

The relationship between the clinical features of children with cerebral palsy and the moods of their parents

Serebral palsili çocukların klinik özellikleri ile ebeveynlerinin duygudurumları arasındaki ilişki

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Abstract

Purpose: The aim of this study was to compare the depression and anxiety levels between mothers and fathers of children with cerebral palsy (CP) and to explore the association between the clinical features of children with CP and the moods of their parents.

Materials and methods: A total of 95 children with CP and their parents were included in this cross sectional study. The type of CP was identified and their functional levels were assessed with the Gross Motor Functional Classification System and the Bimanual Fine Motor Function. The depression and anxiety levels of parents was evaluated with Hospital Anxiety and Depression Scale.

Results: The mothers of children with CP had significantly higher anxiety levels compared to the fathers of children with CP whereas there were no statistically significant difference between depression levels of mothers and fathers. Mother's anxiety and depression levels showed positive correlation with functional status of children with CP. Father's depression level, furthermore a positive correlation between mother's anxiety level and father's anxiety level was demonstrated. Moreover, father's depression and anxiety level exhibited a poor positive correlation with functional status of children with CP.

Conclusion: Our findings indicate that mothers of children with CP had significantly higher anxious mood compared to the fathers of them. Identifying which factors are associated with moods of each parents of children with CP may provide benefit in order to determine the active support for family.

Key words: Cerebral palsy, moods of parents, depression, anxiety.

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Özet

Amaç: Bu çalışmanın amacı, serebral palsili (SP) çocukların anneleri ve babaları arasındaki depresyon ve anksiyete düzeylerini karşılaştırmak ve SP'li çocukların klinik özellikleri ile ebeveynlerinin duygudurumları arasındaki ilişkiyi araştırmaktır.

Gereç ve yöntem: Bu kesitsel çalışmaya, toplamda 95 SP'li çocuk ve onların ebeveynleri dahil edildi. SP'nin tipi tanımlandı ve SP'lilerin fonksiyonel seviyeleri Kaba Motor Fonksiyon Sınıflama Sistemi ve Bimanual Fine Motor Fonksiyon ile değerlendirildi. Ebeveynlerin depresyon ve anksiyete düzeyleri ise Hastane Anksiyete ve Depresyon Ölçeği ile değerlendirildi.

Bulgular: SP'li çocukların anneleri ve babalarının depresyon düzeyleri arasında istatistiksel olarak anlamlı bir fark bulunmazken, SP'li çocukların annelerinin anksiyete düzeyleri babalarına göre anlamlı olarak daha yüksek bulunmuştur. Annelerin anksiyete ve depresyon düzeylerinin SP'li çocukların fonksiyonel durumu ve babaların depresyon düzeyi ile pozitif korelasyon gösterdiği, ayrıca annelerin anksiyete düzeyi ile babaların anksiyete düzeyleri arasında pozitif bir ilişki olduğu gösterilmiştir. Diğer taraftan, babaların depresyon ve anksiyete düzeyi, SP'li çocukların fonksiyonel durumları ile zayıf pozitif korelasyon göstermiştir.

Sonuç: Elde ettiğimiz bulgular, SP'li çocukların annelerinin babalarına göre anlamlı olarak daha fazla anksiyeteye sahip olduğunu göstermektedir. SP'li çocukların ebeveynlerinin duygudurumları ile hangi faktörlerin ilişkili olduğunu tanımlamak, aile için aktif desteği belirlemede fayda sağlayabilir.

Anahtar Kelimeler: Serebral palsy, ebeveynlerin duygudurumu, depresyon, anksiyete.

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Introduction

Cerebral palsy (CP) is one of the most common developmental disorder beginning in early childhood and persisting throughout all the lifespan [1]. Although CP is not progressive, there is no cure, thus children and their families live with the disability on a permanent basis [2]. The range of developmental problems and comorbidities of children with CP, such as epilepsy, movement, sensory, perceptual, cognitive, communication and behavior disorders, and secondary musculoskeletal problems, are varied and affect not only children's functioning but also their quality of life and mood as well as their caregivers [3].

Poor psychosocial well-being of parents caring for a child with CP may have an impact on the child, thus, it is important to examine parental well-being. In this sense, research has started to examine the consequences that caring for these children may have an impact on the health and wellbeing of their parents. In a review of 22 studies which focused on parents' process of adaptation to caring for their children with CP, the authors found that these parents generally had higher levels of stress and worse mental health compared to parents of children without developmental disabilities or the general population [4]. Similar results reported consistently in another review that included 40 studies [5].

Such chronic state of a child effects not only on mothers, but also on all members of the family including fathers and disturbs the family relations [6]. It is also important to note that caring for a child with CP does not equally affect all parents. However researches in child psychology do not include fathers in a sufficient measure. Up to date, most of the studies have focused on the impact of caring for a child with CP on mother's mental health and less attention has been paid father's mood. Few studies have compared the moods of each parents of children with CP which were produced conflicting findings [7-10]. To our knowledge there is no literature which evaluates association between clinical features of children with CP and the moods of fathers of children with CP up to date.

