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ORIGINAL ARTICLE

Functional Levels of Children with Cerebral Palsy and Their Association with Family Impact and Maternal Health

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Abstract

OBJECTIVES: To examine the relationships between gross motor function, manual ability, and functional independence in children with cerebral palsy (CP), and their associations with maternal health-related quality of life and family impact.
DESIGN: Retrospective cross-sectional chart review with blinded assessment of routinely collected outcome measures.
MATERIALS AND METHODS: Records of 45 children with CP were screened; 23 children aged 4–13 years who met predefined eligibility criteria and their primary caregiver mothers were included in the final analysis. Children's gross motor function, manual ability, and functional independence were assessed using the Gross Motor Function Classification System (GMFCS), Manual Ability Classification System (MACS), and Pediatric Functional Independence Measure (WeeFIM). Maternal health-related quality of life and family impact were evaluated using the Nottingham Health Profile (NHP) and Impact on Family Scale (IOFS). Associations were analysed using Spearman correlation and multiple linear regression.
RESULTS: WeeFIM showed a strong positive correlation with IOFS, whereas GMFCS showed a strong negative correlation with IOFS. NHP was negatively correlated with child age and WeeFIM. In multivariable analysis, WeeFIM was the only independent factor associated with IOFS. The correlations of IOFS with child age, maternal age, MACS, and NHP did not reach statistical significance. NHP scores were negatively correlated with child age ($\rho = -0.458$, $p = 0.028$) and WeeFIM scores ($\rho = -0.535$, $p = 0.009$). In multiple linear regression, WeeFIM remained the only significant independent factor associated with IOFS, explaining 68.6% of the variance in family impact ($R^2 = 0.686$, adjusted $R^2 = 0.672$).

CONCLUSION: Greater functional independence in children with CP was associated with more favorable family impact and better maternal health-related quality of life. These findings support family-centred rehabilitation approaches that prioritize daily living skills and systematically address caregiver needs.

INTRODUCTION

Cerebral palsy (CP) is a group of permanent disorders of movement and posture that result in activity limitations due to non-progressive disturbances in the developing fetal or infant brain (Rosenbaum *et al.* 2007). As a chronic condition beginning early in life, CP causes long-term limitations and sustained caregiving demand (Garip *et al.* 2017; Marrón *et al.* 2013; Smith & Blamires 2022; Tedla *et al.* 2023)

Caregiver burden affects maternal wellbeing and family functioning, but the relative importance of motor classification versus daily functional independence remains unclear (Haddada *et al.* 2025; Kulkarni & Muley 2025; Liu *et al.* 2023; Zhong & Wijesinghe 2025).

Higher caregiver burden has been associated with increased depressive symptoms and poorer quality of life among caregivers, as well as with greater severity of physical disability in children (Liu *et al.* 2023). Among child-related factors, gross motor function level (GMFCS) and severity of disability have been identified as important determinants of caregiver burden (Sanjaya & Wirawan 2025). Increased severity of disability leads to greater dependence of children on caregivers for activities of daily living, thereby placing higher physical and psychosocial demands on caregivers (Dlamini & Chang 2025). Therefore, the functional level of children with cerebral palsy is considered to be closely related to the health status of caregiver mothers and the impact on the family.

In the literature, the effects of caring for children with cerebral palsy on primary caregivers have been examined from different perspectives. Previous studies have evaluated the impact of caregiving on caregivers' health-related quality of life and family functioning, and have explored potential factors associated with these outcomes (Ying *et al.* 2021). In addition, relationships between child- and family-related variables—such as independence in activities of daily living, motor function levels, type of cerebral palsy, emotional status, and family adaptation—have been investigated in children with cerebral palsy (Akkaya *et al.* 2022).

Studies focusing on caregiver burden and health status have employed various assessment approaches that primarily address key domains, including quality of life, psychological well-being, and family functioning. Findings from systematic analyses indicate that caregiver burden is a multidimensional construct and that these domains have often been examined separately in the literature (Liu *et al.* 2023).

