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Assessment of Depression Severity and its Impact on the Quality of Life among Parents of Pediatric Patients with Clubfoot: A Cross-Sectional Study

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ABSTRACT

Background: Clubfoot is a congenital musculoskeletal condition that needs a prolonged treatment protocol. Parents face psychological challenges such as depression, which can adversely affect their quality of life and impair their caregiving abilities. **Objective:** The purpose of this study is to determine the severity of depression among parents of children with clubfoot and its effect on their quality of life using validated psychometric tools such that DASS-21 and SF-36. **Methodology:** A cross-sectional study was conducted at the Paraplegic Center in Peshawar, Pakistan, between November 2024 and April 2025. Non-probability convenience sampling was used to recruit 196 parents of pediatric clubfoot patients. The DASS-21 was used to assess depression, and the SF-36 Health Survey to assess quality of life. The CUSIT Research Committee gave ethical approval after receiving informed consent. **Results:** Data analysis was done through IBM SPSS version 24. The average depression score among participants was moderate (M= 18.80, SD = 10.25), and the mean QoL score indicated a moderate level of well-being (M = 54.85, SD = 16.94). A strong negative correlation ($r = -0.906$, $p < 0.001$) was found between depression and quality of life. Linear regression analysis confirmed that 83% of the variance in QoL scores could be attributed to depression severity ($R^2 = 0.830$), establishing depression is a strong predictor. Upon SPSS gender- specific analysis, results show that depression scores were higher in female parents (mothers) and significantly lower quality of life compared to male parents ($p < 0.005$). Significantly, 11.6% of mothers fell in the "extremely severe" category of depression, while the percentage of fathers was 3.6%. **Conclusion:** The study highlights a significant connection between depression and quality of life among parents of children with clubfoot. These psychological challenges are particularly more prominent in mothers, highlighting the need for gender-specific interventions.

INTRODUCTION

Clubfoot is a common congenital orthopedic condition characterized by an increased medial longitudinal arch (cavus) and an inwardly rotated foot (equinovarus) (Bina, Pacey, Barnes, Burns, & Gray, 2020) . It is significant that around half of infants with clubfoot have the disorder affecting both feet, even though right-foot abnormalities are more prevalent than left-foot ones(Enweluzo, Ohadugha, Ezenwa-Ahanene, Udechukwu, & Edem, 2024). Clubfoot occurs in two types. Idiopathic clubfoot, which is defined as solitary clubfoot without any underlying medical conditions, accounts for the majority of cases (Anam, Razzaq, Gulzada, Nawaz, & Awais, 2024)A higher risk of having CTEV has been correlated with a number of characteristics, including maternal age, male gender, smoking during pregnancy, marital status, education level, and maternal diabetes, according to several studies (Alomran et al., 2024)

The club foot is one of the most prevalent congenital musculoskeletal abnormalities The prevalence of clubfoot is 1.24 per 1,000 births worldwide, indicating that it is present on all six continents. At a 2:1 ratio, males are impacted more than females (Arsh, Ullah, & Shah, 2024).Prevalence rates were highest in low- and middle-income countries, especially in Africa (1.31, 95% CI: 0.86–1.77) and South-East Asia (1.80,95% CI: 1.32–2.28) (Smythe, Rotenberg, & Lavy, 2023). In Pakistan, over 7,500 newborns are born with clubfoot abnormalities each year (Arsh et al., 2024). Clubfoot is a condition that requires periodic hospital visits for cast application and manipulation, followed by a strict bracing regimen that requires recurrent hospital visits over the course of years (Verma et al., 2024).The Ponseti serial casting process has been the gold standard for treatment throughout the last 20 years (Hopwood, Khan, Kemp, Rehm, & Ashby, 2023).If left untreated, clubfoot can lead to serious complications

and the development of permanent deformity (Panza et al., 2023) .It has been noted that

