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**INVESTIGATING THE PREVALENCE OF ENROLLED CHILDREN WITH AUTISM
SPECTRUM DISORDER FOR SUBSEQUENT PLANNING OF AN INTERVENTION
(AN EXPLORATORY SURVEY OF TOBA TEK SINGH DISTRICT OF FAISALABAD
DIVISION OF PUNJAB PROVINCE OF PAKISTAN)**

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ABSTRACT

The study focused on investigating the prevalence of enrolled children with autism spectrum disorder (ASD) based on the diagnostic criteria of diagnostic and statistical manual of mental disorders (DSM-5) for subsequent planning of an intervention to enhance quality of life of children at Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan. A self-developed questionnaire based on general qualitative questions and specific quantitative questions was used to collect data from the purposefully chosen 16 master degree special educationists dealing children with intellectual and developmental disabilities. Thematic analysis and descriptive analysis enabled the researchers to interpret the results of the study across the general qualitative questions and specific quantitative questions respectively. The obtained results based on thematic analysis generally indicated no accurate acquaintance of 16 special educationists. The obtained results based on descriptive analysis specifically indicated lower percentages of responses over: a) rudiments of admission criteria for child/children with ASD; b) prevalence of enrolled children with ASD and c) placement availability and fitting context for child/children with ASD on a predetermined scale of measurement. Based on the findings of the study, the researchers concluded that the prevalence of the enrolled children with ASD is unknown and undiagnosed. Later, it was suggested that accurate acquaintance of special educationists with DSM-5 is necessary on one hand while obtaining diagnostic report based on Diagnostic and Statistical Manual of Mental Disorders (DSM-5) and

detailed implementation of Individuals with Disabilities education Act (IDEA) is of utmost importance for the concerned authorities of the institution to enroll a newly arrived child under autistic category for subsequent planning of an intervention to enhance quality of life of this segment of population on other hand.

Keywords: Special education, autism spectrum disorder, diagnostic criteria, enrolled children, intervention, quality of education

1. INTRODUCTION

Autism Spectrum Disorder (ASD) is one of the developmental disabilities. It begins early in childhood and lasts throughout the life span of children with ASD. It affects social communication and behavior (s)/interest (s) of children with ASD. Both of the areas must have difficulties to be diagnosed as ASD. However, individuals with ASD can be diagnosed at any age of life but symptoms generally appear in the first three years of the life of children [1].

Abnormal facial expressions and tone of voice, avoidance and/or poor eye contact, delays in speech and/or flat speech, difficulties in language comprehension, behavioral disruptions, deficits in social communication and interaction are the hallmark features of children with ASD. Children with ASD have: a) difficulties with social communication and interaction; b) restricted and repetitive patterns of behaviors and interests; and c) current level of symptoms create a barrier in the ability of

children to perform appropriately at home, school and/or other areas of daily life [1].

Global prevalence rates of combined pervasive developmental disorder (PDD) and autistic disorder (AD) based on survey studies published since 2006 vary from 1.9 children with AD to per 10, 000 children with AD and 72.6 children with AD to per 10, 000 children with AD in the Northern European countries such as United Kingdom, Denmark, Sweden and Iceland [2].

Wong and Hui (2008) [3] conducted a survey study in China and estimated a lower prevalence rate of 16.1 children with PDD to per 10, 000 children with PDD while **Kim et al. (2011) [4]** conducted a survey study in Korea and estimated a high prevalence rate of 189 children with PDD to per 10, 000 children with PDD. **Kawamura and Ishii (2008) [5]** conducted a study in Japan and estimated the prevalence of PDD as 181.1 PDD children to per 10, 000 PDD children.

Published survey studies since 2000 in the region of Japan and China provide varied prevalence rates of children with AD form

2.8 children with AD to per 10, 000 children with AD and 94 children with AD to per 10, 000 children with AD [2]. [6] Estimated a lower prevalence rate of 11.7 children with AD to per 10, 000 children with AD in Indonesia. Likewise, global prevalence rates of children with AD estimated a median of 62 children to per 10, 000 children on other hand [2].

