



BEHAVIOURAL PROBLEMS AND ASSOCIATED FAMILY AND SOCIO-DEMOGRAPHIC FACTORS AMONG CHILDREN OF FACTORY WORKERS IN NORTH INDIA

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ABSTRACT

Introduction: Behavioural problems among children are emerging as a significant public health concern, especially in developing countries like India where socioeconomic disparities and limited access to mental health services prevail. Children of factory workers are particularly vulnerable due to adverse environmental and family conditions. **Aim:** To assess the prevalence of behavioural problems and associated socio-demographic characteristics in children of factory workers, and to evaluate their impact on personal, social, and school life. **Materials and Methods:** This hospital-based cross-sectional observational study was conducted over one year (July 2022–June 2023) in the Department of Paediatrics, ESIC Model Hospital, Noida, Uttar Pradesh. A total of 200 children aged 6–12 years, belonging to factory worker families, were randomly enrolled. Behavioural problems were screened using the Strengths and Difficulties Questionnaire (SDQ) with impact supplement. Socioeconomic status was assessed using the modified Kuppuswamy scale. **Results:** Of 200 participants, 54% were female and 50% belonged to the 6–9 years age group. Overall, 20% had abnormal total SDQ scores, while 31% fell into the borderline category. Emotional symptoms (34%) and conduct problems (22%) were the most common behavioural issues, while hyperactivity (8.5%) and peer problems (4.5%) were less frequent. Significant associations were found between behavioural problems and socio-demographic factors such as urban residence, nuclear family structure, lower parental education, limited leisure time with parents, presence of family conflict, disability in child, and absence of one/both parents ($p < 0.05$). **Conclusion:** Behavioural problems are prevalent among children of factory workers, with emotional and conduct disorders being the most frequent. Socio-demographic and family-related factors strongly influence these problems. Early screening using simple tools like the SDQ and strengthening family support systems may help reduce their long-term impact on children's well-being.

Keywords: Behavioural problems, Children, Factory workers, Socio-demographic factors, Strengths and Difficulties Questionnaire

Introduction

Childhood is a critical phase of growth and development when physical, cognitive, and emotional domains evolve rapidly. Good mental health during this period is essential for academic achievement,

social relationships, and long-term productivity. However, behavioural and emotional problems are increasingly recognised as major public health concerns. According to the **World Health Organization (WHO)**, about **20% of children and adolescents worldwide** are affected by mental health problems, many of which remain underdiagnosed and untreated [1]. The **Global Burden of Disease study** highlights that mental and behavioural disorders contribute significantly to disability among young populations [2].

Epidemiological studies suggest that **5–15% of children worldwide** suffer from behavioural disorders [3]. The burden is disproportionately higher in low- and middle-income countries (LMICs), where mental health services are scarce and stigma prevails [4]. In India, reported prevalence rates among school-going children vary widely, from **6% to over 40%**, depending on population, methodology, and tools used [5,6]. Common childhood disorders include **attention-deficit/hyperactivity disorder (ADHD)**, **oppositional defiant disorder (ODD)**, **conduct disorder (CD)**, and internalising problems such as **anxiety and depression** [7]. These can be broadly grouped as **externalising disorders** (e.g., ADHD, ODD, CD) or **internalising disorders** (e.g., anxiety, depression) [8]. If unrecognised, they can impair academic performance, disrupt social functioning, and predispose to substance use and psychiatric illnesses in adulthood [9].

Risk factors for childhood behavioural problems are multifactorial, involving genetic vulnerability, family dynamics, and environmental influences. Studies have linked **low parental education, single-parent households, family conflict, parental illness, substance abuse, and poverty** with increased risk [5,6]. Broader determinants such as urbanisation, migration, and socioeconomic disadvantage also play important roles [4]. Children of factory workers represent a socioeconomically vulnerable subgroup. These families often live in congested urban or peri-urban settlements, with limited parental supervision due to long working hours and financial pressures. Such conditions may predispose children to behavioural problems, yet there is limited research on this specific population in India.

Screening and early recognition are essential for intervention. The **Strengths and Difficulties Questionnaire (SDQ)** is a widely validated screening tool for behavioural problems. It assesses five domains—emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behaviour—and has been applied in several Indian studies [7]. For example, **Srinath et al.** reported a prevalence of **12.5% behavioural problems** among children in Bengaluru [5], while **Gupta et al.** observed **22.7% prevalence in Kanpur** [6]. Despite this evidence, most studies have focused on schoolchildren from general or mixed populations; little is known about children of industrial or factory workers, whose psychosocial environment may differ substantially.

Given the paucity of data, this study was undertaken to evaluate **behavioural problems and their socio-demographic correlates among children of factory workers** in a hospital-based setting. By identifying at-risk groups and associated determinants, the findings aim to strengthen early detection and guide preventive interventions for vulnerable children in LMIC settings.

