



## **SOCIODEMOGRAPHIC FACTORS AND QUALITY OF LIFE OF MOTHERS OF CHILDREN WITH CEREBRAL PALSY: IMPACT ON CHILDREN'S PSYCHOSOCIAL HEALTH**

### **SOCIODEMOGRAFSKI FAKTORI I KVALITETA ŽIVOTA MAJKI DJECE SA CEREBRALNOM PARALIZOM: UTICAJ NA PSIHOSOCIJALNO ZDRAVLJE DJECE**

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#### **ABSTRACT**

The aim of this retrospective study was to examine the association between the quality of life of mothers of children with cerebral palsy and various sociodemographic characteristics, as well as to analyze the relationship between mothers' subjective assessments of their quality of life and the psychosocial functioning of their children. The sample consisted of 61 mothers and their children diagnosed with cerebral palsy. Data were collected using the PedsQL™ 2.0 Family Impact Module and the PedsQL™ 4.0 Pediatric Quality of Life Inventory, both completed by the mothers. Socioeconomic status was assessed using the Hollingshead Index. Statistical analyses included descriptive statistics and nonparametric tests, including Spearman's correlation, and were conducted using IBM SPSS Statistics 25. The results indicated that sociodemographic factors had a limited impact on mothers' quality of life, whereas the psychosocial functioning of the child significantly influenced the mothers' daily lives. These findings highlight the need for comprehensive support that addresses the emotional and social dimensions of children's health in order to improve the overall well-being of their mothers.

**Key words:** cerebral palsy, mothers, quality of life, psychosocial functioning, socioeconomic factors, caregivers.

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## SAŽETAK

Cilj ove retrospektivne studije bio je ispitati povezanost kvaliteta života majki djece s cerebralnom paralizom sa sociodemografskim karakteristikama, kao i analizirati odnos između subjektivne procjene kvaliteta života majki i psihosocijalnog funkcionisanja njihove djece. Uzorak je obuhvatio 61 majku i njihovu djecu s dijagnozom cerebralne paralize. Podaci su prikupljeni korištenjem upitnika PedsQL™ 2.0 Family Impact Module i PedsQL™ 4.0 Pediatric Quality of Life Inventory, koje su ispunjavale majke. Socioekonomski status procijenjen je pomoću Hollingsheadovim indeksom, a statistička obrada podataka uključivala je deskriptivne analize i neparametrijske testove, uključujući Spearmanovu korelaciju, a rađena je korištenjem softvera IBM SPSS Statistics 25. Rezultati su pokazali da sociodemografski faktori imaju ograničen utjecaj na kvalitet života majki, dok psihosocijalno funkcionisanje djeteta ima značajan utjecaj na njihov svakodnevni život. Ovi nalazi ukazuju na potrebu za sveobuhvatnom podrškom koja uključuje brigu o emocionalnim i društvenim aspektima zdravlja djece, s ciljem unapređenja općeg blagostanja njihovih majki.

**Ključne riječi:** cerebralna paraliza, majke, kvalitet života, psihosocijalno funkcionisanje, socioekonomski faktori, skrbnici.

## INTRODUCTION

Cerebral palsy (CP) refers to a group of permanent, non-progressive disorders of movement and postural control resulting from damage to or abnormal development of the brain during the fetal or early postnatal period (Nobakht, Rassafiani, Hosseini et al., 2020). It is the most common cause of physical disability in childhood, with a prevalence of approximately 1 in 600 live births (McIntyre, Goldsmith, Webb et al., 2022). The consequences of CP are lifelong and can significantly affect various aspects of functioning (Sadowska, Sarecka-Hujar & Kopyta, 2020).

Although motor dysfunction is the core characteristic of CP, the clinical presentation is often complex and includes numerous comorbidities, such as speech and language disorders, cognitive impairments, sensory dysfunctions, and emotional difficulties (Vuong, 2022; Sawyer, 2022). These challenges substantially limit the child's ability to perform everyday activities independently, including feeding, personal hygiene, and dressing, making them reliant on continuous support from their environment (Janssen-Potten, Roks, Roijen et al., 2023).