However, it remains unclear whether family impact and maternal health-related quality of life are more closely associated with motor classification levels or with children's practical independence in daily activities. The present study therefore aimed to examine whether gross motor function, manual ability, and performance-based functional independence are differentially associated with family impact and maternal health-related quality of life in children with cerebral palsy and their mothers.

METHODS

Study Design

TThis retrospective observational chart review was conducted with blinded assessment of routinely collected outcome measures. Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Medipol University (IRB No: 1032). All procedures complied with the principles outlined in the Declaration of Helsinki. Given the retrospective nature of the study, the ethics committee waived the requirement for written informed consent. Despite the retrospective design, all outcome measures were collected as part of routine clinical assessments at the time of initial evaluation and retrieved from medical records.

Sample Size

Because of the retrospective design, no a priori sample size calculation was performed. Instead, all eligible patients assessed during the predefined study period were included. The study population comprised all patients who met the inclusion criteria during the predefined study period approved by the ethics committee.

Participants

This retrospective study was conducted at the Physical Therapy and Rehabilitation Clinic of University Hospital between September 2024 and September 2025. The records of 45 children diagnosed with cerebral palsy were screened for eligibility. Of these, 22 children were excluded because they were outside the predefined age range of 4–18 years. Consequently, 23 children with cerebral palsy and their primary caregiver mothers aged 4–13 years were included in the final analysis. Detailed inclusion and exclusion criteria are presented in Table 1. Demographic data of children and mothers were recorded.

Measures

Outcome measures were used to assess relationships among the primary study variables. All outcome measures were obtained at baseline as part of routine clinical assessment using validated instruments administered by trained assessors. The selected outcome

Table 1. Inclusion and exclusion criteria for children with cerebral palsy (CP) and their mothers. Inclusion criteria required children aged 4–18 years with a diagnosis of CP living with a mother who was the primary caregiver responsible for daily care and decision-making. Exclusion criteria included neurodegenerative disorders other than CP and primary caregivers who were not parents.

Inclusion criteria
• Age between 4 and 18 years • Diagnosis of cerebral palsy (CP) • Living with the mother, provided that the mother is the primary caregiver responsible for the child's daily care and decision-making
Exclusion criteria
• Presence of neurodegenerative disorders other than CP • Primary caregiver not being a parent • Inability of parents to complete questionnaires or presence of cognitive impairment • Mothers with serious or chronic medical conditions (e.g., diabetes mellitus, stroke) or severe chronic psychological disorders

measures were chosen to capture relevant clinical and functional parameters related to the study objectives.

Children with cerebral palsy were classified according to the Gross Motor Function Classification System (GMFCS). Motor and functional abilities were assessed using the GMFCS and the Manual Ability Classification System (MACS), while functional independence was evaluated using the Pediatric Functional Independence Measure (WeeFIM). Maternal health-related quality of life and family impact were assessed using the Nottingham Health Profile (NHP) and the Impact on Family Scale (IOFS), respectively.

Demographic and Clinical Characteristics

Demographic characteristics, including child age and maternal age, were obtained retrospectively from medical records. Clinical data related to cerebral palsy, including functional classification levels, were collected during the study assessments.

Gross Motor Function Classification System (GMFCS)

The Gross Motor Function Classification System (GMFCS) is a standardized five-level classification system used to describe gross motor function in children with cerebral palsy, with higher levels indicating greater motor impairment (Palisano *et al.* 1997). According to the GMFCS, children are classified as follows: Level I—walks without limitations; Level II—walks with limitations; Level III—walks using hand-held mobility devices; Level IV—self-mobility is limited and children are transported or use powered mobility; and Level V—severe limitations in mobility, with children transported in a manual wheelchair (Palisano *et al.* 2000; Palisano *et al.* 2008).

