Original Article

Prevalence of children at risk of behavioral problems among preschool children between the ages of 3 and 6 years

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ABSTRACT

Background: Behavioral problems often go unnoticed in children; however, it is important to identify and treat the problem in childhood to prevent the long-term disability. **Objective:** The objective of the study was to find the prevalence of children "at risk" of behavioral problems in preschoolchildren and to identify the social, environmental, and family factors associated with the risk of behavioral problems in preschoolchildren. **Materials and Methods:** A cross-sectional observational study was conducted in 370 children from 3 to 6 years of age studying in preschools of Bhopal, using Preschool Pediatric Symptom Checklist. Bivariant analysis was performed using Chi-square test on STATA 11.2. **Results:** Overall prevalence of children at risk of behavioral problems was found to be 46.7% in the studied population. Children belonging to low-income families were at a higher risk of developing behavioral problems ($p<0.001$). Working mothers and time spent by fathers had a positive impact on a child's behavior ($p=0.008$). Other factors that were studied but did not have significant association were gender, age, time spent by mother with child, presence of a sibling, and family size. **Conclusion:** The main factors contributing to increase in risk in children for developing behavioral problems were found to be less time spent by father with child and lower family income. However, working status of mothers did not increase the risk of developing behavioral problems.

Key words: *Behavioral problem, Preschoolchildren, Risk factors*

John F. Kennedy once said, "Children are the living messages we send to a time we will not see." Therefore, it is imperative for a child to develop in a happy, healthy, and in the most mentally and physically sound manner. Behavioral problems are not a form of mental disorder but a deviation from social behavior and manifestation of signs and symptoms which suggest a future risk to the child's development. Achenbach and Edelbrock have categorized behavior problems into two major categories: Internalizing and externalizing behaviors. Internalizing behavior normally includes psychosomatic disorders, social withdrawal, anxiety, extreme wariness, and sadness and is most often noted with the girl child, whereas the externalizing behaviors are a form of negative behavior, more often exhibited by the boys, which include defiance, destruction of property, hyperactivity, anger, and impulsivity [1].

A number of studies regarding the prevalence of childhood behavior problems have been conducted in several countries. The estimated prevalence ranges from 24% to 74% [2-5]. In spite of its high prevalence, behavioral problems in children often go unnoticed due to many reasons, one of which may be due to prolonged and constant absence of working parents. Hence, many a times, parents fail to notice their child's behavioral pattern. Most of the mental, emotional, and behavioral disorders have their roots in childhood and youth. Studies have suggested that sociodemographic factors, such as low socioeconomic level, young maternal age, and low level of parental education, family size, and order of birth, have been associated with a higher risk of developing internalizing, externalizing, and attention problems in preschoolchildren [6-10].

Different studies infer that many of these problems have their roots in childhood and if diagnosed and treated early, their manifestations in adulthood can be avoided. It is imperative to treat behavioral problems and they should be given equal importance as other medical issues. Behavioral problems are often neglected, as evidenced by the fact that it is a relatively unexplored area of research, especially in India.

Therefore, the present study was planned on preschoolchildren between 3 and 6 years of age to find the prevalence of children "at risk" of behavioral problems and to study the association of social, environmental, and family factors with the risk of behavioral problems.

MATERIALS AND METHODS

The present cross-sectional observational study was conducted on children from 3 to 6 years of age who were clinically healthy

attending preschools in the city of Bhopal and without any history of major disorders. Children with a history of any major systemic disease, history of birth asphyxia, any developmental delay, neurological disorders or seizures, and recurrent hospitalizing were excluded from the study.

Institutional Ethical Committee clearance was obtained before the initiation of the study. The study duration was from September 2018 to February 2019. The parents and the principal were informed of the purpose of the study and informed written consent was taken before enrollment in the study. Anonymity of the children and their guardians was maintained.

The sample size was calculated using the formula, $N=4pq/d^2$ where, N=Sample size, p=Prevalence of children at risk of developing behavioral problems, q=100−p, and d=Absolute precision taken as 5%. As per the previous studies conducted in India, the prevalence of emotional/behavioral disorders ranges from 2.6% to 35.6%. Based on the calculation, $N=4pq/d^2=4 \times 35.6 \times 64.4/25$, a sample size of 366.82 was obtained which was rounded off to 370. A random sampling technique was used and five private play schools were selected in five different areas of Bhopal.

