

# Research Paper: Correlation Between Mother-Child Relationship and Participation of Children and Adolescents With Cerebral Palsy in Leisure Time Activities



Alireza Amiri<sup>1</sup>, Minoo Kalantari<sup>1\*</sup>, Mehdi Rezaee<sup>1</sup>, Alireza Akbarzadeh Baghban<sup>2</sup>

1. Department of Occupational Therapy, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

2. Physiotherapy Research Centre, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran.



**Citation:** Amiri A, Kalantari M, Rezaee M, Akbarzadeh Baghban A. Correlation Between Mother-Child Relationship and Participation of Children and Adolescents With Cerebral Palsy in Leisure Time Activities. Iranian Rehabilitation Journal. 2018; 16(2):203-215. <http://dx.doi.org/10.32598/irj.16.2.203>

**doi:** <http://dx.doi.org/10.32598/irj.16.2.203>

## Article info:

**Received:** 02 Nov 2017

**Accepted:** 15 Apr 2018

## Keywords:

Patient participation, Cerebral palsy, Leisure activities, Mother-child relationship

## ABSTRACT

**Objectives:** This study aimed at evaluating the correlation between mother-child relationship and the rate of participation of children and adolescents with cerebral palsy in leisure time activities.

**Methods:** This study is a descriptive and correlational research. The statistical population included cerebral palsy children aged 7-17 years with a mother who is at least 25 years old. A sample size of 152 children was selected using systematic random sampling. The children filled the King's assessment of participation and enjoyment questionnaire, whereas the mothers responded to a survey of Roth's mother-child relationship evaluation. We collected the data and analyzed them (Spearman's correlation test, One-way ANOVA, Kruskal-Wallis, and Mann-Whitney) using SPSS 16 software.

**Results:** The results showed that there is a correlation between mother-child relationship and the rate of participation of cerebral palsy children in leisure time activities. There was a significant correlation between acceptance of child and the increasing involvement in leisure activities in case of cerebral palsy children. Over protection, excessive ease, and child rejection in a mother-child relationship was associated with reduction in the participation rate of the cerebral palsy children and adolescents in leisure activities. In case of quadriplegic children, the acceptance of child and participation rate was low compared to hemiplegic and diplegic children. Excessive ease of a mother-child relationship in girls was more than boys, but boys experienced more child rejection of a mother-child relationship than girls.

**Discussion:** Participation rate, frequency (how often), and the enjoyment of participation in leisure time activities were correlated with mother-child relationship. Participation differences were existed among CP groups.

## \* Corresponding Author:

**Minoo Kalantari, PhD**

**Address:** Department of Occupational Therapy, School of Rehabilitation, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

**Tel:** +98 (21) 77542057

**E-mail:** mn\_kalantari@yahoo.com

## 1. Introduction

**C**erebral palsy is a non-progressive disease and one of the most common movement disorders in children that leads to shortness, deformities, and functional limitations [1, 2]. The damage to the child's brain affects the motor system and leads to reduced coordination, poor balance, and abnormal movement pattern. The prevalence of cerebral palsy is 5 per 2,000 live births, with a ratio of one boy to three girls [3]. Children with cerebral palsy are prone to lower participation rate in social activities, daily living activities, and fewer benefits from social welfare and friendship [4]. Also, Orlin described that the involvement of these children in leisure time activities is less than the healthy children [5].

Traditionally, the early diagnosis, precise classification, and efforts to diminish abnormal movement patterns, such as spasticity, muscle weakness, and increasing range of motion in cerebral palsy children was the critical goal of the health services. Now, the rehabilitation professionals have set their interest to grow the social participation of these children as a critical goal [6]. It is widely acknowledged that participation in leisure activities and entertainment is an essential component of healthy and disabled children's development, which leads to the development of their skills, competencies, communication, and acquisition the physical and mental health [7, 8].

According to the World Health Organization's International Classification of Functioning disability and health (ICF), participation is the involvement of the person in the life situations. This classification states that the context of the disabled person can affect their participation. The context consists of personal and environmental factors including family factors, technology, products, natural environment and building, support and relationships, attitudes, services, and policies [9].

Recent studies have demonstrated some predictors of children's participation such as family factors, child factors, and environmental factors. These studies indicate the predictive role of socio-demographic characteristics of the family (such as income and family functioning) in the participation, but the parent-child relationship was not investigated [10, 11].

The results of Hastings and Richard's study (2003) indicated that caring for a cerebral palsy child can lead to several problems in the parents, such as sleep disorders, mental health problems, social interactions problems, marital problems and financial pressure. Mothers of disabled children

experience more stress than their fathers. Also, the disability of a family member, while disrupting family cohesion, creating physical and psychological pressure and reduces the health-based behaviors in the mother [12].

The quality of life in mothers with a cerebral palsy child is lower than mothers with healthy children, and this can affect the relationship between the mother and child [13]. Kochanska et al. (1999) indicated that in healthy children, the initial positive relationship between mother and child had a positive effect on the rate of development of child's social skills and increasing the rate of child participation [14].