The Pediatric Functional Independence Measure (WeeFIM)

The Pediatric Functional Independence Measure (WeeFIM) assesses functional independence in basic daily activities in children. Scores can range from 18 to 126, depending on the child's level of functionality. Turkish reliability and validation was reported (Tur *et al.* 2009).

Manual Abilities Classification System in Children with Cerebral Palsy (MACS)

The Manual Ability Classification System (MACS) is a five-level classification system that describes how children with cerebral palsy use their hands to handle objects in daily activities. Level I indicates that the child handles objects easily and successfully; Level II denotes reduced quality and/or speed when handling objects; Level III reflects difficulty in handling objects and the need for assistance to prepare or modify activities; Level IV indicates limited ability to handle simple objects in adapted situations; and Level V represents severe limitations in manual ability, with inability to handle objects even in simple activities (Eliasson *et al.* 2006).

Impact On Family Scale (IOFS)

Impact On Family Scale (IOFS) was developed to measure the impact of chronically disabled children on their families (Stein & Riessman 1980). The revised version of the scale measures the family's level of impact under four main headings: financial burden, familial and social impact, personal strain, coping, and the total impact (Stein & Jessop 2003). Impact On Family Scale was adapted to Turkish, and its validity and reliability were reported (Beydemir 2008).

The Nottingham Health Profile (NHP)

The Nottingham Health Profile (NHP) is a questionnaire that measures a person's perceived health problems and the impact of these problems on their daily lives, assessing energy, pain, emotional reactions, social isolation, sleep levels, and physical activity. 0 represents the best health status, and 100 represents the worst health status (McEwen 1993). NHP was adapted to Turkish, and reliability and validity were reported previously (Küçükdeveci *et al.* 2000).

Statistical Analysis

All statistical analyses were performed using IBM SPSS Statistics version 30.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as median, minimum, and maximum values. The normality of data distribution was assessed using the Shapiro–Wilk test. Because the variables were not normally distributed, relationships between study variables were evaluated using Spearman's rank correlation coefficient. To determine independent factors associated with the IOFS, multiple linear regression analysis was performed. Child age, maternal age, WeeFIM, GMFCS, and MACS were entered into the initial regression model based on clinical relevance and the study's prespecified conceptual framework. Regression diagnostics were reviewed to assess model suitability, and multicollinearity was examined using variance inflation factors (VIF). VIF values in the initial model ranged from 1.949 to 3.881 and remained below 5.0, indicating no severe multicollinearity. A two-tailed p-value of <0.05 was considered statistically significant.

RESULTS

The records of 45 children with cerebral palsy were screened for eligibility. Of these, 22 children were excluded because they were outside the predefined age range of 4–18 years. Consequently, 23 children with cerebral palsy and their primary caregiver mothers were included in the final analysis (Figure 1).

The children's median age was 7.0 years (range: 4.0–13.0 years), while the median maternal age was 35.0 years (range: 26.0–45.0 years). The demographic and clinical characteristics of the participants are presented in Table 2.

Spearman correlation analysis revealed a strong positive correlation between IOFS and WeeFIM scores (ρ = 0.768, p < 0.001), indicating that higher functional independence in children was associated with a more favourable family impact. In contrast, IOFS showed a strong negative correlation with GMFCS level (ρ = −0.621, p = 0.002), suggesting that poorer

