SUB-THRESHOLD AUTISTIC TRAITS AS PREDICTOR OF EXPERIENTIAL AVOIDANCE AND MOOD STATES AMONG UNIVERSITY STUDENTS

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ABSTRACT
Features of autism are prevalent not only in diagnosed patients with Autism Spectrum Disorder (ASD) but in the general population also with fewer severities (Gokcen et al., 2014). The present research intended to find out the role of subthreshold autistic traits (SATs) on experiential avoidance and mood states of university students. A sample of (N = 201) undergraduate university students (M_age = 21.77; SD_age = 1.64; 84.1% women; 14.9% men) was recruited using convenient sampling technique. Urdu versions of Autism Quotient (AQ; Baron-Cohen et al., 2001), Acceptance and Action Questionnaire II (AAQ-II; Bond et al., 2011) and Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) were administered to the participants as measures of autistic traits, experiential avoidance and mood states respectively. Results of linear regression revealed total score of AQ as a significant predictor of AAQ and Negative Affect subscale of PANAS. Hierarchical regression analysis further depicted that two of the subscales of AQ i.e. imagination and social skills significantly predicted positive and negative affect respectively. Mediation analysis using PROCESS demonstrated that experiential avoidance fully mediated the relationship between imagination and positive affect while partially mediated the association between social skills and negative affect. Results are discussed with a focus on early identification and intervention strategies to mitigate the adverse impact of experiential avoidance and negative mood on mental health of individuals with higher level of autistic features.

Keywords: Subthreshold Autistic Traits, Experiential Avoidance, Hierarchical regression, Intervention strategies, Mental Health

INTRODUCTION
Autism Spectrum Disorder (ASD) is a lifelong neurological disorder with different levels of severities of and manifestations (Chiarotti & Venerosi, 2020). Several researchers (Elsabbagh, 2012; Imm et al., 2019) have provided prevalence estimates of ASD in different regions throughout the word; however, in South Asia, the prevalence of ASD is determined 5.05% over 1000 births (Poovathinal et al., 2016). According to the Diagnostic and Statistical Manual of Mental Disorder (DSM-5; American Psychiatric Association, 2013) The symptoms of ASD includes restricted interests, interpersonal problems, stereotyped behaviors and repetitive thoughts. The symptoms vary in continuum from individuals having more severe symptoms with intellectual disabilities to people having less severe symptom manifestation with preserved intelligence but disturbed emotional states and psychological functioning (Gokcen et al., 2014). Such less severe traits among general population are termed as subthreshold autistic traits (Baron-Cohen et al., 2001; Jobe & White, 2007; Sasson et al., 2013). Individuals having these traits frequently displayed below average empathizing (Baron-Cohen, 2007), mood symptoms (Dell’Osso et al., 2016), experiential avoidance and even mental disorders (Takara & Kondo, 2014).

Experiential avoidance (EA) is one of the core distressing mechanisms behind several psychological disorders as it is the tendency to suppress and overlook the unwanted inner experiences instead of facing and regulating them (Hayes et al., 1996). It is a wide-ranging reluctance to remain in contact with inner personal experience by exercising maladaptive strategies (Fernandez-Rodriguez, 2018). When instead of focusing on other higher goals in life, EA is used as frequently and rigidly as efforts and energy are directed to suppress the internal unwanted thoughts and events (Hayes et
al., 2006), it contributes to the psychological disorders (Kashdan et al., 2006). It also create hindrances in the ability to decide whether the existing behavior should be modified or retained for the attainment of particular goals (Pinto-Gouveia et al., 2012). The persistence on the same behavior, despite the situational or psychological need of the alternative one is the core factor behind experiential avoidance and psychological inflexibility (Chawla & Ostafin, 2007). Positive or negative affective states are related to emotion regulation (Fergus, 2013) and psychopathological outcomes (Reed, 2016). Researchers have established a link between affective states, empathetic skills and mental health outcomes (Kashdan et al., 2006). Affectivity is described as positive and negative affect (Bond et al., 2011) based on psychopathological outcomes and linked to behavioral aspects. Negative affect contributes to rigid patterns of behavior (Jacob et al., 2013) and restricted and repetitive behavioral patterns also the hallmark of Autism that inhibit the social engagement for these individuals (Gokcen et al., 2014). Hence, the experiential avoidance may explain the connection of unpleasant emotional experiences associated with autistic features. Lot of work has been done on ASD and its associated features worldwide, but still there is a dearth of literature with reference to subthreshold autistic traits (SATs) among individuals having average intelligence especially in the context of Pakistan. Therefore, the current work is aimed at discussing SAT as a predictor of experiential avoidance and negative mood.