Pashmdarfard et al. in a systematic review (2017) concluded that most participatory studies in Iran were in the field of daily life activities [15]. Therefore, more studies are demanded in the field of leisure time activities in such children. It is essential to understand factors that influence the participation rate in leisure activities because it is helpful in making decisions and planning to increase the participation of children with cerebral palsy in leisure and recreation activities.

Specifically, the present study has three objectives: 1. To describe the diversity, intensity, and enjoyment of participation in leisure activities in CP types (Quadriplegic, Hemiplegic, and Diplegic); 2. To investigate the pattern of mother-child relationship in CP types; and 3. To evaluate the correlation between mother-child relationship and the participation rate in leisure activities.

## 2. Methods

### Participants

This study is a descriptive and correlational research. Cerebral palsy children aged 7-17 years with a mother who is at least 25 years old, were the statistical population of present study. The sample size was estimated to be 150 using Cochran's method. Initially, we collected the information of 2734 individuals with physical disabilities from the Welfare Organization and the Exceptional Education in Bojnourd city and studied the files of these individuals. Of these, 718 individuals were diagnosed with cerebral palsy. After examining the conditions for inclusion into the study, 476 people met the inclusion criteria. Among them, we selected 163 individuals using systematic random sampling. The samples were divided into three groups according to their CP types: 1. Hemiplegic group; 2. Quadriplegic group; and 3. Diplegic group.

The inclusion criteria included: 1. The cerebral palsy children at the age of 7-17 years; 2. Child's mother aged at least

25 years; 3. Children with cerebral palsy diagnosed by a neurologist; 4. Mother's consent to participate in the study and complete the questionnaire; 5. Child's consent to participate in the study and complete the questionnaire; 6. The absence of more than one child with cerebral palsy in the family; 7. The absence of the history of mental illness in the mother; 8. Children's IQ score, 50 and above according to the SPARKLE [16] classification system.

The exclusion criteria were: 1. Unwillingness to complete the questionnaire; 2. Failure to understand the questionnaire; and 3. Failure to complete the questionnaire correctly.

### Measurement

We used the Persian version of Children's Assessment of Participation and Enjoyment (CAPE) for gathering participation data of children with cerebral palsy in leisure time activities. The CAPE scale was designed to record the participation and enjoyment data of healthy or disabled children in daily living activities, except compulsory school activities and self-care activities. These activities include recreational activities, physical activities, social activities, skill-based activities and self-improvement activities. The children completed the questionnaire. The children were also allowed to take help from their mother or caregiver to complete the questionnaire, if necessary. The Persian version of the CAPE test has face validity. The Intraclass Correlation Coefficient (ICC) for subclass scores and the total score was more than 0.75. Also, the internal consistency of the Cronbach's alpha coefficient for the 55 items of the questionnaire was 0.86 which showed that the CAPE test equivalence was acceptable. More than 85% of the questions showed a high correlation with the relevant subscale (0.44-0.84). The CAPE test was appropriate for the target population [17].

Maternal-child relationship data were collected using the Mother-Child Relationship Evaluation (MCRE) questionnaire. This measuring tool evaluated the mother's views on four interactions with the child: 1. Acceptance of the child; 2. Excessive ease; 3. Over protection; and 4. Child rejection. The Persian validity and reliability of this test were performed on 30 persons in 2005, and the following results were obtained using the Cronbach Alpha formula: "Acceptance of Child=0.77", "Child Rejection=0.72", "Excessive Ease=0.71", and "Over Protection=0.78". The test was valid. A team of expert teachers confirmed the reliability of the test and the test was considered applicable in Iranian mothers [18].

## 3. Results

### Participant description

The sample of this study consisted of 152 cerebral palsy children aged 7-17 years with a mother who was at least 25 years old. The rate of participation in this study was 93.25%. We excluded the 11 individuals from the study due to an unwillingness to complete the questionnaire, and failure to accurately complete the questionnaire. Characteristics of the samples are shown in Table 1. Table 2 shows descriptive statistics of participant's MCRE scores, categorized by CP groups and gender. We analyzed the diversity, intensity, and enjoyment scores of overall participation, and each of five activity subtypes of CAPE, in CP groups and two genders. Table 3 describes the results.

### The percentage of leisure activities

When we analyzed the percentage of CAPE scores, we found that highest diversity of participation is related to 'Going to the party' (93.42% of the sample), 'Watching TV or rental movies' (88.82%), and 'Listening to music' (84.21%). Also, children and adolescents

**Table 1.** Characteristics of the 152 children with cerebral palsy

Characteristic		N
Age (years)	Mean±SD	10.49±3.48
Sex	Girls	62(40.8%)
	Boys	90(59.2%)
CP group	Hemiplegia	60(39.5%)
	Quadriplegia	44(28.9%)
	Diplegia	48(31.6%)

