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COMPARISON OF TEMPERAMENT OF CHILDREN ACROSS THREE DIFFERING DEVELOPMENTAL PATTERNS

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Abstract

Background: *Temperament is set of early emerging characteristics responsible for differences in behavioral and emotional reactivity. Temperamental dimensions are believed to have a strong impact on developmental trajectories particularly in early and middle childhood.*

Objectives: *the present study aimed to explore and compare the temperament across three developmental groups of children including children with Autism spectrum disorder Intellectual disabilities and typical development.*

Method: *cross sectional design was used to study the temperament of children with ASD (n = 92), with intellectual disability (n = 105) and those following typical developmental pattern (n = 239) selected through systematic random sample. The sample was selected from mainstream schools, special educational institutes and psychiatric and developmental pediatric departments of Lahore. The measures used for data collection were demographic form, Childhood Behavior Questionnaire (CBQ) and Temperament of Middle Childhood Behavior Questionnaire (TMCQ).*

Results: *Highest scores on effortful control were observed in participants of typically developing group and lowest in those in ASD group. Participants in typically developing groups scored highest on surgency and participants in ASD group scored lowest on this domain. Scores on negative affectivity trait were highest in participants diagnosed with ASD and lowest in children with typical developmental pattern.*

Conclusion: *children diagnosed with intellectual disability and ASD and those following typical development showed significant differences in their scores on temperamental traits.*

INTRODUCTION

Temperament is a set of earliest emerging characteristics of an individual that predisposes one to relate with their environment in a particular way and define several aspects of functioning (1). Though temperament has marked individual differences, it remains relatively stable across situations.

Until recently, there was a strong disagreement on nature of temperament that whether it is influenced by genetic or environmental factors (2). Now it is largely recognized that both genetic and environmental factors have moderate influence on temperament (3).

Most of the conceptual models described temperament as a multidimensional construct with several dimensions. Surgency, effortful control and negative affectivity are the core dimensions of temperament according to most conceptual models. Surgency and effortful control reportedly share positive associations, whereas, these two share inverse association with negative affectivity (4).

Surgency is depicted in impulsivity, high activity, low level of shyness and sociability. Effortful control is characterized with skills in cognitive and motor domains and mainly manifested through perceptual sensitivity, attention focus and inhibitory control. On the other hand, negative affectivity is mainly defined by anger, fear, sadness, frustration and poor soothability (5). Literature has largely highlighted predominantly positive interface of surgency and effortful control with a broad range of performance variables (6,7,8).

Literature has linked temperament with typical and atypical pattern of functioning, academic achievement (4), emotional regulation (9), adaptive functioning and many other dimensions of functioning (10,11).

Temperamental features may influence individual's developmental pathways, functioning and predisposes to several emotional and behavioral problems (7, 12). For instance, high sociability reported to be a protective factor against stress and behavioral problems (12,13), whereas, negative affectivity traits particularly predict both externalized and internalized behavioral problems (14,15).

As temperament attributes to variations in functioning, many researchers attempted to study the temperamental variations in children with developmental problems and those following typical developmental pattern (16). Researchers concluded that temperamental differences in children following typical and atypical developmental pattern impact both the proficiency and outcomes of several dimensions of functioning (17). Careful review of literature indicted scarcity of literature on this significant area of functioning. The present study was designed to fill in the gap in existing literature in Pakistan. The objectives of this study were (i) to explore the temperament of children with Intellectual disabilities, Autism spectrum disorder and typical development, (ii) to compare the temperament of children with intellectual disability, autism spectrum disorder and typical development and (iii) to identify the gender differences in temperament of children across three groups.

METHOD

In total 436 children were selected using systematic random sample technique for this study. G-power analysis with 0.05 significance level was used to determine the sample size. Sample included children with ASD (n = 92), with intellectual disability (n = 105) and those following typical development pattern (n = 239). All participants had age between 5 and 11 years including boys and girls. Participants were contacted in schools, child psychiatry and developmental pediatric departments and special education institutes of Lahore.

The measures of data collection in the present study were demographic form, Temperament of Middle Childhood Behavior Questionnaire and Childhood Behavior Questionnaire. The *demographic form* was used to record. It included questions about gender, age, academic grades etc., along with detailed questions related to family and family members. *Temperament in Middle Childhood Questionnaire (TMCQ)* comprised 157 statements used to measure three core domains that is effortful control, surgency and negative affectivity further divided into15 sub dimensions of temperament of children aged between 8 and 11 years. Primary caregiver or someone well familiar with child rate each statement on a 5 point Likert scale [18]. The measure reported to have a good psychometric features with alpha values ranging from .79 to .90 [19,20]. *Children's Behavior Questionnaire – Teacher Short Form (CBQ-T)* assessed temperament of children. It includes 94 items and has three broader big five domains and 17 temperamental dimensions among children ages between 5 and 7 years. Responses are recorded on a 7 point Likert scale based on child's behavior during past six months [19].