The Preschool Pediatric Symptom Checklist (PPSC) is an 18-item emotional/behavioral screening instrument which aids in the early detection of emotional/behavioral problems for infants and preschoolers, and the original checklist was used to collect data. Questions on the PPSC were developed after an extensive review of relevant measures, literature, and consultation with parents of young children and experts in child development. "Not at all," "somewhat," and "very much" were the options in each question and the response for each was scored as "0," "1," and "2," respectively. In case of multiple responses received for a single question, the highest answer was taken into consideration and for the unanswered question, the response was scored 0. All the scores were added and their sum was considered as the final score. A child with a PPSC total score of 9 or greater was graded as the child "at risk" and needed further evaluation [11].

A pro forma was used to collect the details of the child (name, age, sex, religion, etc.), mother's and father's details (name, age, occupation, daily hours of working, and time spent with child), sibling's details (number of siblings, their age and sex, and any sibling with diagnosed behavioral problem), and the family details (number of adults and children in the family and their sex, primary caretaker of child, and total family income per month). In our study, monthly family income of the parents was categorized as ≤50,000, 50,000–200,000, and >200,000 INR.

The children were given the printed copy of the PPSC and pro forma, and the parents were asked to fill the details. A letter was also attached, explaining the purpose of the study and it was advised that the children scoring 9 or above in the PPSC go to a psychologist for further evaluation. The collected data were then tabulated and the statistical analysis was performed by STATA 11.2 (College Station TX, USA). Chi-square test was used to measure the association between the risk factors and the PPSC score and these were expressed as frequency and percentage. $p<0.05$ was considered as statistically significant.

RESULTS

In this study, a total of 370 children (male=180 and females=190) were included and the majority of them, 78 (43%) males and 82 (43%) females, belonged to the age group of 5–6 years followed by 4–5 years age group (M=55 and F=61) and age group of 3–4 years (47 children each). Out of 370 children, 173 (46.7%) children had PPSC score ≥9 and were at risk of developing behavioral problems while 49% of males and 45% of females were "at risk." The association between the risk of developing behavioral problem and age was not statistically significant (Table 1).

Association of various risk factors with the risk of developing behavioral changes is presented in Table 2. A significant association was found between the family income and behavioral problems ($p<0.001$). Association of behavioral problems and time spent with individual parents was assessed and time spent by fathers had a positive impact on a child's behavior ($p=0.008$). In our study, working status of the mother had a statistically significant positive effect on the behavioral problem and their children found to have less chances of the development of behavioral problems. Other factors including gender, age, time spent by mother with child, having a sibling, and family size did not have a significant association with the risk of developing behavioral problems (Table 2).

DISCUSSION

Behavioral disorders though prevalent are often ignored in children due to lack of awareness. The incidence of behavioral problems in adults such as depression, anxiety, attention-deficit/hyperactivity disorder, and conduct disorders is on the rise and is becoming a major issue among the young generation too. The prevalence of behavioral problems in children ranges from 24% to 74% [2-5]. In our study, children with PPSC score ≥9 were considered to be at risk of behavioral problems. Based on this, 46.7% of children were at risk of developing behavioral problems in our study. Studies have suggested that the prevalence of behavioral problems increase with advancing age [6]. Similarly, in our study, the prevalence of risk of behavioral problems was higher in the children of the age group of 5–6 years and least in the age group of 3–4 years.

Literature suggests that the child's sex is another individual factor which has been associated with behavior problems. It has been shown that males are at higher risk of mental health problems than females [2,12]. The result of our study was in

Table 1: Behavioral problems in males and females in different age groups

Gender	3–4 years	4–5 years	5–6 years	Total	p-value
	PPSC ≥9	PPSC ≥9	PPSC ≥9		
Male	21 (24%)	25 (28%)	42 (48%)	88	0.966
Female	19 (22%)	24 (28%)	42 (50%)	85	
Total	40	49	84	173	