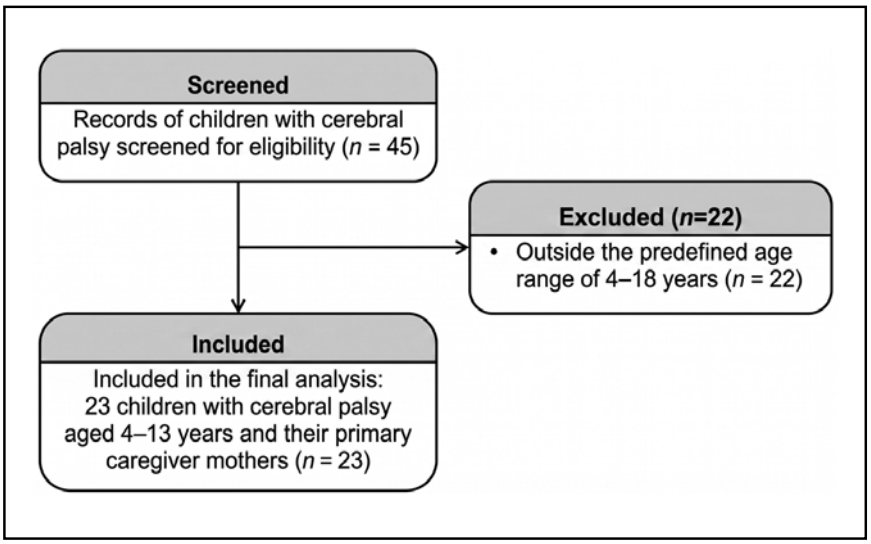

Fig. 1. Flow chart of participant selection. Records of 45 children diagnosed with cerebral palsy (CP) were screened for eligibility during the study period. Twenty two children were excluded because they were outside the predefined age range of 4–18 years or did not meet other eligibility criteria. The final sample comprised 23 children aged 4–13 years and their primary caregiver mothers, who were included in the analysis of functional levels, family impact, and maternal health-related quality of life.

Table 2. Demographic and clinical characteristics of children with cerebral palsy aged 4–13 years and their primary caregiver mothers (n = 23). Values are presented as median (minimum–maximum) unless otherwise indicated. Child characteristics include age, sex, CP type, GMFCS level, MACS level, and WeeFIM total score. Maternal characteristics include age, Nottingham Health Profile (NHP) total score, and Impact on Family Scale (IOFS) total score. Higher WeeFIM scores indicate greater functional independence; higher NHP scores indicate poorer perceived health; higher IOFS scores indicate more favorable family impact.

	Median (Min–Max)
Child age (years)	7.0 (4.0–13.0)
Mother age (years)	35.0 (26.0–45.0)
GMFCS	2.0 (1.0–5.0)
WeeFIM	101.0 (23.0–126.0)
MACS	1.0 (1.0–5.0)
IOFS	72.0 (40.0–78.0)
NHP	6.0 (1.0–25.0)

Min = minimum; Max = maximum; GMFCS = Gross Motor Function Classification System; MACS = Manual Ability Classification System; WeeFIM = Pediatric Functional Independence Measure; IOFS = Impact on Family Scale; NHP = Nottingham Health Profile

gross motor function was associated with a less positive family impact. The correlations of IOFS with child age (ρ = 0.367, p = 0.085), maternal age (ρ = 0.392, p = 0.064), MACS level (ρ = −0.400, p = 0.059), and NHP score (ρ = −0.401, p = 0.058) did not reach statistical significance.

NHP scores demonstrated moderate negative correlations with child age (ρ = −0.458, p = 0.028) and WeeFIM scores (ρ = −0.535, p = 0.009). Since higher NHP scores indicate poorer perceived health status, these findings suggest that older child age and greater functional independence in children were associated with better maternal health-related quality of life. No statistically significant correlations were found between NHP scores and maternal age, GMFCS level, or MACS level (Table 3).

Factors associated with IOFS were examined using multiple linear regression analysis (Table 4, Figure 2, Figure 3). A backward elimination method was applied to obtain the final model. Child age, maternal age, WeeFIM, GMFCS, and MACS were initially entered into the model. In the final model, WeeFIM was identified as the only significant independent factor associated with IOFS. For each one-point increase in WeeFIM score, the IOFS total score increased by 0.304 points (B = 0.304, SE = 0.045, standardized β = 0.829, 95% CI: 0.211–0.397, p < 0.001). The overall regression model was statistically significant (F(1,21) = 45.979, p < 0.001), explaining 68.6% of the variance in IOFS scores (R^2 = 0.686, adjusted R^2 = 0.672).

