

## Research Paper

## The Correlation Between Leisure Participation and Parental Life Balance in Children and Adolescents With Cerebral Palsy and Their Typically Developing Peers



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## ABSTRACT

**Objectives:** Leisure participation is restricted among children with cerebral palsy (CP). This leads to adverse consequences on their health and well-being. Identifying the associated factors of leisure participation can help in planning interventions for its promotion. This study aims to investigate the correlation between leisure participation and parental life balance in children/adolescents with CP and their typically developing peers.

**Methods:** This cross-sectional study was conducted from January to April 2021, in Bojnourd City, Iran. The target population of this study was children/adolescents with CP between the ages of 7 to 17 years. We recruited 68 children/adolescents with CP and 66 of their typical peers using the convenience sampling method. All children and adolescents completed the children's participation and enjoyment questionnaire while their parents answered the life balance inventory questions.

**Results:** The Mean±SD age of children/adolescents with CP was 10.13±2.53, and 54.4% were boys. The mean age of typically developing children/adolescents was 10.50±2.98, and 54.5% were boys. In the CP group, the mothers' life balance was correlated with the leisure participation of their children (P=0.01). Also, the fathers' life balance was correlated with the leisure participation of their adolescents (P=0.01). The correlation between the mothers' life balance and the leisure participation of their adolescents, and also between the father's life balance and the leisure participation of their children was not significant (P>0.05) in the CP group. The leisure participation of typically developing children and adolescents was not correlated with their parental life balance (P>0.05).

**Discussion:** The leisure participation of children and adolescents with CP was correlated with the life balance of their parents. Occupational therapists and other health professionals are advised to consider the parental life balance in their plans to promote the leisure participation of children and adolescents with CP.

## Keywords:

Adolescents, Cerebral palsy, Children, Leisure, Life balance

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## Highlights

- The leisure participation of cerebral palsy children/adolescents was correlated with the life balance of their parents.
- The parents of children/adolescents with cerebral palsy were perceiving a higher amount of unbalance in their life compared to the parents of typically developing children/adolescents.

## Plain Language Summary

The intensity of participation in leisure activities was correlated with the life balance of the parents of children/adolescents with cerebral palsy. This is noticeable because the parents of such children/adolescents experienced less amount of balance in their life than the parents of typically developing children/adolescents. Occupational therapists should consider the life balance of the parents in planning their interventions to promote the leisure participation of children/adolescents with cerebral palsy.

### 1. Introduction

Cerebral Palsy (CP) is known as a common movement disorder in children/adolescents, with a prevalence rate of 2 to 2.6 per 1000 live birth in Iran [1, 2]. Children/adolescents with CP can experience several functional limitations [3], a lower quality of life (QOL) [4], and a lower rate of participation in leisure activities in their lifetime [5]. Leisure participation can lead to the individual's health promotion, well-being, QOL, knowledge of self, and a sense of community-belonging in children/adolescents [6, 7]. Besides, the participation of such individuals in leisure activities can result in developing their skills, competencies, and friendships in an enjoyable manner [8]. According to the World Health Organization's *International Classification of Functioning Disability and Health (ICF)*, participation is defined as involvement in a real-life situation. Accordingly, the participation of an individual can be affected based on their context [9]. As defined by ICF, leisure participation is the involvement of children/adolescents in any form of play and recreational or leisure activity, such as formal and informal play and sports, physical fitness, relaxation, art galleries visits, cinemas or theatres, engaging in crafts or hobbies, reading for enjoyment, playing musical instruments, and traveling for pleasure [9]. Different factors can contribute to the leisure participation of children/adolescents with CP [10]. Some studies have concluded that individual factors of children/adolescents with CP can influence their participation in social and leisure activities [11, 12]. Besides, a significant body of the literature demonstrated that family factors could contribute to the participation of such individuals in leisure activities [13]. Although the life balance of the parents can be considered as a subset of family factors, to the best of our

knowledge, there is a gap in the body of literature regarding the correlation between the leisure participation of children/adolescents with CP and their parental life balance. According to the life balance model, life balance is a satisfying pattern of daily activity that is healthful, meaningful, and sustainable to an individual within the context of their current life circumstances [14].

