aggressiveness are positively related to success in the sports arena. Studies have revealed that aggression differs significantly at different levels of athletic competitions with elite athletes exhibiting a higher level of aggression and recommended psychological preparation is of utmost importance. Numerous studies have been conducted on different levels of athletes revealed equivocal results, sports psychologists believe that aggressive behavior can be negative, morally unacceptable, and may lead to a decrease in performance but have a common place for hockey, football, and boxing that can be targeted at aggression (Dinesh and Kumar, 2016).

In recent days, aggressive behavior has become a vital problem and most companies have a great deal of concern. The whole world seems to be under the pressure of aggressive actions in various ways. Violence in many parts of the world creates anxiety and undoubtedly creates chaos and disturbs the peace and harmony of the world. The cycle of aggression is used in different ways. We talk about "good" aggression and "bad" aggression. Aggression is a term commonly used in sports. Any kind that is carried out to harm another person is called aggression. Aggression is desirable behavior for maximum performance in sports and games, players must be aggressive with the nature of the game. The reason that aggression is usually the frustration of the situation (Kumar and Kaur, 2016).

Cricket is a gentlemen’s game but like other games, the performance of the players is affected by the aggression in positive or negative ways. In some studies, it was described that bowling is much affected positively by aggression. The reason was that bowlers began to play bowling with a fluid run to create a linear pulse that passes through the lower end of the upper body on the anterior foot during delivery which leads to aggression (Akash and Krishna, 2016).

Fast bowlers or fast pitchers rely on speed to get out of a batsman. The main mission of a bowler is to eliminate the batsman. Throw a small ball into the bat and bust him once before he arrives. Skilled bowlers can throw the ball with such rotation that it is thrown in a different direction on the ground by a false bat (Kumar, 2016).

The purpose of this work in the game of cricket is to observe how fast the diffusion inside and outside the competition is aggressive. During the competition, the failure the competition is
divided into emotional and physical violence. The aggressor's aggression is a social problem arising from the desire to work and to prove the moral interest. The study strives to find out the extent to which the aggression affects the performance of the fast bowler since fast bowlers are more inclined to fully exert their energies to create more paces and attack and get a batsman out. It can also lead to adverse effects and undesired results. (Krishnaveni and Shahin, 2014).

Accordingly, the present study is intended to survey a sample of fast bowlers in Govt. Colleges of Faisalabad Division, Punjab, Pakistan, at intermediate level to investigate the impact of aggression on fast bowler’s performance. This study will help future coaches and physical education teachers to develop competence in cricket. Therefore, it was hypothesized that aggression has a positive and significant influence on the performance of fast bowlers among college players. Some latest studies in the field of physical educations have been reported in (Iqbal et al., 2019; Salma et al., 2020; Aamina et al., 2020; Aqsa et al., 2020; Threem et al., 2020; Aqsa et al., 2021; Rabia et al., 2021; Sana et al., 2021; Saadia et al., 2021; Farwa et al., 2021; Hira et al., 2021).

MATERIAL AND METHODS

Participants: In this research, the population was from all the boy’s Govt. Colleges of Faisalabad Division, Punjab, Pakistan. Ninety-two (n=92) fast bowlers as a sample size were approached through a simple random sampling method.

Instrument: In this research data was collected by survey method and the research instrument (Arnold HB, Mark P., 1992) for aggression was a 5 Likert-scale (strongly disagree to strongly agree) questionnaire. Reliability of the study was ensured with the statistical test Cronbach's alpha through pilot testing, which was 0.98.

Procedure: Data were collected from respondents on a structured questionnaire through personal visits by the researcher. Each item of the instrument was assigned numbers from 1 to 5 corresponding to strongly disagree to strongly agree. Items on the aggression scale were classified into four factors physical aggression, emotional aggression, anger, and hostility. The cricket profile of selected players was used for their bowling performance by their respective college management. Bowling strike rate, economy rate, and bowling average were used as dependent variables and their performance factors as well. Aggression attributes were used as independent variables and score variables for each segment were generated from corresponding selected numbers (1 to 5).

Data Analysis: Descriptive statistics, Pearson product-moment correlation analysis, and multiple regression analysis were carried out to analyze the data. Kolmogorov-Smirnov test was applied for data normality. The level of significance was accepted at $p \leq 0.05$. 

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RESULTS

Based on 5-Likert scale data, the score variables Physical Aggression (PA), Emotional Aggression (EA), anger, and hostility were computed. The descriptive statistics, and the mean and standard deviation of all study variables are given in Table 1. The same table showed that the levels of physical aggression, emotional aggression, anger, and hostility of the participants are above moderate.

Table 1 Descriptive Statistics and Data Normality Test.