CP: Cerebral Palsy; N: Number; SD: Standard Deviation

**Table 2.** Descriptive scores of MCRE in CP groups and two genders

Variable	Descriptive Statistics				95% CI			
	Mean	SD	Min	Max	Lower Bound	Upper Bound		
Acceptance of child	CP group	Hemiplegia	33.48	4.50	26	48	32.32	34.65
		Quadriplegia	28.32	7.07	15	45	26.17	30.47
		Diplegia	33.85	5.92	24	47	32.13	35.57
	Sex	Boys	31.57	5.90	16	47	30.33	32.80
		Girls	32.89	6.68	15	48	31.19	34.58
	Overprotection	CP group	Hemiplegia	32.80	7.38	17	49	30.89
Quadriplegia			33.80	4.68	19	43	32.37	35.22
Diplegia			36.19	6.22	20	49	34.38	38.00
Sex		Boys	34.34	7.07	17	49	32.86	35.83
		Girls	33.89	5.48	20	48	32.49	35.28
Excessive ease		CP group	Hemiplegia	38.48	4.86	28	48	37.23
	Quadriplegia		38.80	4.00	31	45	37.58	40.01
	Diplegia		38.65	4.11	29	49	37.45	39.84
	Sex	Boys	37.86	4.61	28	49	36.89	38.82
		Girls	39.74	3.75	31	49	38.79	40.69
	Child rejection	CP group	Hemiplegia	33.60	7.26	19	53	31.72
Quadriplegia			34.95	5.74	23	53	33.21	36.70
Diplegia			31.75	6.20	15	47	29.95	33.55
Sex		Boys	34.36	6.88	15	53	32.91	35.80
		Girls	32.03	5.95	16	44	30.52	33.54

Iranian Rehabilitation Journal

CP: Cerebral Palsy; SD: Standard Deviation; Min: Minimum; Max: Maximum; CI: Correlation Interval

with CP reported the highest enjoyment of participation in these activities.

Horseback riding (1.97% of the sample), fishing (2.63% of the sample) and doing individual physical activities (2.63% of the sample), had the lowest participation rate in the samples. The minimum enjoyment of participation was related to these activities.

Children and adolescents with CP showed maximum intensity of participation in Watching TV or rental movies, Listening to music, and Talking on the phone (2-3 times a week or more) as compared to Doing individual physical activity, Fishing, and Horseback riding (frequency of 2-3 times in a month).

### The correlation between participation in leisure activities and MCRE scores

We analyzed the correlation between the mother-child relationship subscales with overall participation and each of five activities subtypes scores of CAPE, using Spearman's correlation test. The results are shown in Table 4.

The diversity and intensity of overall participation and each of five activity subtypes of CAPE had a high correlation with acceptance of child. The increasing of acceptance of child in the mother-child relationship was associated with enhanced participation rate in leisure activities. Child rejection in the mother-child relationship was correlated

Table 3. Descriptive scores of CAPE in CP groups and two genders

Variables	Diversity					Intensity					Enjoyment				
	Mean	SD	95% CI		Mean	SD	95% CI		Mean	SD	95% CI				
			Lower Bound	Upper Bound			Lower Bound	Upper Bound			Lower Bound	Upper Bound			
Overall participation	CP group	Hemiplegia	21.22	8.51	19.02	23.42	1.91	0.73	1.72	2.10	3.72	0.44	3.60	3.83	
		Quadriplegia	9.55	5.65	7.83	11.26	.86	0.59	0.68	1.04	3.38	0.96	3.09	3.68	
	Diplegia	20.08	8.74	17.54	22.62	1.71	0.64	1.53	1.90	3.60	0.39	3.49	3.71		
		Boys	17.66	9.61	15.64	19.67	1.56	0.83	1.38	1.73	3.54	0.72	3.39	3.69	
	Girls	17.23	9.00	14.94	19.51	1.52	0.75	1.33	1.71	3.65	0.48	3.52	3.77		
		Hemiplegia	6.91	2.31	6.31	7.51	3.10	1.12	2.81	3.39	3.67	0.53	3.53	3.80	
Recreational activities	CP group	Quadriplegia	3.79	2.56	3.01	4.57	1.64	1.20	1.28	2.01	3.11	1.30	2.71	3.50	
		Diplegia	7.00	1.65	6.52	7.47	2.95	0.70	2.75	3.16	3.59	0.46	3.45	3.72	
	Boys	5.96	2.70	5.39	6.53	2.61	1.26	2.34	2.87	3.48	0.84	3.30	3.66		
		Girls	6.14	2.51	5.50	6.78	2.67	1.14	2.38	2.96	3.47	0.85	3.26	3.69	
	Hemiplegia	3.53	2.63	3.42	4.21	1.26	0.95	1.01	1.51	3.37	1.27	3.04	3.70		
		Quadriplegia	0.63	0.94	0.34	0.92	0.23	0.41	0.11	0.36	1.41	1.83	0.85	1.97	
Diplegia	3.16	2.95	2.30	4.02	1.08	0.93	0.81	1.35	3.16	1.31	2.78	3.54			
	Boys	2.91	2.73	2.33	3.48	1.03	0.96	0.83	1.24	2.99	1.56	2.66	3.32		
Girls	2.09	2.57	1.44	2.75	0.72	0.84	0.50	0.93	2.37	1.81	1.91	2.83			
	Sex														