In this context, parents—most often mothers—assume the primary caregiving role, providing not only basic physical care but also emotional and organizational support. This role demands a high level of commitment and sustained involvement (Blasco, García-Galant, Berenguer-González et al., 2023; Rassafiani & Sahaf, 2011; Stillerova, Liddle, Gustafsson et al., 2016). It is frequently a long-term, intensive, and insufficiently supported role, both by healthcare and social systems (Fujiura, 2014; Gardiner & Iarocci, 2012). Consequently, mothers as primary caregivers bear the main burden of daily care, making them particularly vulnerable to chronic stress, emotional exhaustion, and reduced quality of life (Masulani-Mwale, Mathanga, Silungwe et al., 2016).

Numerous studies have shown that the ongoing care of a child with complex needs can negatively affect mothers' physical and mental health, social participation, professional opportunities, and the family's financial stability (Jalili, Godarzi, Rassafiani et al., 2013). Moreover, the lack of adequate social and institutional support exacerbates their situation, deepening disparities in quality of life compared to the general population (Bella, Garcia & Spadari-Bratfisch, 2011).

Given the frequent presence of comorbidities in children with CP—including intellectual disabilities, epilepsy, and speech impairments—it is essential to provide comprehensive, continuous, and coordinated multidisciplinary care. However, the everyday implementation of such care typically falls on the parents, further compromising their functional well-being (Glinac, Matović, Delalić et al., 2017).

Quality of life (QoL) is a multidimensional construct encompassing both objective and subjective aspects of an individual's daily functioning. It includes emotional states, interpersonal relationships, living conditions within the community, social and cultural norms, and the influence of political and economic factors on everyday life (Colver, 2009; Badia, Longo, Orgaz et al., 2013). According to Rosenbaum (2008), QoL tends to be higher among individuals who have the opportunity to engage in meaningful activities that foster a sense of belonging, compared to those who are denied such participation.

Given these considerations, investigating the quality of life of mothers of children with CP, as well as identifying its determinants, is of critical importance. Such knowledge can serve as a foundation for the development of targeted interventions aimed not only at supporting the well-being of mothers as primary caregivers but also at indirectly improving the health and functional outcomes of children with CP and their families.

Objectives of the study:

1. To examine the association between the quality of life of mothers of children with CP and selected sociodemographic characteristics (child's age, sex, mother's age, educational level, place of residence, and socioeconomic status);
2. To analyze the relationship between mothers' subjective assessment of their quality of life and the psychosocial functioning of their children.

## **MATERIALS AND METHODS**

### **Participants**

The study included 61 mothers who were the primary caregivers of children with a clinically confirmed diagnosis of cerebral palsy, as well as 61 children. Data were retrospectively collected from records containing the results of the PedsQL™ 2.0 and PedsQL™ 4.0 questionnaires.

Inclusion criteria were: a clinical diagnosis of cerebral palsy, child age between 5 and 18 years at the time of questionnaire completion, and completed quality of life questionnaires from the mother's perspective.

Exclusion criteria included: incomplete questionnaires, missing essential data, and the presence of other serious diagnoses in the mothers that could significantly affect their daily functioning.

### **Study Design and Procedures**

This study was conducted as a retrospective analysis of previously collected data within the framework of a research project at the University Clinical Center Tuzla. All participants provided informed consent, and only de-identified data were used for the purposes of this analysis to ensure privacy and confidentiality.

### **Measurement Instruments**

The PedsQL™ Family Impact Module (Version 2.0) was used to assess parental and family functioning. It consists of eight subscales: physical, emotional, social, and cognitive functioning, communication, worry, daily activities, and family relationships. Responses were provided on a 5-point Likert scale ranging from 0 (never) to 4 (almost always), and scores were transformed to a 0–100 scale, with higher scores indicating better functioning (Varni, Sherman, Burwinkle et al., 2004).

The PedsQL™ 4.0 Generic Core Scales were used to assess children's psychosocial functioning. This instrument covers four domains: physical, emotional, social, and school functioning. The child's psychosocial health score was calculated as the mean of emotional, social, and school functioning subscale scores. Raw scores were transformed to a 0–100 scale in accordance with standardized scoring instructions (Varni, Seid & Kurtin, 2001).