PPSC: Preschool Pediatric Symptom Checklist

Table 2: Association of various risk factors with behavioral changes

Variable	Number (n=370)	Preschool Pediatric Symptom Checklist ≥9 (%)	p-value
Family income			
≤50,000	196	119 (60)	<0.001
50,000–2 lakhs	144	41 (28)	
>2 lakhs	19	7 (37)	
Non-disclosure	11		
Time spent with mother			
<4 h	29	8 (28)	0.043
4–6 h	50	20 (40)	
>6 h	291	145 (50)	
Time spent with father			
2 h	66	37 (56)	0.009
2–4 h	195	98 (51)	
>4 h	109	38 (35)	
Working status of mother			
Working	108	39 (36)	0.008
Non-working	262	134 (51)	
Size of the family			
<5 members	226	106	0.736
≥5 members	143	67	
No response	1		
Presence of sibling			
Younger sibling	85	41 (48)	0.795
Older sibling	172	80 (47)	

correlation to this fact as male children were slightly at higher risk than female children. This could be because male children often exhibit externalizing behavioral problems which are noticed earlier and more easily than the internalizing behavioral problems of girls.

In our study, family income found to have an effect on the child's social life. Low family income leaves the child geographically and socially isolated resulting in lack of support networks. Evidence suggest that children with low socioeconomic status manifest symptoms of psychiatric disorders and maladjusted social functioning more frequently than children who live in better circumstances [2,6]. The results of our study were in accordance with literature, we found that 60% of children with monthly family income of ≤50,000 INR were at risk of a behavioral problem when compared to the families with higher monthly income.

Employment has a positive impact on women's health. Our study found a significant association of maternal working status and child's risk of developing behavioral problem. The risk of behavioral problems was higher in children whose mothers were not working. We noted that children of working mothers were engaged in extracurricular activities in their free time while their mothers were at work when compared to the children of homemakers. Similarly, Sorensen and Verbrugge have highlighted the fact that despite the stress from the job, many women are quite efficient at juggling home duties and their job. In fact, it has a positive impact on their health as it provides an alternative for personal identity and satisfaction. Employed mothers have positive perceptions and provided more enriching home environments for their children. Working mothers also try to balance the income status which again has a positive role ion child's behavior [13].

There have been studies highlighting the importance of a father as a major factor in the behavioral development of a child. About 56% of children who spent 2 h with father were found to have risk of behavioral problems. The risk decreased as the time spent with father increased. Time spent with the parents was inversely proportional to the behavioral problems. Aldous and Mulligan concluded that the preschoolers who were difficult to raise and whose fathers actively took care had fewer problems as grade–schoolers [14]. Sarkadi *et al*. also found that more time spent by children with their father helps reduce the frequency of behavioral problems in boys and psychological problems in young women and enhances the cognitive development of child [15].

Size of the family also plays a significant role in the behavior of a child. In a study by Reddy *et al*., a higher risk of behavioral problems in children belonging to a nuclear family was observed. Family atmosphere filled with tension and anxiety which is usually seen with the nuclear families invariably affects the children and thus they are at higher risk of behavioral changes. On the contrary, a study by Gupta *et al*. showed that even in a joint family setup which has more members, the risk is equal [16]. However, the results of our study did not find size of the family as a risk factor for behavioral problems in children.

The number of children and order of birth also have shown association with behavioral problems in the previous studies and

the firstborn is considered to be at risk of developing behavior problems. This could be due to the greater attention paid to them and higher expectations from the children which may result in changes in behavior. Furthermore, with the birth of a sibling, the firstborn usually reacts with anxiety, feelings of abandonment, and anger. Lawson and Mace reported that having an older sibling may have a positive impact on a child's mental health, while the presence of a younger sibling may have a negative impact [17]. However, our study did not show association of sibling and behavior changes.

Even though the sample size selected by us is representative of general population, the limitation of our study is that only children from the urban population were studied. We further recommend such studies to be conducted with a larger sample size involving children from all socioeconomic backgrounds. Furthermore, the prevalence of individual behavioral changes should be assessed.

CONCLUSION

In our study, the prevalence of the risk of developing behavioral problem in children was 46.7%. The maternal working status and time spent with the father were found to have a significant positive impact on the child's behavior and low family income was the strongest risk factor for the development of behavioral problems.

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