**METHODOLOGY**

The current research was aimed at investigating relationship among autistic traits, experiential avoidance and positive and negative mood, it also intended to measure the predictive values of autistic traits for experiential avoidance and mood states of individuals.

**Participants**

The total sample size for the current study was (N=201) students. Participants were university students, through convenient sampling technique. All the participants were early adults and Mean age of the participants was 21.77 (SD=1.64). The Students from regular undergraduate programs at the Department of Applied Psychology were considered as participants and those who have passed out from the university or studying as part time students under weekend programs were not included in the current study. The following table described the demographic details of the participants.

| Table No. 1: Demographic Characteristics of Participants (N=201) |
|-----------------------------------------------|
| Variables | Groups | f (%) | M (SD) |
| Age | | | 21.7 (1.68) |
| No. of friends | | 4.98 (6.6) |
| Gender | Males | 30 (14.9) | |
| | Females | 169 (84.1) | |
| | Missing | 2 (1) | |
| | Total | 201 (100) | |
| Family System | Joint | 54 (32.5) | |
| | Nuclear | 147 (67.3) | |
| | Total | 210 (100) | |
| Residence | Urban | 150 (74.6) | |
| | Rural | 50 (24.9) | |
| | Missing | 1 (0.5) | |
| | Total | 747 (100) | |

**Measures**

Along with demographic data sheet, the following measures were administered to the participants

**Autism Quotient (AQ; Baron-Cohen et al., 2001)**

AQ is a 50 items self-report measure design to assess autistic traits among journal population with average intelligence (Baron-Cohen et al., 2001). AQ consists of five factors (i.e. social skills, attention switching, attention to details, communication and imagination) each factor having equal number of items. Each item is scored on 0 or 1 based on the given criteria by the original authors. Each item in either of the factors score 1 point if the participants responds on autistic like characteristics either milder or stronger. Maximum score on AQ is 50 and above 25 is the screening cut-off for AQ. For the current research, Urdu version of AQ by Ayesha Fawad was used in the current research.
**Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011)**

AAQ-II is a self-report single factor measure of experiential avoidance. It is a Likert-type scale ranging from 1 (never true) to 7 (always true). Maximum score on AAQ-II is 49 and the highest score is indicative of the higher experiential avoidance. AAQ-II has shown an excellent internal consistency reliability (α = .78).

**Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)**

PANAS is used in the current study to know the participants’ feelings during a particular time. It is a 10-items measure with two distinct factors i.e. PANAS (positive) and PANAS (negative). Response options on PANAS ranged from 1 (never) to 5 (always). Total score on PANAS is meaningless as both of the factors have independent scoring. Maximum score on each of the factors is 25 and higher scores are indicative to higher positive and negative affect respectively. Both of the subscales of PANAS have shown good alpha reliability, i.e. (α = .73) for PANAS (P); (α = .84) for PANAS (N).

**Procedure**

The current study is a sub portion of a major doctoral dissertation, which was approved from the Board of Studies of the Department and Institutional Review Board of the University. Formal permission of data collection was obtained from the Head of concerned Department. We approached the participants and informed them about the objectives of the current study. Consent forms along with demographic data sheet were filled and the participants responded to the Urdu versions of above-mentioned scales.