The aim of this study was to compare the depression and anxiety levels between mothers and fathers of children with CP and to explore

the association between the clinical features of children with CP and the moods of their parents.

Materials and methods

Children with CP and their parents who attended the Physical Medicine and Rehabilitation Clinic at the Pamukkale University were included in this cross-sectional study. All the parents were informed about the study procedure and gave their written informed consents to participate in the study according to Helsinki Declaration. Ethical approval for the study was granted by the Pamukkale University Ethics Committee.

Parents who met the following inclusion criteria were invited to participate: (1) to be the father or the mother of a child with CP and (2) able to speak, and understand Turkish. Exclusion criteria were as follows: (1) absence of one of the parents and (2) refuse to participate the study.

After demographic information of children with CP was obtained, detailed medical history and physical examination including functional assessment were performed. The type of CP was identified and their functional levels were assessed with the Gross Motor Functional Classification System (GMFCS) and the Bimanual Fine Motor Function (BFMF).

The GMFCS is a tool for functional assessment, and its scores have a close relationship with motor impairments, including spasticity and decreased muscle strength. GMFCS is a scale specific to children with CP and composed of five levels according to gross motor functions; Level I: Walks without limitations, Level II: Walks without assistive devices, limitations are present in walking outdoors, Level III: Walks with assistive device, Level IV: Self-Mobility with limitations; may use powered mobility Level V: Self mobility is severely limited even if assistive technologies are used [11].

The BFMF classifies fine motor function in children with CP. BFMF classifies fine motor function according to the child's best ability to grasp, hold and manipulate objects for each hand separately. BFMF describes five levels of fine motor function and covers the entire spectrum of limitations in fine motor function that may be found among children with various CP

sub-types. Level I includes children with minor limitations and levels IV-V describe children with severe functional limitations [12].

Psychological well-being of parents was measured by the Hospital Anxiety and Depression Scale (HAD) developed by Zigmond and Snaith [13]. The HAD is a commonly used scale that is quick and easy to complete. HAD measures both anxiety and depression, and it was designed to detect anxiety and depression in nonclinical populations. It comprises anxiety and depression subscales, each with seven items. Each item is rated on a scale of 0-3, items are summed to give a total score ranging from 0 to 21, with higher scores indicating greater anxiety and depression. The Turkish versions of the HAD was shown to be reliable and valid. The authors provide cut-off scores indicating that an individual is at risk of clinically anxious or depressed mood. Seven was found to be the cut-off score for depression subscale and ten for anxiety subscale [14].

Statistics

Sample size was calculated as 93 patients to determine the HAD score difference between parents of children with CP with a power 80% or above according to the data obtained from the other studies.

All statistical analyses were performed using SPSS version 17.0 for Windows (Statistical Package for the Social Sciences Inc, Chicago, IL, USA). Descriptive statistics were used to describe demographic characteristics. The Kolmogorov Simirnov test was used to analyze normal distribution assumption of the data. As the distributions were not normal, nonparametric tests were used in statistical evaluation. Continuous variables were analyzed with Mann Whitney U test, whereas categorical variables were analyzed with a chi squared test to compare the significance of the differences between parents of children with CP. Spearman correlation analysis was used to assess correlation between parents anxiety and depression levels with clinical variables. A value >0.6 was defined as indicative of a good correlation, with moderate correlation between 0.4-0.6, and poor correlation <0.4 . In all analyses, p values <0.05 were considered as statistically significant.

Results

A total of 110 parents of children with CP were eligible for this study, Fifteen of whom had to be excluded from the study; Ten parents of the children with CP refused to participate to the study and five of them were excluded due to the absence of one of the parents. Therefore a total of 95 children with CP and their parents were included in this cross sectional study. Fifty children with CP were male and 45 were female, with a mean age of 7.39 years. The majority of the children with CP (73.6%) were spastic type CP including 29 patients were diplegic, 18 were quadriplegic, 23 were hemiplegic. Also the majority of children with CP were in the first three level according to both GMFCS and BFMF. Demographic and clinical characteristics of CP patients included in this study are given in Table 1.

The mean age of the mothers of the children with CP was found as 35.78 ± 7.3 years, and the mean age of the fathers was 37.68 ± 8.0 years. There was no statistical difference between the level of education and ages when fathers and mothers of children with CP compared. However there was a statistically significant difference between the current work situation of parents. While the majority of mothers of children with CP were housewife (82.1%), the majority of fathers were employee (77.9%). Mothers of children with CP had statistically higher HAD anxiety scores compared to the fathers of children with CP. Moreover using recommended cut-off point, mothers of children with CP had significantly higher anxious mood compared to the fathers of children with CP ($p < 0.001$). However there was no statistical difference according to HAD depression scores when compared the fathers and mothers of children with CP. On the other hand using the recommended cut-off point, 55.8% of mothers and 46.3% of fathers of children with CP were at risk of clinically depressed mood respectively, with no statistical difference, as shown in Table 2.

