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RESEARCH PAPER

Exploratory Factor Analysis of Differential Classroom Behavior of Autism Scale (DCBA)

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ABSTRACT

This research has explored the differential classroom behaviours of children with autism exhibited during their studies during class time. The study used a sequential exploratory design. The study was conducted in the district of Lahore to develop an indigenous tool to investigate the differential classroom behaviors of children with autism. With the help of related literature and in-depth interviews of teachers working with autism for the last 5 years, a tool was developed. The self-developed tool was validated by 5 experts from the relevant field. A sample of 100 teachers was recruited using the purposive sampling technique and the data was collected by using the indigenously developed scale. Exploratory factor analysis was run to find out the emerging factors related to differential classroom behaviors. The analysis revealed that there was a total of eight factors related to differential classroom behaviors of students with autism. The factors included communication deficit, inattentiveness, impulsiveness, lack of socialization, academic approach, acting out behaviors, sensory issues and Restrictive and Repetitive Behaviors. Future studies are needed to investigate the reasons behind the differences in the behaviors of students with autism and how these differences affect their overall functioning.

KEYWORDS Academic Achievement, Autism, Differential Behaviors

Introduction

Autism Spectrum Disorder (ASD) is the most common disorder that is recognized widely and an enriching topic for researchers. (American Psychiatric Association, 2013). Mostly the research studies focused on the areas such as etiology, prevalence, incidence, diagnosis, interventions and treatments (Lord et al., 2018). According to many research studies, there is not a single treatment that can be best to manage the behavioral issues posed by students with autism due to the variation in their characteristics. It is still undefined whether autism is a disability or it is a set of unique skills that can be seen and used as the strength of the child. This concept is still under discussion. What makes an autistic child different from other autistic children are its unique features and different patterns of behaviors (US Department of Health and Human Services et al., 2017).

Autism is a neurodevelopmental disorder that has fluctuating degrees of verbal and nonverbal communication and repetitive behaviors and it has difficulties in social interaction. Autism can be diagnosed professionally based on problems in two main areas: social communication and restrictive, repetitive behavior or interests (Shapse, 2008). These two areas of deficit are the main features of autism. Moreover, these symptoms must be possessed by an autistic child since its childhood. Social interaction is also lacking in these children. Therefore, they need to learn how to become social and without acquiring the basic listening, speaking, reading, writing and mathematics (literacy skills) it is difficult for them

to interact with the people they are around (US Department of Health and Human Services et al., 2017).

Literature Review

According to the Least Restrictive Environment of the Individuals with Disabilities Education Act (2004) the students who are entitled to special education receive education and other facilities in the least restrictive environment (Morin et al., 2019). Just like many others, starting school is an important change that nearly all children get to embrace and so different children have different experiences as they go through this transition. This transition is likely to be more challenging for children with ASD (Quintero, 2011). There is research evidence that youngsters with autism who have a great start at school tend to perform better than those who had it the other way (Marsh et al., 2017).

Teachers, at this level, value the social engagement of a child more than academic performance for successful adjustment. However, the same becomes a problem for children with ASD because they have different social, communal and behavioral difficulties that result in a poor start (Individuals with Disabilities Education Act, 1990, 2004) It is important to consider the hurdles preventing smooth school transition, as well as protective measures as social, emotional and behavioral problems of children with ASD, lead to bullying, peer rejection, poor outcome or even school exclusion (Sobba, 2019). While preparing a child for school during his pre-school and checking if he is ready for this transition, parents and teachers should keep in mind the emotional, behavioral and social difficulties faced by children with ASD. Generally, the researchers evaluate how well a child picks academically, socially, and emotionally (Marsh et al., 2017).

It is vital to identify the strong and weak parts of children with ASD before the transition and during the academic period make it successful, there has to be continuous intervention even after the start of school. There is a need to develop school-based programs to children with ASD for improvement in emotional, social, communal and academic domains (Marsh et al., 2017).

It is necessary to take in account the current evidence of ongoing successful school-based programs in order to develop more like these. However, it is unfortunate that the existing researches are not previously passed on and there is a lack of synthesis of the available evidence due to which our current knowledge base is not readily apparent. Therefore, it is yet to establish when a child with ASD is ready for school and what type of his behavior will have the impact on his studies. For this, it is critical to collect and consolidate the present evidence on the types of provisions required by children with ASD, their families and schools, and specific interventions and individual issues that help to enable an optimistic start to school and successful academic performance (Charman, 2004).

Material and Methods

Sample

The sample size of this study was 100 teachers working with autism for the last 10 years resided in the district of Lahore. The sample selected by using purposive sampling technique. Only those teachers recruited in the sample met the inclusion criteria i.e. working experience with autism and minimum one year of experience.