DISCUSSION

The main finding of this study was that performance-based functional independence, as measured by WeeFIM, showed the strongest association with family

Table 3. Spearman correlation coefficients among child functional measures, family impact, and maternal health-related quality of life in children with cerebral palsy aged 4–13 years and their mothers (n = 23). Variables include child age, maternal age, Gross Motor Function Classification System (GMFCS) level, Manual Ability Classification System (MACS) level, Pediatric Functional Independence Measure (WeeFIM) total score, Impact on Family Scale (IOFS) total score, and Nottingham Health Profile (NHP) total score. Positive coefficients indicate direct relationships, and negative coefficients indicate inverse relationships. Higher WeeFIM scores indicate greater functional independence; higher NHP scores indicate poorer perceived health; higher IOFS scores reflect more favorable family impact. Statistically significant correlations (p < 0.05) are indicated with an asterisk.

	IOFS		NHP	
	rho	*p*	rho	*p*
Child age (years)	0.367	0.085	−0.458*	0.028
Mother age (years)	0.392	0.064	−0.224	0.305
GMFCS	−0.621**	0.002	0.368	0.084
WeeFIM	0.768**	<0.001	−0.535**	0.009
MACS	−0.400	0.059	0.280	0.195
NHP	−0.401	0.058	—	—

GMFCS = Gross Motor Function Classification System; MACS = Manual Ability Classification System; WeeFIM = Pediatric Functional Independence Measure; IOFS = Impact on Family Scale; NHP = Nottingham Health Profile
rho = Spearman correlation coefficient
*p < 0.05, **p < 0.01

Tab. 4. Multiple linear regression analysis of factors associated with Impact on Family Scale (IOFS) total score in children with cerebral palsy aged 4–13 years and their mothers (n = 23). The initial model included child age, maternal age, Pediatric Functional Independence Measure (WeeFIM) total score, Gross Motor Function Classification System (GMFCS) level, and Manual Ability Classification System (MACS) level. The final model was obtained using backward elimination and retained WeeFIM as the only significant independent predictor of IOFS. Regression coefficients (B), standard errors (SE), standardized beta values, 95% confidence intervals (CI) for B, and p values are presented. Higher IOFS scores indicate more favourable family impact; higher WeeFIM scores indicate greater functional independence.

	Regression coefficients						
	B	SE	β	t	*p*	95.0% Confidence Interval for B	
						Lower Limit	Upper Limit
Constant	38.659	4.272	—	9.050	<0.001	29.775	47.543
WeeFIM	0.304	0.045	0.829	6.781	<0.001	0.211	0.397

B: unstandardized regression coefficient, SE: Standard error, β: Standardized regression coefficient
Variables initially entered into the model: child age, maternal age, WeeFIM, GMFCS, and MACS.
Model Statistics: F(1,21) = 45.979; p < 0.001; R^2 = 0.686; adjusted R^2 = 0.672.

