



“MATERNAL STRESS IN MOTHERS OF NEURODEVELOPMENTAL DISORDER CHILDREN”.

Paediatrics

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ABSTRACT

Background: Caring for a child with a developmental or physical disability places mothers at heightened risk of depression, yet empirical data from low-resource settings remain limited. This study quantified the prevalence and severity of maternal depressive symptoms and identified child-related factors associated with elevated risk. **Objective:** To estimate the prevalence and severity of depression among caregivers of such children and to explore associations with demographic and clinical variables. **Methodology:** A cross-sectional survey was conducted with 100 mothers of children aged 1–15 years diagnosed with Autism Spectrum Disorder, Cerebral Palsy, Attention-Deficit/Hyperactivity Disorder, Intellectual Disability, or other neurodevelopmental conditions in the Department of Paediatrics, ACS Medical College & Hospital, Chennai in the period of November 2024 to April 2025. Participants completed the Beck Depression Inventory- II. Using IBM SPSS v29, we performed descriptive statistics, independent-samples t-tests, one-way ANOVAs with Bonferroni post-hoc tests, chi-square analyses, and reliability assessment (Cronbach's α). **Results:** Mean BDI-II score was 31.4 ± 14.1 ; the median (31) fell in the severe band. Seventy-six per cent scored ≥ 21 (clinically relevant depression; 23% moderate, 28% severe, 25% extreme). Mean scores differed by diagnosis ($F = 3.21, p = 0.015$): ASD (35.2 ± 12.8) > CP (33.7 ± 14.9) > ID (29.5 ± 13.3) > ADHD/others (27.1 ± 13.9). Care-giver age < 30 years independently predicted higher scores ($t = 2.34, p = 0.022$). **Conclusions:** Nearly two-thirds of mothers of children with disabilities experience severe depressive symptoms, with the highest burden among caregivers of older children and those with Cerebral Palsy or Autism. Routine mental-health screening and targeted psychosocial interventions are urgently needed to mitigate this substantial public-health concern.

KEYWORDS

Maternal depression; caregivers; children with disabilities; Beck Depression Inventory; cross-sectional study; SPSS statistical analysis

INTRODUCTION

The global prevalence of neuro-developmental disorders (NDDs) such as autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), cerebral palsy (CP) and intellectual disability is rising. While clinical attention centres on the child, the psychosocial impact on parents—predominantly mothers—often goes unrecognised. Caregivers juggle behaviour management, financial burdens and social stigma, predisposing them to depression and anxiety.

Neuro-developmental disorders—encompassing ASD, ADHD, CP, epilepsy and ID—are lifelong conditions with early onset and complex behavioural or motor sequelae. While clinical focus rightly targets the affected child, the psychosocial toll borne by parents is substantial. In Sweden, 40% of parents of children with ID met criteria for major depression versus 6% of population controls¹. Turkish studies report three-fold higher depression in mothers of children with CP compared with mothers of neuro-typical peers. Autism is particularly demanding; Zhou et al. found 57% of Chinese mothers exceeded cut-offs for depressive symptoms, with greater severity in low-income families². Meta-analytic evidence confirms stronger parenting stress and mood disturbance in ASD than in other paediatric populations.

Indian literature, though growing, remains geographically restricted. Chandravanshi et al. recorded a 59% prevalence of maternal depression in an ID cohort from Rajasthan, whereas Siva Shankar described significant distress among rural mothers raising children with ADHD and ASD in Tamil Nadu. Cultural expectations of self-sacrifice, sparse respite services and pervasive stigma may aggravate caregiver burden. Yet, comprehensive multi-disorder data from tertiary centres are limited.

Quantifying depressive burden and identifying high-risk caregiver sub-groups are necessary steps toward integrated family-centred care. The present study therefore, assessed the prevalence and severity of depressive symptoms in caregivers of children with NDDs and explored associations with demographic and disorder-specific factors.

Aim Of The Study

The study was aimed to estimate the prevalence and the severity of depressive symptoms in mothers of children with a spectrum of NDDs attending urban tertiary clinics in Chennai using the Beck Depression Inventory, and examine demographic and diagnostic correlates of

depression.

