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Quality of Life of Parents of Children with Hearing Impaired

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ABSTRACT

Background: Hearing impairment is one of the most prevalent childhood disabilities worldwide, with profound effects on speech, language, and social development. Beyond the child, parents of hearing-impaired children face significant psychosocial and economic challenges that may compromise their quality of life. Evidence from low and middle-income countries remains limited, particularly in Pakistan, where disability-related stigma and restricted access to specialized services may exacerbate parental burden. Objective: To assess the quality of life of parents of children with hearing impairment in Pakistan across physical, psychological, social, and environmental domains using the WHOQOL-BREF. Methods: A cross-sectional observational study was conducted between January and June 2023 in Lahore at tertiary hospitals, rehabilitation centers, and special schools. A total of 113 parents of children aged one to four years with diagnosed hearing impairment were recruited using random sampling. Data were collected through interviewer-administered WHOQOL-BREF questionnaires and analyzed using SPSS v21.0, applying descriptive statistics, chi-square tests, and independent t-tests. Results: Parents reported low quality of life across all domains, with the lowest scores in psychological health (mean = 20/100) followed by physical health (40/100). Mothers consistently scored lower than fathers, particularly in psychological health (18.2 vs. 22.6, p = 0.027). Larger family size was associated with significantly poorer physical health (p = 0.033). Conclusion: Parents of hearing-impaired children in Pakistan experience compromised quality of life, especially mothers who face disproportionate psychological burden. Family-centered interventions, psychosocial support, and stigma reduction strategies are needed to improve parental well-being and enhance child rehabilitation outcomes.

Keywords

Hearing impairment; Quality of life; Parents; WHOQOL-BREF; Pakistan; Psychological health.

INTRODUCTION

Hearing impairment is one of the most prevalent sensory disabilities globally, affecting approximately 466 million people worldwide, including 34 million children, with projections indicating that this number will rise substantially by 2050 (1). The condition encompasses a spectrum of auditory dysfunctions ranging from mild to profound, which can arise from genetic, perinatal, or environmental factors. In children, hearing impairment has far-reaching consequences, as it disrupts speech, language, social, and cognitive development, often necessitating lifelong rehabilitative interventions such as hearing aids or cochlear implants (2). Beyond the affected child, hearing impairment exerts a substantial psychosocial and economic burden on parents, who assume central roles in healthcare decision-making, rehabilitation adherence, and daily caregiving (3).

The quality of life (QOL) of parents of children with hearing impairment has emerged as an important yet underexplored dimension of pediatric audiology and rehabilitation. According to the World Health Organization (WHO), QOL is defined as individuals' perceptions of their position in life, in the context of culture, value systems, and goals (4). Multiple studies have shown that parents of children with disabilities experience higher stress, anxiety, and depressive symptoms compared to parents of typically developing children, which may in turn influence both parental well-being and child outcomes (5,6).

In families of children with hearing loss, stressors include financial constraints related to treatment, challenges in communication, social stigma, and concerns about the child's educational and social integration (7). Mothers, who often bear the majority of caregiving responsibilities, are disproportionately affected, with evidence suggesting lower levels of psychological well-being and resilience compared to fathers (8).

International literature demonstrates a consistent association between childhood hearing loss and reduced parental QOL. Studies from Iran, Israel, and Norway have reported significantly higher rates of parental stress, lower satisfaction with family functioning, and greater reliance on coping mechanisms among parents of hearing-impaired children compared to controls (9–11). Interventional studies also suggest that psychological support and structured training programs can improve parental mental health and family quality of life (12). However, evidence from low- and middle-income countries (LMICs) remains scarce, despite the higher prevalence of untreated childhood hearing impairment, limited access to early intervention services, and strong sociocultural stigmas surrounding disability (13).

In Pakistan, where childhood disability is frequently stigmatized and access to specialized rehabilitation services remains limited, parents of children with hearing impairment may face unique psychosocial and economic burdens. Yet, there is a paucity of systematic research exploring how such burdens affect parental QOL. This knowledge gap limits the ability of healthcare professionals and policymakers to design targeted interventions that could support families and enhance both parental and child outcomes.