parents experiencing congenital deformities of their child have higher levels of stress, anxiety, and depression taking care of a child with significant health conditions such as clubfoot can be a substantial psychological challenge for parents(Leblebici, Tarakçı, Güngör, Tarakci, & Bursalı, 2024). Parents have the responsibility of ongoing medical treatments, hospital visits, and concerns about the child's future which impose emotional and physical burdens on caregivers, especially parents. The most common health issue that parents have to face is depression, which is characterized by persistent low energy, loss of interest, and functional impairment, lacking their ability to cope with the recovery process of their child's condition (Mustafa *et al.,* 2022). Globally, depression is a widespread condition among parents. A 2025 meta-analysis reported a pooled global prevalence of 45% for depressive symptoms among parents of children with autism spectrum disorder (Lam, Cheng, Leo, Toh, & He, 2025). Depression is a health condition that is closely related with another crucial outcome for caregivers: their quality of life (QoL)(Cai, Verze, & Bjerklund Johansen, 2021). Depression has an adverse effect on quality life of parents and degraded quality of life because of pain, isolation and financial strain that can increase depressive symptoms(Rostami, Abbasi, Soleimani, Moghaddam, & Zeraatchi, 2023). Empirical studies have noted that the parents who are suffering from higher depression tend to report lower quality of life in various domains such as physical, emotional and social. However, a parent's ability to carry out such responsibilities can get compromised by depression (Boettcher, Denecke, Barkmann, & Wiegand-Grefe, 2020). Research has indicated that children who encounter caretaker depression are less likely to cope with their illnesses effectively. For instance, almost one-third of the parents in a long-term study of families with children who have asthma had clinically significant depression, and significantly, worse adherence to therapy for the child was predicted by higher caretaker depressive symptoms (Margolis et al., 2022) . The objectives of this study are to assess the severity of depression in parents of children with clubfoot deformity, identifying whether symptoms are mild, moderate, or severe and to evaluate the impact of depression on parents' quality of life (QoL), examining how mental health affects emotional well-being, social relationships, and overall life satisfaction. Depression may also have an impact on parental capability to provide care, their adherence to therapy, and the dynamics of the family. A neglected parental quality of life (QoL) can create a stressful home environment that can influence the emotional and social growth of a child, and poor mental health in parents can lead to reduced participation in their child's therapy, which can negatively influence outcomes in rehabilitation. The study will give lawmakers, support organizations, and medical professional's crucial information by highlighting the psychological problems these parents face. The findings could improve family-centered care, help develop targeted mental health therapies, and eventually improve parent satisfaction and child treatment results.

METHODOLOGY

This quantitative cross-sectional study, conducted at the Paraplegic Center Peshawar a well-established rehabilitation facility located in the Khyber Pakhtunkhwa province of Pakistan from November 2024 to May 2025, aimed to examine the relationship between depression severity and quality of life among parents of children with idiopathic clubfoot. A non-probability convenience sampling technique was used to recruit 196 participants, calculated via Open Epi with a 15% anticipated frequency, 95% confidence interval, and 5% margin of error. Eligible participants were parents aged 18 years or older, actively involved in their child's treatment for at least one month, and willing to provide informed consent, while those with recent traumatic events, psychiatric illness, or children with non-idiopathic clubfoot were excluded. Data were collected in a standardized manner using the DASS-21 to assess depression severity and the SF-36 to evaluate quality of life, alongside demographic information. Ethical approval is obtained from the corresponding institutional review board. Data were collected from the Paraplegic Center after approval by the Departmental Research Committee of City University of Science and Information Technology Peshawar.

RESULTS

Descriptive Statistics

This research consists of 196 parents of children with clubfoot. The mean age of parents ranged from 19 to 41 years (M = 28.29, SD = 4.93), indicating a relatively young population of caregivers. Depression severity was measured from DASS-21 (Depression, Anxiety, and Stress Scale). The mean value of depression severity ranged from 0 to 42 (M = 18.80, SD = 10.25), while quality of life scores from the SF-36 ranged from 21 to 90 (M = 54.85, SD = 16.94). The mean results reported mild to moderate levels of depressive symptoms and moderate levels of quality of life (Table 1).