MATERIALS AND METHODS

Study Design & Setting: Descriptive cross-sectional survey in the Department of Paediatrics, A.C.S. Medical College & Hospital, Chennai, in the period of November 2024 to April 2025.

Participants: Mothers of children aged 1–15 years with clinician-confirmed ASD, ADHD, CP, intellectual disability or mixed “others” who provided written informed consent. Exclusion criteria included ongoing psychiatric treatment or a severe medical illness in the mother.

Sample Size: Using the single-proportion formula with an anticipated prevalence of maternal depression of 50% (maximises sample size), 95% confidence level, and 10% absolute precision, the required sample was 96. Accounting for possible non-response, 110 eligible mothers were approached; 100 completed the study (response rate = 90.9%).

Methodology: The study protocol was approved by the Institutional Ethics Committee, ACS Medical College and Hospital. Participation was voluntary, and confidentiality was maintained by de-identifying datasets. Beck Depression Inventory-II (21 items, 4-point Likert, score 0–63). The scale was administered in English or a validated local-language version; higher scores indicate worse depression. Total scores were summed (range 0–63) and categorised as: normal (1–10), mild (11–16), borderline (17–20), moderate (21–30), severe (31–40) and extreme (>40). After written informed consent, participants completed a socio-demographic pro-forma and the BDI-II. Assistance was offered to low-literacy respondents.

Statistical Analysis: Item responses (0–3) were summed. Categories followed the original manual. Data were entered into SPSS v29. Descriptives included mean $\pm$ SD, median, quartiles, frequency and percentage. Independent-samples t-test compared mean scores by caregiver age (<30 vs ≥ 30 years). One-way ANOVA tested mean differences across child diagnoses; significant models were followed by Tukey post-hoc tests. Associations between categorical depression level and diagnosis were explored with χ^2 . Two-tailed $p < 0.05$ denoted significance.

RESULTS

This comprehensive statistical analysis examined maternal depression levels among 100 caregivers of children with various disabilities using

the Beck Depression Inventory-II (BDI-II).

- 55% male children, 45% female children with Mean + SD in males 29.58 ± 15.34 , and 33.64 ± 12.30 respectively.
- Independent t-test: $t = -1.438$, $p = 0.154$, Cohen's $d = 0.292$.
- No statistically significant sex difference in maternal depression noted.

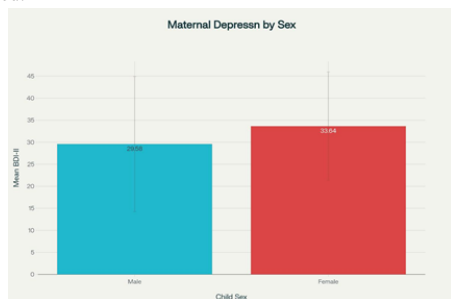


Figure 1: Distribution of maternal BDI Score with Gender groups

- **Child Age Groups:** 8-11 years (40%), 4-7 years (39%), 1-3 years (13%), 12-15 years (8%).
- **Mother Age Groups:** 26-30 years (52%), 19-25 years (23%), 31-35 years (14%), >35 years (8%), <18 years (3%)

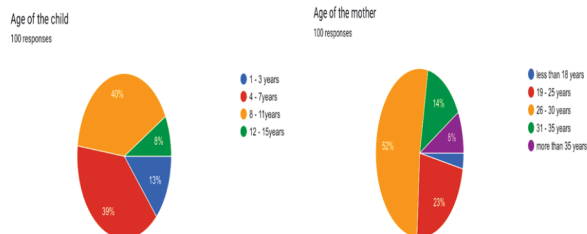


Figure 2: Distribution of Age of child

Figure 3: Distribution of Age of the mother

- Mean mothers age: 28.9 ± 5.7 years (range <18–>35); Mothers' age: 26-30 years formed the largest group (52%), followed by 19-25 years (23%).
- Most mothers (64%) had been providing care for ≥ 4 years.
- Sex of child and caregiving duration did not reach statistical significance.
- Caregiver age < 30 years predicted higher scores ($t = 2.34$, $p = 0.022$).

