



Frequency of Depression in Parents of Children with Neurodevelopmental Disorders

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ABSTRACT

Background: Long-term care and assistance are frequently necessary for neurodevelopmental disorders (NDDs), including intellectual disability, attention-deficit/hyperactivity disorder, autism spectrum disorder, and global developmental delay. Parents' psychological health can be greatly impacted by the caring duties related to these diseases, especially raising their risk of depression. **Methodology:** Over the course of six months, a descriptive cross-sectional study was carried out at Department of Psychiatry and Behavioral Sciences, D.H.Q/Allied Hospitals, Faisalabad Medical University, Faisalabad. Using a non-probability sequential sampling strategy, 93 parents of children with neurodevelopmental problems were included. A standardized questionnaire comprising sociodemographic data and the Patient Health Questionnaire-9 (PHQ-9) to measure depressive symptoms was used to gather data. PHQ-9 scores were used to classify depression; a score of ≥ 10 was seen as a marker of clinically severe depression. Frequencies and percentages were computed after data analysis using SPSS version 25. To account for effect modifiers such mother and child age, child gender, number of children with NDD, kind of disorder, maternal education, place of residence, and socioeconomic level, stratification was used. **Findings:** Of the 93 participants, 50 (53.8%) did not fit the criterion for depression, while 43 (46.2%) parents had depression. Depression was shown to be more common in moms than in fathers, as well as in parents from poorer socioeconomic backgrounds. Compared to parents of children with other neurodevelopmental disorders, parents of children with autism spectrum disorder exhibited comparatively greater levels of depression symptoms. **Conclusion:** A significant number of parents of children with neurodevelopmental abnormalities suffer from depression. To enhance the mental health of parents and the general well-being of families, early screening, psychological counseling, and caregiver support programs should be incorporated into pediatric and developmental healthcare services.

INTRODUCTION

The central nervous system's (CNS) functions are impacted by a diverse range of chronic conditions known as neurodevelopmental disabilities (NDD). They are caused by a malfunction in the behavioral, learning, language, or physical areas of functioning throughout the developmental stage and frequently persist throughout a person's lifespan. NDDs include learning problems, sensory and motor impairments, autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), and intellectual disability (ID). Neurodevelopmental diseases have a multifaceted etiology that includes idiopathic origins, genetic anomalies, exposure to toxins, and prenatal infections.¹ 0.63% of people have intellectual disability (ID), 5–11% have attention-deficit/hyperactivity disorder (ADHD), 0.70–3% have autism spectrum disorder (ASD), 3–10%

have specific learning disorder (SLD), 1–3.42% have communication disorders (CDs), and 0.76–17% have motor disorders (MDs), according to a recent systematic review.²

According to reports, more than 6% of children in Pakistan have a developmental disability (ID or ASD).³ 33.3% of symptomatic referrals for neurodevelopmental disorders in Pakistan were diagnosed with ASD, 24.5% with global developmental delay, and 15.5% with ADHD, according to a study on the subject. Out all the youngsters, 11.57% had two diagnoses.⁴ People with disabilities mainly depend on their families for their physical, social, and emotional needs. Children with neurodevelopmental disabilities are more susceptible to psychopathologies like depression because they require a different style of parenting and attention than children who are typically developed.⁵ The Global Burden of Diseases, Injuries, and Risk Factors

Study (GBD) 2019 lists depression as one of the two most incapacitating mental illnesses and one of the top 25 global causes of burden.⁶ According to a cross-sectional study conducted in Saudi Arabia, 85.1% of parents of children with NDDs suffered from depression, and there was no discernible correlation between the type of NDDs and parental depression rates.⁵

According to a cross-sectional study conducted in India, moms of children with neurodevelopmental disabilities experienced depression in 38% of cases, anxiety in 43% of cases, and both in 30% of cases. Depression was seen in 19.2% of parents of children with ISD⁷ and 14.2% of parents of children with ID, according to the type of NDDs. 58.7% of moms of children with neurodevelopmental problems had clinical depression, according to a recent study conducted in Pakistan.⁸

There is little information available about the frequency of various childhood neurodevelopmental disorders in Pakistan, as well as the effects of parenting children with these conditions on the functioning of parents and their susceptibility to psychopathology.

