TRAIT IMPULSIVITY, ALCOHOL INTAKE AND ALCOHOL-RELATED AGGRESSION

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ABSTRACT

The objective of the study was to determine the association of trait impulsivity and alcohol related aggression among university students of Pakistan.

The study design was a cross-sectional with a convenient sample of 209 university students, 47 females and 162 males, age group 17-26 with a mean age of M=21.95 years (SD=2.414) was obtained. AUDIT, HADS, BIS-11, BUS, TFLB and ARAQ scales were utilized to assess aggression, alcohol intake, and impulsivity in social drinkers. This study was conducted during the time period of January’2010 till December’2011. The data was analysed using SPSS 17.

Cognitive dimension of impulsivity was statistically associated with alcohol related aggression. A linear predictive capacity of alcohol consumption with aggression was also observed. The total score on the ARAQ scale was found to be significantly correlate with most of the variables at p<0.005 with the exception of gender at p<0.01 and age, which was not found to significantly correlate with the ARAQ score. All four ARAQ subscales significantly correlated with all of the BIS and BP subscales at p<0.05. Gender was found to significantly correlate with the ARAQ total score (N=, r = 0.134, p<0.03 (one–tailed)).

Alcohol related aggression is associated with cognitive component of impulsivity among a representative sample of university students. An immediate need to identify and treat impulsivity among individuals consuming alcohol is imperative and may help to control harmful aggression.

Key Words: Trait impulsivity, alcohol, aggression.

INTRODUCTION

Dysfunction in executive cognitive function (ECF) is associated with both impulsivity and varying patterns of alcohol ingestion and individuals high on impulsive traits exhibit excessive aggressiveness after alcohol intake compared to general population. While this is well known in western world, it has not been studied in muslim world. Impulsivity is a multidimensional concept that has been defined variously as an inability to wait, or to inhibit inappropriate behaviours irrespective of a particular situation, or it is a tendency to act without forethought and insensitivity to consequences.1,2 In the domain of personality, impulsivity is considered as a trait dimension and is usually measured by self-report personality questionnaires such as Barratt Impulsiveness Scale BIS-11.3 Disinhibition has been characterized by several sub dimensions, including impulsivity, aggression, high activity level, and sensation seeking.4

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The student population is mostly at risk due to the effects of poor impulse controls and the associated impact whereas, male gender is more impulsive than females and misuse illicit drug more.5&6

Brown et al 2009, mentions in his study that alcohol use damages the brain structure and functioning has the direct effect on the impulsivity and aggression resulting in, misjudgement, disinhibition and lack of planning or foresightedness leading to unprovoked aggression.7

Giancola found that nearly 65% of male murderers displayed signs of frontal dysfunction on neurological examination determining that a prefrontal lesion was the best predictor of violent behaviour in a sample of 45 neuropsychiatric patients.8

According to Brown et al 2009 the inability or unwillingness to inhibit behavioural impulses has long term prognostic significance. Markers of disinhibited behavior in pre-school-aged 15 or elementary school-aged 16 children predict AUD risk in late adolescence and early adulthood, whereas indicators of neurobehavioral disinhibition have been associated with increased risks for the development of adolescent substance use and problems. Impulsive behaviour due to negative affect was significantly associated with level of alcohol consumption and level of alcohol-related risk. Steep discounting of future rewards was associated with alcohol consumption while poor premeditation was associated with adverse drinking consequences.7

Executive cognitive functioning (ECF) includes response inhibition, attention, working memory, strategy and assessment of behaviour consequences. Thus, it can be argued that impulsive individuals are more prone to alcohol use and alcohol problems due to their inability to control their behaviour which results from dysfunction in ECF. However, impulsive people tend to drink more and because alcohol further impairs ECF there is a possibility that there would be an increase in problems related to alcohol consumption among impulsive individuals.9

According to behaviorist approach ‘aggression is to deliver noxious stimuli to another organism or, it is ‘the delivery of any form of definite and observable harm-giving behavior towards any target’, without mentioning the eventual intention of the actor. Aggression can be categorized as direct- indirect harm, physical, verbal (verbal means words to inflict harm) and active- passive aggression (extent to which the aggressor actively engages or passively engages by not doing anything).10 Pernanen 1976, hypothesized that psychological coping mechanisms that rely on conceptual or abstract reasoning are being affected by the excessive alcohol consumption which further increases the probability of an aggressive reaction.11&12