Islamic Republic of Pakistan is situated in South Asia. It is the sixth most populous country of the world. The population of the Islamic Republic of Pakistan is about 180 million with almost 45 % segment of population below the age of 18 years. Measuring Sustainable Development Goals (SDGs) for Inclusion, Learning and Equity Lessons from the Annual Status of Education report (ASER) Pakistan estimated the prevalence of 58, 482 for the differently abled segment of population in the province of Punjab. According to the census 2017, Islamic Republic of Pakistan has one million differently abled segment of population. Amongst the above mentioned figure of differently abled segment of population, the current prevalence of autism spectrum disorder in Pakistan is unknown [7].

1.1 Rationale of the Study

There is a great need to identify the enrolled segment of population with ASD in

the special education centers/schools of the province of Punjab, Pakistan. This study will help to know the exact number of enrolled children with ASD at four special education centers of Toba Tek Singh district of the province of Punjab, Pakistan. Identification of children with ASD and planning for intervention has long been focus of attention for the researchers but this particular area is not studied in Pakistan. Therefore, the authors were interested to know the exact segment of population enrolled at four special education centers of Toba Tek Sing district for subsequent planning of an intervention.

1.2 Purpose of the Study

An exploratory survey of Govt. Special Education Centre Toba Tek Singh tehsil, Govt. Special Education Centre Gojra tehsil, Govt. Special Education Centre Pir Mahal tehsil, and Govt. Special Education Centre Kamalia tehsil of Toba Tek Singh district of Faisalabad division was generally performed to conduct a contextual analysis for a subsequent planning of an intervention to enhance quality of education.

General Purpose It was generally performed to get knowledge/awareness about ASD of special education teachers teaching at four tehsil level Govt. Special Education Centres of Toba Tek Singh district of

Faisalabad division of Punjab province of Pakistan.

Specific Purpose It was specifically performed to know the: a) rudiments of admission criteria for child/children with ASD; b) prevalence/total number of enrolled figure of population with Autism Spectrum Disorder (ASD); and c) placement availability and fitting context for child/children with ASD.

1.3 Research Questions

The researchers formulated following questions to meet the purpose of the study:

1. Do the special educationists at tehsil based Govt. Special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan have accurate acquaintance with autism spectrum disorder?
2. What are the rudiments of admission criteria at tehsil based Govt. Special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan?
3. What is the prevalence of enrolled children with autism spectrum disorder based on diagnostic

criteria of diagnostic and statistical manual of mental disorders (DSM-5) at tehsil based Govt. Special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan?

4. Is there placement availability and fitting context for children with autism spectrum disorder at tehsil based Govt. Special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan?
5. To what extent diagnosis of children at the time of admission for ASD is based on diagnostic report and/or educational eligibility later determined on the basis of regulations governed by the (IDEA, 2004) helps special educationists to design and implement specific intervention to target area (s) of deficit (s)?

2 MATERIALS AND METHODS

2.1 Population

Special educationists with minimum master degree holder in special education at four tehsils of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan was the population of the study.

2.2 Sample Strategy

16 special educationists with master degree in special education dealing to children with mental retardation at four tehsils of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan were chosen purposefully and taken as the sample of the study. Total 7 female teachers with mean age of 29 years and total 9 male teachers with mean age of 30 years participated in the exploratory survey of the study.

2.3 Research Design

A mixed methods research design including quantitative data collection and analysis and quantitative data collection and analysis was performed to accomplish the requirements of the survey study.

2.4 Research Instrument

Researchers have developed a questionnaire to perform exploratory survey (Annexure-1). Part 1 of the questionnaire was based on open ended questions, part 2 of the questionnaire was based on close ended questions, and part 3 and part 4 of the questionnaire were optional and based on open ended questions.

Questionnaire was started from demographical questions. It included twelve questions such as: a) name of the teacher

dealing with mentally retarded children; b) gender; c) age; d) qualification; e) diploma (related to autism spectrum disorder); f) date of joining; g) current grade; h) grade at the time of appointment; i) experience at present station; j) previous experience (if any); k) name of working station (in case of previous experience); and l) total experience.