<table>
<thead>
<tr>
<th>Items</th>
<th>Mean</th>
<th>SD</th>
<th>Kolmogorov Statistic</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Aggression</td>
<td>3.84</td>
<td>6.01</td>
<td>0.09</td>
<td>92</td>
<td>0.07</td>
</tr>
<tr>
<td>Emotional Aggression</td>
<td>3.96</td>
<td>2.59</td>
<td>0.12</td>
<td>92</td>
<td>0.30</td>
</tr>
<tr>
<td>Anger</td>
<td>3.62</td>
<td>4.95</td>
<td>0.30</td>
<td>92</td>
<td>0.08</td>
</tr>
<tr>
<td>Hostility</td>
<td>3.88</td>
<td>4.35</td>
<td>0.27</td>
<td>92</td>
<td>0.13</td>
</tr>
<tr>
<td>Bowling Strike Rate</td>
<td>18.15</td>
<td>3.33</td>
<td>0.07</td>
<td>92</td>
<td>0.20</td>
</tr>
<tr>
<td>Economy Rate</td>
<td>5.85</td>
<td>1.15</td>
<td>0.08</td>
<td>92</td>
<td>0.20</td>
</tr>
<tr>
<td>Bowling Average</td>
<td>17.51</td>
<td>3.94</td>
<td>0.08</td>
<td>92</td>
<td>0.19</td>
</tr>
</tbody>
</table>

The current study included three major dependent variables such as bowling strike rate, economy rate, and bowling average which were to be analyzed under the physical and psychological attitudes of the fast bowlers. Therefore, the normality of the said variables was checked through histogram charts (Figure 1) and the Kolmogorov test (Table 1) was applied to all study variables. The results of both techniques indicated that the data were normally distributed.

Figure 1 Histogram Charts for Bowling Strike Rate, Economy Rate, and Bowling Average
To find out the relationship between the generated score variables and observed variables of cricket players the Pearson correlation coefficients were computed and listed in Table 2. Bowling strike rate of the players was significantly and positively correlated with physical aggression ($r = 0.348, p < 0.01$), emotional aggression ($r = 0.335, p < 0.01$), anger ($r = 0.311, p < 0.01$) and hostility ($r = 0.257, p < 0.05$). The economy rate had a negative and significant correlation with ($r = -0.24, p < 0.05$) while the bowling average had a non-significant correlation with physical and emotional aggression, anger, and hostility of the players.

The influence of physical aggression, emotional aggression, anger, and hostility of the fast bowlers on their bowling strike rate, economy rate, and bowling average, the multiple regression analysis was employed. For this purpose, three multiple regression models were designed for bowling strike rate, economy rate, and bowling average separately.

**Table 2 Pearson Correlation Coefficients (n=92)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Bowling Strike Rate</th>
<th>Economy Rate</th>
<th>Bowling Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Aggression</td>
<td>0.348**</td>
<td>-0.174</td>
<td>0.131</td>
</tr>
<tr>
<td>Emotional Aggression</td>
<td>0.335**</td>
<td>-0.193</td>
<td>0.120</td>
</tr>
<tr>
<td>Anger</td>
<td>0.311**</td>
<td>-0.240*</td>
<td>0.046</td>
</tr>
<tr>
<td>Hostility</td>
<td>0.257*</td>
<td>-0.147</td>
<td>0.102</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 & ** Correlation is significant at the 0.01

Model 1:

Bowling Strike Rate (BSR)

\[
BSR = \beta_0 + \beta_1(\text{PA}) + \beta_2(\text{EA}) + \beta_3(\text{Anger}) + \beta_4(\text{Hostility}) + \epsilon
\]

Model 2:

Economy Rate (ER)

\[
ER = \beta_0 + \beta_1(\text{PA}) + \beta_2(\text{EA}) + \beta_3(\text{Anger}) + \beta_4(\text{Hostility}) + \epsilon
\]

Model 3:

Bowling Average (BA)

\[
BA = \beta_0 + \beta_1(\text{PA}) + \beta_2(\text{EA}) + \beta_3(\text{Anger}) + \beta_4(\text{Hostility}) + \epsilon
\]
Where $\beta_0$ is constant (intercept) of the line, $\beta_1, \beta_2, \beta_3, \& \beta_4$ are slopes (rate of change) of the line and $\varepsilon$ is the random factor.

The summaries of the fitted multiple regression models for the bowling strike rate, economy rate, and bowling average of the bowlers were listed in table 3. This table shows multiple correlations (R), coefficient of determination ($R^2$), adjusted $R^2$, and standard error of estimate (S.E) of the fitted in all above Equations. The same table shows that there were low multiple correlations ($R = 0.45, 0.45, 0.39$) between dependent and independent variables for all the models. The coefficients of determination had a very small value ($R^2 = 0.19, 0.24, 0.15$) which indicates that only 19%, 24%, and 15% of the variability in bowling strike rate, economy rate, and bowling average can be explained by the said regression models 1, 2 and 3, respectively. Similarly, adjusted $R^2$ has also a low value. However, all the three models were significant ($p<0.05$) as shown by ANOVA results in Table 4.