Alcohol intoxication leads to an inability to properly perceive and process information from the environment, interpret social cues, and formulate new strategies based on that information in order to cognitively regulate one’s behaviour and achieve one’s goals.9 Acute alcohol consumption disrupts the functioning of the prefrontal cortex (the primary neural substrate believed to sub serve executive functioning) and its sub cortical connections, especially the hippocampus, which, may be the cause of recognition of threat. Alcohol intoxication is often associated with violent crimes, suicide, and the spread of sexually-transmitted diseases, injuries, automobile accidents, high impulsiveness, low self-control, negative emotionality, sensation seeking, and other psychopathy-related personality characteristics.13

To the best of our knowledge not many studies on alcohol have been conducted in Pakistan, whereas in other countries multiple studies have been done to prove the association between impulsivity and aggression or alcohol and aggression or impulsivity. In this study effort have been made to find out the association of trait impulsivity to alcohol related aggression if alcohol is being used as the mediator of impulsivity and aggression. The hypothesis is that, impulsivity predicts aggression when mediated by the use of alcohol since alcohol inhibits the control of acting out behaviour and the non-aggressive impulses in an individual.

**METHODOLOGY**

This is a cross-sectional study. And the sampling technique is opportunistic. There were 209 participants, 47 females and 162 males. These participants were between the ages 19 and 26 with a mean age of M=21.95 (SD=2.414). University students were recruited for the purpose of this study. Only social drinkers were included in this study and they were able to understand and comprehend written english.

**INCLUSION CRITERIA**

- adolescents ranging from age range of 19 an 26 years
• Social drinkers
• University students
• Students who can read and understand and comprehend English

EXCLUSION CRITERIA
• adolescents below or above this age range
• Pathological drinkers
• Non university students (too keep bias in check)

The questionnaire consists of six different scales; AUDIT, HADS, BIS-11, BUS, TFLB and ARAQ.

Alcohol Use Disorders Identification Test: AUDIT is a widely used 10-item self-report measure of hazardous and harmful alcohol use. The AUDIT has a good internal validity (a ranging from 0.80 to 0.94).

The Hospital Anxiety and Depression Scale: HADS HADS assesses the symptom severity of anxiety disorders and depression in the general population. HADS has good internal consistency (a ranging from 0.76 to 0.80).

Barratt impulsiveness scale: BIS-11 contains 30-items self-report questionnaire with a total score and three subscales measuring different aspects of impulsivity: non-planning, motor and cognitive impulsivity. BIS-11 has high internal consistency (a ranged from 0.79 to 0.83).

Buss-Perry Aggression Questionnaire: BPAQ is a 29-item self-report questionnaire on which respondents rate on a 5-point scale the degree to which items describe them. BPAQ has good internal consistency (a=0.89).

TFLB: the time line follow back depicts the use of alcohol in the previous week.

Alcohol-Related Aggression Questionnaire: ARAQ is a 28-item self-report questionnaire that assesses proneness to alcohol-related aggression. The ARAQ shows good internal consistency (a= 0.96).

PROCEDURE
The participants were approached within and outside the premises of the university, hostel settings and lecture halls. The first 209 volunteers were recruited fulfilling the inclusion criteria, both males and females were eligible, provided they could read and understand English. It was empirical that all participants be social drinkers and not under the effects of the other controlled/uncontrolled substances as it could affect the results of the study. The first year graduates have been excluded from the study as they are in the struggling phase of change in their life and prone to take more of alcohol which can skew the results. Participants were handed over the information sheet to overview the purpose of the study. The informed consent was signed followed by a complete battery of questionnaires in a predetermined sequence. The estimated time taken to complete the task was 25-30 minutes. Participants were required to complete the questionnaire once. The debriefing sheet was also given to the participants individually in the end providing the contact numbers of the project supervisor and the related helpline to combat the effects of the questionnaire if any.

