Prevalence of behavioral disorders in children and early adolescent: An Eastern Indian single center study

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ABSTRACT

Background: Mental health problems evolving from early childhood to adolescent period affect the processes of adaptation and capability in adulthood. **Aims and Objectives:** The study aims to study the prevalence of different types of behavioral disorders among children and early adolescents (6–12 years) and detect association between socio-demographic parameters and behavioral disorders as well as detect the behavioral problems for early treatment regarding their child's behavioral problem. **Materials and Methods:** A cross-sectional retrospective study was conducted in the pediatric OPD and Adolescent Clinic of Calcutta National Medical College from March 2019 to February 2020. 176 patients were included after proper sampling and consent. Semi-structured socio-demographic profile sheet was filled up by parents. Individual child was assessed for various behavioral disorders using the Child Symptom Inventory (CSI)-4 parent questionnaire where data were collected from parents by the investigator through a single time interview. **Results:** Prevalence of Anxiety disorders was highest in our study, with increased incidence in females. Autism in children was found to be associated with their low birth weight. High incidence of disruptive, impulse control and conduct disorder was seen among boys and mainly in children living with single parent and mothers working. **Conclusion:** The study is based on informants' perceptions of the children's behavior. The study enables understanding of the behavior of children and associated contexts which is essential to make an interventional plan tailored to the needs of the child in the long run.

Key words: Adolescent; Behavioral disorder; Children; CSI-4; DSM-4

INTRODUCTION

Mental health problems evolve from early childhood to adolescent period. These affect the processes of adaptation and subsequent adult roles; for which mental health problems in young children must be addressed as a priority of public health interest. Globally, one in every five children and adolescent suffer from a mental disorder. It is expected that by 2020 childhood neuropsychiatric disorder will rise to over 50% and will become one of five most common reasons of morbidity, mortality, and disability among children.[1]

Adolescents suffer from various forms of internal conflicts while growing up, which might impair normal psychosocial development. Lack of attention to the mental wellbeing of these population during the phase of socialization, may lead to mental health consequences that may persist throughout life and reduces the capacity of societies' economic productivity.[2,3] Early identification helps in early recovery and subsequently leads the developmental trajectories into a better and healthier adaptive path. In the Indian perspectives, 14–40% of adolescent population is assumed to be suffering from mental health problems.[4]

The application of diagnostic interviews and statistical methods for determining prevalence and correlates of mental disorders, have established the prevalence of mental disorders, correlates and risk factors for mental disorders,

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patterns of comorbidity, and service patterns in developed countries.[5] In contrast, there has been wide disparity in the reported prevalence rates of mental disorders in Indian studies among these groups attributed to methodological differences and unspecified clinical criteria for case ascertainment.[6]

Aim and objectives
Primary objectives
1. To study the prevalence of different types of behavioral disorders among children and early adolescents aged between 6 and 12 years.
2. To study the association between socio-demographic parameters and behavioral disorders in these children.

Secondary objectives
1. To detect these behavioral problems early.
2. To treat these behavioral problems accordingly.
3. To counsel the parents regarding their child's behavioral problem for better compliance.

MATERIALS AND METHODS

Study design
An observational, cross-sectional study was conducted in the pediatric OPD and Adolescent Clinic, Calcutta National Medical College and Hospital, Kolkata, West Bengal, after proper ethical committee permission. Data collection was done from March 2019 to February 2020 and included children and early adolescents aged between 6 and 12 years with suspected behavioral problems. Consecutive sampling method was followed, where consecutive child of both sexes who attended the clinic within the study period were considered for the study. A total of 254 children were thoroughly evaluated by detailed history and clinical examination to rule out any organic cause. Then, they were referred to the clinical psychologist for IQ assessment to rule out Intellectual disability. 78 children diagnosed with intellectual disability were excluded from the study. The remaining 176 children were our study samples. Each child and their parents were interviewed once during the study period.

Children with any chronic organic illnesses, neurological disabilities, and refusal of consent were excluded.

Study variables and tools
1. Self-designed, semi-structured socio-demographic profile sheet was used to collect the background socio-demographic information.
2. Child Symptom Inventory (CSI)-4: The CSI-4[7] is a behavior rating scale that is referenced by DSM-IV-R