### Table 3 Summary of the Models

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>$R^2$</th>
<th>Adjusted $R^2$</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model-1</strong></td>
<td>0.45</td>
<td>0.19</td>
<td>0.15</td>
<td>3.06</td>
</tr>
<tr>
<td><strong>Model-2</strong></td>
<td>0.49</td>
<td>0.24</td>
<td>0.20</td>
<td>1.03</td>
</tr>
<tr>
<td><strong>Model-3</strong></td>
<td>0.39</td>
<td>0.15</td>
<td>0.11</td>
<td>3.71</td>
</tr>
</tbody>
</table>

$a=$Bowling strike rate, $b=$ Economy rate, $c=$Bowling average,
Predictors: (Constant), Hostility, Anger, Emotional Aggression, Physical Aggression

### Table 4 ANOVA Results for Significance of the Models

<table>
<thead>
<tr>
<th>Items</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>192.299</td>
<td>4</td>
<td>48.075</td>
<td>5.107</td>
<td>0.001</td>
</tr>
<tr>
<td>Residuals</td>
<td>818.909</td>
<td>87</td>
<td>9.413</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>28.823</td>
<td>4</td>
<td>7.206</td>
<td>6.815</td>
<td>0.000</td>
</tr>
<tr>
<td>Residuals</td>
<td>91.992</td>
<td>87</td>
<td>1.057</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regression</td>
<td>216.823</td>
<td>4</td>
<td>54.206</td>
<td>3.940</td>
<td>0.005</td>
</tr>
<tr>
<td>Residuals</td>
<td>1197.020</td>
<td>87</td>
<td>13.759</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), Hostility, Anger, Emotional Aggression, Physical Aggression,
Dependent Variable: 1Bowling Strike Rate, 2Economy Rate, 3Bowling Average

Table 5 shows the results for the significance of the regression coefficients of the models for bowling strike rate, economy rate, and bowling average. This table indicates the values of intercept (constant), slopes ($\beta_s$) of the lines, standard error (SE) of the estimate, t-statistic, and $p$-values for regression coefficients of each variable.

### Table 5: Significance of Regression Coefficients of the Models
The results (βs) of the same table showed that physical aggression positively influenced bowling strike rate, economy rate, and bowling average. It was non-significant for bowling strike rate but significant for economy rate and bowling average. Emotional aggression had a positive and a non-significant influence on bowling strike rate but a negative and significant effect on the economy rate and bowling average. Similarly, anger had a positive and a non-significant influence on bowling strike rate but a negative and significant effect on the economy rate and bowling average. Hostility had a negative and significant influence on the bowling rate but it had a positive effect on the economy rate and bowling average. It was significant for the economy rate but non-significant for the bowling average. Anger had a positive and a non-significant influence on the bowling strike rate but it had a negative and significant effect on the economy rate and bowling average. The fitted (predicted) models for bowling strike rate, economy rate, and bowling average are given below:

**Model-1:**

\[ \text{BSR} = 12.86 + 0.25 \text{ (PA)} + 0.76 \text{ (EA)} + 0.18 \text{ (Anger)} - 0.74 \text{ (Hostility)} \]

**Model-2:**

\[ \text{ER} = 4.98 + 0.26 \text{ (PA)} - 0.34 \text{ (EA)} - 0.52 \text{ (Anger)} + 0.39 \text{ (Hostility)} \]

**Model-3:**

\[ \text{BA} = 8.24 + 0.97 \text{ (PA)} - 0.32 \text{ (EA)} - 1.48 \text{ (Anger)} + 0.63 \text{ (Hostility)} \]
DISCUSSION
This study had been designed to find out the effect of physical aggression, emotional aggression, anger, and hostility of cricket players on their bowling performance. A sample size of 92 male bowlers was collected. The information regarding players’ aggression, anger, and hostility was obtained through a structured questionnaire. The internal consistency of the scale was 0.98. The levels of physical aggression, anger, and hostility of the players were above a moderate level. The bowling strike rate of the players had a significant and positive correlation with physical and emotional aggression, anger, and hostility. Emotional aggression had a positive and significant while hostility had a negative and significant influence on bowling strike rate. Physical aggression, emotional aggression, anger, and hostility had a significant influence on the bowling strike rate. Emotional aggression and hostility had a significant influence on the bowling strike rate. Physical aggression and anger had also significant influence on bowling average.

There is sufficient evidence to suggest that athletes who participate in contact sports were more aggressive than non-athletes (Sharma, et al 2017). Shahin (2014) also reported that the level of hostility after the game was considerably higher. This study also showed that the level of aggression and hostility in bowlers was above a moderate level. Wani (2017) described that aggression can be utilized to win the game. Negative emotions can influence their performance adversely. In the current study, it was observed that emotional aggression and anger had a negative influence on bowler’s economy rate and bowling average (Taylor and Ogilvie, 2001). A less aggressive strategy improved the performance (Dawil, 2007). Similarly, the current research work showed that less hostility improved the bowling strike rate but physical aggression had a direct relationship with performance. Lower the physical aggression lower the performance in bowling strike rate.

CONCLUSION
Physical aggression had a positive and significant influence on the bowler’s performance but emotional aggression and anger had a significantly negative effect on the performance. Hostility had a negative and a significant effect on the bowling strike rate but a positive influence on the economy rate and bowling average. It was concluded that aggression can be utilized to boost the performance of fast bowlers at the college level.

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