STATISTICAL ANALYSIS
The present study is a co relational design with repeated measurements. A parametric correlational Pearson test was applied. This was carried out to measure the degree of association between scores of alcohol consumption, impulsivity, trait aggression and alcohol related aggression. A partial correlational analysis was performed to control for the effects of anxiety and depression on the relevant variables. Finally, multifactorial regression analysis was performed using the backwards method to examine the predictive capacity of the variables on aggression as measured by BP total and alcohol related aggression as measured by ARAQ total.

ETHICS
The Ethics Review Committee of Ziauddin University approved this study. Participants were informed about the nature of the study before the study started. They were told that they were free to participate, with the option of staying anonymous and that they could withdraw any time during the procedure. This study did not carry any risk for participants.

RESULTS
The study set out to investigate the relationship between impulsivity and alcohol related aggression.

The results of the psychological measures are presented in Table 1. The mean AUDIT score (10.54 ± 8.39) was above the recommended safe-drinking cutoff value of 8, suggesting that the average participant’s drinking behaviour was potentially harmful to their
health, although the mean weekly number of alcohol units consumed (24.47±55.658) was within limits stipulated as safe by the British government. The mean scores for HAD-A (8.27 ± 3.97) and HAD-D (4.92 ± 3.49) were both below the cut-off point recommended by. The correlation matrix shows that there were a large number of significant correlations. The total score on the ARAQ scale was found to significantly correlate with most of the variables at p<0.0005, with the exception of gender at p<0.01 and age, which was not found to significantly correlate with the ARAQ score at all. The ARAQ total score was also significantly correlated with the BP total score [N=209, r =0.300, p<0.0005 (one-tailed)] and the AUDIT [N=209, r =0.256, p<0.0005 (one-tailed)]. The AUDIT was found to significantly correlate with the BP [N=209, r =0.300, p<0.0005 (one-tailed)] and the TLFB [N=209, r =0.199 p<0.0005 (one-tailed)]. Also the total BP was significantly correlated with TLFB [N=209, r = 0.139 p<0.05 (one-tailed)].

Gender was found to significantly correlate with the ARAQ total score [N=, r = 0.134, p<0.03 (one-tailed)]. A partial correlational analysis was performed to control for the effects of anxiety and depression on the relevant variables. This did not change the significance of any of the results, except for the correlation between gender and ARAQ-PA, which was no longer significant.

A regression analysis was performed to determine the predictive capacity of the independent variables on the dependent variable of alcohol-related aggression, as measured by the total score on the ARAQ. A significant model emerged p<0.0005. SPSS indicated that the model accounted for 30.7%of the variance within the sample (adjusted R² =0.307). Table 2 shows that the score obtained on the AUDIT was the greatest predictor of alcohol-related aggression (t =8.08 p<0.00005, b =1.04), followed by the hostility component of the BP (t =2.93, p<0.004, b = 0.59).

A second regression was executed to determine the predictive capacity of the independent variables on the dependent variable of trait aggression, as measured by the total score on the BP aggression questionnaire. With this acting as the dependent variable a significant model emerged: p<0.0005. SPSS