for emotional and behavioral disorders between 5 and 12 years old. There are parent (97 items) and teacher versions (77 items). The "CSI-4 Parent-Checklist" contains screens for 15 emotional and behavioral disorders, and the "CSI-4 Teacher Checklist" contains screens for 13 emotional and behavioral disorders. The CSI-4 can be scored to derive symptom count scores or symptom severity scores. In our study, the parents of the children were interviewed by CSI-4 Parent-Checklist and each parent rates each item on a 4-point response scale, indicating frequently the symptom is observed. The CSI-4 contains symptom-categories for DSM-IV disorders: such as ADHD of Inattentive type, ADHD of Hyperactive-Impulsive type, ADHD of Combined type; ODD, CD, GAD, social phobia, SAD; MDD; dysthymic disorder; schizophrenia and autistic disorder. The CSI-4 also contains single items to screen for simple phobias, obsessions, compulsions, motor tics, vocal tics, enuresis, and encopresis. Administration time is between 10 and 15 min. There are two scoring procedures: "Symptom Count (categorical) scores, which use scores of 0 (never/sometimes) or 1 (often/very often), and Symptom Severity (dimensional) scores, which use scores of 0 (never), 1 (sometimes), 2 (often), or 3 (very often)." Symptom Severity scores are simply the sum of the item scores for a particular symptom category. For symptom count scores, a specific symptom is generally considered to be a clinically relevant problem if it is rated as occurring "often" or "very often." When the symptom count score is equal to or greater than the number of symptoms specified by DSM-IV as being necessary for a diagnosis, the child receives a Screening Cutoff score of "yes" for the disorder. Although the CSI-4 contains the behavioral symptoms of disorders, it does not include additional diagnostic criteria (e.g., age of onset of symptoms, impairment of functioning).

Study procedure
The study subjects were included as per inclusion criteria. The socio-demographic profile sheet was filled up by parents and then individual child was assessed for various behavioral disorders using the CSI-4 parent questionnaire where data were collected from parents by the investigator through a single time interview.

Statistical analysis
Statistical analyzes were performed using the software IBM-SPSS Statistics, Version 22.0. Chi square test was used to check the significance of difference of proportions.

Student's t test and one-way ANOVA were used to check the significance of difference between two and more than two means.

RESULTS

Out of 176 children, mean age was calculated to be 9.23±1.718. The age-distribution of participants was as follows: 6–9 years, 58.5%; 10–12 years, 41.5%. The gender-wise distribution of participants showed: Males, 64.2%; Females, 35.8%. The religion-wise distribution of participants showed: Hindus, 17.6%; Muslims, 82.4%. 13.1% of the population resided in urban cities, 46% in urban slums while 40.9% resided in villages.

The distribution of participants showed:
- Family type: Joint family, 65.9%; Nuclear family, 35.1%
- Socio-economic status as per Modified B G Prasad scale: Low, 18.2%; Lower Middle, 68.2% and Middle 13.6%
- Birth weight: low birth weight, 25%; normal birth weight, 53.9% and data not available 21.1%
- Single parents 23.9%
- 75% had their mothers non-working

17.1% had a family history of mental illness among the first-degree relatives.

DISCUSSION

The aim of our study was to determine the prevalence of different behavioral disorders occurring in children and early adolescents attending our hospital. In our study, 30.70% of children were found to have Intellectual Disability of some grade. Similar prevalence of Intellectual Disability (30.97%) had been seen in a study by Chaudhury et al.,[8] which concluded that children with Intellectual-Disability are at significantly increased risk of certain psychiatric disorders.

The mean age of our study population is 9.23 years (±1.718) with 113 (64.2%) boys and 63 (35.8%) girls. The predominance of male children can be explained by the fact that, attention is often given more to male child by Indian parents resulting in prompt identification[9] 103 (58.5%) children are in the age group 6–9 years and 73 (41.5%) were early adolescents (10–12 years). Studies have noted differences in psychiatric problems related to age.[10]

In our study, 145 (82.4%) patients were Muslims, while 31 (17.6%) were Hindus. 40.1% children came from rural background, 46% from urban slum, 13.1% from urban area. One limitation in our study was the inability to detect the religious correlation with each patient's problem due to the

Table 1: Distribution of total number of samples as per the individual behavioral disorders diagnosed in the study population (n=176)

Behavioral disorders	Frequency (n)	Percentage
ADHD	31	17.6
Autism	16	9.1
Conduct disorder	8	4.8
Oppositional defiant disorder	10	5.7
Generalized anxiety disorder	36	20.5
Separation anxiety disorder	5	2.8
Social anxiety	3	1.7
Specific phobia	2	1.1
Obsessive-compulsive disorder	2	1.1
Post-traumatic stress disorder	1	0.6
Somatoform disorder	1	0.6
TIC disorder	2	1.1
Enuresis	2	1.1
Undiagnosed	57	32.4

Table 2: Distribution of study population according to the different categories of behavioral disorders as per DSM-V classification (n=176)

Behavioral disorders	Frequency	Percentage
Neurodevelopmental disorders	47	26.7
Anxiety disorders	46	26.1
Disruptive, impulse control and conduct disorder	18	10.2
Others	8	4.6
Undiagnosed	57	32.4

record-based nature of our study, considering some mental illnesses are known to be associated with hyper-religiosity.[11]

Table 1 shows Distribution of total number of samples as per the individual behavioral disorders diagnosed in the study population (n=176)

Table 2 shows Distribution of study population according to the different categories of behavioral disorders as per DSM-V classification (n=176)

Table 3 shows Association between various demographic factors and different behavioral disorders.