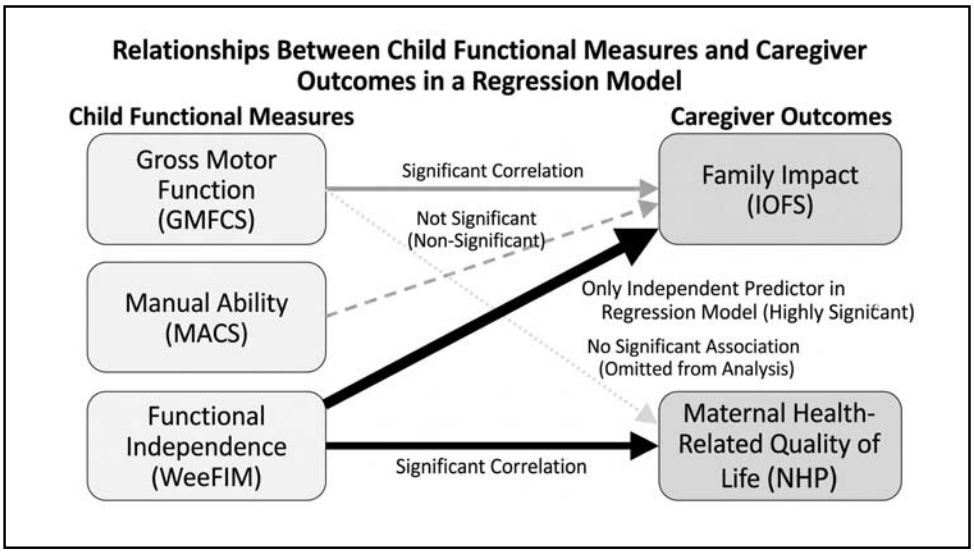

Fig. 2. Conceptual framework of hypothesized relationships between child functional measures and caregiver outcomes in cerebral palsy. Gross motor function (GMFCS) and manual ability (MACS) represent classification-based measures of impairment, whereas the Pediatric Functional Independence Measure (WeeFIM) reflects performance-based independence in daily activities. The Impact on Family Scale (IOFS) assesses the perceived impact of the child's condition on the family, and the Nottingham Health Profile (NHP) measures maternal health-related quality of life. Arrows illustrate the associations examined in this study, with a highlighted arrow from WeeFIM to IOFS indicating that functional independence showed the strongest association with family impact and remained the only independent predictor of IOFS in multivariable analysis. Moderate associations were observed between WeeFIM and NHP, whereas GMFCS and MACS showed weaker or non-significant relationships with maternal health-related quality of life.

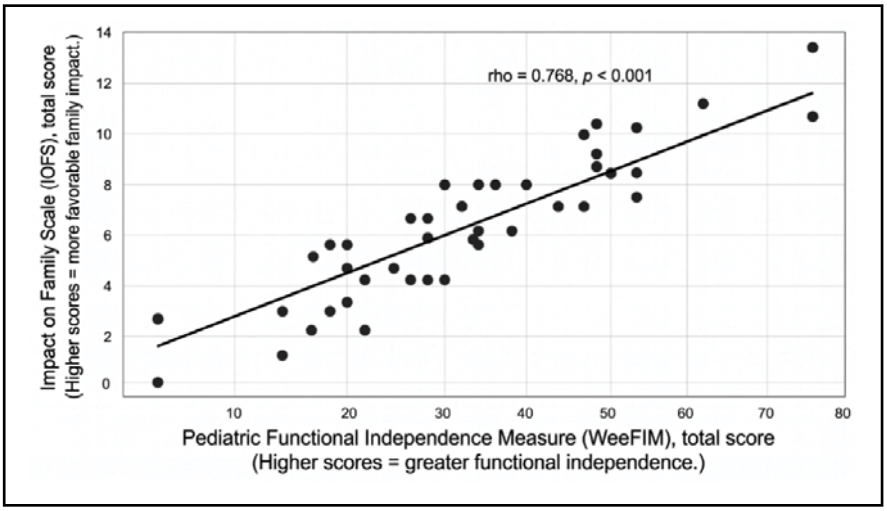

Fig. 3. Relationship between functional independence and family impact in children with cerebral palsy aged 4–13 years. Each point represents an individual child–mother dyad (n = 23). The Pediatric Functional Independence Measure (WeeFIM) total score is plotted on the x axis, and the Impact on Family Scale (IOFS) total score is plotted on the y axis. Higher WeeFIM scores indicate greater functional independence in daily activities, and higher IOFS scores reflect more favorable family impact. The positive trend illustrates the strong association between children's functional independence and family impact observed in this sample (Spearman rho = 0.768, $p < 0.001$).

impact and remained the only independent factor associated with IOFS in multivariable analysis, explaining most of the variance in family impact scores. Gross motor function was also associated with family impact, whereas manual ability was not independently associated in this sample. Maternal health-related quality of life was associated with child age and functional independence rather than with motor classification levels (Altındağ *et al.* 2007; Duygun & Sezgin 2003; Erdoğanoğlu 2006). However, to our knowledge, no previous study has simultaneously investigated the relationship between children's functional levels and both family impact (IOFS) and maternal general health (NHP).