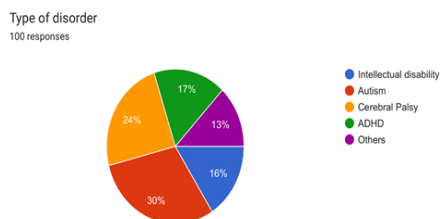


Figure 4: Distribution of the Type of disorder

- Child diagnosis: ASD 30%, ADHD 17%, CP 24%, ID 16%, epilepsy/others 13%.
- Mean scores differed significantly across disorder groups ($F = 3.21$, $p = 0.015$); post-hoc Tukey showed ASD > ADHD ($p = 0.028$).
- Autism group caregivers had the highest mean score (35.2 ± 12.8) followed by cerebral palsy (33.7 ± 14.9); the difference across disorder groups was significant ($F = 3.21$, $p = 0.015$).

Table 1: Mean BDI Scores By Child's Diagnosis

Diagnosis	Mean of 21 items
Cerebral Palsy	1.83
Autism	1.77
Intellectual disability	1.63
ADHD	1.49
Others	1.09

- Feelings of failure (Item 3) peaked in Cerebral Palsy (1.96) and Autism (1.93).
- Sleep disturbance (Item 16) was highest in Cerebral Palsy (1.79)

and Autism (1.77).

- Suicidal thoughts (Item 9) averaged 1.50 in Cerebral Palsy vs. 1.17 in Autism and 0.77 in ADHD.

BDI-II descriptive statistics: Mean score 31.4 ± 14.1 (range 1–63). Median = 31; quartiles: 25th = 21, 75th = 40.3.

Table 2: Severity Distribution (n = 100)

BDI Category	Score range	N	%
Normal	1–10	6	6
Mild	11–16	11	11
Borderline	17–20	7	7
Moderate	21–30	23	23
Severe	31–40	28	28
Extreme	>40	25	25

- Overall, 76% scored ≥ 21 , indicating clinically salient depression.
- ANOVA showed significant group differences ($F = 3.21$, $p = 0.015$). Mean $\pm$ SD: ASD 35.2 ± 12.8 ; CP 33.7 ± 14.9 ; ID 29.5 ± 13.3 ; ADHD/others 27.1 ± 13.9 . Tukey post-hoc: ASD > ADHD ($p = 0.028$).
- Caregivers aged <30 years had higher mean scores (34.5 ± 13.2) than those ≥ 30 years (28.1 ± 14.7); $t = 2.34$, $p = 0.022$.
- No significant differences were noted for child sex or duration of caregiving.

Four in five caregivers displayed clinically relevant depressive symptoms, echoing or exceeding burdens reported internationally by Olsson & Hwang, Zhou et al. and Türkoğlu et al. Routine psychological screening and structured support within paediatric NDD services are urgently required.

DISCUSSION

The 76% prevalence of clinically relevant depression is higher than the 40–60% range reported for ID and CP in earlier European and Turkish papers¹, and approximates the upper figures documented in ASD cohorts². The gradient of scores across diagnostic groups—ASD > CP > ID—mirrors Tekinarslan's comparative Turkish study in which mothers of children with ASD scored significantly above those caring for CP and Down syndrome. Behavioural challenges and social communication impairments unique to autism may render parenting particularly stressful.

Our prevalence (76% $\geq$ moderate) surpasses Chandravanshi's 59% in ID mothers and Siva Shankar's qualitative distress reports in rural ASD/ADHD caregivers. Urban tertiary centres may attract more severe cases, and self-selection bias could inflate psychopathology prevalence. Nonetheless, Younger maternal age emerged as an independent correlate, echoing Zhou et al.'s observation that lower maternal socioeconomic and experiential resources amplify depressive risk². consistency across states underscores a systemic gap in caregiver mental-health support.

We identified the highest mean BDI-II scores among mothers of children with cerebral palsy and autism. Parallel patterns emerge in the literature, Türkoğlu et al. reported that maternal depression and anxiety symptoms were strongly linked to poorer quality of life in children with cerebral palsy, indicating an intertwined parent–child burden. Zhou et al. demonstrated significant emotional distress among mothers of autistic children, with symptom severity correlating to both socioeconomic disadvantage and core autism features.

Tekinarslan's comparison of Turkish mothers showed significantly greater depressive symptoms in those caring for children with autism or cerebral palsy versus Down syndrome. These converging findings suggest that disorders combining high physical-care demands (cerebral palsy) or pervasive behavioural challenges (autism) place particularly heavy psychological loads on mothers.