Variables	Diversity					Intensity					Enjoyment				
	Mean	SD	95% CI		Mean	SD	95% CI		Mean	SD	95% CI				
			Lower Bound	Upper Bound			Lower Bound	Upper Bound			Lower Bound	Upper Bound			
Social activities	CP group	Hemiplegia	5.33	1.81	4.86	5.80	2.60	0.82	2.38	2.81	3.78	1.27	3.04	3.70	
		Quadriplegia	3.47	0.94	0.34	0.92	1.64	1.15	1.28	1.99	3.27	1.21	2.90	3.63	
		Diplegia	5.08	1.98	4.50	5.66	2.29	0.93	2.01	2.56	3.66	0.49	3.52	3.81	
	Sex	Boys	4.72	2.26	4.24	5.19	2.24	1.12	2.00	2.47	3.51	0.93	3.31	3.70	
		Girls	4.70	1.91	4.22	5.19	2.20	0.91	1.96	2.43	3.72	0.50	3.60	3.85	
Skill-Based activities	CP group	Hemiplegia	2.71	1.85	2.23	3.19	1.20	0.88	0.97	1.43	2.71	1.85	2.23	3.19	
		Quadriplegia	0.84	1.21	0.47	1.21	0.41	0.61	0.22	0.60	0.84	1.21	0.47	1.21	
		Diplegia	2.20	1.91	1.65	2.76	0.98	0.88	0.72	1.24	2.20	1.91	1.65	2.76	
	Sex	Boys	2.01	1.87	1.61	2.40	0.87	0.86	0.69	1.05	2.69	1.67	2.34	3.04	
		Girls	2.01	1.88	1.53	2.49	0.95	0.89	0.72	1.18	2.88	1.64	2.46	3.29	
Self-Improvement activities	CP group	Hemiplegia	2.71	2.15	2.15	3.27	1.33	1.05	1.05	1.60	3.17	1.22	2.85	3.48	
		Quadriplegia	0.79	1.17	0.43	1.51	0.42	0.64	0.22	0.62	1.47	1.78	.93	2.02	
		Diplegia	2.62	2.14	2.00	3.24	1.21	0.89	0.95	1.47	3.08	1.29	2.70	3.45	
	Sex	Boys	2.04	1.99	1.62	2.46	1.00	0.94	0.80	1.19	2.54	1.65	2.20	2.89	
		Girls	2.25	2.23	1.69	2.82	1.07	1.03	0.81	1.33	2.80	1.54	2.41	3.20	

CP: Cerebral Palsy; SD: Standard Deviation; CI: Correlation Interval

Table 4. Spearman test results

Variable	CI	Acceptance of Child		Over Protection		Excessive Ease		Child Rejection	
		CI	P	CI	P	CI	P	CI	P
Overall participation	Diversity	0.479**	0.000	-0.202*	0.013	-0.195*	0.016	-0.244**	0.002
	Intensity	0.463**	0.000	-0.208*	0.010	-0.177*	0.030	-0.203*	0.012
	Enjoyment	-0.060	0.451	0.039	0.631	0.183*	0.024	0.075	0.362
Recreational activities	Diversity	0.347**	0.000	-0.130	0.114	-0.056	0.491	-0.241**	0.003
	Intensity	0.320**	0.000	-0.104	0.202	-0.048	0.553	-0.171*	0.036
	Enjoyment	0.041	0.612	0.021	0.793	0.140	0.085	-0.005	0.953
Physical activities	Diversity	0.379**	0.000	-0.231**	0.004	-0.187*	0.021	-0.225**	0.005
	Intensity	0.384**	0.000	-0.199*	0.014	-0.180*	0.026	-0.210**	0.009
	Enjoyment	0.142	0.082	-0.002	0.972	-0.005	0.941	0.024	0.771
Social activities	Diversity	0.409**	0.000	-0.273**	0.001	-0.164*	0.043	-0.209**	0.010
	Intensity	0.386**	0.000	-0.247**	0.002	-0.117	0.151	-0.093	0.254
	Enjoyment	0.025	0.751	0.061	0.454	0.142	0.080	0.118	0.148
Skill-Base activities	Diversity	0.400**	0.000	-0.159*	0.050	-0.260**	0.001	-0.129	0.113
	Intensity	0.394**	0.000	-0.131	0.109	-0.238**	0.003	-0.125	0.124
	Enjoyment	0.263**	0.001	0.051	0.531	-0.052	0.523	0.027	0.743
Self-Improvement activities	Diversity	0.351**	0.000	-0.184**	0.023	-0.207*	0.010	-0.260**	0.001
	Intensity	0.347**	0.000	-0.177*	0.029	-0.205*	0.011	-0.216**	0.008
	Enjoyment	0.159	0.051	0.091	0.266	0.046	0.572	-0.009	0.916

\*\* : Correlation is significant at the 0.01 level; \* : Correlation is significant at the 0.05 level; CI: Correlation Interval; P: P-value

with the reduction of diversity and intensity of overall participation, recreational activities, physical activities, and self-improvement activities. In social activities, the diversity had a high correlation with child rejection at the 0.01 level of significance ( $P=0.010$ ). There was no significant correlation between child rejection with intensity and enjoyment of participation in leisure activities.

Excessive ease and over protection was correlated with intensity and diversity of overall participation, physical activities, and self-improvement activities in leisure activities.