Some studies have reported that parents, especially mothers of children with CP, experience an imbalance in their daily time-use and very low health-related QOL in the trajectory of giving care to their children frequently [15, 16]. However, the parental life balance in the parents of such children/adolescents has not been investigated yet; also, this has not been compared with the parents of their typically developing peers. This becomes more noticeable when these circumstances can adversely contribute to their child's health and participation [13].

Thus, the present study has three objectives: 1) investigate the correlation between the parental life balance and the leisure participation in CP children/adolescents and also in typically developing peers; 2) compare the parental life balance between the parents of children/adolescents with CP and the parents of typically developing peers; and 3) predict the prevalence odds ratio (POR) of an unbalanced life among the parents of children and adolescents with CP.

### 2. Materials and Methods

This was a cross-sectional study. Children/adolescents from the age of 7 to 17 years who were diagnosed with CP comprised the target population. Throughout the current literature, the age of 7 to 12 years is categorized as children and the age of 12 to approximately 18 years as

adolescents, which in the Iranian educational system can be considered as school-age and high-school-age, respectively [17-21]. The sample size was calculated with the  $\alpha$  of 0.05, the power of 0.95, and the estimated correlation coefficient of 0.4 via the G\*Power software [22]. Based on the results, 70 individuals were estimated as the sample size for each group. Among children and adolescents with CP, registered in the electronic databases of the Social Welfare Organization, Education Organization, and Roshd Occupational Therapy Clinic in the city of Bojnourd, we recruited a group of 70 individuals who met the inclusion criteria, using the convenience sampling method. All individuals were willing to participate in the current study. The inclusion criteria for the CP group were as follows: 1) children/adolescents with CP, according to the diagnosis of a neurologist; 2) children/adolescents from the age of 7 to 17 years; 3) children/adolescents with an IQ score of at least 70, according to the SPARCLE's estimated cognitive level (ECL) form [23, 24]; and 4) parents without a history of a chronic movement and or psychotic disorder. For the recruitment of the typical children/adolescents (the typical group), 70 individuals who met the inclusion criteria were recruited among the students of schools and high schools in the city of Bojnourd, using the convenience sampling method. All individuals were willing to participate in the current study. The inclusion criteria for the typical group were similar to the CP group, except for items 1 and 3.

Of 70 children/adolescents with CP (CP group), 2 individuals were eliminated from the study because of incorrectly completing the questionnaire. In addition, among the 70 typically developing children/adolescents, 4 individuals were eliminated (three of them did not complete the questionnaires correctly, and one of them withdrew from the study).

During the first session, initially, we provided all the necessary information and instructions about the study procedure and the completion of the questionnaires to the participants, then the demographic data of the children/adolescents and their parents were collected. An occupational therapist determined the level of gross motor and the level of manual ability of children/adolescents according to the gross motor function classification system – expanded and revised (GMFCS E&R) and the manual ability classification system (MACS), respectively. Finally, we gave the questionnaires, including life balance inventory (LBI) (to gather the life balance data of fathers and mothers) and children's assessment of participation and enjoyments (CAPE) (to gather the leisure participation data of children/adolescents), to the participants. In the case of a disabled

child/adolescent, their parent could help them complete the questionnaire. During the completion of the questionnaires, the researcher was available via phone call and or face-to-face meetings in case of unexpected problems. We collected the completed questionnaires after two weeks. In the typically developing children/adolescents, the initial meeting was held at their school or high school, and except for step 3, all other steps were followed similar to the CP group.

LBI is a self-administration tool, developed by Kathleen, and is used to obtain the parents' life balance data [25]. It was built on the proposed conceptual model of life balance [14]. The LBI consists of 53 activities, categorized into four need-based dimensions of life balance, including health, relationship, identity, and challenge. For each activity that an individual does or wants to do, the congruence construct was obtained by rating the perceived satisfaction (1=the lowest, 2=either too little or too much, 3=the highest) with the congruence between the amount of time that they spent to do the activity compared to the amount of time they wanted to do such activity. The total average score across all items is generated through the scoring of the LBI and indicates the congruence construct of the model of life balance components. The primary version of LBI has a good internal consistency (the Cronbach  $\alpha$  of 0.89 to 0.97) [25]. It was translated into the Persian language [26].