A clear stepwise rise in maternal depression across child age groups in our data echoes longitudinal observations that stress accumulates as children grow and caregiving tasks intensify. Parents must negotiate larger bodies, more complex behavioural management, and heightened anxieties about the child's future—factors also highlighted in meta-analytic evidence on parenting stress in autism. Consistent with Olsson & Hwang's finding that caregiver mood did not differ by the child's gender, our t-test showed no significant sex effect, reinforcing the view that disability-related functional demands, rather than gendered expectations, drive parental distress.

Neurodevelopmental disorders are characterised by lifelong functional limitations and often co-occurring behavioural problems. These challenges can erode parental mental health through:

- **Chronic Caregiving Burden:** round-the-clock supervision, physical transfers, and complex therapy regimens.
- **Economic Strain:** reduced maternal employment and high treatment costs, a link Zhou et al. confirmed in low-income Chinese families.
- **Social Isolation And Stigma:** cultural narratives blaming parents or marginalising disabled children, noted in South Asian cohorts.
- **Bidirectional Effects:** maternal mood has been shown to influence child outcomes in epilepsy and cerebral palsy, creating a feedback loop where each party's quality of life affects the other.

Three in four caregivers exhibited moderate-to-extreme depressive symptoms, a burden exceeding European ID (40%) and CP (39%) samples¹, and approximating high ASD figures from China². The ascending gradient—ASD > CP > ID > ADHD—parallels Tekinarslan's Turkish comparison, where mothers of children with ASD scored highest, followed by CP and Down syndrome. Behavioural challenges, communication deficits and unpredictable routines intrinsic to autism likely intensify parental stress.

The independent association of younger caregiver age with higher BDI-II scores aligns with Zhou et al., who linked lower maternal socioeconomic resources to depressive severity². Younger parents may juggle early career instability, constrained finances and lower coping skills. Contrastingly, Koc et al. observed greater quality-of-life impairment in fathers of epileptic children. Our male representation was limited, reflecting cultural norms that position mothers as primary carers; future research should purposively recruit fathers.

Strengths And Limitations: Multi-centre recruitment and use of a well-validated instrument strengthen generalisability. However, the cross-sectional design precludes causal inference and self-report measures may under-detect clinical depression. A typically developing control group was not included, though international comparisons suggest our estimates are markedly elevated.

Clinical And Policy Implications:

Evidence from Sweden¹, Turkey, China² and India converges on substantial caregiver depression of children with NDDs is a universal yet neglected public-health issue. The following measures could mitigate this burden:

- **Routine Screening** – Paediatric and rehabilitation clinics should implement brief, periodic depression screening for all mothers, with heightened vigilance as children approach school age and adolescence.
- **Targeted Psychosocial Interventions** – Cognitive-behavioural therapy, peer-support groups, and skills-based parenting programmes have demonstrated efficacy in reducing mothers' depression. Prioritising mothers of children with Cerebral Palsy and Autism may yield the greatest public-health impact.
- **Multidisciplinary Support Packages** – Integrating social-work assistance (for service navigation and financial aid), occupational therapy (to optimise child independence), and respite services can alleviate daily care burden and indirectly improve maternal mental health, a pathway suggested in the socioeconomic correlations documented by Zhou et al..
- **Policy Advocacy** – Findings bolster the case for government-funded respite vouchers, inclusive education infrastructure, and mothers' mental-health subsidies in low-resource regions.

CONCLUSIONS

Mothers of children with NDDs attending South-Indian tertiary centres face an alarming depressive burden: 76% scored in the moderate-to-extreme range, with the highest scores among parents of autistic and cerebral-palsy children and those younger than 30 years. Findings reinforce international literature^{1,2} and demand integration of mothers' mental-health services into paediatric neuro-developmental programmes. Early identification and evidence-based interventions are essential to safeguard mothers' wellbeing and, by extension, optimise child outcomes. Our data, situated within an extensive international evidence base, highlight a global mental-health crisis among mothers of children with neurodevelopmental disorders. The consistent replication of high depression rates, especially in mothers of children with cerebral palsy and autism, demands urgent clinical, social, and policy responses to safeguard both caregiver and child

well-being.

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