#### MCRE mean scores differences, among CP groups

We compared the means of MCRE subscales among CP groups using one-way ANOVA. Table 5 describes the re-

sults. According to the results of Levene test, the difference of variances of acceptance of child, excessive ease, over protection, and child rejection among the CP groups was not significant. Tukey post hoc test was used for pairwise comparisons between the groups.

According to the ANOVA results, the means of acceptance of child and over protection in the mother-child relationship, among three groups of CP, had a significant difference. The Tukey test results showed that the mean of acceptance of child in quadriplegic children was significantly less than hemiplegic ( $P=0.000$ ), and diplegic ( $P=0.000$ ) children. The difference of acceptance of child's mean between hemiplegic and quadriplegic children was not significant ( $P=0.978$ ). The mean difference of excessive ease among CP groups was not significant. Over protection in quadriplegic children

Table 5. ANOVA test results of MCRE mean scores, among CP groups

Variables	Levene Statistic						ANOVA Results						Tukey Post Hoc Test Result		
	P	SS	df	MS	F	P	Group1-Group2	MD	P	95% CI					
										Lower Bound	Upper Bound				
Acceptance of child	0.065	891.80	2	445.90	13.29	0.000	Hemiplegia-Quadriplegia	5.16**	0.000	2.20	8.14				
							Hemiplegia-Diplegia	-0.371	0.978	-2.89	2.15				
							Quadriplegia-Diplegia	-5.53**	0.000	-8.86	-2.21				
Over protection	0.084	314.13	2	157.06	3.91	0.022	Hemiplegia-Quadriplegia	-0.995 *	0.023	-3.88	-1.88				
							Hemiplegia-Diplegia	-3.388	0.768	-6.56	0.21				
							Quadriplegia-Diplegia	-2.392	0.113	-5.17	0.39				
Excessive ease	0.342	2.50	2	1.25	0.065	0.937	Hemiplegia-Quadriplegia	-0.312	0.721	-2.04	1.41				
							Hemiplegia-Diplegia	-0.163	0.849	-1.85	1.52				
							Quadriplegia-Diplegia	0.150	0.871	-1.67	1.96				
Child rejection	0.202	239.40	2	119.70	2.81	0.063	Hemiplegia-Quadriplegia	-1.35	0.297	-3.91	1.20				
							Hemiplegia-Diplegia	1.85	0.145	-0.65	4.35				
							Quadriplegia-Diplegia	3.20 *	0.020	0.51	5.89				

\*\* : Difference is significant at the 0.01 level; \* : Difference is significant at the 0.05 level; CI: Correlation Interval; SS: Sum of Squares; MS: Mean of Squares; df: degree of freedom; MD: Mean Difference; P: P-value



was significantly more than hemiplegic children ( $P=0.023$ ). The mean of child rejection in quadriplegic children was significantly less than diplegic children ( $P=0.020$ ).

#### MCRE mean scores differences among two genders

We compared the variances of acceptance of child, excessive ease, over protection, and child rejection among the two genders using Levene test. According to the results demonstrated in Table 6, the difference of variances of acceptance of child and child rejection was not significant between the two genders, but the variances of excessive ease and over protection showed significant difference.

We compared the mean of MCRE subscales in two genders using independent t-test. The results showed that the mean of excessive ease in females was more significant compared to the males ( $P=0.006$ ). Child rejection in males was more than females ( $P=0.032$ ). The mean difference of acceptance of child and over protection was not meaningful among both the genders.

#### CAPE mean scores differences among CP groups

The means of diversity, intensity, and enjoyment of overall participation and each of five activity subtypes of CAPE were compared among CP groups using Kruskal-Wallis test. According to the results demonstrated in Table 7, in quadriplegic children the means of diversity and intensity of overall participation and each of five activity subtypes, were meaningful less than hemiplegic and diplegic children.

The mean difference of overall participation and each of activity subtypes among hemiplegic children and diplegic children were not significant. The quadriplegic children's enjoyment of participation in the physical activities, skill-based activities, and self-improvement activities was less than hemiplegic and diplegic children. The difference of mean between the quadriplegic and diplegic children was not meaningful in overall participation and each of five activity subtypes.

#### CAPE mean scores differences among two genders

We used Mann-Whitney test for comparing means of diversity, intensity, and enjoyment of overall participation and each of five activity subtypes. The results are demonstrated in Table 8.

The results confirmed that the means of diversity ( $p=.020$ ) and intensity ( $P=0.021$ ) of physical activities in males are significantly more than females. The difference of means of overall participation and other activity subtypes was not significant among both the genders.