There was a positive moderate correlation between mother's anxiety level and BFMF, GMGFC ($p < 0.001$). Furthermore a positive poor correlation between mother's anxiety level with father's anxiety and depression levels was demonstrated ($p < 0.05$). Whereas there was no correlation between mother's anxiety level

and age of them, level of education and age of children with CP. Correlation analyses indicated that mother's depression level was positively associated with BFMF, GMFC and father's depression level ($p<0.001$). However mother's depression level was not associated with age of them, level of education and age of children with CP. Relationship between clinical parameters of children with CP and moods of mother's are given in Table 3.

There was a positive poor correlation between father's anxiety level and BFMF, GMFC ($p<0.05$). However there was no correlation between father's anxiety level and age of them, level of education, age of children with CP. On the other hand father's depression level was positively associated with BFMF, GMFC while no correlation was found between father's depression level and age of them, level of education, age of children with CP as shown in Table 4.

Discussion

In this cross-sectional study, we compared the depression and anxiety levels between mothers and fathers of children with CP and investigated the relationship between the clinical features of patients with CP and the moods of their parents. Our results demonstrated that the mothers of children with CP had significantly higher anxious mood compared to the fathers of children with CP whereas about a half of parents were at risk of clinically depressed mood with similar rates between mothers and fathers of children with CP. Results of the present study revealed that mother's anxiety and depression levels showed positive correlation with functional status of children with CP. Father's depression level, furthermore a positive correlation between mother's anxiety level and father's anxiety level was demonstrated. Moreover, father's depression and anxiety level exhibited a poor positive correlation with functional status of children with CP.

Table 1. Demographic and clinical characteristics of patients with cerebral palsy

	Cerebral Palsy (n=95)
Gender, n (%)	
Men	50 (52.6%)
Women	45 (36.6%)
Age (years) (mean±SD)	7.39±4.59
Type of cerebral palsy, n (%)	
Diplegia	29 (30.5%)
Quadriplegia	18 (18.9%)
Hemiplegia	23 (24.2%)
Ataxic	17 (17.9%)
Dyskinetic	5 (5.3%)
Mixed	3 (3.2%)
GMFCS, n (%)	
Level 1	35 (36.8%)
Level 2	15 (15.8%)
Level 3	11 (11.6%)
Level 4	4 (4.2%)
Level 5	30 (31.6%)
BFMF, n (%)	
Level 1	30 (31.6%)
Level 2	15 (15.8%)
Level 3	10 (10.5%)
Level 4	13 (13.7%)
Level 5	27 (28.4%)

GMFCS: Gross Motor Functional Classification System
BFMF: Bimanual Fine Motor Function

Table 2. Comparison of sociodemographic characteristics and moods of parents of children with cerebral palsy

	Mother (mean±SD)	Father (mean±SD)	p
Age (years) (mean±SD)	35.78±7.32	37.68±8.01	0.138
Educational level, n (%)			0.226
Illiterate	4 (4.2%)	-	
Primary	53 (55.8%)	53 (55.8%)	
High	21 (22.1%)	25 (26.3%)	
University	17 (17.9%)	17 (17.9%)	
Occupation, n (%)			<0.001
Government official	11 (11.6%)	19 (20%)	
Employee	6 (6.3%)	74 (77.9%)	
Housewife	78 (82.1%)	-	
Unemployed	-	2 (2.1%)	
HAD Anxiety	10.40±5.38	7.52±4.29	<0.001
HAD Depression	8.64±4.42	7.83±4.38	0.177
Anxiety			<0.001
Absent	54 (56.8%)	78 (82.1%)	
Present	41 (43.2%)	17 (17.9%)	
Depression			0.192
Absent	42 (44.2%)	51 (53.7%)	
Present	53 (55.8%)	44 (46.3%)	

p: Mann-whitney U for continuous variables or chi square for categorical variables

HAD: Hospital Anxiety and Depression Scale

Table 3. Relationship between clinical features of children with cerebral palsy and moods of their mothers

	Mother's Anxiety Spearman rho	p value	Mother's Depression Spearman rho	p value
Age of patients	0.58	0.579	-0.11	0.919
Age of mothers	0.56	0.593	0.81	0.435
Educational Level of mothers	0.123	0.235	0.032	0.761
GMFCS	0.493	<0.001	0.444	<0.001
BFMF	0.414	<0.001	0.398	<0.001
Mother's depression	0.685	<0.001	1	<0.001
Father's Anxiety	0.249	0.015	0.196	0.066
Father's Depression	0.260	0.011	0.395	<0.001

p: Spearman correlation

GMFCS: Gross Motor Functional Classification System

BFMF: Bimanual Fine Motor Function

Table 4. Relationship between clinical features of children with cerebral palsy and moods of their fathers