Because of a number of circumstances, depression is already becoming more common in our nation, and because of the country's limited resources and economic situation, raising a child with a disability can be difficult, stressful, and unpleasant. Only in industrialized nations are the majority of studies conducted on the relationship between child care and depression among parents of children with neurodevelopmental disabilities. There is a gap in the literature because there is a lack of local data regarding the trends of various neurodevelopmental disorders. With this study, we hope to learn more about the extent of the issue in our area so that we can diagnose it and take prompt action to better assist and support these parents.

METHODOLOGY

A descriptive cross-sectional research approach was used in this study to ascertain the prevalence of depression in parents of children with neurodevelopmental disorders. The study was conducted at D.H.Q/Allied Hospitals, Faisalabad Medical University, Faisalabad, in the Department of Psychiatry and Behavioral Sciences. During the six months that data was being collected, parents who were taking their kids to follow-up appointments, clinical evaluations, or treatments were asked to participate in the study. Using the WHO sample size calculator, the sample size was calculated as follows: sample size = 93, margin of error = 7.1%, expected proportion = 14.2%⁷, and confidence level = 95%.

Autism spectrum disorder, attention-deficit/hyperactivity disorder, intellectual disability, global developmental delay, speech and language disorders, learning disorders, and cerebral palsy associated with developmental delay were among the neurodevelopmental disorders for which the study population was composed of parents. Medical records and assessments by licensed pediatric neurologists or child psychiatrists using accepted diagnostic standards were used to confirm the diagnosis of neurodevelopmental disorders in children. Participants in the study might be either the father or the mother who was with the child during the hospital stay.

Parents who were the biological parents of a child with a neurodevelopmental disability, between the ages of 18 and 50, and who gave their informed agreement were eligible to participate. To prevent confounding variables, parents who had a history of severe mental illness, such as schizophrenia, bipolar disorder, or other psychotic illnesses, were not included. The study also eliminated parents who refused to provide their consent or who had cognitive impairment or serious communication problems that made it impossible for them to grasp the questions.

A systematic questionnaire with two primary sections was used to gather data. A demographic and clinical information form created by the researcher to gather pertinent background data about the parents and their kids was included in the first section. Parents' age, gender, marital status, level of education, occupation, monthly household income, type of family (nuclear or joint), place of residence (urban or rural), and number of children were all noted in this section. The child's age, gender, neurodevelopmental disorder diagnosis, length of time since diagnosis, existence of comorbid conditions, and current therapy or treatment were all included.

The Patient Health Questionnaire-9 (PHQ-9), a well used and validated measure for evaluating depressive symptoms, was the standardized depression screening test included in the second section of the questionnaire. Nine questions on the PHQ-9 match the criteria used to diagnose depressive disorders. With 0 representing "not at all" and 3 representing "nearly every day," each item is assessed on a four-point Likert scale that assesses the frequency of symptoms during the previous two weeks. The overall score, which ranges from 0 to 27, indicates more severe depressed symptoms. The intensity of depression was classified as: mild (5–9), moderate (10–14), moderately severe (15–19), severe depression (20–27), and minimal (0–4). For the purposes of this study, a PHQ-9 score of 10 or greater was considered indicative of clinically significant depressive symptoms.

SPSS V-23 was used to enter all of the data. For every quantitative variable, including the mother's and child's ages, the length of the illness, and the length of treatment, the mean and standard deviation were computed. For all qualitative variables, including child gender, mother education, number of children with NDD, kind of NDD, socioeconomic position, residence, and mother depression, frequency and percentage were computed. The frequency of depression was compared using the chi-square test. Stratification was used to control effect modifiers such as the child's and mother's age, gender, number of children with NDD, type of NDD, mother's education, place of residence, and socioeconomic position. Chi-square post-stratification analysis was used. A P-value of less than 0.05 was considered significant.

RESULTS

The mean age of the parents was 34.7 ± 7.8 years, with ages ranging from 22 to 52 years. Among the participants, 58 (62.4%) were mothers and 35 (37.6%) were fathers. Regarding marital status, the majority of participants 89 (95.7%) were married, while 4 (4.3%) were single, divorced, or widowed. In terms of educational status, 18 (19.4%) had primary education, 29 (31.2%) had

secondary education, 32 (34.4%) had higher secondary education, and 14 (15.1%) had a university-level education (Table 1).