### Table 1: Descriptive Statistics Displaying Means and Standard Deviations for Variables Investigated

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean ± Standard Deviation</th>
<th>Measure</th>
<th>Mean ± Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeline Follow back (TLFB)</td>
<td>24.47 ± 55.658</td>
<td>Buss -Perry Verbal (BP-V)</td>
<td>13.18 ± 3.47</td>
</tr>
<tr>
<td>AUDIT</td>
<td>10.54 ± 8.39</td>
<td>Buss-Perry Hostility (BP-H)</td>
<td>19.42 ± 5.79</td>
</tr>
<tr>
<td>HADS Anxiety (HADS-A)</td>
<td>8.27 ± 3.97</td>
<td>Buss –Perry Anger (BP-A)</td>
<td>17.98 ± 4.54</td>
</tr>
<tr>
<td>HADS Depression (HAD-D)</td>
<td>4.92 ± 3.49</td>
<td>Buss-Perry Physical (BP-P)</td>
<td>21.91 ± 6.73</td>
</tr>
<tr>
<td>BIS Total</td>
<td>67.34 ± 9.37</td>
<td>ARAQ Total (Araq-T)</td>
<td>24.98 ± 17.56</td>
</tr>
<tr>
<td>BIS Cognitive (BIS-C)</td>
<td>16.21 ± 3.92</td>
<td>ARAQ Aggression (ARAQ-A)</td>
<td>7.80 ± 6.73</td>
</tr>
<tr>
<td>BIS Motor (BIS-M)</td>
<td>24.63 ± 4.01</td>
<td>ARAQ Trait Aggression (ARAQ- TA)</td>
<td>2.18 ± 2.38</td>
</tr>
<tr>
<td>BIS Non Planning (BIS-NP)</td>
<td>26.60 ± 4.96</td>
<td>ARAQ Pain and Anxiety (ARAQ-PA)</td>
<td>4.72 ± 4.02</td>
</tr>
<tr>
<td>Buss Perry Total (BP)</td>
<td>72.25 ± 16.125</td>
<td>ARAQ Drinking Context (ARAQ-DC)</td>
<td>2.60 ± 2.38</td>
</tr>
</tbody>
</table>

### Table 2: Dependent Variable = ARAQ Total

<table>
<thead>
<tr>
<th>B</th>
<th>SE B</th>
<th>B</th>
<th>P&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit</td>
<td>1.042</td>
<td>.129</td>
<td>.498</td>
</tr>
<tr>
<td>BP Aggression</td>
<td>- .211</td>
<td>.248</td>
<td>-.055</td>
</tr>
<tr>
<td>BP hostility</td>
<td>.586</td>
<td>.199</td>
<td>.193</td>
</tr>
<tr>
<td>BIS cognitive</td>
<td>.026</td>
<td>.272</td>
<td>.006</td>
</tr>
<tr>
<td>Age</td>
<td>.381</td>
<td>.421</td>
<td>.052</td>
</tr>
</tbody>
</table>

### Table 3: Dependent Variable: BP Total

<table>
<thead>
<tr>
<th>B</th>
<th>SE B</th>
<th>B</th>
<th>P&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARAQ total</td>
<td>.188</td>
<td>.062</td>
<td>.204</td>
</tr>
<tr>
<td>BIS cognitive</td>
<td>.614</td>
<td>.280</td>
<td>.150</td>
</tr>
<tr>
<td>Gender</td>
<td>-.930</td>
<td>2.552</td>
<td>-.024</td>
</tr>
<tr>
<td>BIS NP</td>
<td>.430</td>
<td>.220</td>
<td>.132</td>
</tr>
</tbody>
</table>

The BIS total score significantly correlated with the BP total score [N=209, r =0.300, p<0.0005 (one-tailed)] and the AUDIT [N=209, r =0.256, p<0.0005 (one-tailed)]. The AUDIT was found to significantly correlate with the BP [N=209, r =0.300, p<0.0005 (one-tailed)] and the TLFB [N=209, r =0.199 p<0.0005 (one-tailed)]. Also the total BP was significantly correlated with TLFB [N=209, r = 0.139 p<0.05 (one-tailed)].
indicated that the model accounted for 9.2% of the variance (adjusted $R^2 = 0.092$).

Table 3 shows that the score obtained on the BIS cognitive was the greatest predictor of trait aggression ($t = 2.19, p<0.03, b = 0.614$), followed by the ARAQ total ($t = 3.01, p<0.003, b = 0.188$).

**DISCUSSION**

Overall the results from the present study support the hypothesis that impulsivity and more specifically the cognitive component of impulsivity predicts alcohol related aggression as measured by ARAQ total. There were positive correlations among most of the variables and further analysis showed that the most predictive factors for alcohol related aggression as measured by ARAQ total were hazardous alcohol use, aggression, hostility, the cognitive component of impulsivity and age. Moreover, concerning trait aggression as measured by BP total score the most predictive factors were ARAQ total, cognitive impulsivity, gender and non-planning impulsivity.

The study shows that there is likely to have a predictive capacity of trait impulsivity with the consumption of alcohol and consequently the disinhibition caused by alcohol use. Inferring that, the people who are likely to score high on the impulsivity are also more likely to be consuming more alcohol and as an effect, would be more aggressive in their behaviour.