## 4. Discussion

In this study, the mother-child relationship had a significant role in the participation of cerebral palsy children and adolescent in leisure time activities. Acceptance of child in the mother-child relationship was associated with the increasing participation rate of children and adolescents with CP in leisure activities. Previous studies have shown that children with responsive mothers to their behavioral pattern

**Table 6.** Independent t-test results of MCRE mean scores, among two genders

Variable	Equality of Variances	Levene's Test for Equality of Variances		T-Test for Equality of Means					
		F	P	t	df	MD	P	95% Confidence Interval of the Difference	
								Lower	Upper
Acceptance of child	Assumed	0.537	0.465	-1.284	150	-1.320	0.201	-3.353	0.712
Over protection	Not assumed	4.527	0.035	0.448	147.86	0.457	0.655	-1.559	2.474
Excessive ease	Not assumed	4.122	0.044	-2.77 *	145.9	-1.886	0.006	-3.233	-0.540
Child rejection	Assumed	1.484	0.225	2.159 *	150	2.323	0.032	0.197	4.450

\*: Difference is significant at the 0.05 level (2-tailed); df: degree of freedom; MD: Mean Difference; P: P-value

Table 7. Kruskal-Wallis test results of CAPE mean scores, among CP groups

Variable	Domain	Chi-Square	df	P	Pairwise Comparisons					
					Quadriplegia-Diplegia		Quadriplegia-Hemiplegia		Hemiplegia-Diplegia	
					SD	P	SD	P	SD	P
Overall participation	Diversity	50.80**	2	0.000	-5.72	0.000	6.69	0.000	0.686	1.00
	Intensity	49.37**	2	0.000	-5.32	0.000	6.75	0.000	1.18	0.704
	Enjoyment	4.81	2	0.090	N/A	N/A	N/A	N/A	N/A	N/A
Recreational activities	Diversity	42.26**	2	0.000	-5.77	0.000	5.66	0.000	-0.417	1.00
	Intensity	41.57**	2	0.000	-5.44	0.000	5.87	0.000	0.151	1.00
	Enjoyment	5.22	2	0.073	N/A	N/A	N/A	N/A	N/A	N/A
Physical activities	Diversity	46.13**	2	0.000	-5.31	0.000	6.45	0.000	0.885	1.00
	Intensity	44.15**	2	0.000	-5.23	0.000	6.29	0.000	0.818	1.00
	Enjoyment	25.32**	2	0.000	-3.48	0.001	4.94	0.000	1.31	0.563
Social activities	Diversity	19.25**	2	0.000	-3.17	0.004	4.27	0.000	0.954	1.00
	Intensity	22.75**	2	0.000	-2.58	0.030	4.77	0.000	2.10	0.105
	Enjoyment	3.87	2	0.144	N/A	N/A	N/A	N/A	N/A	N/A
Skill-Base activities	Diversity	32.91**	2	0.000	-3.92	0.000	5.65	0.000	1.56	0.355
	Intensity	27.20**	2	0.000	-3.50	0.001	5.15	0.000	1.15	0.397
	Enjoyment	24.79**	2	0.000	-2.86	0.013	4.97	0.000	2.01	0.132
Self-Improvement activities	Diversity	32.91**	2	0.000	-3.92	0.000	5.65	0.000	1.56	0.355
	Intensity	27.20**	2	0.000	-3.50	0.001	5.15	0.000	1.50	0.397
	Enjoyment	24.79**	2	0.000	-2.86	0.013	4.97	0.000	2.01	0.132

Iranian Rehabilitation Journal

\*\* : Difference is significant at the 0.01 level (2-tailed); df: degree of freedom; SD: Standard Deviation; P: P-value; ; N/A: Not Applied

had more self-confidence and higher performance in their everyday activities [19, 20].

Our findings confirmed that excessive ease, over protection, and child rejection in the mother-child relationship were correlated with decreasing the participation rate of children and adolescents with CP in leisure time activities. Gau and Chang (2013) concluded that the unresponsive mothering, less maternal affection, and overprotection in a mother-child relationship is associated with reducing of participation and function of healthy and ADHD children in daily activities [21]. It is critical that children engage in

motivating activities through provided opportunities to increase their participation [22].

According to the results of present study, the highest percentage of participation was in Going to a party, Watching TV or a rental movie, and Listening to music. Whereas in a study in Spain, the Hanging out, and Visiting had the highest percentage of participation, which can have a cultural background [11].

In this research, the acceptance of child in quadriplegic children was significantly less than hemiplegic and diplegic children. The quadriplegic children ex-

Table 8. Mann-Whitney test results of CAPE mean scores, among two genders

Domain	Variable	Mann-Whitney U	P
Overall participation	Diversity	2711.00	0.767
	Intensity	2682.50	0.687
	Enjoyment	2560.00	0.385
Recreational activities	Diversity	2665.00	0.637
	Intensity	2682.00	0.685
	Enjoyment	2760.00	0.908
Physical activities	Diversity	2179.00 *	0.020
	Intensity	2180.00 *	0.021
	Enjoyment	2301.00	0.058
Social activities	Diversity	2788.50	0.995
	Intensity	2715.00	0.778
	Enjoyment	2527.00	0.303
Skill-Base activities	Diversity	2766.50	0.928
	Intensity	2640.50	0.572
	Enjoyment	2572.00	0.393
Self-Improvement activities	Diversity	2705.00	0.745
	Intensity	2777.50	0.962
	Enjoyment	2526.50	0.308

\*: Difference is significant at the 0.05 level (2-tailed); P: P-value

Iranian Rehabilitation Journal

perienced more child rejection than diplegic children. Also, over protection of these children was more than hemiplegic children. The literature described that over-protective behavior in parental attitude was associated with an understanding that these children are vulnerable and helpless [23]. Our results supported that the excessive ease in females was significantly more than the males, whereas, the males experienced more child rejection. According to the Jankowaska's study results (2015), the parental attitude is a possible explanation for difference of excessive ease and child rejection between two genders.