Materials and Methods

This was a hospital-based cross-sectional observational study conducted in the Department of Paediatrics, Employee's State Insurance Corporation (ESIC) Model Hospital, Sector-24, Noida, Uttar Pradesh. The study was carried out over a period of one year, from July 2022 to June 2023, after obtaining approval from the Institutional Ethics Committee. Written informed consent was obtained from the parents of all enrolled participants prior to data collection.

The study population comprised children of factory workers who were registered beneficiaries of ESIC and were attending the outpatient department or admitted in the paediatric ward at the time of recovery and discharge. A total of 200 children, both boys and girls, aged between 6 and 12 years, were recruited using a simple random sampling technique. Children with chronic illnesses or conditions likely to affect behaviour assessment were excluded to avoid confounding.

The sample size was calculated using the formula $n = (Z1-\alpha/2)^2 P(1-P)/d^2$, considering an average prevalence of 21% behavioural problems reported in community studies, with an absolute precision

of 6% and a 10% anticipated drop-out rate. Based on this calculation, 200 children were included in the study.

Data collection involved face-to-face interviews with parents and children using a structured socio-demographic proforma. Information was recorded on variables such as age, sex, school grade, birth order, hobbies, time spent in leisure activities, number of close friends, parental age, education, occupation, family type, number of siblings, housing conditions, religion, presence of disability, substance abuse in the family, and conflicts within the household. Socioeconomic status was assessed using the **modified Kuppuswamy socioeconomic scale**, which classifies families into upper, upper middle, lower middle, upper lower, and lower socioeconomic groups based on education, occupation, and income of the head of the household.

Behavioural problems were assessed using the **Strengths and Difficulties Questionnaire (SDQ)** with the impact supplement, developed by Goodman [10]. The SDQ is a validated 25-item screening tool that evaluates five domains: emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial behaviour. Each item is scored on a three-point scale (not true, somewhat true, certainly true). Subscale scores are generated for each domain, and a total difficulties score (ranging from 0–40) is obtained by summing all domains except prosocial behaviour. The scores were categorised as “normal,” “borderline,” or “abnormal” based on established cut-offs. The impact supplement further assessed perceived distress, social impairment, and burden on others, providing insight into the functional consequences of behavioural problems. Children with abnormal SDQ scores were referred to the Department of Psychiatry for further evaluation and management.

Statistical analysis

Statistical analysis was performed using **SPSS version 23 (IBM Corp., Armonk, NY, USA)**. Data were coded and initially entered into Microsoft Excel before transfer to SPSS. Categorical variables such as gender, family type, and religion were summarised as frequencies and percentages, while continuous variables such as age and SDQ scores were expressed as mean $\pm$ standard deviation (SD). Normality of quantitative data was assessed using the Kolmogorov–Smirnov test. The chi-square test (or Fisher’s exact test where appropriate) was used to evaluate associations between categorical variables. Student’s *t* test was applied for comparison of continuous variables between groups. A *p* value of <0.05 was considered statistically significant at 95% confidence interval.

Observation & Results

A total of 200 children of factory workers aged between 6 and 12 years were included in the study. The mean age of participants was 8.9 ± 2.1 years, with 50% belonging to the 6–9 years age group and the remaining 50% in the 10–12 years age group. Females constituted 54% of the study population. The majority of children (72%) were from nuclear families, and 58% of parents belonged to the lower middle or upper lower socioeconomic strata as per the modified Kuppuswamy scale.

Table 1: Socio-demographic profile of study participants (n=200)

Variable	Categories	Frequency (%)
Age group (years)	6–9	100 (50.0)
	10–12	100 (50.0)
Gender	Male	92 (46.0)
	Female	108 (54.0)
Family type	Nuclear	144 (72.0)
	Joint	56 (28.0)
Socioeconomic status*	Upper middle	42 (21.0)
	Lower middle	78 (39.0)
	Upper lower	38 (19.0)
	Lower	42 (21.0)

Variable	Categories	Frequency (%)
No of close friend	<1	58 (29.0)
	2-3	67 (33.5)
	>4	75 (37.5%)

*Based on modified Kuppaswamy scale

The overall prevalence of behavioural problems as assessed by the SDQ was 20% (abnormal category), while 31% of children fell into the borderline range. Emotional symptoms were the most common domain of abnormality (34%), followed by conduct problems (22%). Hyperactivity (8.5%) and peer problems (4.5%) were comparatively less frequent. Prosocial behaviour was found to be normal in the majority of children.

Significant associations were observed between behavioural problems and several socio-demographic factors. Children from nuclear families, lower parental education, families with conflicts, absence of one or both parents, and those with limited parental leisure time had significantly higher rates of abnormal SDQ scores ($p < 0.05$). Similarly, behavioural problems were more common among children with disabilities and in families with substance abuse.