Table 1
Demographic information of Sample

Variables	%
Gender of students	
Male	73
Female	27

Age of students	
3-5	15
6-9	39
10-15	46
Grades of students	
Below 1	20
1-2	35
3-4	42
5-6	3
Level of severity	
Mild	37
Moderate	59
Severe	3
Profound	1
Daily duration of study	
1-2 hours	88
3-4 hours	11
5-6 hours	1
Teachers' Experience	
1-5 years	51
6-10 years	47
11-15 years	2
Teachers' Age	
20-25	9
26-30	38
31-39	41
40 and above	12
Teachers' Qualification	
MA	19
M.Phil.	67
Ph.D.	10
Others	4
Gender of teachers	
Male	4
Female	96

Research Design

This study used the mixed-method sequential exploratory design. The researcher conducted interviews with 13 teachers who have been working with autism for the last 10 years. After qualitative data collection, the quantitative section was completed by collecting and analyzing data.

Instrument

To develop the instrument, the researcher conducted interviews with 13 teachers. The sample of teachers was selected by using a purposive sampling technique. The teachers met the inclusion criteria of the sample i.e. working experience with autism and the minimum experience was 10 years. The purpose of the interviews was the development of the research instrument. Thematic analysis of the interview revealed Hyperactivity, Lack of communication and socialization, Repetitive behaviors, and sensory processing difficulties. After collecting the data by conducting the interviews, a close-ended instrument was developed comprising 31 items related to different behaviors of students with autism. the response was taken on a five-point Likert scale (Never, Rarely, Sometimes, Often, Very often).

Results and Discussion

Exploratory factor analysis was applied to check the psychometric properties of Differential Classroom Behavior of Autism Scale (DCBA). Principle component analysis with varimax rotation was used.

Table 2
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.787
Bartlett's Test of Sphericity	Approx. Chi-Square	2310.694
	Df	465
	Sig.	.000

Table 2 measures the adequacy of our data its value should be greater than (.6-.7). The value of adequacy in this table is (.787), it means it is greater than .6 that shows that it is adequate to make factors. So our data is the most suitable to make factors. The value of Bartlett's Test of Sphericity is also pointed (df=465). The significant value is (Sign=.000). All 31 questions are unrelated to each other and there is no link among the questions. There is no relation between the factors so the hypothesis is rejected.

Table 3
Rotated Component Matrix

	Component							
	F1	F2	F3	F4	F5	F6	F7	F8
Gives eye contact when calls his/her name	.696							
Sustains attention on task	.746							
Listen when talking to her/him directly	.785							
Sits attentively during class	.808							
Scream during the class		.761						
Make awkward noises during the class		.706						
Gives answers of the questions during class	.720							
Follows the command at once	.759							
The child talks unnecessarily during class				-.512				
Ignore extraneous stimuli during class					-.776			
Repeat the words and sentences							.833	
Plays quietly (keeps noise level reasonable)								.896
Listens to other students during studies	.530							
Shares his/her lunch and belongings with other students				.686				
Remembers the sequence of daily activities				.805				
Greets the students when enters in the class	.595							
Reads the lesson with few mistakes			.711					
Write the classwork with few mistakes			.714					
Asks questions related to the class work			.648					

Misbehaves during the period when one activity finishes and next starts		.721					
Waits for his/her turn	.733						
Child wants to taste objects around him/her			-.534				
Child looks for things to touch during class time			-.610				
Child exhibits any abusive behavior during the study				-.632			
Child performs any aggressive or violent behavior during the study							
Child attacks on his/her peers		.546					
Child shows any repetitive behavior during the study						.665	
Child flicks his/her fingers or flap his/her hands during the study						.794	
Child rocks back and forth during the class time						.714	
Child prefers to work alone during class					.563		
Child resists to physical contact during the study					.507		

Note: factor loading >.50 have been boldfaced

Table 3 shows the number of factors and the number of items loaded in each factor. It has 8 factors and it shows how many items are loaded in each factor. The numbers of items are different in each factor. This table describes the number of items loaded at each factor. Each item in the factor is not loaded in another factor which shows that all the factors are exclusive and the data is accurate for further process.

Factor 1: Communication Deficit

Factor 1 contained three items indicating different communication related depicted by items 1, 3, and 7. These items were about "eye contact", "listening when talking" and "giving answers to the questions". These items denoted the difficulties to communicate in the class children with autism face during academic time.

Factor 2: Inattentiveness

Factor 2 contained six items indicating inattentiveness depicted by items 15, 4,10,8,13,2. These items were "Remembers the sequence of daily activities", "Sits attentively during class", "Ignore extraneous stimuli during class", "Follows the command at once", "Listens to other students during studies" and "Sustains attention on task". These items indicated the difficulties to be attentive in class.

Factor 3: Impulsiveness

Factor 3 contained six items that showed impulsiveness by items 5,6,9,12,27 and 28. These items were about "Scream during the class", "Make awkward noises during the class", "The child talks unnecessarily during class", "Plays quietly (keeps noise level reasonable)", "Child flicks his/her fingers or flaps his/her hands during the study" and "Child rocks back and forth during the class time". These items indicated the impulsiveness of children with autism in the class.

