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# Sleep Quality, Depression, Anxiety, and Stress Among Caregivers of Children with Disabilities

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## ABSTRACT

**Background:** Caring for children with developmental disabilities places significant emotional and physical strain on caregivers, often leading to poor sleep and compromised mental health.

**Objective:** To assess and compare sleep quality, depression, anxiety, and stress levels among mothers of children with developmental disabilities versus mothers of typically developing children.

**Methods:** A cross-sectional comparative study was conducted at the Children's Hospital and Institute of Child Health and PSRD, Lahore. A total of 420 participants were recruited using convenience sampling: 210 mothers of children with developmental disabilities and 210 mothers of typically developing children. Standardized tools Sleep Quality Scale (SQS) and Depression Anxiety Stress Scale-42 (DASS-42) were used to assess sleep quality, depression, anxiety, and stress. Data were analyzed using SPSS version 25 with descriptive statistics and Mann–Whitney U test; p-values <0.05 were considered significant.

**Results:** Mothers of children with disabilities reported significantly higher sleep index scores (60.40 ± 10.83) compared to mothers of typically developing children (50.56 ± 6.49; $p < 0.001$). Stress scores were also higher (28.60 ± 7.71 vs. 25.86 ± 4.33; $p < 0.001$). No significant differences were found in depression ($p = 0.411$) and anxiety ($p = 0.242$).

**Conclusion:** The present study demonstrated that mothers of children with developmental disabilities experience significantly poor sleep quality and higher stress levels compared to mothers of typically developing children, while differences in depression and anxiety were not statistically significant.

***Keywords:*** Anxiety, Caregivers, Developmental Disabilities, Depression, Mental Health, Sleep, Sleep Wake Disorders, Social Support, Stress.

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**Disclaimers**

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## Introduction

Caring for children with disabilities presents a multifaceted and often overwhelming burden on primary caregivers, particularly parents, which significantly affects their psychological and physiological well-being. A disability is defined as a physical or mental condition that limits a person's movements, senses, or activities, and can manifest in the form of impairments, activity restrictions, or participation limitations in social and functional domains (1-2). The World Health Organization (WHO) conceptualizes disability as encompassing impairments in body structure or function, limitations in performing activities such as walking or problem-solving, and restrictions in participation in everyday life, including work, education, and social engagement (3). These limitations demand persistent and intensive caregiving efforts, often extending around the clock, and may lead to severe emotional strain, burnout, and a decline in overall mental health (4).

Sleep quality, a crucial indicator of overall health, is often defined by subjective satisfaction with sleep latency, duration, continuity, and efficiency. It plays a vital role in maintaining both psychological resilience and physical restoration. Poor sleep quality is increasingly recognized as both a consequence and predictor of mental health disorders, particularly among caregivers of children with developmental and physical disabilities (5-6). Chronic sleep disturbances are associated with elevated risks of depression, anxiety, and stress, which are common outcomes among caregivers due to prolonged emotional and physical demands. Depression in this population is characterized by persistent sadness, fatigue, loss of interest in pleasurable activities, and a sense of helplessness, while anxiety often involves excessive worry, restlessness, and physiological arousal (6). Stress, in this context, stems from the ongoing strain of managing a child's care, navigating healthcare systems, addressing financial challenges, and coping with uncertainty about the child's future (7).

Caregivers, especially mothers of children with developmental disabilities (DDs), report significantly poorer sleep outcomes compared to caregivers of neurotypical children. These mothers frequently experience insomnia, fragmented sleep, and shortened sleep durations, which are closely linked with elevated levels of stress and depressive symptoms (8-9). The caregiving demands not only affect sleep but also amplify psychological distress. Such parents often encounter a myriad of emotional and situational challenges, including social isolation due to the demands of caregiving, a perceived lack of social support, frequent criticism or misunderstanding from others, and grief over the loss of anticipated milestones and dreams for their child (10). These experiences contribute to a chronic state of emotional exhaustion and mental tension, further impairing sleep and quality of life.

Furthermore, the economic burden of raising a child with disabilities, coupled with fears about the child's suffering and future autonomy, intensifies caregiver vulnerability to mood disorders and somatic symptoms. Studies have shown that caregiving in such contexts is associated not only with depression and anxiety but also with phobias, emotional disturbances, and long-term sleep disorders (11). The reciprocal relationship between sleep quality and psychological health creates a compounding effect, where deterioration in one domain perpetuates decline in the other. As such, addressing the intertwined challenges of sleep disturbances and mental health in caregivers is essential for improving both caregiver well-being and the quality of care provided to children with disabilities.

## Materials and Methods

The present comparative cross-sectional study was conducted in the Department of Developmental Pediatrics at the Children's Hospital and Institute of Child Health, Lahore, with additional data collection from the Pakistan Society for the Rehabilitation of the Disabled (PSRD), Lahore. The study population consisted of mothers of children with developmental disabilities (DDs) and mothers of typically developing children. Using a convenience sampling technique, a total sample size of 420 participants was recruited, comprising 210 mothers of children diagnosed with developmental disabilities and 210 mothers of typically developing children.