CAPE was used to assess the participation intensity of children and adolescents in leisure activities. CAPE is a self-reported tool and consists of 55 activities. Each activity is rated "Yes" or "No," if it has been performed in the past four months. If the activity has been performed, the intensity of the activity is score from 1 (one time in the past 4 months) to 7 (once a day or more). The CAPE is applicable for children/adolescents at the age of 6 to 19, with and without CP, and can be administered in both methods of self-administration or via interviewing the caregiver as a proxy [27]. It has been concluded that the Persian version of the CAPE has good reliability (the Cronbach  $\alpha$  coefficient of 0.86 and ICC of >0.75) in the Iranian population [28].

Classification of children/adolescents with CP in terms of their ambulatory function and manual ability function was performed using the GMFCS E&R and MACS, respectively. Each of these classifications has five levels ranging from 1 to 5, and the higher levels indicate greater limitations in the intended function. It has been reported that the Persian versions of the GMFCS E&R and the MACS (test-retest  $K=0.874$ ,  $ICC=0.974$ ; and inter-rater reliability  $K=0.849$ ,  $ICC=0.947$ ) have a good validity and reliability in the Iranian population [29, 30].

Table 1. Participants' characteristics

Characteristic	Mean±SD/No. (%)		
	CP Group (n=68)	Typical Group (n=66)	
Fathers	Age (y)	40.74±6.29	40.45±6.54
	Life balance	8(11.8)	62(93.9)
	Employment	63(92.6)	60(90.9)
Mothers	Age (y)	36.51±6.10	36.44±6.11
	Life balance	7(10.3)	41(62.1)
	Employment	8(11.8)	15(22.7)
Children/Adolescents	Age (y)	10.13±2.53	10.50±2.98
	Children*	48(70.6)	40(60.6)
	Adolescents**	20(29.4)	26(39.4)
	Children's age (y)	8.90±1.83	8.50±1.78
	Adolescents' age (y)	13.10±1.11	13.58±1.41
Ambulatory function (Children/Adolescents)	Gender (Boy)	37(54.4)	36(54.5)
	Independent	41(60.3)	100
	Dependent	27(39.7)	0
Manual ability function (Children/Adolescents)	Independent	44(64.7)	100
	Dependent	24(35.3)	0

\* School-age (7-<12 years); \*\* High school-age (12-<18 years). CP: cerebral palsy.

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We used the Chi-square test to investigate the following items: 1) the distribution of children/adolescents based on gender and age group, and 2) the distribution of parents based on employment status, between the two groups. The correlation between the parental life balance and the intensity of leisure participation of children/adolescents was analyzed using the Spearman correlation test. To analyze the differences in the life balance of the parents between the CP group and the typical group, the Mann-Whitney test was used. The POR of an unbalanced life in the parents between the two groups and also among the CP children/adolescents in terms of their ambulatory function, manual ability function, CP types, and age group, was predicted using the logistic regression analysis. Throughout the statistical analysis, some dichotomizations of the parents and children/adolescents were done as well. We statistically dichotomized the parents based on their LBI scores, according to the manual scoring of LBI, as parents with an unbalanced life (scores from 1 to 1.99) and parents with a balanced life (scores from 2 to 3), as defined by LBI. In addition,

the statistical dichotomization of all children/adolescents with CP was done according to their need for the support of an assistant or a supervisor in their ambulatory functions as independent (the first two levels of GMFCS E&R), and dependent (GMFCS E&R levels III, IV, and V). Likewise, statistical dichotomizing of such individuals was done according to their manual ability functions (the first two levels of MACS as independent, and the MACS levels of III, IV, and V as dependent). All statistical analyses were performed via the SPSS software, version 16 (IBM Corporation, USA).