Table 2: Distribution of children according to SDQ domains (n=200)

SDQ Domain	Normal n (%)	Borderline n (%)	Abnormal n (%)
Emotional symptoms	102 (51.0)	30 (15.0)	68 (34.0)
Conduct problems	132 (66.0)	24 (12.0)	44 (22.0)
Hyperactivity	168 (84.0)	15 (7.5)	17 (8.5)
Peer problems	182 (91.0)	9 (4.5)	9 (4.5)
Prosocial behaviour	156 (78.0)	22 (11.0)	22 (11.0)

Table 3: Association of behavioural problems with family and parental factors

Factor	Normal/Borderline (%)	Abnormal (%)	p value
Family type			
– Nuclear (n=144)	108 (75.0)	36 (25.0)	0.03*
– Joint (n=56)	52 (92.9)	4 (7.1)	
Parental education			
≤secondary	96 (70.1)	41 (29.9)	0.01*
≥graduate	64 (88.9)	8 (11.1)	
Family conflict			
Presence of family conflict	58 (65.9)	30 (34.1)	<0.01*
No family conflict	102 (85.7)	17 (14.3)	

*Significant

Table 4: Association of behavioural problems with child-related factors

Factor	Normal/Borderline (%)	Abnormal (%)	p value
Gender			
Male (n=92)	72 (78.3)	20 (21.7)	0.64
Female (n=108)	88 (81.5)	20 (18.5)	
Child with disability	7 (46.7)	8 (53.3)	<0.01*
No disability	153 (82.3)	32 (17.7)	
Absence of parent(s)	15 (62.5)	9 (37.5)	0.04*
Both parents present	145 (82.4)	31 (17.6)	

*Significant

Discussion

The present study assessed behavioural problems and their socio-demographic correlates among children of factory workers aged 6–12 years. Using the SDQ, we found that **20% of children had abnormal behavioural scores**, while 31% were in the borderline range. Emotional problems and conduct disorders were the most common difficulties, whereas hyperactivity and peer problems were less frequent. These findings highlight a substantial burden of behavioural issues in this vulnerable group.

Our prevalence estimate is broadly consistent with other Indian studies. **Srinath et al.** reported a 12.5% prevalence of behavioural disorders among children in Bengaluru [5], while **Gupta et al.** found 22.7% in Kanpur [6]. Similarly, studies from Nagaland and Gujarat reported prevalence rates ranging between 15–30% [11,12]. The slightly higher rates in our study may reflect the socio-economic vulnerabilities of factory worker families, such as long parental working hours, limited supervision, and financial stress.

In terms of domains, **emotional problems** were most frequent in our cohort (34%). This pattern has been observed in other Indian studies, which reported anxiety, fearfulness, and sadness as common concerns [5,11]. Emotional difficulties may be related to family conflict, insecurity, and lack of supportive environments, all of which were common in our study population. **Conduct problems (22%)** were also prominent, similar to findings from **Jogdand and Naik**, who reported high rates of aggression and disruptive behaviour in children from socioeconomically disadvantaged backgrounds [13].

Interestingly, **hyperactivity (8.5%)** and **peer problems (4.5%)** were less frequent in our study compared to western data, where ADHD prevalence is often higher [7,14]. This difference may partly reflect cultural perceptions, under-recognition by parents, or methodological variation. It suggests that Indian children of factory workers may experience more internalising problems than externalising disorders.

We observed significant associations between behavioural problems and **family structure, parental education, family conflict, parental absence, and disability in the child**. Children from nuclear families were more likely to have behavioural issues compared to those in joint families. This finding aligns with the view that extended family networks provide emotional buffering and supervision [12,15]. Similarly, lower parental education was significantly linked to abnormal SDQ scores, consistent with previous reports that highlight the role of parental literacy in promoting positive child development [16].

Family conflict and absence of parents were among the strongest predictors of behavioural problems. Children exposed to marital discord, domestic violence, or lack of parental support often exhibit anxiety, aggression, or poor peer adjustment [13,17]. Likewise, children with disabilities were more likely to have behavioural difficulties, reflecting the dual burden of medical and psychosocial challenges.

Contrary to some studies, **gender was not significantly associated** with behavioural problems in our cohort. While boys are often reported to have more externalising problems and girls more internalising problems [7], our findings suggest that socio-environmental stressors may overshadow gender differences in this group.

Overall, our results underscore the need for **early screening and intervention** in children of factory workers. Tools like the SDQ are brief and cost-effective, making them feasible for hospital and community settings. Integrating behavioural screening into school health and primary care programmes, along with parental counselling and family support interventions, could reduce the long-term burden of these problems.

Conclusion

Behavioural problems are prevalent among children of factory workers, with one in five showing abnormal scores on the SDQ. Emotional and conduct problems were the most common difficulties identified. Socio-demographic and family factors, particularly nuclear family structure, lower

parental education, family conflict, absence of parents, and child disability, were significantly associated with behavioural issues. These findings highlight the importance of early recognition, family-based interventions, and strengthening of social support systems for vulnerable groups. Incorporating behavioural health screening into paediatric practice and school health programmes may help mitigate the adverse long-term consequences of childhood behavioural disorders.

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