Part 1 of the questionnaire was consisted of close ended general questions in terms of: 1) knowledge of special education teachers about ASD with three specifications such as defining: a) ASD; b) diagnostic criteria based on DSM-5; and c) types of interventions designed and implemented interventions inside the classroom settings to treat/teach child/children with ASD.

Part 2 of the questionnaire was consisted of specific close ended questions in terms of: 1) rudiments of admission criteria with two specifications such as: i) to know about the production of medical history of the child/children at the time of admission on 3 point likert scale such as (1) yes, (2) no, and (3) don't know, and ii) to know about the grounds of placing the child/children under the category of mental retardation on 3 point likert scale such as (1) intelligence quotient, (2) adaptive behavior test, and (3) diagnostic criteria of ASD based on DSM-5; 2) prevalence of enrolled children with ASD

with five specifications such as: i) to know about the total number of enrolled children with ASD under the category of mental retardation at the time of admission on 6 point likert scale such as (1) 0 number of child/no child, (2) 1 number of child, (3) 2 number of children, (4) 3 number of children, (5) more than 3 (give number), (6) don't know, ii) to know about the basic criteria of enrollment at the time of admission (in case of enrollment) on 3 point likert scale such as (1) medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on diagnostic and statistical manual of mental disorders (DSM-5), (2) eligibility for educational services are later determined on the basis of regulations governed by the (IDEA, 2004), iii) to know about the total number of children identified later with ASD on 6 point likert scale such as (1) 0 number of child/no child, (2) 1 number of child, (3) 2 number of children, (4) 3 number of children, (5) more than 3 (give number), (6) don't know, iv) to know about the basic criteria of later identification on 3 point likert scale such as (1) later produced medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on diagnostic and statistical manual of mental disorders (DSM-5), (2) eligibility for educational services are later

determined on the basis of regulations governed by the (IDEA, 2004), (3) both (1 & 2), and 5), and v) to know about the professional involved in identification on 4 point likert scale such as (1) special educator, (2) psychologist/physician, (3) speech therapist, and (4) other/(1, 2, and 3); and 3) placement availability and fitting context with two specifications such as: i) to know about the availability of especially arranged and designed sub-category for the placement of the child/children with ASD under the category of mentally retarded children on 3 point likert scale such as (1) yes, (2) no, and (3) don't know, ii) to know about the context appropriate for teaching children with ASD inside the classroom settings 3 point likert scale such as (1) yes, (2) no, and (3) don't know.

Part 3 was formulated optionally. It included three more questions to inquire in case of the enrollment of child/children with ASD at the time of admission and/or later identification based on DSM-5 such as: a) type (s) of intervention (s) the special education teacher designed and implemented inside the classroom setting to teach child/children with ASD; b) type of deficit (s) targeted in intervention; and c) extent of the success of intervention (in case of evaluation at the end).

Likewise, part 4 was formulated optionally. It included one more question to inquire in case of the enrollment of child/children with ASD at the time of admission and/or later identification based on DSM-5 such as: a) total number of children (including all children with ID, ADHD, DD, ND, and others) enrolled under the category of mentally retarded children (MRC).

2.5 Procedure of the Study

First of all, researchers gave brief description to participants of the study about the exploratory survey to be conducted at Govt. special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan. Later, necessary instructions related to formulation of questionnaire were given over the tool to administer.

The researchers administered part 1 of the exploratory questionnaire. It generally enabled the researchers to know the knowledge of special education teachers in terms of defining: a) ASD; b) diagnostic criteria of ASD based on DSM-5 and; c) interventions designed and implemented to treat/teach child/children with ASD.

The researchers administered part 2 of the exploratory questionnaire. It specifically enabled the researchers to know the: 1) rudiments of admission criteria in

terms of: a) medical history (diagnostic report) of the child/children at the time of admission; b) grounds of placing the child/children under the category of mental retardation, 2) prevalence of enrolled children with ASD in terms of: a) total number of enrolled children with ASD under the category of MRC at the time of admission; b) diagnostic criteria of enrollment at the time of admission (in case of enrollment); c) total number of enrolled children identified later as children with ASD; d) diagnostic criteria of later identification; and e) involvement of professionals in identification; and 3) placement availability and fitting context in terms of: a) availability of especially arranged and designed sub-category for the placement of the child/children with ASD under the category of mentally retarded children; b) context appropriate for teaching children with ASD inside the classroom settings.