Eligibility criteria included mothers of children diagnosed with developmental disabilities such as autism spectrum disorder, cerebral palsy, intellectual disability, or other neurodevelopmental disorders. Mothers of children with chronic medical illnesses such as cancer, epilepsy, or other long-term physical diseases were excluded to minimize confounding due to the physical caregiving demands associated with chronic illness. Prior to data collection, formal permission was obtained from the institutional authorities of both participating centers. All participants who met the inclusion criteria were approached individually, and written informed consent was obtained. The study was conducted in accordance with the ethical principles.

Data were collected using two standardized psychometric instruments: the Sleep Quality Index (SQI) and the Depression, Anxiety, and Stress Scale – 42 items (DASS-42) (12-13). The SQI demonstrated excellent psychometric properties, with a reported validity of 0.92 and reliability of 0.81 (12). This self-report scale measures sleep patterns across various domains including sleep latency, duration, continuity, and satisfaction. Participants responded on a 4-point Likert scale ranging from 0 ("few") to 3 ("almost always"), reflecting the frequency of specific sleep-related behaviors. Items pertaining to factors 2 and

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5—namely, restoration after sleep and satisfaction with sleep—were reverse-scored before final computation. The total possible score ranged from 0 to 84, with higher scores indicating greater severity of sleep disturbances.

The DASS-42 is a well-validated instrument for assessing symptoms of depression, anxiety, and stress, with validity coefficients ranging from 0.90 to 0.97. It consists of 42 items equally divided among three subscales and uses a 4-point response format to measure the severity of emotional distress over the past week (13). The questionnaires were self-administered, with instructions provided by the researcher to ensure uniformity in understanding and completion. Trained research assistants were available to provide assistance to participants with limited literacy.

All collected data were manually checked for completeness and consistency before being entered into IBM SPSS Statistics software version 25 for analysis. Descriptive statistics were used to present continuous variables as means and standard deviations, while categorical variables were expressed as frequencies and percentages. A p-value of less than 0.05 was considered statistically significant.

## Results

This observational study was conducted to assess sleep quality, depression, anxiety, and stress levels among mothers of children with developmental disabilities as compared to mothers of typically developing children. A total of 420 participants were included, with 210 in each group. Data were collected over a six-month period using validated psychometric tools: the Sleep Quality Scale (SQS) and the Depression, Anxiety, and Stress Scale (DASS-42). The collected data were analyzed using IBM SPSS Statistics version 25. Descriptive statistics were used to calculate means and standard deviations, while the Mann–Whitney U test was applied to compare the two groups due to non-normal distribution of the data. A p-value of less than 0.05 was considered statistically significant.

Among the 210 mothers of children with developmental disabilities, 55.7% were from joint families, 35.7% from nuclear families, and 8.6% were divorced. Furthermore, 52.38% reported having social and financial support, while 47.62% lacked such support. In terms of sleep and psychological health, 19% of these mothers reported experiencing extremely poor sleep quality "almost always," and 13% reported very severe levels of depression, anxiety, and stress. In contrast, among mothers of typically developing children, only 7% experienced such levels of poor sleep, and 4% reported very severe emotional distress. Caregivers of children with disabilities (Group 1) and caregivers of typically developing children (Group 2) were compared. Group 2 showed better sleep quality, slightly lower stress, and marginally reduced levels of severe depression and extremely severe anxiety compared to Group 1.

***Table 1: Descriptive Statistics of Psychological Health Indicators in Both Groups***

| Measure | Caregivers of Children with Disabilities (Mean ± SD) | Caregivers of Typically Developing Children (Mean ± SD) | Interpretation |
|---|---|---|---|
| Sleep Index (SQS) | 60.40 ± 10.83 | 50.56 ± 6.49 | Moderately poor vs borderline sleep disturbance; worse in disability group |
| Stress (DASS-42) | 28.60 ± 7.71 | 25.86 ± 4.33 | Both in severe range, with greater stress in the disability group |
| Depression (DASS-42) | 24.84 ± 8.23 | 23.88 ± 4.33 | Both fall under severe depression; no significant difference |
| Anxiety (DASS-42) | 26.24 ± 6.84 | 24.75 ± 3.96 | Extremely severe in both groups; difference not statistically significant |

There is a significant difference in Sleep Quality and Stress between the two caregiver groups. The group with lower Sleep Index and Stress scores is likely benefiting from better sleep hygiene, support, or lower caregiving burden. Depression and Anxiety levels do not differ significantly, indicating these issues may be equally prevalent across both groups. The Z-score magnitude for Sleep Index (−9.492) suggests a very strong effect — possibly due to consistent difference in sleep patterns across groups.