### 3. Results

In this study, the participation rate equaled 97.14% and 94.28% for the CP and typical groups, respectively. The overall Mean±SD age was 10.31±2.76 years in children/adolescents, and 54.5% were boys. The Mean±SD age of fathers and mothers was 40.60±6.39 and 36.48±6.08 years, respectively. No significant statistical difference was found in the distribution of children/adolescents be-

**Table 2.** Correlation significance of parental life balance inventory domains with the intensity of leisure participation of children and adolescents

LBI Domains		Intensity of Leisure Participation					
		P (Correlation Coefficient)					
		CP (n=68)			Typical (n=66)		
		C&A (n=68)	C (n=48)	A (n=20)	C&A (n=66)	C (n=40)	A (n=26)
Overall	F	0.074 (0.218)	0.661 (0.065)	0.010 (0.561*)	0.607 (-0.056)	0.630 (-0.079)	0.910 (-0.023)
	M	0.001 (0.379**)	0.010 (0.366*)	0.140 (0.342)	0.150 (0.179)	0.524 (0.104)	0.131 (0.304)
Health	F	0.000 (0.414**)	0.008 (0.380**)	0.032 (0.481*)	0.973 (-0.004)	0.759 (0.050)	0.580 (-0.114)
	M	0.014 (0.296*)	0.096 (0.243)	0.201 (0.298)	0.007 (0.327**)	0.160 (0.226)	0.017 (0.465*)
Relationship	F	0.179 (0.165)	0.771 (0.043)	0.046 (0.452*)	0.908 (-0.015)	0.468 (0.118)	0.342 (-0.194)
	M	0.004 (0.341**)	0.015 (0.350*)	0.154 (0.331)	0.109 (0.199)	0.403 (0.136)	0.121 (0.312)
Identity	F	0.040 (0.250*)	0.198 (0.189)	0.117 (0.362)	0.721 (-0.045)	0.187 (-0.213)	0.052 (0.385)
	M	0.006 (0.329**)	0.004 (0.410**)	0.696 (0.093)	0.784 (-0.034)	0.906 (-0.019)	0.725 (-0.073)
Challenge	F	0.147 (0.178)	0.581 (0.082)	0.036 (0.470*)	0.657 (-0.056)	0.394 (-0.138)	0.567 (0.118)
	M	0.003 (0.350**)	0.011 (0.364*)	0.154 (0.331)	0.902 (-0.015)	0.338 (-0.156)	0.360 (0.187)

C&A: children and adolescents together; C: children; A: Adolescents; F: Father; M: Mother; CP: cerebral palsy. \*\*Correlation is significant at the level 0.01. \*Correlation is significant at the level 0.05.

tween the two groups (CP and typical groups) in terms of their gender ( $P>0.05$ ), and age categories ( $P>0.05$ ). Also, the distribution of parents, who were employed, among the CP group was similar to the typical group ( $P>0.05$ ). Table 1 demonstrates the participants' characteristics.

### Parental life balance associations with the leisure participation of children

According to Table 2, we found a significant correlation between the life balance of mothers with the intensity of leisure participation of their children ( $P<0.05$ ) in the analysis based on the age group of children/adolescents with CP, whereas such association was not meaningful for their adolescents ( $P>0.05$ ). In the fathers of the CP group, we found that the life balance of fathers was significantly correlated with the leisure participation of their adolescents ( $P<0.05$ ). There was no significant correlation between the life balance of fathers and the leisure participation of their children ( $P>0.05$ ). In the correlation analysis of all children and adolescents as a whole, we found a significant association between the life balance of mothers and the leisure participation of

their children and adolescents in the CP group ( $P<0.05$ ); however, this association was not significant for the life balance of fathers ( $P>0.05$ ).

We find no significant correlation between the overall life balance of parents and the leisure participation of children/adolescents (not as a whole nor based on their age group) in the typical group.

### Comparison of parental life balance among the CP and typical children and adolescents

We compared the parental life balance between two groups. As reported in Table 3, we found that the LBI's scores (overall and in each of its domains) were significantly lower in the parents (both fathers and mothers) of the CP group compared to the typical group ( $P<0.01$ ).