Given these considerations, the present study aimed to assess the quality of life of parents of children with hearing impairment using the WHO Quality of Life Scale (WHOQOL-BREF). The research specifically focused on evaluating physical, psychological, social, and environmental domains of parental well-being, thereby generating locally relevant evidence to inform rehabilitation strategies and family-centered interventions. The study hypothesized that parents of children with hearing impairment would report significantly lower QOL scores across all domains compared to international reference populations.

MATERIALS AND METHODS

This study employed a cross-sectional observational design to evaluate the quality of life of parents of children with hearing impairment. The rationale for this design was its appropriateness for assessing the prevalence and distribution of health-related outcomes in a defined population within a limited timeframe (14). The study was conducted over six months, from January to June 2023, across multiple sites in Lahore, Pakistan, including Mayo Hospital, the University of Lahore Teaching Hospital, Hamza Foundation, and Afzal Alam School. These facilities were selected because they provide specialized services for children with hearing impairment, thereby ensuring access to a diverse and representative sample of affected families.

The study population comprised parents of children diagnosed with hearing impairment. Eligibility criteria included biological mothers or fathers of children aged one to four years who had a confirmed diagnosis of hearing impairment by an audiologist. Parents of children with co-existing psychological disorders or significant comorbidities such as cerebral palsy, intellectual disability, or chronic medical illness were excluded to reduce confounding influences on parental quality of life. Participants were selected using a random sampling technique from clinic and school registries, and recruitment was carried out through direct contact during scheduled visits to the participating institutions. Written informed consent was obtained from all participants prior to enrollment. For parents with limited literacy, the consent form and study procedures were explained verbally in Urdu, and consent was recorded with a thumb impression witnessed by a third party.

Data collection was performed using the standardized World Health Organization Quality of Life Scale (WHOQOL-BREF), which comprises 26 items covering four domains: physical health, psychological health, social relationships, and environment, along with two items assessing overall quality of life and general health (15). To ensure accessibility, the questionnaire was translated into Urdu using forward backward translation by bilingual experts, with cultural adaptation to enhance clarity. Parents with low literacy levels were assisted by trained interviewers who read each item aloud in simple terms. This method minimized the risk of misinterpretation and ensured inclusivity of participants regardless of education level.

The primary variables in this study were domain-specific quality of life scores derived from WHOQOL-BREF. Each domain was operationally defined according to WHO guidelines, with responses scored on a five-point Likert scale and transformed into a 0–100 scale. Independent variables included demographic factors such as age and gender of the parent, parental education, socioeconomic status, family history of hearing impairment, and birth order of the child. Bias was addressed by standardizing data collection procedures, training interviewers, and ensuring anonymity to reduce social desirability effects. To limit confounding, subgroup analyses were planned for sociodemographic characteristics, and comparisons were adjusted statistically.

The sample size was calculated using a single population proportion formula, based on an estimated prevalence of hearing impairment of 24.9% in Pakistan, with a 95% confidence interval and 5% margin of error. The resulting minimum sample size was 113 parents, which was achieved during the study period. Data were entered into SPSS version 21.0 (IBM Corp., Armonk, NY, USA) for analysis. Descriptive statistics were computed as means, standard deviations, and proportions for demographic and outcome variables.

Inferential statistics included independent t-tests and one-way ANOVA to examine group differences across QOL domains, while chi-square tests were used for categorical comparisons. A multivariable linear regression model was planned to adjust for potential confounders such as parental education, socioeconomic status, and child's birth order. Missing data were handled through pairwise deletion if fewer than 5% of responses were missing; otherwise, multiple imputation techniques were applied to maintain statistical power. Subgroup analyses were performed for mothers versus fathers and for parents with versus without a family history of hearing impairment. Statistical significance was set at $p < 0.05$. Ethical approval for the study was obtained from the Institutional Review Board of the University of Lahore (Approval No: UOL/DRS/2023/011). All procedures adhered to the ethical principles of the Declaration of Helsinki. Participation was voluntary, and participants were informed of their right to withdraw at any stage without consequences. Confidentiality was strictly maintained, with data stored under password protection and physical forms secured in locked cabinets accessible only to the research team. To ensure reproducibility and data integrity, standardized protocols were followed for translation, administration, and scoring of the WHOQOL-BREF, and an audit trail of data management procedures was maintained for verification.