GMFCS showed a significant negative correlation with IOFS, indicating that poorer gross motor function was associated with less positive family impact. Although MACS was also negatively correlated with IOFS, this association did not reach statistical significance. These findings suggest that gross motor limitations may have a more evident relationship with family impact than manual ability in the present sample, consistent with previous reports showing that greater physical support requirements are associated with less positive family quality of life (Schertz

et al. 2016). WeeFIM showed a strong positive correlation with IOFS, suggesting that greater functional independence contributes to more favourable family outcomes, supporting previous findings reported by Bek *et al.* (Bek *et al.* 2009). These findings are consistent with previous studies demonstrating that greater physical dependency and reduced functional capacity in children with cerebral palsy are associated with less positive family quality of life and increased caregiver burden (Erdoganoglu 2006; Ones *et al.* 2005; Schertz 2016).

In multiple linear regression, WeeFIM was the only significant independent factor associated with IOFS, explaining 68.6% of the variance in family impact in this sample (R^2 = 0.686, adjusted R^2 = 0.672). This finding highlights the central role of functional independence in determining family impact. While GMFCS and MACS classify gross motor and manual abilities, WeeFIM reflects performance in daily living activities, which is closely related to caregiving demands. This finding suggests that real-life functional independence may be more critical for family well-being than motor classification levels alone in this sample.

A notable contribution of the present study is the distinction between classification-based measures of impairment (GMFCS and MACS) and a performance-based measure of independence (WeeFIM). The findings suggest that everyday functional performance may be more closely related to family impact than motor classification levels alone. Our findings suggest that real-life functional performance, rather than classification level alone, was associated with more positive family outcomes. This distinction highlights the potential importance of targeting daily living skills in rehabilitation, as practical independence may be more closely associated with family well-being than motor classification status alone.

Maternal health-related quality of life, as measured by the NHP, was significantly associated with child age and functional independence. NHP scores showed moderate negative correlations with child age and WeeFIM scores. Given that higher NHP scores indicate poorer perceived health, these findings suggest that older child age and greater functional independence were associated with better maternal health-related quality of life. In contrast, NHP scores were not significantly associated with maternal age, GMFCS, or MACS. These findings suggest that maternal perceived health may be more closely related to children's practical independence in daily activities than to gross motor or manual classification levels in this sample. Nevertheless, maternal health is likely influenced by multiple factors, including psychological stress, social support, socioeconomic conditions, coping strategies, and caregiving demands, which were not assessed in the present study. Differences across studies may also be attributable to variations in study populations, assessment tools, cultural contexts, and the multifactorial nature of maternal well-being.

The direction of the relationship suggests that more positive family impact may be associated with better maternal perceived health, as higher IOFS scores indicate more favourable family impact and higher NHP scores indicate poorer health status. Beydemir (Beydemir 2008) reported associations between IOFS subdomains and NHP scores, although the coping domain showed a different pattern from the other IOFS domains. Although IOFS and NHP showed a moderate negative correlation, this association did not reach statistical significance and should therefore be interpreted cautiously, particularly given the small sample size.

To our knowledge, only limited studies have examined the relationships between IOFS and NHP or IOFS and WeeFIM separately (Bek 2009, Beydemir 2008). In the present study, widely used functional classification systems were combined with both IOFS and NHP to provide a comprehensive evaluation of child functionality, family impact, and maternal health. This integrated approach contributes to the literature by offering a multidimensional perspective on how children's functional limitations relate to both family impact and maternal health in cerebral palsy.

Clinically, these findings highlight the importance of adopting a family-centered rehabilitation approach for children with cerebral palsy. Interventions aimed at improving functional independence, particularly in daily living activities, may enhance children's abilities and potentially contribute to family well-being and maternal quality of life. Therefore, rehabilitation programs should address both child-centered functional goals and caregiver support needs to reduce family burden.