### Prevalence Odds Ratios of an unbalanced life in the parents

We predicted the POR of an unbalanced life in the parents of children/adolescents with CP and compared

**Table 3.** Significance of parental life balance differences among CP and typical children/adolescents

LBI Domains	Groups	LBI's Scores		P
		Mean±SD (95% CI)		
		CP Group (n=68)	Typical Group (n=66)	
Overall	Fathers	1.74±0.29 (1.67-1.81)	2.17±0.13 (2.14-2.20)	0.001
	Mothers	1.68±0.33 (1.60-1.76)	2.04±0.21 (1.98-2.09)	0.001
Health	Fathers	1.74±0.34 (1.65-1.82)	2.36±0.22 (2.30-2.42)	0.001
	Mothers	1.70±0.41 (1.60-1.80)	2.09±0.34 (2.01-2.18)	0.001
Relationship	Fathers	1.80±0.32 (1.72-1.87)	2.21±0.19 (2.16-2.26)	0.001
	Mothers	1.60±0.35 (1.52-1.69)	1.96±0.26 (1.89-2.02)	0.001
Identity	Fathers	1.70±0.35 (1.61-1.78)	2.03±0.21 (1.97-2.08)	0.001
	Mothers	1.74±0.34 (1.66-1.82)	2.07±0.23 (2.01-2.13)	0.001
Challenge	Fathers	1.59±0.49 (1.48-1.71)	1.88±0.41 (1.78-1.98)	0.001
	Mothers	1.76±0.43 (1.65-1.86)	2.11±0.39 (2.01-2.21)	0.001

CP: cerebral palsy; CI: confidence interval.

it with the parents of the typical group. Accordingly, as the results demonstrated in Table 4, a total of 93.8% of fathers with a CP child/adolescent experienced an unbalance in their lives, while 70.9% of mothers of such individuals experienced an unbalance in their life. Interestingly, the POR of an unbalanced life in the fathers who had a child/adolescent with CP was 11.62 times more than fathers with a typically developing child/adolescent. Likewise, this rate was 14.29 times higher in the mothers of such individuals compared to the mothers of typically developing children/adolescents. Contrary to our expectations, children/adolescents with CP with the levels of 3 to 5 in GMFCS E&R and MACS could

not predict a higher POR of an unbalanced life in their parents (neither fathers nor mothers) compared to the independent, among the CP group (P>0.05). Likewise, the POR of an unbalanced parental life was not significantly different among children/adolescents with CP in terms of their age group (P>0.05).

#### 4. Discussion

Based on the results, the life balance of mothers was positively correlated with the intensity of leisure participation of children with CP which indicates the more amount of balance in the mother's life, the more inten-

**Table 4.** Significance of the prevalence odds ratio of the parental unbalanced life

Categories			No (%)	POR	95% CI		P
			Unbalanced Life		Lower	Upper	
Child/adolescent status	With CP	Female	60(93.8)	11.62	3.32	40.64	0.001
		Male	61(70.9)	14.29	5.65	36.10	0.001
Ambulatory function	Dependent	Female	24(40.0)	1.11	0.243	5.08	0.892
		Male	26(42.6)	4.45	0.505	39.31	0.178
Manual ability function	Dependent	Female	21(35.0)	0.897	0.195	4.13	0.889
		Male	23(37.7)	3.63	0.411	32.10	0.246
Age group	Child	Female	41(68.3)	0.308	0.035	2.68	0.287
		Male	42(68.9)	0.368	0.041	3.27	0.370

POR: prevalence odds ratio; CI: confidence interval; F: fathers; M: mothers; CP: cerebral palsy.



sity of leisure participation in their children. This is the same as what we found for the life balance of fathers and leisure participation of their adolescents. This is in line with our finding that family factors can influence the leisure participation of children/adolescents with CP [13]. Contrary to what we found in the mothers, the overall amount of balance in the fathers' life was not significantly associated with the leisure participation of their child in this particular population. A possible explanation in this regard is that mothers are mutually involved in the co-occupations with their CP child to a greater extent compared to fathers. In addition, this can be because of the parenting style that is prevailed in the Iranian context; the mothers are the main caregivers of their school-aged children with CP [31]. Therefore, more cultural-oriented studies are needed in this regard for generalizing the results to other cultures. We found no association between the life balance of fathers with the leisure participation of typically developing children/adolescents. Similar results were obtained regarding the overall life balance of mothers in such individuals. It can be a result of the dependency that children/adolescents with CP have on their parents to participate in daily and leisure activities [32]. It has been stated that the mothers of children with CP commonly experienced an unbalanced life [26]. We found similar results in the comparison of parental life balance between the CP and the typical groups in our study. Based on our findings, the parents (both fathers and mothers) of children/adolescents with CP significantly perceived a greater amount of unbalance in their life compared to the parents of the typically developing children and adolescents. This was true for the overall score of LBI and its domains. This can be explained by problems that parents of children/adolescents with CP are faced including stress, loss of joy, loss of social support, and financial hardships [33]. It has been stated that the psychological and physical health of parents of such individuals was strongly influenced by the child's demands and behaviors in the family [34].