The diversity and intensity of overall participation and each of five activity subtypes in quadriplegic children was less than hemiplegic and diplegic children. Others have noted that participation in recreation and other life activities of children with more physical dysfunction was less than children with better motor function [24-26].

The enjoyment of participation in physical activities, skill-based activities, and self-improvement activities in quadriplegic children was less than hemiplegic and diplegic children. According to the Canadian study in which Majnemer et al. (2008) investigated the participation and enjoyment of leisure activities in school-aged children with cerebral palsy, the enjoyment of participation was not significantly different among children and adolescents [10]. A possible explanation is that the enjoyment of participation of CP types was not investigated in their research. In this study, the rate of diversity and intensity of physical activities in males was meaningful more than females. In other activities, there was no significant difference among both the genders, which was consistent with the results of the previous study [27].

## 5. Conclusion

The results of this study showed that there is a correlation between the mother-child relationship with the participation

of child with cerebral palsy in leisure time activities. Acceptance of child in a mother-child relationship is correlated with increasing rate of cerebral palsy child's participation in leisure time activities. A significant correlation existed between excessive ease, over protection, and child rejection in a mother-child relationship with a reduction of participation of the cerebral palsy children in leisure activities. In quadriplegic children, the acceptance of child in a mother-child relationship was less than the hemiplegic and diplegic children, and also, these children experienced more rejection compared to the other CP groups. Quadriplegic children experienced less diversity and intensity of participation in leisure activities than hemiplegic and diplegic children. The males showed more diversity and intensity of physical activities than females, but there was no meaningful difference in other activity subtypes among them.

One limitation of this study was that the gross motor function of children was not measured. Other limitations were: 1. Requirement a long time for filling the questionnaire that may affect the results through confusion and impatience of mother and child; 2. Lack of some children's ability for filling the questionnaire that could lead to change in their perception and answers; and 3. The CAPE test has measured the participation of children within the past four months which can influence the participation of children. Thus, further studies are needed to meet these limitations.

## Ethical Considerations

### Compliance with ethics guidelines

This study is confirmed by the ethical committee of School of Rehabilitation, Shahid Beheshti University of Medical Sciences (Ethics code: IR.SBMU.RETECH.REC.1396.641).

### Funding

This study was carried out with the financial support of Department of Occupational Therapy, Faculty of Rehabilitation, Shahid Beheshti University of Medical Sciences.

### Conflict of interest

The authors declare no conflict of interest

### Acknowledgments

We thank the professors, the Welfare Organization, the Exceptional Education Organization, caregivers and the individuals who participated in this study.

## References

- [1] Baxte P MC, Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M, Colver A, Damiano D, Graham HK. The definition and classification of cerebral palsy. *Developmental Medicine and Child Neurology*. 2007; 49(s2):1-44. [PMID]
- [2] Khalaji M KM, Shafiee Z, et al. The effect of hydrotherapy on health of cerebral palsy patients: An integrative review. *Iranian Rehabilitation Journal*. 2017; 15(2):173-80. [DOI:10.18869/nrip.irj.15.2.173]
- [3] Imms C DK, Imms C, Taylor N. What is cerebral palsy? In: Imms C DK, Imms C, Taylor N, editors. *Physiotherapy and Occupational Therapy for People with Cerebral Palsy A Problem-Based Approach to Assessment and Management* London: Mac Keith Press; 2010.
- [4] Shikako-Thomas K MA, Law M, Lach L. Determinants of Participation in leisure activities in children and youth with cerebral palsy: Systematic review. *Physical & Occupational Therapy in Pediatrics*. 2008; 28(2):155-69. [DOI:10.1080/01942630802031834]
- [5] Orlin M, Palisano R, Chiarello L, et al. Participation in home, extracurricular, and community activities among children and young people with cerebral palsy. *Developmental Medicine & Child Neurology*. 2010; 52(2):160-6. [DOI:10.1111/j.1469-8749.2009.03363.x] [PMID]
- [6] Simeonsson J DC, Gail S, Huntington, Janey Sturtz McMillen, J. Lytle Brent, Rune. Students with disabilities: A national survey of participation in school activities. *Disability and Rehabilitation*. 2001; 23(2):49-63. [DOI:10.1080/096382801750058134]
- [7] Nordtorp H NA, Jahnsen R, Moser T, Strand L. Reliability of the Norwegian Version of the Children's Assessment of Participation and Enjoyment (CAPE) and Preferences for Activities of Children (PAC). *Physical & Occupational Therapy in Pediatrics*. 2013; 33(2):199-212. [DOI:10.3109/01942638.2012.739269] [PMID]
- [8] Kristensen PL, Møller N, Korsholm L, Wedderkopp N, Andersen LB, Froberg K. Tracking of objectively measured physical activity from childhood to adolescence: the European youth heart study. *Scandinavian Journal of Medicine & Science in Sports*. 2008; 18(2):171-8. [DOI:10.1111/j.1600-0838.2006.00622.x] [PMID]
- [9] World Health Organization. *International classification of functioning, disability, and health*. Geneva: World Health Organization; 2001.
- [10] Majnemer A, Shevell M, Law M, Birnbaum R, Chilingaryan G, Rosenbaum P, et al. Participation and enjoyment of leisure activities in school-aged children with cerebral palsy. *Developmental Medicine & Child Neurology*. 2008; 50(10):751-8. [DOI:10.1111/j.1469-8749.2008.03068.x] [PMID]
- [11] Longo E, Badia M, Orgaz BM. Patterns and predictors of participation in leisure activities outside of school in children and adolescents with cerebral palsy. *Research in Developmental Disabilities*. 2013; 34(1):266-75. [DOI:10.1016/j.ridd.2012.08.017] [PMID]
- [12] Hastings RP. Child behavior problems and partner mental health as correlates of stress in mothers and fathers of children with autism. *Journal of Intellectual Disability Research*. 2003; 47(4-5):231-7. [DOI:10.1046/j.1365-2788.2003.00485.x] [PMID]