With regard to occupational status, 41 (44.1%) of the parents were employed, while 52 (55.9%) were unemployed or homemakers. Most participants 61 (65.6%) belonged to nuclear families, while 32 (34.4%) lived in joint family systems. In terms of residence, 54 (58.1%) participants were from urban areas, while 39 (41.9%) were from rural areas.

The mean age of the children with neurodevelopmental disorders was 6.8 ± 3.1 years. Among the children, 61 (65.6%) were male and 32 (34.4%) were female. According to Table 2, 34 children (36.6%) had autism spectrum disorder, 21 children (22.6%) had attention-deficit/hyperactivity disorder (ADHD), 18 children (19.4%) had intellectual disability, 12 children (12.9%) had global developmental delay, and 8 children (8.6%) had speech and language disorders.

Using the Patient Health Questionnaire-9 (PHQ-9) to measure depressed symptoms, it was found that a significant percentage of parents suffered from depression to varied degrees. Table 3 shows that 27 (29.0%) of the participants had minimum depression, 23 (24.7%) had mild depression, 21 (22.6%) had moderate depression, 14 (15.1%) had moderately severe depression, and 8 (8.6%) had severe depression.

In order to calculate the prevalence of clinically severe depression, a PHQ-9 score of 10 or above was deemed suggestive of depression. 50 parents (53.8%) did not fulfill the criteria for clinically severe depressed symptoms, while 43 parents (46.2%) were deemed to have depression based on this cutoff (Table 4).

Subsequent research revealed that mothers were more likely than fathers to experience depression, with 31 mothers (53.4%) showing signs of depression compared to 12 fathers (34.3%). Additionally, parents from nuclear families and those with less education were shown to experience despair more frequently. However, different sociodemographic parameters had varying degrees of correlation (Table 5).

Table 1
Sociodemographic Characteristics of Parents (n = 93)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Mothers	58	62.4
	Fathers	35	37.6
Marital Status	Married	89	95.7
	Single/Divorced/Widowed	4	4.3
Education Level	Primary	18	19.4
	Secondary	29	31.2
	Higher Secondary	32	34.4
Occupation	University	14	15.1
	Employed	41	44.1
Family Type	Unemployed / Homemaker	52	55.9
	Nuclear	61	65.6
Residence	Joint	32	34.4
	Urban	54	58.1
	Rural	39	41.9

Table 2
Clinical Characteristics of Children with Neurodevelopmental Disorders (n = 93)

Variable	Category	Frequency (n)	%age
Gender of Child	Male	61	65.6
	Female	32	34.4
Type of Neurodevelopmental Disorder	Autism Spectrum Disorder	34	36.6
	ADHD	21	22.6
	Intellectual Disability	18	19.4
	Global Developmental Delay	12	12.9
	Speech and Language Disorder	8	8.6

Table 3
Severity of Depression among Parents Based on PHQ-9 (n=93)

PHQ-9 Category	Frequency (n)	Percentage (%)
Minimal Depression (0-4)	27	29.0
Mild Depression (5-9)	23	24.7
Moderate Depression (10-14)	21	22.6
Moderately Severe Depression (15-19)	14	15.1
Severe Depression (20-27)	8	8.6

Table 4
Frequency of Depression among Parents (PHQ-9 \geq 10) (n=93)

Depression Status	Frequency (n)	Percentage (%)
Depression Present	43	46.2
Depression Absent	50	53.8

Table 5
Stratification of Depression with Respect to Effect Modifiers (n = 93)