Additionally, it enabled the researchers to administer optional questions formulated in part 3 of the questionnaire in case of enrollment of the child/children with ASD at the time of admission and/or later identification based on DSM-5 was investigated positively in part 2 of the questionnaire on one hand. On other hand, it

enabled the researchers to administer optional questions formulated in part 4 of the questionnaire in case of no enrollment of the child/children with ASD at the time of admission and/or later identification based on DSM-5 was investigated positively in part 2 of the questionnaire.

Footnotes

1. The term of 'Mentally Retarded Children (MRC)' is used in Special Education Centers for the category of Intellectual Disability (ID) in the Punjab province of Pakistan.
2. Children with ASD are enrolled under the category of mentally retarded children (MRC) including children with intellectually challenged (ID), children with autism spectrum disorder (ASD), children with attention deficit hyperactive disorder (ADHD), children with developmental disorders (DD), and children with neurodevelopmental disorders (ND) in the Punjab province of Pakistan.

2.6 Statistical Analysis

The researchers used content analysis to analyze part 1 and employed descriptive statistics to interpret results through Statistical Package for Social Sciences (SPSS) of part 2 and part 4 of the research instrument.

3 RESULTS

Results based on Demographical Questions. Total 16 special education teachers teaching to children with mental retardation at four tehsils of Toba Tek Singh district of Faisalabad division with master degree in special education participated in the exploratory survey. Total 7 female teachers represented 43.75% of total responding (mean age of 29). Total 9 male teachers represented 56.25% of total responding (mean age of 34 years).

Thematic Analysis of the Results based on General Qualitative Questions. One central theme emerged from the thematic analysis of the data i.e. no accurate acquaintance of knowledge about autism spectrum disorder across three general qualitative questions. The researchers observed no accurate acquaintance of 16 special education teachers with defining: a) ASD; b) diagnostic criteria of ASD based on Diagnostic and Statistical Manual of Mental Disorders (DSM-5); and c) types of interventions designed and implemented inside the classroom contexts/other contexts to treat/teach child/children with ASD.

Descriptive Statistics of the Results based on Specific Quantitative Questions. It was found that no child was enrolled on the basis of medical diagnosis/report followed by

the diagnostic criteria of ASD based on DSM-5 at the time of admission and/or later identified.

Table 1 shows rudiments of admission criteria in percentage over two attributes. Rudiments of admission criteria for child/children with ASD in terms of: 1) parents provide medical history (diagnostic report) of the child/children with ASD at the time of admission obtained 5% responses in favor of 'yes'; 90% responses in favor of 'no'; and 5% responses in favor of 'don't know' on 3 point likert scale; and 2) grounds of placing the child/children with ASD under the category of mentally retarded children (MRC) obtained 85% responses in favor of 'I. Q test'; 3% response in favor of 'adaptive behavior scale' and 12% responses in favor of 'diagnostic criteria of ASD based on DSM-5' on 3 point likert scale.

Table 2 shows prevalence of enrolled children in percentage over five attributes. Prevalence of enrolled child/children with ASD in terms of: 1) parents provide medical history (diagnostic report) of the child/children with ASD at the time of admission obtained 95% responses in favor of '0 number of child'; 5% responses in favor of '1 number of child'; 0% responses in favor of '2 number of children'; 0% responses in favor of '3 number of children'; 0%