RESULTS

A total of 113 parents of children with hearing impairment participated in the study. The demographic and clinical characteristics of the sample are summarized in Table 1. Mothers represented the majority of respondents (60.2%), and most children were between one and three years of age. Conductive (37.2%) and sensorineural (36.3%) hearing loss were the most common types reported, with mixed hearing loss comprising 26.5%. More than half of the families (54.9%) reported a prior history of hearing impairment.

Self-reported quality of life (QOL) outcomes are summarized in Table 2. Overall, 39.8% of parents rated their QOL as good, 39.8% as neutral, and 20.4% as poor. General health ratings followed a similar pattern, with 33.6% rating their health as good and 31.9% as poor. Domain-specific WHOQOL-BREF results are shown in Table 3. Mean transformed scores indicated the lowest ratings in the psychological domain (20/100), followed by physical health (40/100), social relationships (40/100), and environment (40/100). Comparisons across mothers and fathers showed consistently lower scores among mothers, particularly in psychological health ($p = 0.027$).

Table 1. Demgraphic and Clinical Characteristics of Participants (N = 113)

Variable	Categories	n (%)	p-value*
Parent responding	Mother: 68 Father: 45 (39.8%)	(60.2%)	0.041
Child age	1–2 years: 41 2–3 years: 41 3–4 years: 31 (27.4%)	(36.3%) (36.3%)	0.318
Type of hearing loss	Conductive: 42 Sensorineural: 41 Mixed: 30 (26.5%)	(37.2%) (36.3%)	0.527
Family history of hearing loss	Yes: 62 No: 51 (45.1%)	(54.9%)	0.082
Birth order	1–2: 40 3–4: 41 ≥5: 32 (28.3%)	(35.4%) (36.3%)	0.291

*Chi-square test comparing distributions across subgroups.

Table 2. Overall Quality of Life and General Health Ratings

Variable	Good n (%)	Neutral n (%)	Poor n (%)	p-value*
Overall quality of life	45 (39.8%)	45 (39.8%)	23 (20.4%)	0.112
General health perception	38 (33.6%)	39 (34.5%)	36 (31.9%)	0.289

*Chi-square test for distribution differences.

Table 3. WHOQOL-BREF Domain Scores of Parents of Hearing-Impaired Children

Domain	Mean Score (0–100)	SD	Mothers (n = 68) Mean (SD)	Fathers (n = 45) Mean (SD)	p-value†
Overall QOL & General Health	50	12.5	48.2 (11.9)	52.6 (13.1)	0.041
Physical health	40	14.2	38.1 (13.7)	42.5 (14.6)	0.089
Psychological health	20	10.4	18.2 (9.9)	22.6 (11.0)	0.027
Social relationships	40	13.5	39.0 (12.8)	41.6 (14.1)	0.172
Environment	40	12.8	39.2 (12.5)	41.0 (13.0)	0.221

†Independent samples t-test.

In subgroup analyses (data not shown in tables), parents with a family history of hearing impairment reported marginally better overall QOL scores (mean = 51.8 vs. 48.5, p = 0.062), whereas those with higher birth order children (≥5) showed significantly poorer physical health scores compared to first or second-born children (p = 0.033).