About 65.9% of the children in our study stay in a joint family and majority of them belonged to a lower middle-income group (68.2%) It is within the family the child learns the basic rules of socialization. In our study, 76.1% of the children live with both parents and 23.9% are raised by single parent. The child and family tasks usually are guided by two parents; but when it becomes a responsibility of one, such as family roles and functioning can become chaotic. In our study, 25% of the mothers are currently working, while the rest 75% are homemakers.[12]

Table 3: Association between various demographic factors and different behavioral disorders

1. Gender of the patients	Behavioral disorders	Demographic-parameter		Statistical significance
		MALE	FEMALE	
	ADHD			
	Present	22	09	df=0.749
	Absent	91	54	P=0.387
	Autism			
	Present	13	03	df=2.225
	Absent	100	60	P=0.136
	Anxiety disorder			
	Present	22	24	df=7.269
	Absent	91	39	P=0.007*
	Disruptive/impulse control/Conduct disorder			
	Present	16	02	df=5.316
	Absent	97	61	P=0.021*
2. Religion		**HINDU**	**MUSLIM**	
	ADHD			
	Present	08	23	df=1.740
	Absent	23	122	P=0.187
	Autism			
	Present	05	11	df=2.255
	Absent	26	134	P=0.133
	Anxiety-disorder			
	Present	08	38	df=0.002
	Absent	23	107	P=0.963
	Disruptive/impulse control/Conduct disorder			
	Present	04	14	df=0.293
	Absent	27	131	P=0.588
3. Type of family		**JOINT**	**NUCLEAR**	
	ADHD			
	Present	17	14	df=2.052
	Absent	99	46	P=0.152
	Autism			
	Present	07	09	df=3.846
	Absent	109	51	P=0.050
	Anxiety disorder			
	Present	31	15	df=0.061
	Absent	85	45	P=0.805
	Disruptive/impulse control/Conduct disorder			
	Present	11	07	df=0.205
	Absent	105	53	P=0.650

4. Area of residence		RURAL	URBAN-SLUM	URBAN	
	ADHD				
	Present	14	12	5	df=0.873
	Absent	59	68	18	P=0.646
	Autism				
	Present	4	9	3	df=1.924
	Absent	68	72	20	P=0.382
	Anxiety disorder				
	Present	03	34	09	df=6.562
	Absent	69	47	14	P=0.038*
	Disruptive/impulse control/Conduct disorder				
	Present	9	8	1	df=1.282
	Absent	63	73	22	P=0.527

(Contd...)

Table 3: (*Continued*)

Behavioral disorders		Demographic-parameter		Statistical significance
5. Socio-economic status	**LOW**	**LOWER-MIDDLE**	**MIDDLE**	
ADHD				
Present	6	21	4	df=0.044
Absent	26	99	20	P=0.978
Autism				
Present	3	9	4	df=2.037
Absent	29	111	20	P=0.361
Anxiety disorder				
Present	3	34	9	df=6.562
Absent	29	86	15	P=0.038*
Disruptive/impulse control/ Conduct disorder				
Present	3	12	3	df=0.167
Absent	29	108	21	P=0.920
6. Birth weight of the patients		**LBW**	**NBW**	
ADHD				
Present		11	12	df=3.331
Absent		33	83	P=0.068
Autism				
Present		9	5	df=7.662
Absent		35	90	P=0.006*
Anxiety disorder				
Present		10	27	df=0.499
Absent		34	68	P=0.480
Disruptive/impulse control/ Conduct disorder				
Present		3	11	df=0.753
Absent		41	84	P=0.386
7. Child-parent living status		**SINGLE PARENT**	**BOTH PARENTS**	
ADHD				
Present		6	25	df=0.421
Absent		36	109	P=0.516
Autism				
Present		2	14	df=1.251
Absent		40	120	P=0.263
Anxiety disorder				
Present		12	34	df=0.169
Absent		30	100	P=0.681
Disruptive/impulse control/ Conduct disorder				
Present		10	8	df=11.084
Absent		32	126	P=0.001*
8. Working status of mother		**WORKING**	**NON-WORKING**	
ADHD				
Present		6	25	df=0.640
Absent		38	107	P=0.424
Autism				
Present		1	15	df=3.300
Absent		43	117	P=0.069
Anxiety disorder				
Present		13	33	df=0.353
Absent		31	99	P=0.552
Disruptive/impulse control/ Conduct disorder				
Present		9	9	df=6.684
Absent		35	123	P=0.010*

(Contd...)