Imaging studies of brain structure 112 and longitudinal neurocognitive evaluations of clinical samples of adolescent drinkers 111 suggest differences between heavily alcohol-involved adolescents and control subjects, suggesting a variety of cognitive disabilities, deteriorating late adolescents and young adults who persistently drink heavily. 8

In this study the alcohol consumption has shown the predictive capacity with the alcohol related aggression whereas, alcohol related aggression can be either verbal or physical which can occur due to acute or chronic use of alcohol.

Moreover, evidence shows that dysfunction of executive functioning relates with aggression. Neuropsychological, neurophysiological, behavioural neurology and neuroimaging studies implied dorsolateral prefrontal cortex (DPFC) dysfunction, an area that has been found to sub-serve executive functioning. 8 These studies suggest that persons with low executive functioning may have difficulties inhibiting aggressive impulses. Low executive functioning has been linked with impulsivity. Impulsive aggression is defined as response to provocation without planning and can be captured by low executive functioning. 8

Additionally, alcohol consumption as measured by AUDIT predicts ARAQ which again has been shown in many studies. 17 The more you drink the more alcohol related aggressive you tend to be. Moreover other factors that predict ARAQ were cognitive impulsivity, aggression and hostility. These findings can be conceptualized as all these factors play a role in the expression of alcohol related aggression. The relationship between alcohol consumption and aggression has been well defined in an extensive number of correlational studies. 8 Although from these studies no causal inference can be made. Graham proposed that the disinhibition model could provide an explanation for the alcohol related aggression. Although the fact that not everyone becomes aggressive when they drink leads to the conclusion that other factors play a role in the intoxicated aggression. 18 According to Geen 1990, major premise is that the elicitation of aggression is dependent on the interaction of two general factors. The first involves background variables such as genetics, physiology, temperament, personality, social-cultural expectations, and exposure to violence which predisposes individual and the second factor is provoking or frustrating stimuli in the environment that produce stress, arousal, and anger. These stimuli can take many forms, such as a verbal or physical attack, family conflict, hot temperatures, and physical pain. The results from the present study imply that trait impulsivity and trait aggression play a role in the expression of alcohol related aggression. 19 Inconsistent with our and previous researches, for both husbands and wives high in dispositional hostility, heavy alcohol consumption was positively associated with the occurrence of alcohol-related aggression; for those low in dispositional hostility, however, there was no association between alcohol consumption and alcohol-related aggression. 20

Other studies that examined the effects of alcohol in alcohol related aggression found that alcohol consumption predict alcohol related aggression in individuals who are dispositional aggressive and believe that alcohol causes aggression. 21 On the other hand, Hoaken et al 2003, found that individuals with poor ECP act more aggressively not because they are impulsive but rather because there is an interruption of social information processing i.e. individuals become
aggressive due to their inability to use social cues and make appropriate response.\(^2\)\(^3\)\(^4\) Also McMurray et al. 2007, found that higher levels of impulsivity to relate with poor social problem solving with greater levels of aggression.\(^2\)\(^5\) Acting on impulses while experiencing a negative affect was significantly associated with level of alcohol consumption and level of alcohol-related risk.\(^2\)\(^6\) Thus, impulsivity seems to present an obstacle in the learning process which later contributes to aggression.

There are few limitations of the study that, there was no control group available to compare the results neither the sample was randomized nor controlled. To generalize the results larger sample is required and more general sample collection rather than just university students. For further future researches it is advisable to use larger samples in different settings and with the control groups. For the absolute authenticity of the subject the research should be carried out across different cultures, different age groups and using behavioural measures.

**CONCLUSION**

To conclude, the study investigated whether trait impulsivity predicts alcohol related aggression. The results from the present study support the hypothesis. A possible explanation for the results is dysfunction in ECF caused by both impulsivity and alcohol. It has been suggested that impulsivity causes aggression due to its inability to inhibit behaviour (ECF). Thus when impulsive individuals consume alcohol, which further impairs ECF; there is an increase risk for alcohol related aggression.

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