The Hollingshead Index of Socioeconomic Status was used to assess the family's socioeconomic status based on parental education and occupation. Lower total scores indicate higher socioeconomic status (Stepnowsky, Nelesen, DeJardin, 2004).

The Gross Motor Function Classification System (GMFCS) was used to classify the children's motor function across five levels, with higher levels indicating greater motor impairment.

### **Ethical Considerations**

This retrospective study was conducted with prior approval from the Ethics Committee of the University Clinical Center Tuzla, Bosnia and Herzegovina. All data analyzed were obtained from existing medical records. The study was carried out in strict accordance with ethical standards and guidelines, ensuring participant anonymity and confidentiality throughout the research process.

### **Statistical Analysis**

Data analysis was performed using IBM SPSS Statistics, version 25. Descriptive statistics, including percentages, medians, and interquartile ranges, were used to present the basic characteristics of the sample. The normality of distribution for continuous variables was assessed using the Shapiro–Wilk test. Non-parametric tests, including Spearman's rank correlation, were used to examine associations between variables. Statistical significance was set at  $p < 0.05$ .

## RESULTS

The median age of the mothers at the time of the study was 36 years (range: 26–56 years). Of the 61 participants, 51 mothers (83.6%) were unemployed, while 10 (16.4%) were employed. The median age of the children with cerebral palsy was 8.5 years (range: 5–16.7 years). Among the children, 27 (44.3%) were female and 34 (55.7%) were male. Regarding place of residence, 25 children (41.0%) lived in urban areas and 36 (59.0%) in rural areas. According to the Gross Motor Function Classification System (GMFCS), 22 children (36.07%) were classified at level 5, 12 (19.67%) at level 4, 14 (22.95%) at level 3, 3 (4.92%) at level 2, and 10 (16.39%) at level 1.

The results of the correlation analysis are presented in Table 1 and refer to the association between the quality of life of mothers of children with cerebral palsy and selected sociodemographic variables.

**Table 1.** Association Between Quality of Life of Mothers of Children With Cerebral Palsy and Sociodemographic Factors

<b>PedsQL™ 2.0</b>		<b>CA</b>	<b>CS</b>	<b>MA</b>	<b>ME</b>	<b>PR</b>	<b>SES</b>
<b>FF</b>	Spearman	-.064	-.029	.023	.116	-.030	.016
	p	.623	.824	.863	.375	.816	.900
<b>EF</b>	Spearman	-.151	.026	.134	.244	-.026	.078
	p	.244	.840	.302	.058	.844	.550
<b>SF</b>	Spearman	-.010	.102	-.039	.066	.014	.131
	p	.941	.433	.764	.614	.913	.315
<b>CF</b>	Spearman	-.136	.123	-.134	.146	.058	.033
	p	.297	.347	.304	.261	.660	.798
<b>C</b>	Spearman	-.136	.123	-.134	.146	.058	.033
	p	.297	.347	.304	.261	.660	.798
<b>W</b>	Spearman	.296*	-.037	.165	-.144	.088	-.106
	p	.021	.779	.205	.268	.502	.415
<b>DA</b>	Spearman	-.304*	-.007	-.151	.192	-.114	.207
	p	.017	.960	.247	.139	.381	.109
<b>FR</b>	Spearman	-.073	.043	.110	-.199	.246	-.115
	p	.576	.740	.401	.124	.056	.378
<b>OQoL</b>	Spearman	-.150	.090	-.040	.070	.060	.080
	p	.223	.468	.724	.557	.638	.540

FF – Physical Functioning; EF – Emotional Functioning; SF – Social Functioning; CF – Cognitive Functioning; C – Communication; W – Worry; DA – Daily Activities; FR – Family Relationships; OQoL – Overall quality of life of mothers; CA – Child’s Age; CS – Child’s Sex; MA – Mother’s Age; ME – Mother’s Education; PR – Place of Residence; SES – Socioeconomic Status; Statistical significance:  $p < 0.05$ .

Correlation analysis revealed that most sociodemographic variables were not statistically significantly associated with maternal quality of life dimensions. Notably, two significant correlations were observed: a weak positive correlation between the caregiving domain and the child's age (Spearman's  $\rho = 0.296$ ,  $p = 0.021$ ), and a weak negative correlation between the daily activities domain and the child's age (Spearman's  $\rho = -0.304$ ,  $p = 0.017$ ). Other variables, including the child's age and sex, maternal age and education, place of residence, and socioeconomic status, did not show statistically significant associations.