Factor 4: Lack of socialization

Factor 4 contained four items indicating a lack of socialization depicted by items 14, 16, 21 and 29. These items were about "Shares his lunch and belongings with other students", "Greets the students when enters the class", "Waits for his/her turn" and "Child prefers to work alone during the class. These items showed the lack of socialization of children with autism in the class.

Factor 5: Academic Approach

Factor 5 contained three items indicating academic explained by items 17, 18, and 19. These items were "Reads the lesson with few mistakes", "Writes the classwork with few mistakes" and "Asks questions related to the class work". These items showed the academic-related factors of children with autism in the class.

Factor 6: Acting out behaviour

Factor 6 contained three items indicating acting our behaviour depicted by items 20, 24 and 25. These items were about "Misbehaves during the period when one activity finishes and next starts", "Child exhibits any abusive behaviour during the study" and "Child attacks on his/her peers". These items showed the acting out behaviour of children with autism in the class.

Factor 7: Sensory issues

Factor 7 contained three items indicating sensory issues depicted by items 22, 23 and 30. These items were about, "Child wants to taste objects around him/her", "Child looks for things to touch during class time" and "Child resists physical contact during the study". "These items indicated the sensory issues of children with autism in the class.

Factor 8: Restrictive and Repetitive Behaviour

Factor 8 contained one item indicating restricted and repetitive behaviour depicted by item 26. These items were about, "Child shows any repetitive behaviour during the study". This item indicated the restrictive and repetitive behaviour of children with autism in the class.

Table 4
Cronbach Alphas of Total Items in each Factor

Sr #	Factor	Items	M (SD)	Median	α
1	Communication Deficit	3	17.14(5.11)	16.11	.82
2	Inattentiveness	6	22.15(8.49)	21.18	.89
3	Impulsiveness	6	23.14(9.19)	22.08	.90
4	Lack of Socialization	4	13.17(4.07)	12.14	.90
5	Academic Approach	3	17.79(5.14)	15.14	.80
6	Acting-out behaviors	3	15.18(6.89)	14.15	.81
7	Sensory Issues	3	16.18(7.14)	15.14	.82
8	Restrictive and Repetitive behaviors	1	3.16(1.47)	2.7	.80

Table 4 shows high internal consistency of all factors, alpha values range (.80-.90)

Autism in children is characterized by behavioral problems associated with socializing and interacting with others. Autistic children have problems with communication, behavior and other interaction problems (Ivy Panda, 2019). Autism in children is characterized by repetitive behavior patterns that are indicative of the disorder. Parents and medical practitioners can tell if a child is autistic by observing behavior. In most cases, the condition is not diagnosed in children until they reach their preschool years,

although, in some children, it is diagnosed in their early childhood (Zwaigenbaum, et al. 2005). Researching the educational development of children with autism spectrum disorders is important because it can provide opportunities for higher education, independent living, and successful employment in adulthood (Vanegas, 2019). Though academic success is related to cognitive abilities in children with ASD (Mayes & Calhoun, 2008).

Academic skills such as reading, writing, and problem-solving prepare youth to function independently as adults. Children with autism spectrum disorder (ASD) are at greater risk for academic difficulties and may, as a result, be less prepared than their typically developing peers for future adult responsibilities (John, Dawson & Estes, 2018). Estimates suggest that the majority of children with ASD perform worse than expected in at least one academic area and are 5.5 times more likely to show a math disability than math ability (Oswald et al., 2016). Educators can see this clearly in their schools and classrooms, yet we continually try to add more rigors to academic instruction without trying to work on the barriers that prevent many of our students from achieving academic success. Although many children need help with their social and emotional skills, one of the worst things we can do for a child is to lower our expectations because we feel bad or sorry for them. Instead, set high expectations for them and give them the extra help and support they need to get there. High expectations are required for all. Be what the children need you to be, which may be different for each child. We can complain about what parents didn't instill in them, or we can change their trajectory (Weinstein, 2019).

Conclusion

The conclusion made on the basis of quantitative research analysis is that common behaviours of most of the students with autism are repetitive, impulsive, inattentive, lack of socialization and acting out behaviours.

Limitations

This study used the exploratory sequential mixed-method design to conduct the interviews with teachers, develop an instrument, collect data and check the psychometric properties of the scale. The study has certain limitations such as the generalizability of results can be questioned due to collecting data only from Lahore. Future studies must be designed on a broader level. Data was collected only from teachers. Future researchers must collect data from other stakeholders as well.

Recommendations

Following are the recommendations of the study:

1. Prospective teachers may be trained to manage the differential behaviors of students with autism in a classroom.

2. School administrators may arrange hands-on training for parents to equip them with the relevant information to play their role in the management of children.

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