The project's design and method was reviewed by the relevant ERRC and consent was sought from all concerned authorities. A list of enrolled students was taken from teachers in charge to select students using systematic random sampling technique from each class. Then teachers most familiar with the students were requested to fill the questionnaires about students. Researcher remained there for assisting the teachers but teachers only sorted assistance for few items and filled the questionnaires independently. Demographic form was sent home and parents were requested to provide the required information. All measures were provided in Urdu language. At the end, a letter of thanks was sent to parents and all teachers who helped in data collection. The data was processed and analyzed using statistical package for social sciences (SPSS).

RESULTS

The data were analyzed using both descriptive and inferential statistical procedures.

Table 1 Demographic Information of the Sample

	ASD	ID	TD	Full Sample
Gender				
Boys	66 %	56 %	57 %	59 %
Girls	34 %	44 %	43 %	41 %
Age				
Mean	8.62	9.02	7.94	8.34
SD	1.87	2.02	1.99	2.02
Family System				
Nuclear	47 %	47 %	40 %	43 %
Joint	53 %	53 %	60 %	57 %

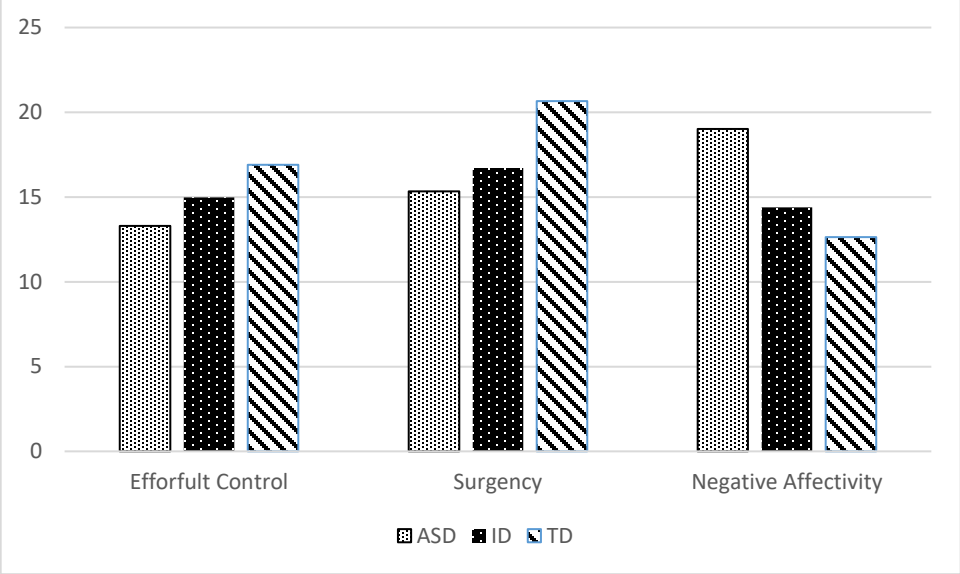
Sample was divided in three groups with 21% participants in ASD (n = 92), 24% in intellectual disability (n = 105) and 55% of participants in typical development (n = 239) group. Overall, boys outnumbered girls in all groups with highest difference observed in ASD group. Mean age of the sample was 8 (SD= 2.02) years. Joint family was the family system of most of the participants across three groups. Mean family income was 43000 with lowest mean income observed in typical development. Parents in typical developmental groups had highest educational level and lowest in intellectual disability group.

Table 2 Scores on Core Domains of Temperament Across three Groups

	ASD	ID	TD	Full Sample
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Effortful Control	13.29 (3.81)	14.97 (4.69)	16.90 (3.09)	13.96 (4.12)
Surgency	15.33 (6.68)	16.72 (5.24)	20.66 (6.65)	17.95 (6.91)
Negative Affectivity	19.01 (5.57)	14.40 (6.73)	12.64 (5.53)	27.76 (15.65)

Scores on surgency ranged from 5.33 to 37 with highest mean score in children with typical development. Mean scores on negative affectivity ranged from 5.25 to 39.07 with highest mean scores in ASD group. Mean score on effortful control ranged from 5.66 to 32.17 with highest mean score in children followed typical development. Gender differences across domains of temperament were also observed as boys scored higher on surgency domain whereas, girls in all groups scored higher on effortful control and negative affectivity.

Comparison of Mean Scores of Temperament Domains .