Table 1

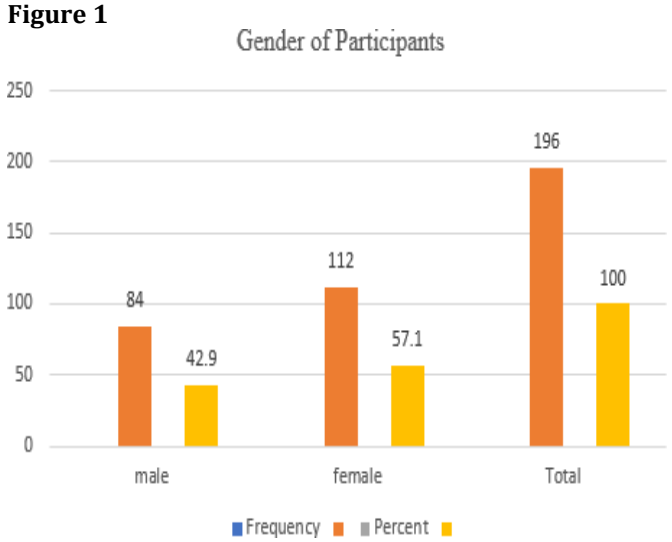
Descriptive Statistics

	N	Minimum	Maximum	Mean
Age		19	41	28.29
SF36_total		21	90	54.85
dass_21_tota l		.0	42.0	18.801
Valid N (listwise)	196			

Gender of participants

The bar chart illustrates both the frequency and percentage of male and female participants in the study, as well as the total sample size. The frequency bar for men reaches 84, and the percentage bar for men reaches 42.9%. This shows that men made up just under half of the sample. The frequency bar for females appears to 112, and the percentage bar shows 57.1%, which means that most of the participants werefemales. The total category has a frequency bar that goes upwards to 196, which confirms the size of the sample, and a percentage bar that goes up to 100%, which shows the full proportion of respondents (Figure 1).

Figure 1



Characteristics of Participants

Table 2 shows the characteristics of participants by gender. It shows that most of the males (81.0%) and females (72.3%) had education up to the 12th class. However, more females (27.7%) had graduated or higher than males (19.0%). Most of the people who took part lived in cities: 63.1% of men and 64.3% of women. A consistent percentage of both male and female participants (71.4%) indicated having male offspring. More than half of the people in both groups said they had a family history of depression: 54.8% of men and 55.4% of women. In terms of family history of clubfoot, 19.0% of male participants and 13.4% of female participants indicated a positive history. The table shows that both genders have similar demographic and family patterns, with a few small differences.

Table 2

Characteristics of Participants

Variables		Male% (n)	Female% (n)
Level of education	Up to 12th class	81.0% (68)	72.3% (81)
	Graduation and above	19.0% (16)	27.7% (31)
Area of living	Urban	63.1% (53)	64.3% (72)
	Rural	36.9% (31)	35.7% (40)
Gender of child	Male	71.4% (60)	71.4% (80)
	Female	28.6% (24)	28.6% (32)
Family history of depression	No	45.2% (38)	44.6% (50)
	Yes	54.8% (46)	55.4% (62)
Family history of clubfoot	No	81.0% (68)	86.6% (97)
	Yes	19.0% (16)	13.4% (15)

Relationship between Depression and Quality of Life

Table 3 shows the link between depression severity (DASS-21) and quality of life (SF-36). The analysis showed a substantial negative correlation ($r = -0.906$, $p < 0.001$). This data suggests that parents with greater depression scores have consistently reported lower quality of life in the physical, emotional, and social domains. The strength of this link shows that depression has a significant impact on the overall well-being of parents who care for children with clubfoot. These findings highlight the importance of frequent psychological screening and prompt support interventions for caregivers, since treating depressed symptoms can significantly improve their health-related quality of life.

Table 3

Relationship between Depression and Quality of Life

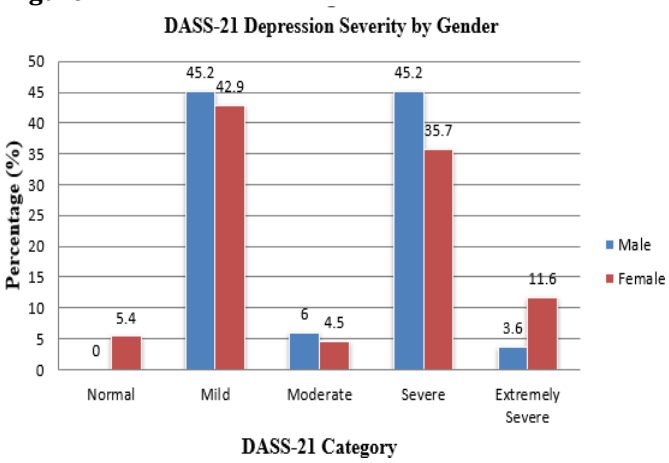
Spearman' s rho		SF36 total	dass_21 total
SF36 total	Correlation Coefficient	1.000	-.906**
	Sig. (2-tailed)	.	.000
	N	196	196
dass_21 total	Correlation Coefficient	-.906**	1.000
	Sig. (2-tailed)	.000	.
	N	196	196