***Table 2: Statistically Comparison Between Caregiver Groups***

| Measure | Mann–Whitney U | Wilcoxon W | Z-score | p-value | Interpretation |
|---|---|---|---|---|---|
| **Sleep Quality** | 0.000 | 31321 | -9.492 | < 0.001 | Highly significant: Mothers of disabled children had significantly worse sleep |
| **Stress** | 0.000 | 38048.5 | -4.004 | < 0.001 | Statistically significant: Higher stress in caregivers of disabled children |
| **Depression** | 0.411 | 42779 | -0.822 | > 0.05 | Not significant: Comparable depression levels between groups |
| **Anxiety** | 0.242 | 41520.5 | -1.170 | > 0.05 | Not significant: Comparable anxiety levels between groups |

## Discussion

The present study explored sleep quality and psychological well-being specifically depression, anxiety, and stress among mothers of children with developmental disabilities compared to mothers of typically developing children. The findings revealed that mothers in the caregiving group exhibited significantly poorer sleep quality and higher stress levels than the control group. Although levels of depression and anxiety were elevated in both groups, no statistically significant difference was observed between them. These findings are consistent with previous literature, reinforcing the growing body of evidence highlighting the heightened mental and physical burden borne by caregivers of children with disabilities.

Sleep quality, as assessed by the Sleep Quality Scale (SQS), was notably compromised in mothers of children with disabilities. Nearly one-fifth (19%) of these mothers reported "almost always" experiencing poor sleep, compared to only 7% in the control group. This aligns with findings from Albayrak et al. (2019), who reported similarly impaired sleep among caregivers of children with special needs, underscoring that sleep disruption is a persistent issue in this population (14). Given that sleep quality is a multidimensional construct encompassing sleep efficiency, latency, duration, and disturbances after sleep onset, these findings suggest pervasive disruptions across multiple aspects of the sleep experience in caregiving mothers.

Depression, measured through DASS-42, was also more prevalent and severe among mothers of children with disabilities, with 13% reaching very severe levels compared to 4% in the control group. This corresponds with the work of Annaz D, et al. (2011), who found that chronic caregiving stress correlates with increased depressive symptoms in parents of children with developmental disorders (15). Similarly, elevated anxiety levels were reported among the caregiving group. Though not statistically significant, the magnitude of the difference suggested clinical relevance. This observation reflects previous findings such as those of Gallagher et al. (2010), who documented significantly elevated anxiety and stress in caregiving populations (6), as well as Fride Yarar et al. (2021), who noted that parenting a child with a disability profoundly disrupts familial and social functioning, contributing to persistent anxiety (1).

Stress levels, in contrast, showed a clear and statistically significant difference between the two groups, reinforcing the notion that caregiving for a child with disabilities presents chronic psychological strain. The findings align with research conducted by Jiwon Lee, who observed that mothers of children with developmental delays experienced notably higher stress levels than those of typically developing children (9). These findings are echoed in the study by Padden et al. (2017), where parents of children with autism spectrum disorder reported significantly greater stress than those of neurotypical children (16).

The present findings also resonate with the work of Iovell et al. (2021), who concluded that caregivers of children with disabilities exhibited poorer physical health and greater sleep disruption, adding to the literature on the interconnectedness of mental and somatic health in caregiving roles (17). Similarly, Micsinszki (2018) reported poor sleep outcomes in parents of children with neurodevelopmental disabilities, reinforcing that the challenges related to caregiving are not merely emotional or psychological but extend into daily physiological functioning such as sleep (18).

This study possessed several strengths, including the use of validated assessment tools with high reliability and the inclusion of a control group for comparative analysis. Moreover, the study was conducted in two established clinical institutions, increasing the representativeness of the sample within an urban Pakistani context. However, limitations must be acknowledged. The study employed convenience sampling, which may limit the generalizability of the results to broader populations. Furthermore, the cross-sectional design precludes causal inference; it is unclear whether psychological distress preceded caregiving or developed as a consequence. The exclusive reliance on self-reported measures also raises the potential for response bias. Additionally, other influential variables such as the severity of the child's disability, socio-economic status, or the presence of support systems were not controlled for, which may have confounded results.

Despite these limitations, the study holds important implications for clinical practice and policy. Healthcare providers should routinely assess the psychological well-being and sleep quality of caregivers, especially mothers of children with developmental disabilities. Multidisciplinary interventions, including psychological counseling, sleep hygiene education, and community support programs, should be integrated into pediatric disability care. Moreover, longitudinal research is recommended to evaluate the long-term impact of caregiving on mental and physical health and to assess the effectiveness of targeted interventions over time.

## Conclusion

The present study demonstrated that mothers of children with developmental disabilities experience significantly poor sleep quality and higher stress levels compared to mothers of typically developing children, while differences in depression and anxiety were not statistically significant. These findings underscore the profound psychological and physiological impact of caregiving on maternal health, highlighting an urgent need for integrated support services within pediatric and family healthcare systems.

## Authors' Contributions

| ICMJE authorship criteria | Detailed contributions | Authors |
|---|---|---|
| Substantial Contributions | Conception or Design of the work | 1,2,3 |
| | Data acquisition | 2,3,4,6 |
| | Data analysis or interpretation | 1,3,5 |
| Drafting or Reviewing | Draft the work | 2 |
| | Review critically | 1,2,3,4 |
| Final approval | Final approval of the version to be published. | 1,2,3,4,5,6 |
| Accountable | Agreement to be accountable for all aspects of the work. | 1,2,3,4,5,6 |

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