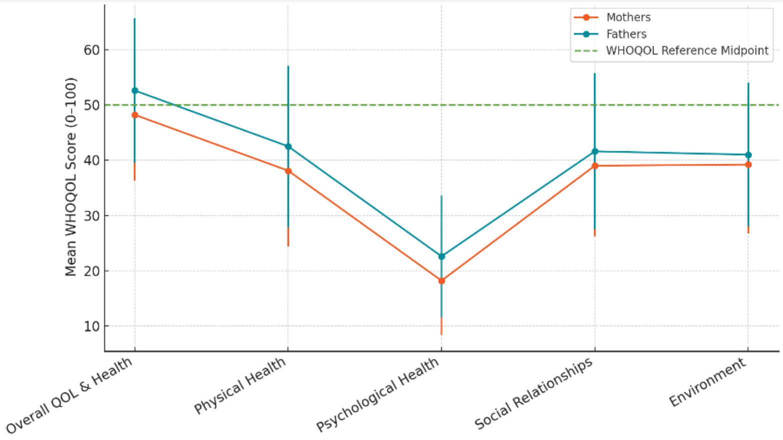
A total of 113 parents participated in the study, of whom 68 (60.2%) were mothers and 45 (39.8%) were fathers. The mean age of children was 2.5 years, with 36.3% aged between one and two years, 36.3% between two and three years, and 27.4% between three and four years. Conductive hearing loss was reported in 42 children (37.2%), sensorineural hearing loss in 41 (36.3%), and mixed hearing loss in 30 (26.5%). More than half of the families, 62 (54.9%), reported a positive family history of hearing impairment, and 41 (36.3%) of the children were the third or fourth-born in their families. These distributions were not significantly different across groups (p > 0.05), indicating demographic homogeneity (Table 1).

When asked to rate their overall quality of life, 45 parents (39.8%) described it as good, an equal number (39.8%) reported it as neutral, and 23 (20.4%) perceived it as poor. Similarly, general health ratings were divided, with 38 parents (33.6%) reporting good health, 39 (34.5%) neutral, and 36 (31.9%) poor. Although mothers were more likely to report poorer outcomes than fathers, these differences did not reach statistical significance for general health (p = 0.289) (Table 2).

Analysis of WHOQOL-BREF domain scores revealed that parents scored lowest in psychological well-being, with a mean of 20 (SD = 10.4) out of 100. This was markedly lower compared to other domains, including physical health (40, SD = 14.2), social relationships (40, SD = 13.5), and environment (40, SD = 12.8). The overall QOL and general health composite score averaged 50 (SD = 12.5). Comparative analysis demonstrated that mothers consistently reported lower scores than fathers across all domains. Psychological health was particularly compromised among mothers, with a mean of 18.2 compared to 22.6 in fathers (p = 0.027). Similarly, the overall QOL score was lower among mothers (48.2 vs. 52.6, p = 0.041), highlighting gender-specific disparities (Table 3).

Subgroup analyses further revealed patterns associated with contextual variables. Parents with a family history of hearing impairment had slightly higher overall QOL scores than those without such history (51.8 vs. 48.5, p = 0.062), suggesting prior exposure may enhance adaptation. In contrast, parents of children with higher birth order (≥5) reported significantly poorer physical health scores compared to those with first- or second-born children (p = 0.033). This finding indicates that caregiving demands may accumulate with family size, thereby diminishing parental well-being.

Overall, the results demonstrate that while some parents perceived their quality of life as adequate, a substantial proportion reported dissatisfaction, with psychological well-being emerging as the most severely affected domain. These findings emphasize the multidimensional burden of childhood hearing impairment on parents, particularly mothers, and underscore the importance of tailored psychosocial and environmental interventions.



The figure compares WHOQOL-BREF domain scores between mothers and fathers of children with hearing impairment. Mothers consistently reported lower scores across domains, most markedly in psychological health (18.2 vs. 22.6) and overall quality of life (48.2 vs. 52.6). Error bars highlight substantial variability, yet the gap between groups remained evident, with mothers' scores falling below the WHOQOL midpoint reference line of 50 in all domains except overall health. Fathers, while scoring slightly higher, also trended below optimal thresholds in physical (42.5) and environmental health (41.0). These findings underscore a clinically relevant disparity, indicating that caregiving disproportionately impacts maternal well-being, particularly in psychological resilience.