Implications for practice

In light of these clinical considerations, the present findings support the use of WeeFIM as a central tool for planning family-centered rehabilitation in children with cerebral palsy in similar special education and rehabilitation settings. Because WeeFIM was strongly associated with IOFS and remained the only independent factor associated with family impact, interventions that explicitly target gains in functional independence in daily living activities should be prioritized. Integrating WeeFIM profiles into multidisciplinary case discussions may help clinicians identify realistic functional goals, align treatment priorities with caregiver needs, and monitor progress over time. Providing mothers with regular feedback on WeeFIM-based changes and incorporating their perspectives into goal-setting may strengthen engagement and create structured opportunities to offer appropriate psychosocial support. In this context, a WeeFIM-driven approach may facilitate more systematic tailoring of rehabilitation programs to children's functional independence while recognizing

its central role in shaping family impact and maternal health-related quality of life, thereby complementing the multidimensional perspective provided by the present study.

A strength of this study is the combined use of functional classification systems and performance-based independence measures together with both family impact and maternal health outcomes, providing a multidimensional perspective rarely addressed simultaneously in previous research. Another strength is the inclusion of WeeFIM as a performance-based measure of daily living independence, which may better reflect real-life caregiving demands compared with classification systems alone. Furthermore, the use of multivariable regression analysis allowed functional independence to be identified as an independent factor associated with family impact.

Nevertheless, this study has several limitations. Its retrospective and cross-sectional design precludes causal inferences, and although no a priori sample size calculation was performed due to the retrospective design, the sample size was comparable to previous studies examining caregiver burden in cerebral palsy populations; however, the relatively small sample and single-center setting may restrict generalizability and increase the risk of overfitting in multivariable analyses. Psychosocial variables such as caregiver mental health, social support, socioeconomic status, and coping strategies were not assessed, and we cannot exclude the possibility that these factors influenced maternal quality of life and family impact. The final sample size of 23 participants may have limited statistical power and the precision of the regression estimates, and although the eligibility criterion extended to 18 years, the included sample ranged from 4 to 13 years; therefore, the findings may not be generalizable to older adolescents with cerebral palsy. Nevertheless, the consistent pattern of associations between WeeFIM and IOFS across correlation and regression analyses supports the robustness of the main finding and underscores the potential value of prioritizing functional independence in family-centred rehabilitation planning. Future prospective studies with larger samples, multi-center recruitment, and more comprehensive psychosocial assessments are warranted to further clarify the relationships between children's functional levels, maternal health, and family impact.

CONCLUSION

This study suggests that children's functional independence is strongly associated with family impact and is also related to maternal health-related quality of life in this sample. WeeFIM emerged as the only independent factor associated with IOFS, underscoring the clinical relevance of daily living performance for family well-being. These findings support family-centred rehabilitation approaches that prioritize functional independence while addressing caregiver needs. WeeFIM emerged as the only significant independent factor associated with IOFS, highlighting the importance of daily living abilities in determining family well-being. Poorer gross motor function was associated with less positive family impact, whereas the association between manual ability and family impact did not reach statistical significance. Maternal health-related quality of life was significantly associated with child age and functional independence, while its association with family impact did not reach statistical significance. Taken together, these findings emphasize the need for family-centered rehabilitation approaches that focus on improving children's functional independence and supporting caregiver well-being.

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AUTHOR CONTRIBUTIONS

ADY and SA made substantial contributions to the conception and design of the study. ADY, SA, BÇ and HGP contributed to data collection and clinical assessments. ADY and SA performed the data analysis. ADY, SA, BÇ and HGP contributed to the interpretation of the data, critically revised the manuscript for important intellectual content, and approved the final version for publication.

DECLARATION OF COMPETING INTERESTS

The authors report no conflict of interest to disclose.

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