responses in favor of 'more than 3'; and 0% responses in favor of 'don't know' on 6 point likert scale; 2) basic criteria of enrollment at the time of admission obtained 3% responses in favor of 'medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5)'; 20% response in favor of 'eligibility for educational services are later determined on the basis of regulations governed by the (IDEA, 2004)'; 25% response in favor of 'enrollment based on Both (1 & 2)'; and 52% responses in favor of 'others' on 4 point likert scale; 3) number of children identified later admission obtained 90% responses in favor of '0 number of child'; 5% responses in favor of '1 number of child'; 5% responses in favor of '2 number of children'; 0% responses in favor of '3 number of children'; 0% responses in favor of 'more than 3'; and 0% responses in favor of 'don't know' on 6 point likert scale; 4) basic criteria of later identification obtained 3% responses in favor of 'medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5)'; 20% response in favor of 'eligibility for educational services are later determined on the basis of regulations governed by the (IDEA, 2004)'; 30% response in favor of 'enrollment based on both (1 & 2)'; and 47%

responses in favor of ‘others’ on 4 point likert scale; and 5) professionals involved in identifying child/children obtained 3% responses in favor of ‘medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5)’; 20% response in favor of ‘special educator/class teacher’; 30% response in favor of ‘psychologist/physician’; 10% responses in favor of ‘speech therapist’; and 40% responses in favor of ‘others/(1, 2, & 3)’ on 4 point likert scale.

Table 3 shows placement availability and fitting context in percentage over two attributes. Placement availability and fitting context in terms of: a) availability of especially designed sub-category obtained 5% responses in favor of ‘yes’; 90% responses in favor of ‘no’; and 5% responses in favor of ‘don’t know’ on 3 point likert scale; and b) context appropriate for teaching children obtained 3% responses in favor of ‘yes’; 85% response in favor of ‘no’ and 12% responses in favor of ‘don’t know’ on 3 point likert scale.

Table 1: Rudiments of admission criteria

Sr. No.	Attributes of rudiments of admission criteria	Responses in percentage over scale of measurement			
		Attributes over scale Percentage	Yes	No	Don't Know
1.	Parents provide diagnostic report		5 %	90 %	5 %
2.	Grounds of placing the child	Attributes over scale Percentage	I. Q Test	Adaptive Behavior Test	Diagnostic Criteria of ASD Based on DSM-5
			85%	3%	12%

Table 2: Prevalence of enrolled children

Sr. No.	Attributes of prevalence of enrolled children	Responses in percentage over scale of measurement						
		Attributes over scale Percentage	0 Number of child	1 Number of child	2 Number of child	3Number of children	More than 3	Don't know
1.	Number of children enrolled as child/children with ASD		95%	5%	0%	0%	0%	0%
2.	Basic criteria of enrollment at the time of admission	Attributes over scale Percentage	Medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5)	Eligibility for educational services are later determined on the basis of regulations governed by the (IDEA, 2004)	Enrollment Based on Both (1 & 2)	Others		
			3%	20%	25%	52%		
3.	Number of children identified later as child/children with ASD	Attributes over scale Percentage	0 Number of child	1 Number of child	2 Number of child	3Number of children	More than 3	Don't know
			90%	5%	5%	0%	0%	0%
4.	Basic criteria of later identification	Attributes over scale Percentage	Medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5)	Eligibility for educational services are later determined on the basis of regulations governed by the (IDEA, 2004)	Enrollment Based on Both (1 & 2)	Others		
			3%	20%	30%	47%		
5.	Professionals are involved in identifying child/children	Attributes over scale Percentage	Special Educator/Class Teacher	Psychologist	Speech Therapist	Others/(1, 2, & 3)		
			20%	30%	10%	40%		

Table 3: Placement availability and fitting context

Sr. No.	Attributes of placement availability and fitting context		Responses in percentage over scale of measurement		
			Yes	No	Don't Know
1.	Availability of especially designed sub-category for the placement of the child/children with ASD	Attributes over scale Percentage	5 %	90 %	5 %
2.	Context appropriate for teaching children	Attributes over scale Percentage	3%	85%	12%

4 DISCUSSION

The purpose of the study was to investigate the enrolled prevalence of children with ASD based on diagnostic and statistical manual of mental disorders (DSM-5) at Govt. Special Education Centres of Toba Tek Singh district of Faisalabad division of Punjab province of Pakistan.