- [13] Mousavi SA AF, Khazaei H. Comparison of life quality in mothers of children with cerebral palsy and normal children. *Journal of Kermanshah University of Medical Sciences*. 2014; 18(9):532-8.
- [14] Kochanska EA. Implications of the mother-child relationship in infancy for socialization in the second year of life. *Infant Behavior and Development*. 1999; 22(2):249-65. [DOI:10.1016/S0163-6383(99)00009-0]
- [15] Pashmdarfard M, Amini M, Mehraban A. Participation of Iranian cerebral palsy children in life areas: a systematic review article. *Iranian Journal of Child Neurology*. 2017; 11(1):1. [PMID] [PMCID]
- [16] Gunel MK, Mutlu A, Tarsuslu T, Livanelioglu A. Relationship among the Manual Ability Classification System (MACS), the Gross Motor Function Classification System (GMFCS), and the functional status (WeeFIM) in children with spastic cerebral palsy. *European Journal of Pediatrics*. 2009; 168(4):477-85. [DOI:10.1007/s00431-008-0775-1] [PMID]
- [17] Amirian SR, Rezaee M, Pashazadeh azari Z, Tabatabaee SM. [The Persian validity and reliability of Children's Assessment of Participation and Enjoyment (Persian)]. *Journal of Rehabilitation Medicine*. 2015; 4(1):26-32.
- [18] Khanjani Z, Hashemi T, Peymannia B, Aghagolzadeh M. [Relationship between the quality of mother-child interaction, separation anxiety and school phobia in children (Persian)]. *Urmia Medical Journal*. 2014; 25(3):231-40.
- [19] Frosch CA, Mangelsdorf SC, McHale JL. Marital behavior and the security of preschooler-parent attachment relationships. *Journal of Family Psychology*. 2000; 14(1):144-61. [DOI:10.1037/0893-3200.14.1.144] [PMID]
- [20] Levendosky AA, Huth-Bocks AC, Shapiro DL, Semel MA. The impact of domestic violence on the maternal-child relationship and preschool-age children's functioning. *Journal of Family Psychology*. 2003; 17(3):275-87. [DOI:10.1037/0893-3200.17.3.275] [PMID]
- [21] Gau SS-F, Chang JP-C. Maternal parenting styles and mother-child relationship among adolescents with and without persistent attention-deficit/hyperactivity disorder. *Research in Developmental Disabilities*. 2013; 34(5):1581-94. [DOI:10.1016/j.ridd.2013.02.002] [PMID]
- [22] Heah T, Case T, McGuire B, Law M. Successful participation: The lived experience among children with disabilities. *Canadian Journal of Occupational Therapy*. 2007; 74(1):38-47. [DOI:10.2182/cjot.06.10] [PMID]
- [23] Jankowska A. Parental attitudes and personality traits, self-efficacy, stress, and coping strategies among mothers of children with cerebral palsy. *Health Psychology Report*. 2015; 3(3):246-59.
- [24] Schenker R, Coster W, Parush S. Participation and activity performance of students with cerebral palsy within the school environment. *Disability and Rehabilitation*. 2005; 27(10):539-52. [DOI:10.1080/09638280400018437] [PMID]
- [25] King G, Law M, Hanna S, King S, Hurley P, Rosenbaum P, et al. Predictors of the leisure and recreation participation of children with physical disabilities: a structural equation modeling analysis. *Children's Health Care*. 2006; 35(3):209-34. [DOI:10.1207/s15326888chc3503\_2]
- [26] King GA, Law M, King S, Hurley P, Hanna S, Kertoy M, et al. Measuring children's participation in recreation and leisure activities: Construct validation of the CAPE and PAC. *Child: Care, Health and Development*. 2007; 33(1):28-39. [DOI:10.1111/j.1365-2214.2006.00613.x]
- [27] Hassani M, Hasani Mehraban A, Aliabadi F, Taghizadeh G. Comparison of participation between children with cerebral palsy and typically developing peers 8-14 years old in leisure activities. *Modern Rehabilitation*. 2013; 7(1):63-9.