**. Correlation is significant at the 0.01 level (2-tailed).

Severity of Depression by Gender

Figure 2 shows severity of depression in men and women based on DASS-21 categories. Most of both men and women are either mildly or severely depressed. For men, 45.2% are mildly depressed, and for women, 35.7% are severely depressed. Moderate depression is less common, affecting 6% of men and 4.5% of women. It's interesting that extremely severe depression is more common in women (11.6%) than in men (3.6%). Also, only women (5.4%) were reported as normal—no men fell into this category. The chart shows that both men and women can be depressed, but men are more likely to be in the mild and severe categories, while women are more likely to be in the extremely severe and normal categories.

Figure 2



A simple linear regression analysis was performed to determine the predictive effect of depression severity on quality of life. The regression model was significant, $F(1, 194) = 947.09$, $p < .001$, with an R^2 of 0.830. This indicates that depression severity accounts for 83% of the variance in quality-of-life scores. The regression equation was SF-36 = 83.162 – 1.506 × DASS-21. This indicates that each one-point increase in depression score results in a 1.51-point decrease in the SF-36 quality of life score. The remaining diagnosis confirmed that the assumptions of regression were met. These findings emphasize the significant negative impact of depression on parental quality of life (Table 4).

Table 4

Regression Analysis-Predictive Role of Depression on Quality of Life

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate	R-Square Change	F Change	df1	df2	Sig. F Change
1	.911[a]	.830	.829	7.001	.830	947.091	1	194	.000

DISCUSSION

This study examined the relationship between depression severity and quality of life (QoL) among parents of children with idiopathic clubfoot and revealed a strong, inverse association between the two variables. The mean depression severity score in the total sample was indicative of mild to moderate depressive symptoms, while the mean SF-36 score reflected a moderate level of QoL. The observed strong negative correlation ($r = –0.906$) suggests that depression severity is a major determinant of QoL in this population. This relationship persisted even after statistical adjustment, as demonstrated by regression analysis, where depression accounted for 83% of the variance in QoL scores. Such a large proportion of explained variance underscores the critical role of mental health in shaping caregivers' daily functioning. This finding is consistent with evidence from studies involving parents of children with disabilities such as cerebral palsy or spina bifida, where depressive symptoms were among the strongest predictors of diminished QoL.

Gender-based analysis revealed that female caregivers had significantly lower QoL scores and higher depression levels compared to males. Specifically, females were overrepresented in the extremely severe depression category, while no male participant reported being in the "normal" depression range. These findings are consistent with global mental health literature indicating that women, particularly mothers in caregiving roles, are at increased risk of emotional distress due to compounded caregiving demands, societal expectations, and limited access to mental health support. Similar patterns have been documented in caregivers of children with clubfoot in both high- and low-resource settings, emphasizing the universality of this vulnerability

Another important finding was that mild and severe depression categories were the most common among both genders**,** but extremely severe depression was notably higher in females. The absence of "normal" depression scores in males suggests that while men in this sample were less likely to report extreme symptoms, they were also unlikely to be free of depressive symptoms altogether. This highlights the need for mental health screening for both parents, regardless of gender, as subthreshold depression can still impair caregiving capacity and well-being.

From a clinical perspective, the regression model (SF-36 = 83.162 – 1.506 × DASS-21) offers a useful predictive tool. The negative coefficient for depression implies that any worsening in depressive symptoms directly reduces QoL, reinforcing the argument for integrating routine psychological assessment into clubfoot management protocols. Addressing depression through targeted mental health interventions could yield substantial improvements in caregiver QoL, indirectly benefiting the child's rehabilitation process.

CONCLUSION

This study found a strong negative association between depression severity and quality of life (QoL) among parents of children with clubfoot, with higher depression scores linked to a 1.51-point decrease in QoL and depression explaining 83% of QoL variation ($r = –0.906$, $p < 0.001$). Female parents reported significantly higher depression and lower QoL than males, with 11.6% of mothers in the extremely severe depression category compared to 3.6% of fathers. While factors such as parental education, family history of depression, and child's gender were not statistically significant predictors, they may still influence outcomes. These results highlight the substantial psychological burden on caregivers—especially mothers—and underscore the importance of integrating routine mental health screening and support, such as counseling and stress management, into pediatric orthopedic care to improve both caregiver well-being and treatment outcomes for children.

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