Participants in ASD group scored lowest on effortful control and highest on negative affectivity. Participants in intellectual disability group scored highest on surgency and relatively similar mean scores were received on negative affectivity and effortful control. On the other hand, participants following typical development scored lowest on negative affectivity and highest on surgency.

Table 3 Scores on Temperament Subdomains for ASD, ID and TD Groups

	ASD		ID	TD	
	M	(SD)	M (SD)	M	(SD)
Activity Control	1.64	(1.29)	2.07 (1.49)	1.71	(1.35)
Activity Level	3.14	(1.29)	3.65 (1.28)	3.33	(1.28)
Affiliation	1.89	(1.45)	2.34 (1.53)	1.92	(1.43)
Anger/ Frustration	4.26	(3.52)	2.97 (1.62)	3.85	(1.43)
Attentional Focusing	2.84	(1.17)	3.04 (1.20)	2.90	(1.18)
Assertiveness	1.55	(1.29)	1.85 (1.34)	1.64	(1.32)
Falling Reactivity/ Soothability	3.55	(1.09)	2.61 (1.32)	3.64	(1.09)
Discomfort	4.05	(1.28)	3.12 (1.67)	4.01	(1.33)
Fear	4.11	(1.39)	3.29 (1.73)	4.06	(1.46)
Fantasy Openness	1.85	(1.41)	2.05 (1.33)	1.99	(1.44)
High Intensity Pleasure	3.50	(1.21)	3.72 (1.19)	3.64	(1.18)
Low Intensity Pleasure	3.42	(1.21)	3.51 (1.27)	3.45	(1.18)
Inhibitory Control	2.87	(1.14)	3.18 (1.26)	2.83	(1.04)
Shyness	3.49	(1.32)	4.03 (1.25)	3.50	(1.34)
Impulsivity	3.28	(1.29)	3.78 (1.21)	3.27	(1.31)
Sadness	3.69	(1.35)	2.79 (1.47)	3.62	(1.35)
Perceptual Sensitivity	3.42	(1.32)	3.37 (1.33)	3.31	(1.32)

As on subdomains within the three core domains of temperament, participants showed cross group differences. These differences are similar to the pattern observed in core temperamental domains.

DISCUSSION

Temperamental domains share a complex relationship with developmental and emotional problems and experts described different mechanisms to explain this association (21). The association between temperamental domains and psychopathology is described to be influenced by areas of pre frontal cortex, genes associated with individual differences in temperament and several environmental factors (22,23). For this reason, it was interesting to study the temperamental variations in children following different developmental patterns.

The main goal of the present study was to assess the temperament in children diagnosed with intellectual disabilities, autism spectrum disorders and those following typical developmental pattern in 437 children from Lahore city. Boys outnumbered girls in present sample and thus reflects the general population trend reported in middle childhood in general population of Pakistan (24). Another demographic trend reported in various studies is joint family system and majority of the present sample also belonged to this specific family style (25).

Temperament contribute significantly to an individual's potential and affects human functioning in many ways (20, 26). Traits of temperament directly influence the development of emotional, social and behavioural adjustment and are also linked with early identification and prevention of psychopathologies (27, 28, 29).

The literature has linked negative affectivity with higher levels of stress and many psychological disorders (29). This is consistent to findings of the present study, which revealed that scores of negative affectivity domain were significantly higher in ASD and intellectual disability groups compared to scores of those in typical development group. Interestingly, participants in ASD group scored significantly lower on self regulation and higher on negative affectivity when compared with scores of children in other two groups. This pattern is supported by results reported in previous researchers that reported the similar pattern of scores on temperamental domains (30).

On the other hand, effortful control and surgency are mostly associated with lower levels of distress and lower vulnerability to psychological disorders (31).

Consistent to findings reported in many previous studies, the scores of surgency were found to be highest in typically developing participants than scores of children in ASD and ID groups.

Self regulation is reported to be generally associated with with several indices of healthy functioning (32). Literature reports that temperamental domains comprising effortful control and surgency strongly predict high functioning in children with and without developmental disabilities (33,30). The findings of this project would be helpful for clinical professional, teachers and researchers to understand the temperament and factors affecting the expression of temperament in children in Pakistan. The findings can be helpful for professionals to make individualized management plans for children suffering from behavioral and developmental problems.

CONCLUSION

The findings of the present study reported significantly different trend of scores on subdomains of temperament of children with ASD and intellectual disability compared to children with typical development.

Authors Contribution

Conceptualization: AN, MK,ES
Methodology: AN, MK
Data Collection: AN, AS, ES
Formal Analysis: AN,ES,KI,UA, AS
Writing Review and Editing: AN,MK, AS, UA, ES, KI.
All authors have read and agreed to the published version of the manuscript.

Conflicts of interest

The authors declare no conflict of interest.

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