Variable	Category	Depression Present n (%)	Depression Absent n (%)	Total	P-value
Age of Mother (years)	≤ 30	12 (44.4%)	15 (55.6%)	27	0.89
	31-40	18 (47.4%)	20 (52.6%)	38	
	> 40	13 (46.4%)	15 (53.6%)	28	
Age of Child (years)	≤ 5	17 (51.5%)	16 (48.5%)	33	0.62
	6-10	16 (44.4%)	20 (55.6%)	36	
	> 10	10 (41.7%)	14 (58.3%)	24	
Gender of Child	Male	29 (47.5%)	32 (52.5%)	61	0.79
	Female	14 (43.8%)	18 (56.2%)	32	
Number of Children with NDD	One Child	34 (43.6%)	44 (56.4%)	78	0.19
	Two or More	9 (60.0%)	6 (40.0%)	15	
Type of NDD	Autism Spectrum Disorder	18 (52.9%)	16 (47.1%)	34	0.71
	ADHD	9 (42.9%)	12 (57.1%)	21	
	Intellectual Disability	8 (44.4%)	10 (55.6%)	18	
	Global Developmental Delay	5 (41.7%)	7 (58.3%)	12	
	Speech/Language Disorder	3 (37.5%)	5 (62.5%)	8	
Education of Mother	Primary	11 (61.1%)	7 (38.9%)	18	0.28
	Secondary	14 (48.3%)	15 (51.7%)	29	
	Higher Secondary	13 (40.6%)	19 (59.4%)	32	
	University	5 (35.7%)	9 (64.3%)	14	
Residence	Urban	24 (44.4%)	30 (55.6%)	54	0.67
	Rural	19 (48.7%)	20 (51.3%)	39	
Socioeconomic Status	Low	19 (54.3%)	16 (45.7%)	35	0.31
	Middle	16 (42.1%)	22 (57.9%)	38	
	High	8 (40.0%)	12 (60.0%)	20	

DISCUSSION

In this study, the prevalence of depression in parents of children with neurodevelopmental disorders (NDDs) was evaluated, and related clinical and sociodemographic characteristics were discovered. Based on PHQ-9 scores, the results showed that 46.2% of parents had clinically severe depressive symptoms. The significant psychological stress that caregivers of children with developmental disabilities bear is highlighted by this high incidence. Numerous recent research have out in various nations have shown similar results.

According to a systematic analysis by Lam XR et al⁹, depression is highly prevalent among parents of children with neurodevelopmental disorders worldwide, with about 45% of caregivers of children with autism spectrum disorder reporting depressed symptoms. The results of the current study and the prevalence reported in that review are quite similar, indicating that depression among caregivers is a problem that is present in all demographics and healthcare systems. The common difficulties in providing care for kids with developmental impairments, such as behavioral issues, the need for ongoing therapy, and worries about the child's future independence, may account for these commonalities.

Parents of children with neurodevelopmental impairments had an even greater frequency of depression (85.1%), according to another study by Alrahili N et al.¹⁰ in Saudi Arabia. Although this prevalence is significantly greater than the one found in the current study, cultural differences, variances in sample characteristics, and the use of various screening technologies may be the cause of the discrepancy. Notwithstanding these variations, both studies stress the importance of early detection and management for depression, which is very common among parents of children with developmental disabilities.

In line with other research findings, the current study also discovered that moms had greater rates of depression than fathers. Mothers were more than three times as likely to suffer from depression as the general population, according to a study looking into depressed symptoms among parents of autistic children. The fact that mothers are frequently the primary caregivers and spend more time overseeing everyday activities, treatment sessions, and behavioral issues related to neurodevelopmental disorders may be the cause of this greater vulnerability.¹¹ According to another cross-sectional study by Alibekova R et al.¹², parents of children with autism spectrum disorder frequently exhibit signs of stress, anxiety, and despair. The findings underlined that increased caregiving responsibilities and a perceived lack of social support are closely linked to psychological suffering in parents. These findings are corroborated by the current study's findings, which show that many parents expressed emotional tension associated with their caregiving duties and worries for the growth and future welfare of their children. Compared to parents of children with other neurodevelopmental disorders like ADHD or intellectual handicap, parents of children with autism spectrum disorder showed higher levels of depression in the current study. This result is in line with earlier studies that demonstrated that parents of children with autism

frequently bear a heavier caregiving load because of the significant communication impairments, behavioral issues, and requirement for long-term specialized interventions. Parents of children with autism had far greater levels of stress and psychological discomfort than parents of children with average development, according to research on parental stress in households with autistic children.¹³

In a different study, Sánchez-Amate JJ et al.¹⁴ looked at the mental health of parents of children with autism spectrum disorder and discovered that depressive symptoms associated with emotional stress, caregiver burden, and guilt are common among parents. The scientists came to the conclusion that the degree of family support available and the severity of the child's condition are strongly correlated with caregivers' emotional discomfort. These results are consistent with the current study, which also found that parents of children with more severe developmental impairments experienced higher levels of depression.