A self-developed questionnaire qualitatively analyzed question 1 of the study and found no accurate acquaintance of the participants with autism spectrum disorder over generally formulated open ended questions in part 1 of the questionnaire.

A self-developed questionnaire quantitatively analyzed question 2 of the study and found rudiments of admission criteria based on I. Q test majorly followed by adaptive behavior scale over specifically formulated close ended questions in part 2 of the questionnaire.

Question 3 on the prevalence of enrolled children with ASD under the category of MRC based on the diagnostic criteria of diagnostic and statistical manual of mental

disorders (DSM-5) defined for ASD at the time of admission was quantitatively analyzed and found no child enrolled over specifically formulated close ended questions in part 2 of the questionnaire.

Question 4 on the placement availability and fitting context for child/children with ASD under the category of MRC was quantitatively analyzed and found no placement availability and fitting context for child/children with ASD over specifically formulated close ended questions in part 2 of the questionnaire.

Part 3 of the questionnaire was not administered in the presence of the figures mentioned above which ultimately left question 5 of the study to be dissatisfied in terms of investigating the extent of the diagnosis of children at the time of admission for ASD based on DSM-5 helps special educationists to design and implement specific intervention to target area (s) of deficit (s), hence it remained questionable on one hand.

On other hand, ultimate administration of part 4 finally enabled the researchers to obtain total number of identified children/segment of population enrolled under the category of intellectual disability instead of knowing figure of enrolled children with ASD.

Part 3 of the questionnaire was not administered in the perspective mentioned above on one hand. On other hand, ultimate administration of part 4 finally enabled the researchers to obtain total number of identified children/segment of enrolled population under the category of intellectual disability instead of knowing the exact segment of enrolled population with autism spectrum disorder. These results are supported by the research study conducted by [8] who investigated that the children with autism spectrum disorder are placed with mentally retarded children in the Govt. Special Education Centers of the Punjab province of Pakistan. Hence, this situation is still prevailed related to the diagnosis, placement and for subsequent planning of an intervention for this segment of population enrolled under the category of mentally challenging children in the Govt. Special Education Centers of the Punjab province of Pakistan investigated through this exploratory survey.

5 FINDINGS

The researchers derived following findings from the obtained results of the study:

1. Parents do not provide diagnostic report of the child at the time of admission.
2. Grounds of placing the child at MRC category is based on I. Q tests.
3. 5% number of children is enrolled as children with ASD at the time of admission.
4. Children are not enrolled and/or later identified on the basis of medical history/diagnostic report followed by the guidelines of the diagnostic criteria of ASD based on (DSM-5).
5. Eligibility for educational services is not later determined on the basis of regulations governed by the (IDEA, 2004).
6. Special educator, class teacher, psychologist, speech therapist and others play a role in identifying the child/children with ASD.
7. Availability of especially designed sub-category for the placement of the child/children with ASD is 90%.
8. Availability of especially designed sub-category for the placement of the child/children with ASD is 85%.

6 CONCLUSION

Findings of the exploratory survey enabled the researchers to conclude that the total number of children with ASD enrolled under the category of mentally retarded children (MRC) is unknown and undiagnosed segment of population on one hand and suggested to administer a screening questionnaire over identified segment of population to further locate children with ASD on other hand.

7 SUGGESTIONS

1. Accurate acquaintance of special educationists with DSM-5 is necessary.
2. Medical history/diagnostic report based on DSM-5 at the time of admission is of crucial importance for the concerned authority of the institution to enroll the newly arrived child under autistic category based on the diagnostic criteria of DSM-5 defined for the ASD segment of population.
3. Eligibility for educational determination should be governed by the IDEA, 2004.

8 RECOMMENDATIONS

1. Government of the Punjab, Pakistan, should establish separate Govt. Special Education Centres/Schools

for the placement of children with ASD under the territory of the Punjab province of Pakistan.

2. Govt. Special Education Centres/Schools should provide especially designed sub-category for the placement of children under the category of mentally retarded children (MRC)/Govt. Special Education Centres/Schools should provide especially designed separate category for the placement of children with ASD.

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