### Association Between Mothers' Quality of Life and Children's Psychosocial Functioning

Table 2 presents the association between mothers' self-reported quality of life and the psychosocial functioning of children with cerebral palsy.

**Table 2.** Association Between Mothers' Quality of Life and Psychosocial Health of Children With Cerebral Palsy

	PedsQL™ 2.0. PedsQL™ 4.0.	PF	EF	SF	CF	C	W	DA	FR	OQoL
	Spearman	.362**	.405**	.352**	.197	.197	.254*	.291*	.272*	.404**
PSH	p	.004	.001	.005	.128	.128	.048	.023	.034	.001

PSH – Child's Psychosocial Health; PF – Physical Functioning; EF – Emotional Functioning; SF – Social Functioning; CF – Cognitive Functioning; C – Communication; W – Worry; DA – Daily Activities; FR – Family Relationships; OQoL – Overall quality of life of mothers; \*Statistical significance:  $p < 0.05$ ; \*\* Statistical significance:  $p < 0.01$ .

Spearman's correlation analysis demonstrated a statistically significant association between higher levels of children's psychosocial health and most aspects of maternal quality of life. The strongest correlations ( $p < 0.01$ ) were observed for maternal physical functioning (Spearman's  $\rho = 0.362$ ), emotional functioning (Spearman's  $\rho = 0.405$ ), and social functioning ( $\rho = 0.352$ ). Moderately significant correlations ( $p < 0.05$ ) were identified between children's psychosocial health and the caregiving, daily activities, and family relationships domains in mothers. Additionally, overall maternal quality of life showed a statistically significant positive correlation with children's psychosocial health (Spearman's  $\rho = 0.404$ ,  $p = 0.001$ ), indicating that better psychosocial health in children with cerebral palsy is associated with higher overall quality of life ratings reported by their mothers.

## DISCUSSION

The results of this study indicate that the analyzed sociodemographic factors—including the child's age, child's sex, mother's age, mother's educational level, place of residence, and family socioeconomic status—were not statistically significantly associated with the overall quality of life of mothers of children with cerebral palsy (all  $p$ -values  $> 0.05$ ). However, two quality of life domains showed statistically significant, albeit weak, correlations with the child's age: the domain of worry was positively correlated with child's age (Spearman's  $\rho =$

0.296,  $p = 0.021$ ), whereas the domain of daily activities demonstrated a negative correlation (Spearman's  $\rho = -0.304$ ,  $p = 0.017$ ).

Our findings support previous research indicating a limited impact of sociodemographic factors on the daily challenges faced by parents of children with developmental disabilities (Wijesinghe, Cunningham, Fonseka et al., 2015; Wijesinghe, Fonseka & Hewage, 2013). Instead, the emotional and physical demands related to caring for a child with permanent functional limitations represent key determinants of reduced parental quality of life (Sonune, Gaur & Shenoy, 2021; Barreto, Bento, Barreto et al., 2020). Such caregiving disrupts routine activities and can negatively affect the caregiver's psychophysical health (Kondekar, Ansari & Ghatol, 2024; Albayrak, Biber, Çalışkan et al., 2019; Carona, Crespo & Canavarró, 2013; MacDonald & Callery, 2008).

Contrary to our findings, several previous studies have identified significant associations between parental quality of life and factors such as age, educational level, and income (Pandit, Singh, Karn et al., 2021; Ying, Rostenberghe, Kuan et al., 2021; Xia, Sun, Li et al., 2020; Farajzadeh, Maroufizadeh & Amini, 2020; Wu, Zhang & Hong, 2017). Farajzadeh, Maroufizadeh, and Amini (2020) reported a significant effect of educational level on parents' perception of quality of life, a relationship not observed in our sample. The absence of a significant socioeconomic status effect in this study aligns with findings by Iram, Ghaffar, Solangi et al. (2023), which may suggest the need for more precise operationalization of this construct in diverse socio-economic contexts. Maternal employment has been identified as a significant predictor of better quality of life in certain domains in previous research (Farajzadeh, Maroufizadeh & Amini, 2020; Ahmadizadeh, Rassafiani, Khalili et al., 2015), likely due to its contribution to a sense of autonomy and financial support for the family. Additionally, findings by Kassa, Tadese, Eriku et al. (2024) indicate that younger caregivers and those with higher incomes report better physical quality of life, confirming that specific sociodemographic characteristics may have differential effects depending on population specifics and broader social contexts. Such discrepancies across studies may be explained by cultural, social, and healthcare system differences between countries.