**RESULTS**

Before finding out the relationship and the predictive nature of the variables, we scrutinized the data for normality distribution. For the existing data set, range of skewness for all the variables was (from .165 to -.770; SE = .172) and kurtosis was (from .128 to 1.23; SE = .341). George and Mallery (2010) claimed that +2 to _2 are the acceptable values for normal distribution (Skewness and Kurtosis) of a data set. All the variables fall in the acceptable range as abovementioned criteria which proved univariate normality of the dataset.

**Table No. 2: Mean (M), Standard Deviation (SD), Cronbach’s Alpha Coefficient (α) and McDonald’s Omega Coefficient (Ω) of AQ, AAQ and Positive and Negative subscales of PANAS (N=201)**

| Scale       | M   | SD  | K   | N   | α   | Ω   |
|-------------|-----|-----|-----|-----|-----|-----|
| AQ total    | 23.6| 7.31| 50  | 201 | .801| .812|
| AAQ         | 18.6| 7.04| 7   | 201 | .768| .754|
| PANAS (P)   | 18.5| 3.37| 5   | 201 | .646| .651|
| PANAS (N)   | 12.7| 4.09| 5   | 201 | .731| .633|

Descriptive statistics (M, SD) and reliability estimates i.e. Cronbach’s alpha (α) and Macdonald’s Omega (Ω) reliability was depicted in table 2. Table revealed excellent reliability estimates for AAQ both on (α = .801) and (Ω = .812), whereas AAQ, PANAS (P) and PANAS (N) also showed good reliability estimates respectively.

**Table No. 3: Correlation Coefficient among and AQ subscales, (AAQ) and PANAS P and PANAS N (N=201)**

| Variables   | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. AQ total | 1   |     |     |     |     |     |     |     |     |
| 2. SS       | .740** | 1   |     |     |     |     |     |     |     |
| 3. AS       | .756** | .425** | 1   |     |     |     |     |     |     |
| 4. IMG      | .544** | .373** | .222** | 1   |     |     |     |     |     |
| 5. AD       | .617** | .289** | .362** | .135 | 1   |     |     |     |     |
| 6. Comm     | .844** | .544** | .565** | .354** | .395** | 1   |     |     |     |
| 7. AAQ      | .213** | .202** | .107 | .267** | .018 | .183** | 1   |     |     |
| 8. PANASP   | -.112 | -.101 | -.059 | -.142* | -.016 | -.092 | -.257*** | 1   |     |
| 9. PANASN   | .230** | .254** | .076 | .171* | .097 | .223** | .592*** | -.256*** | 1   |
Table 3 demonstrated the inter correlation among Autism Quotient (Social Skills, Attention Switch, Imagination, Attention to Detail and Communication), Acceptance and Action questionnaire, and Positive and Negative Affect Schedule (Positive) and (Negative) subscales. It indicated that total score on Autism Quotient had significant correlation with Acceptance and Action Questionnaire (r=.213, p<.005) and negative affect (r=.230, p<.005). Social Skills; one of the subscales of AQ had significant positive correlations with Acceptance and Action Questionnaire (r=.254, p<.001) and with negative affect (r=.254, p<.001) of PANAS. Two other subscales of AQ, i.e. Imagination; and Communication had significant positive correlation with AAQ (r=.267, p<.001; r=.223, p<.005) and PANAS (r=.171, p<.05; r=.183, p<.005) negative affect. Whereas imagination had a week significant negative correlation with positive subscale of PANAS (r=-.142, p<.05). Moreover, table also revealed a significant negative correlation (r=-.257, p<.001) of AAQ and a positive relationship between AAQ and negative subscale of PANAS (r=.592; p<.001).