Another significant factor linked to depression in the current study was socioeconomic level. Compared to parents from middle- and high-income groups, parents from lower socioeconomic categories showed higher levels of depression. Because specialized therapies, behavioral interventions, and educational support services for children with neurodevelopmental problems can be costly and frequently need long-term commitment, financial stress may be a major contributor to caregiver burden. Similar findings from earlier research have shown that financial difficulties have a detrimental impact on family well-being and raise psychological stress levels among caregivers.^{15,16}

In the current study, maternal education was also observed to affect the prevalence of depression. Compared to mothers with higher educational attainment, those with lower educational attainment showed higher levels of depressive symptoms. Higher education may increase access to social support networks, enhance coping mechanisms, and raise understanding of healthcare options. On the other hand, parents with less education could find it challenging to comprehend their child's diagnosis and find the right kind of treatment.^{17,18}

Additionally, the current study showed that parents in rural areas experienced slightly greater levels of depression than their urban counterparts. This result can be connected to the scarcity of medical facilities and rehabilitation services in rural areas. Rural families frequently have to travel great distances to provide their kids with diagnostic and therapeutic treatments, which can put them under more financial and emotional strain. Therefore, one of the key factors affecting caregiver mental health is access to specialist healthcare services.

The correlation between the number of children with neurodevelopmental abnormalities and parental depression was another significant finding in this study. Compared to parents of a single child with developmental abnormalities, parents of many children with developmental disorders showed higher levels of depression. Reduced social support, financial pressure, and mental tiredness might result from the increased caregiving load brought on by having several children in

need of specialized care.

Another important factor that has been linked to depression in parents of children with neurodevelopmental disorders is social isolation and stigma. Perceived social stigma was positively correlated with depressed symptoms, according to a study looking at stigma among parents of autistic children. The authors came to the conclusion that treatments targeted at enhancing social support and caregiver self-efficacy may lessen parental depression.¹⁸

The possible link between the developmental outcomes of children and the mental health of their parents has also been brought to light by research. For instance, a large cohort study by Lin YH et al.¹⁹ showed that there may be a link between parental depression and a higher incidence of neurodevelopmental problems in children. The study emphasizes the significance of addressing parental mental health as part of comprehensive child development care, even though the causality's direction is still unclear.

Additionally, meta-analytic research²⁰ indicates that parenting efficacy and total family well-being are closely linked to parental stress and depression. Parents who experience ongoing psychological stress may find it more difficult to participate in behavioral training programs, therapeutic interventions, and supportive parenting techniques that are necessary for kids with developmental disorders. Therefore, enhancing caregiver well-being and child developmental outcomes requires addressing parental mental health.

The importance of including parent mental health screening in pediatric and developmental clinics is highlighted by the study's findings. By using validated tools such as the PHQ-9, routine screening may be able to identify parents who are in psychological distress and facilitate early referral for counseling or psychiatric support. Cognitive behavioral therapy is one psychological

treatment that has been shown to improve family dynamics overall and reduce depression in parents of children with special needs.

When assessing the findings, it is crucial to consider the several limitations of this research. First, because of the cross-sectional design, it is challenging to establish a causal relationship between depression and the contributing factors. The results may not be as generalizable to a wider population due to the study's limited sample size (n = 93) and single tertiary care hospital setting. A clinical diagnostic interview was not employed to measure depression; instead, a self-reported screening tool (PHQ-9) was used, which may have led to an overestimation or underestimation of depressive symptoms. The caregiver burden, coping strategies, and family support are some additional potential contributing factors that were not fully investigated. Future studies are encouraged to use larger sample sizes and multicenter formats in order to provide more comprehensive evidence.

CONCLUSION

The recent study demonstrated that depression is common among parents of children with neurodevelopmental problems, since over half of the participants had clinically severe depressive symptoms. Numerous factors, including the type of neurodevelopmental illness, maternal education, socioeconomic status, and stress from caring, might affect the mental health of parents. These findings highlight the need for early screening and psychological support for caregivers in pediatric and developmental clinics. Parental mental health must be addressed in order to improve the overall care of children with neurodevelopmental issues and the family's well-being.

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