The results of the current study indicated that the POR of an unbalanced life was significantly higher (14.29 times more) among the mothers of the CP group than the mothers of the typical group. Likewise, similar results were found among the fathers of the CP group (with a POR of 11.62 times more). Consistent with this finding, the literature has noted that giving care to children with CP can result in a social and psychological burden, little recreation and joy, imbalance in the time-use, and ultimately less satisfaction in the parents of such individuals [13, 15, 33, 35]. Interestingly, contrary to our expectations, motor dependency (neither ambulatory nor manual ability function) of children/adolescents with CP

could not predict a higher POR of an unbalanced life in their parents compared to such individuals who were independent in their motor functions.

Congruent with this result, although the caregivers of children with CP experience a lower health status compared to those of typically developing children, the severity of the motor disorder in such children was not correlated with the health status of their caregivers [35]. This could explain what we observed in our group of CP children/adolescents. One study in this regard has concluded that the unbalanced life in mothers of children with CP was correlated with the child's disability [26]. This seems contrary to our results, however, it can be because of the wider range of age in the present study compared to the samples of that study. According to our findings, the POR of unbalanced life among the parents of children/adolescents with CP was not meaningfully different in terms of their child's age group (children and adolescents). It has been indicated that the parents of such children are faced with various challenges revealed by constraints especially in the social and physical environment in the trajectory of their giving care [36]. Overall, it appears that the greater amount of POR of an unbalanced life in the parents who have a child/adolescent with CP revealed more from their social and physical environmental factors than the internal factors of their children; however, further research is needed in this regard.

### Limitations

This study faced the following limitations: 1) the CAPE questionnaire gathers the leisure participation data of the past four months which can result in a seasonal effect in such data; 2) although our two groups of parents were homogeneous in terms of their employment status, other factors that potentially can influence the parental life balance such as family's socio-economic status were not investigated in the current study; 3) in this study, some other personal factors of children and adolescents with CP, such as their cognitive function which potentially could predict the POR of an unbalanced life in their parents were not investigated; and 4) because of the small sample size of the CP group, the results of the current study may provide a limited significant practical information. Although the generalizability of our results can be limited because of the contextual interferences in the parental life balance and leisure participation of children. This was a cultural-based study in this regard, which is valuable in such a field. Further cultural-oriented research in this field is suggested for such individuals.

## 5. Conclusion

This study revealed that the life balance of mothers is associated with the intensity of leisure participation of school-aged children with CP. Also, the life balance of fathers was associated with the leisure participation of adolescents with CP. This is especially noticeable because the parents of such children and adolescents perceived an unbalanced life to a greater extent than the parents of typically developing children/adolescents. The intensity of leisure participation of typically developing children/adolescents was not correlated with their parental life balance (neither fathers nor mothers). Although the POR of an unbalanced life among the parents of CP children/adolescents was not dependent on gross motor function, manual ability levels, and the age group of their child/adolescent, it was at least 10 times more than those with typically developing child/adolescent. Occupational therapists and other health professionals should consider the life balance of mothers and fathers for school-aged children/adolescents with CP in their planning interventions aimed at promoting the leisure participation of such children/adolescents.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of the [University of Social Welfare and Rehabilitation Sciences](#) with the approval code of IR.USWR.REC.1399.224. All participants (children/adolescents with CP, typically developed children/adolescents, and their parents) were willing to participate in this study and signed their informed consent form.

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### Authors' contributions

All authors equally contributed to preparing this article.

### Conflict of interest

The authors declared no conflict of interest.

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