Table No. 4: Hierarchical regression of AQ (total and subscales) and AAQ as predictors of positive affect among university students (N=201)

| Predictors | B    | SE  | β    | t     | R²   | ΔR² |
|------------|------|-----|------|-------|------|-----|
| Step 1     |      |     |      |       |      |     |
| Imagination| -.298| .147| .142*| 2.02  | .020 | .015|
| Step 2     |      |     |      |       |      |     |
| Imagination| -.165| .149| .079 | -1.10 | .072 | .062|
| AAQ        | -.113| .034| .236**| -3.32 |      |     |

Note: Step 1: F(df) = 4.08 (1, 199), p < .05, Step 2: F(df) = 7.66 (2, 198), p < .005

Table 4 depicted the stepwise hierarchical regression analysis of AQ and AAQ as predictors of positive affect among university students. In the first step imagination one of the subscales of Autism Quotient is a significant predictor (β=.142, p<.05) of positive affect accounting for 1% of variance. In this step AQ total and all other subscales were excluded due to the insignificant predictors of positive affect. In the second step, imagination (β=.079, p>.05) and AAQ (β=.236, p<.001) are the significant predictors causing 62% of variance.

Table No. 5: Hierarchical regression of AQ (total and subscales) and AAQ as predictors of negative affect among university students (N=201)

| Predictors | B    | SE  | β    | t     | R²   | ΔR² |
|------------|------|-----|------|-------|------|-----|
| Step 1     |      |     |      |       |      |     |
| Social Skills | .538 | .145| .254***| 3.70  | .064 | .060|
| Step 2     |      |     |      |       |      |     |
| Social Skills | .297 | .122| .140* | 2.43  | .370 | .363|
| AAQ        | .328 | .034| .564***| 9.78  |      |     |

Note: Step 1: F(df) = 13.70 (1, 199), p < .001, Step 2: F(df) = 58.03 (2, 198), p < .001

Table 5 depicted the stepwise hierarchical regression analysis of AQ and AAQ as predictors of negative affect. In the first step social skills one of the subscales of Autism quotient is a significant predictor (β=.254, p<.001) of negative affect accounting for 6% of variance. In this step AQ total and all other subscales were excluded due to the insignificant predictors of negative affect. In the second step, social skills (β=.140, p<.05) and AAQ (β=.564, p<.001) are the significant predictors causing 36% of variance.
Figure 1: Mediating role of AAQ between AQ (imagination) and Positive Affect

Figure 1 revealed how the outcome variable i.e. positive affect was predicted from the subscale of Autism Quotient (Imagination) and experiential avoidance (AAQ). Mediation analysis depicted that imagination significantly predicted positive affect but experiential avoidance (AAQ) fully mediated the relationship between imagination and positive affect. Figure depicted that experiential avoidance had significant negative effect on positive mood regardless of the impact of autistic traits.

Figure No. 2: Mediating role of AAQ between AQ (Social Skills) and Negative Affect

Figure 2 revealed how the outcome variable i.e. negative affect was predicted from the subscale of autism quotient (SST) and experiential avoidance. Mediation analysis depicted that social skills (One of the subscale of AQ) was associated with negative affect and experiential avoidance (AAQ) partially mediated the relationship between social skills and negative affect.

DISCUSSION

The present study was conducted to explore the predictive role of autistic traits and experiential avoidance on mood states of university students. Autistic traits were measured through Autism Quotient, which has five sub factors assessing social skills, attention switch, imagination, attention to detail, and communication of participants. Whereas AAQ was a unidimensional measure which was administered to the participants to find out experiential avoidance. Positive and Negative Affect with its positive and negative subscales was also administered to the client. Table 1 revealed the demographic characteristics of the participants. All of the participants were early adults, and the female participants outnumbered the male participants. Participants were the regular undergraduate students recruited from the Department of Applied Psychology for research purpose. The students from weekend program, from affiliated colleges and those who have passed out from the university were excluded. They were approached in their classroom settings and the administration of scales was done in a group format. Table 2 revealed reliability estimates of AQ, AAQ and PANAS (P) and (N) along with mean and standard
deviation of the scale. Reliability estimates were described in terms of internal consistency and omega reliability. It is revealed from the table 2 that all of the scale used in this study are suitable for the current population bearing $\alpha=.08, .76, .64$ and $.73$ for AQ, AAQ and PANAS positive and negative subscales respectively.