	Father's Anxiety Spearman rho	p value	Father's Depression Spearman rho	p value
Age of patients	0.074	0.477	0.149	0.148
Age of fathers	0.053	0.609	0.140	0.175
Educational level of fathers	-0.123	0.236	-0.124	0.230
GMFCS	0.221	0.031	0.232	0.025
BFMF	0.291	0.004	0.307	0.002
Father's depression	0.747	<0.001	1	<0.001

p: Spearman correlation

GMFCS: Gross Motor Functional Classification System

BFMF: Bimanual Fine Motor Function

According to the available literature, quality of life levels of parents of children with CP are worse than the ones found for the general population and that of parents of healthy children [4, 5]. The importance of routine screening for parental mental health problems in childhood intervention is highlighted by these findings. In addition, research and intervention in this area must take into account possible differences between father's and mother's adaptation to their child's difficulties. In this sense, some studies suggest that mothers of children with CP have worse quality of life and mental health than fathers, suggesting that the role adopted by women within the caring situation or their interpretation could explain this difference [10, 15]. In a qualitative study which 13 mothers and 13 fathers of children with CP were included, the adaptation process in mothers and fathers at the individual, parental, marital and extrafamilial levels, and the similarities and differences in their experience of living with a child with CP were explored. The results show that mothers and fathers are more likely to view the situation differently than similarly [15]. In a study of 235 mothers and fathers of children and adults with CP, the prevalence of psychiatric morbidity among the parents was reported. The findings indicate that the mental well-being of many fathers and even more mothers was severely affected by the caring process [10]. Also in a recent study depression, posttraumatic stress were reported to be higher in mothers of preterm infants than fathers of them [16]. In accordance with these studies, our mothers of children with CP had significantly higher anxious mood compared to the fathers of children with CP. In contrast, two studies reported that there was no statistically significant difference in the evaluation of depression between mothers and fathers of children with CP [7, 8]. Similar to these studies, our results showed no statistical difference according to HAD depression scores when compared the fathers and mothers of children with CP.

In the last decades, there has been growing interest in studying the factors that can influence the emotional wellbeing of parents of children with CP [17]. There were conflicting results. Some studies found that depression and anxiety levels of mothers were associated with functional disability levels in children with CP [18,

19] and others were not found any association between mothers mood and functional level of children with CP [20, 21]. There were links between parent distress and lower levels of emotional availability for parents and their child with CP. In contrast to expectations, Barfoot et al. [21] found no association between emotional availability and the level of the child's functional status. Results do not always converge, probably as a consequence of the samples' heterogeneity and the methodologies employed in the different studies. Similar to some studies [18, 19], we also demonstrated that mother's anxiety and depression levels were positively associated with functional status of children with CP. Although there has been a great deal of research exploring how children affect parents, there have been many fewer studies of the interrelationships between mothers' and fathers' psychological well-being. In a previous study, 18 parents of children with autism reported on their stress and their general mental health, mothers and fathers did not differ in their levels of stress and depression, but mothers reported more anxiety than fathers [22]. Also correlation analyses in that study revealed that child behaviour problems and fathers' mental health were associated with mothers' stress. However, neither child behaviour problems nor mothers' mental health was associated with fathers' stress [22]. To our knowledge there is no literature which evaluates the relationship between the moods of parents of children with CP and moods of fathers in relations with clinical features of children up to date. We believe that present study is the first study which revealed that mothers anxiety and depression levels showed positive correlation with fathers depression level, furthermore a positive correlation between mother's anxiety level and father's anxiety was demonstrated. Moreover, father's depression and anxiety level exhibited a positive correlation with functional status of children with CP. There is a need for a larger study to better understand relationships among these variables. However, it was thought important to retain father's data in the analysis since they are part of the family unit.

Potential limitations of our study are its cross-sectional design and having no healthy control group. Since this is a cross-sectional study that does not allow us to find causal relations.

Moreover, the present study was performed only in one clinic, therefore the sample may not be representative of the general population. Finally, further data with larger sample size including fathers of children with CP that represents multicenter clinics are needed to better understand the association between the clinical features of children with CP and the moods of their parents.

In conclusion, our findings indicate that mothers of children with CP had significantly higher anxious mood compared to the fathers of them and identifying which factors are associated with moods of each parents of children with CP, may provide benefit in order to determine the active support for family. Healthcare professional should take into account that depression and anxiety levels may be higher in parents of children with CP.

Conflict of Interest: No conflict of interest was declared by the authors.

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