DISCUSSION

The present study investigated the quality of life of parents of children with hearing impairment in Pakistan, focusing on physical, psychological, social, and environmental domains using the WHOQOL-BREF. The findings demonstrated that parents, particularly mothers, experience markedly lower scores across all domains, with psychological health being the most severely affected. These results align with international evidence that caregiving for children with disabilities is associated with elevated stress, anxiety, and poorer well-being compared to parents of typically developing children (16). The consistently lower scores reported by mothers underscore gendered disparities in caregiving responsibilities, reflecting the disproportionate psychosocial burden borne by women in South Asian societies (17).

The pronounced impairment in psychological health observed among mothers mirrors findings from Iran and Israel, where maternal stress and depressive symptoms were linked to the presence of childhood hearing loss (18,19). Several mechanisms may account for this association, including the heightened emotional response to diagnosis, sustained uncertainty regarding child development, and persistent stigma surrounding disability in traditional communities (20). Furthermore, limited social support systems and financial constraints may exacerbate distress, leaving mothers particularly vulnerable. The observed mean score of 18.2 out of 100 in psychological health indicates a level of impairment that warrants urgent intervention, as parental mental health directly influences children's rehabilitation outcomes and family cohesion (21).

The study also revealed significant gender differences in overall quality of life, with mothers reporting lower scores than fathers. This disparity is consistent with prior research showing that mothers assume the primary caregiving role, often at the expense of their own health, employment opportunities, and social participation (22). A Norwegian study similarly found that parental quality of life was inversely associated with the severity of hearing loss in children, with mothers disproportionately affected (23). In the Pakistani context, sociocultural expectations of maternal caregiving, compounded by limited mental health resources, may further contribute to this disparity.

In terms of contextual factors, parents with a family history of hearing impairment demonstrated slightly higher overall quality of life scores, though this difference did not reach statistical significance. This trend may reflect greater adaptation or familiarity with hearing loss, resulting in improved coping mechanisms. Conversely, parents of children with higher birth order (≥5) reported significantly poorer physical health scores, suggesting cumulative caregiving demands and financial strain in larger families. Such findings highlight the need to consider family structure and socioeconomic status when designing support programs for parents of children with disabilities (24).

The broader implications of these results are substantial. First, the low quality of life scores across all domains highlight the urgent need for comprehensive, family-centered interventions in Pakistan. Psychosocial support, counseling services, and structured stress management programs have been shown in other contexts to improve parental well-being and family functioning (25). Second, integrating parental mental health screening into pediatric audiology and rehabilitation services may allow early identification of at-risk caregivers. Finally, public health initiatives aimed at reducing stigma, increasing awareness, and expanding access to educational and financial resources for families with hearing-impaired children could mitigate the adverse impact of caregiving.

Despite these contributions, the study has limitations that warrant acknowledgment. The cross-sectional design precludes causal inference, and the reliance on self-reported measures may introduce reporting bias. Moreover, the study was conducted in urban tertiary care centers and associated schools, potentially limiting generalizability to rural populations where healthcare access and social dynamics differ markedly. Nonetheless, the use of a validated instrument, systematic data collection procedures, and a representative sample size enhance the robustness of the findings.

In conclusion, this study provides evidence that parents of hearing-impaired children in Pakistan experience compromised quality of life, particularly in psychological health. The gendered disparity identified highlights the need to prioritize maternal well-being in family-centered care models. Future longitudinal research should explore how early interventions, community-based support, and rehabilitation strategies can mitigate parental burden and improve both caregiver and child outcomes.

CONCLUSION AND RECOMMENDATIONS

This study highlights the considerable burden experienced by parents of children with hearing impairment in Pakistan, with overall quality of life scores falling below optimal thresholds across physical, psychological, social, and environmental domains. Mothers consistently reported poorer outcomes than fathers, particularly in psychological health, reflecting gendered disparities in caregiving responsibilities. Family history of hearing impairment appeared to modestly buffer the impact, whereas larger family size was associated with poorer physical health among parents. These findings underscore the need for targeted, family-centered interventions that address parental stress, provide psychosocial support, and reduce societal stigma. Policies integrating mental health services within pediatric audiology programs, alongside broader community awareness initiatives, are crucial to improving the well-being of both parents and their children.

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