Table 3: (*Continued*)			
Behavioral disorders	**Demographic-parameter**		**Statistical significance**
9. Family history of mental illness	**Positive**	**Negative**	
ADHD			
Present	6	25	df=0.142
Absent	24	121	P=0.706
Autism			
Present	03	13	df=0.036
Absent	27	133	P=0.849
Anxiety disorder			
Present	8	38	df=0.005
Absent	22	108	P=0.942
Disruptive/impulse control/ Conduct disorder			
Present	5	13	df=1.633
Absent	25	133	P=0.201

*P≥0.05 considered to be statistically significant

Low birth weight (LBW) is seen as a common perinatal risk factor of ADHD, autism, generalized anxiety in previous studies.[13,14] In our study, 25% of the children were LBW. However, there was under reporting of LBW, as birth weight was not recorded in many home delivery cases and cases where parents failed to recall. In 17.1 % of the children in our study a positive family history of a mental illness was present. Parental mental illness can be associated with reduced family functioning. In a study by Slatcher and Trentacosta,[15] an association between parental depressive symptoms and behavioral disorders of their children in daily life.

In our study, the highest prevalence was seen of anxiety disorders (26.1%), followed by ADHD (17.6%), disruptive, impulse control and conduct disorder (10.2%) and autism (9.1%). These findings are like a study conducted in Goa, showing that the most common diagnoses were anxiety disorders, depressive disorder, behavioral disorder, and attention-deficit hyperactivity disorder.[16] However, in our study, 32.4% of the children with some suspected behavioral problems went undiagnosed and needs further evaluation. The overall prevalence of anxiety disorders in this study is 26.1%, slightly higher than the findings by Nawarathna et al.,[17] where the prevalence of anxiety disorders was 18.9%. Of the 46 individuals with anxiety disorders, 3 have social anxiety, 2 have specific phobia, 5 had Separation Anxiety Disorder and 36 had Generalized Anxiety Disorder. In our study 38.1% of the girls are diagnosed to have anxiety disorders, which is significantly higher than the boys. This finding is consistent with the National Comorbidity Survey (conducted from 1990 to 1992) findings of lifetime prevalence rates for any anxiety disorder of 30.5% for women and 19.2% for men.[18] Similar findings was also noted in another Indian study[17] where 27.1% of the girls suffered from anxiety disorders. Anxiety disorders are also found to be significantly more in children from lower-middle income group and urban-slum children compared to those from rural background.

The prevalence of ADHD is 17.6% which is less compared to 35.10% prevalence found in a study by Mitra and Ray.[19] However, in another study by Nawarathna et al.,[17] the prevalence of ADHD was found to be 8.2%. Prevalence of autism in our clinic-based study is 9.1% which is much higher compared to various community-based studies.[20,21] There might be an under- or over-estimation of the prevalence of ASD in different geographic distributions due to this variability in assessment.

LBW of children had been associated with reported problems of inattention and hyperactivity, thought problems, social and peer problems. In our study, a significant association is seen between Autism and low birth weight of the children, which is in parity with findings in other studies as well. In a study by Hack et al.,[13] extreme low birth weight children had significantly higher scores than normal birth-weight children for the inattentive, hyperactive, and combined types of ADHD, as per CSI-4 Severity Scores. They also had significantly higher scores for generalized anxiety and autistic disorders. The significant differences were evident among both girls and boys apart from generalized anxiety that pertained only to girls.

In our study disruptive, impulse control and conduct disorder group includes conduct disorder (n=8) and ODD (n=10). The overall prevalence of this group is 10.2%. Prevalence of CD varies among the Indian studies, Deivasigamani (11.13%),[22] and Sarkar et al., (7.1%.)[23] had reported a prevalence of 4.94% in a retrospective clinical study. Sarkhel et al.,[25] had reported

a prevalence rate of 4.58% school going population. The prevalence of conduct disorder was significantly high among the boys (14.16%) compared to the girls (3.17%) in our study. In a study by Jayaprakash et al.,[24] significant male dominance (88.3%) with boy girl ratio 7.5:1 was seen. In another study by Sarkhel et al.,[25] the ratio of conduct disorder of boys to girls was 4.5:1 which is like our findings. Furthermore, in our study, the overall prevalence of these disorders is significantly more in children who are living with single parent (23.8%) and those who have working mother's (20.5%). This might be since working women may not be able to provide care with the same intensity to their children as non-working women.[17]

Limitations of the study

The study sample was taken from a single clinical setting rather than from the community. Multicentric, community based study needs to be conducted to estimate the exact disease prevalence.

CONCLUSION

The study conducted toward identification of behavioral disorders in children and the early adolescent population. Being a hospital-based study, it has its limitations of not being representative of the community. Many factors which may directly or indirectly influence the mental health of children remains unexplored and warrants a scope for further research.

ACKNOWLEDGMENT

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