Table 3 described the inter correlation among AQ total and sub scales, AAQ and PANAS P and PANAS N. It was revealed from the table that AQ total and all of its subscales except attention switch (AS) and attention to details (AD) had significant positive correlation with AAQ. These findings were compatible with (Zangoi et al., 2019) who reported that there was a significant relationship of AAQ with AQ and hording behavior. Correlation matrix also revealed a non-significant relationship between PANAS P and AAQ total and subscales except for one of the subscale of AQ i.e. Imagination. On the other hand PANAS N had a significant positive correlation with AQ except for Attention to details subscale. Moreover, Table 3 also depicted a significant positive correlation between experiential avoidance and negative affect and a significant negative correlation was revealed between experiential avoidance and positive affect. These results go in line with (Luoma et al., 2020).

Hierarchical regression analyses in Tables 4 and 5 revealed the predictive relationship of AQ (along with subscales) and AAQ on Positive and Negative Affective states of the university students. It was depicted from Table 4 that from the total and subscale scores of AQ only imagination was a significant predictor of PANAS P but after adding AAQ in the next step, the effect of imagination was observed as non-significant whereas AAQ was only the significant predictor of PANAS P accounting for 62% of variance. Table 5 also indicated the predictive relationships of AQ (total and subscales) and AAQ with negative affect. It revealed that in step 1, social skills (one of the subscales of AQ) was a significant predictor of negative affect accounting for 6% of variance but after adding AAQ in next step, social skills become a very week predictor and AAQ had a significant predicting relation with negative affect accounting for 36% of variance. Non-significant predictors on each step were excluded.

Overall results of regression analyses revealed that not all types of AQ found to be related but our study finds those subscales i.e. social skills and imagination to identify predictors along with the scores of AAQ. Poor social skills are a significant predictor of negative mood, due to the destitute social skills, people many feel deprived, they have less psychological flexibility and experience of loneliness can also be a future contributor to the negative mood (Jobe & White, 2007) and even psychopathology (Sasson et al., 2013). Lack of imagination is negatively predicting positive affectivity due to irritability. Poor imaginative skills are inversely correlated with positive affect that indicated that positive poor imagination may create hindrance in experiencing positive emotions, whereas improved imagination skills may lead to positive affectivity.

Figure 1 & 2 depicted a mediation analysis of AAQ between the relationship of AQ (subscapes) and PANAS Positive and Negative, using the bootstrap sample of 500 with 95% confidence interval (MacKinnon et al. 2004; Preacher & Hayes 2004) was conducted. Results of the mediation analysis confirmed the full mediation of AAQ ($\beta = .236; CI = -.180$ to -.046) between imagination and positive affect by explaining a non-significant direct effect of imagination on positive affect ($\beta = -.078; CI = -.45$ to .129; $p>.05$) and a partial mediation on ($\beta = .564; CI = .262$ .94) between social skills and negative affect. Results of mediation analysis explained experiential avoidance as a strong mediating variable between AAQ and positive and negative affect. From this analysis, we concluded that rather than autistic traits, experiential avoidance and psychological inflexibility commonly considered as predictor of positive and negative mood symptoms among university students.

Despite some limitation i.e. small sample size, sample taken from only the faculty of social sciences, and non-comparable sample of men and women, the implications of the present research are discussed in terms clinical utility of the findings. High level of experiential avoidance supported by problematic behaviors differently conceptualized in different contexts i.e. coping, emotion regulation (Fergus et al., 2013), inflexibility related to ASD and SAT (Baron-Cohen et al., 2001, because underlying mechanisms behind these are same and have impact on negative affect which is an important predictor and premorbid condition in several mental disorders (Fernandez-Rodriguez, 2018). This mechanism can be used for the process of early interventions and management of psychological problems as well. These people are more likely to express negative mood and it can be suitable for acceptance and action therapy for dealing with people having problems, with the objective to enhance their acceptance of situations.
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