It is important to emphasize that caring for a child with cerebral palsy has a direct and detrimental impact on the physical and mental health of parents, as corroborated by recent research (Liu, Zhang, Cui et al., 2025). Emotional and financial support provided by family, community, and social networks can mitigate stress levels and contribute to improved overall functioning of caregiving parents (Skok, Harvey & Reddihough, 2006; Carona, Moreira & Silva, 2014). Therefore, it is crucial that relevant institutions engage more actively through systemic support measures such as formal caregiving services, financial assistance, and employment facilitation programs for parents of children with cerebral palsy (Liu, Zhang, Cui et al., 2025).

The second aim of the study was to examine the relationship between mothers' subjective assessments of their quality of life and the psychosocial functioning of their children with cerebral palsy. The results revealed statistically significant positive correlations between higher levels of children's psychosocial functioning and better maternal physical (Spearman's  $\rho = 0.362$ ;  $p = 0.004$ ), emotional (Spearman's  $\rho = 0.405$ ;  $p = 0.001$ ), and social functioning (Spearman's  $\rho = 0.352$ ;  $p = 0.005$ ). Individual domains of maternal functioning

— such as worry, daily activities, and family relationships — also demonstrated moderate but statistically significant associations with the psychosocial health of the children ( $p < 0.05$ ). These findings suggest that better psychosocial health in children with cerebral palsy is positively associated with mothers' perceived quality of life.

These findings confirm the interdependence between caregiver quality of life and the psychosocial well-being of children with cerebral palsy, consistent with previous research (Garip, Ozel, Tuncer et al., 2017). The psychological burden of caring for a child with complex developmental needs often results in increased levels of depression, anxiety, and stress in parents, which may adversely affect the emotional and social functioning of the child (Ones, Yilmaz, Cetinkaya et al., 2005; Prudente, Barbosa & Porto, 2010).

Cerebral palsy, as a chronic condition, exerts a multidimensional impact on the child and family, encompassing emotional, social, and economic aspects of the caregiver's life (Glasscock, 2000; Koman, Smith & Shilt, 2004). Although socioeconomic status was not associated with the overall quality of life of mothers in this study, the psychosocial health of the child emerged as a strong predictor of parental functioning.

These results support the findings of Ying, Rostenberghe, Kuan et al. (2021), who emphasize the need for targeted support for parents of children with cerebral palsy, as their mental and physical health has direct consequences on the developmental outcomes of their children. Garip, Ozel, Tuncer et al. (2017) further highlight that parental fatigue and emotional exhaustion may negatively impact the effectiveness of rehabilitation, underscoring the importance of integrated psychosocial interventions and the availability of assistive technologies to alleviate caregiver burden.

The study by Glinac, Sinanovic, Glinac et al. (2023) confirms that the quality of life of mothers of children with cerebral palsy depends on the quality of life of their children, with particular emphasis on the child's physical and social functioning as key factors. Assessing the quality of life of both mothers and children should be an integral component of clinical evaluation to facilitate better planning and provision of appropriate support.

Limitations of this study include its retrospective design and the fact that quality of life data were collected solely from mothers, without incorporating the children's perspectives. Additionally, not all factors potentially influencing quality of life were included. Due to the study design, findings indicate associations but do not establish causality.

## CONCLUSION

Based on the obtained results, it can be concluded that sociodemographic factors have a limited impact on the quality of life of mothers of children with cerebral palsy, whereas the psychosocial functioning of the child plays a significant role in shaping the daily lives of their mothers. These findings highlight the need for comprehensive support that addresses the emotional and social aspects of the child's health, with the aim of improving the overall well-being of the mothers.

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