

Depression in Mothers of Children with Cerebral Palsy and Its Relation to Severity and Type of Cerebral Palsy

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Abstract- Children with cerebral palsy (CP) suffer from several problems, so the family especially the mothers undertake a lot of social and emotional difficulties. The purpose of this study was to determine the severity of depression in mothers of children with CP in comparison with mothers who have normal children and its relation to the type of CP and severity of the disability. During this descriptive-analytic study, 43 mothers who had younger than 8 year-old children with CP under rehabilitation services in SABA clinic, related to the University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, Iran, were selected as the case group by simple sampling. A data registration form and the Beck Depression Inventory II were completed by them. The type of CP and the severity of disability were determined by a pediatrician and an occupational therapist respectively, using the Gross Motor Function Classification System (GMFCS). Seventy-seven mothers of normal children, serving as the control group for comparing with case group, filled in the same questionnaires. There were significant differences in the mean depression scores ($P=0.003$) between the two groups. Having a child with CP also increases the risk of developing depression in mothers as much as 2.26 times ($OR=2.26$). There were no statistically significant differences in depression scores and the severity of disability and also among the five types of CP. It seems that having a child with CP is probably associated with higher prevalence and severity of depression in mothers. So treatment or prevention of depression in mothers of children with CP is highly recommended for improving the rehabilitation process and achieve better results in these children.

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Introduction

The birth of a developmentally disabled child is a family stressor and mothers often feel guilty and sense of responsibility because of their character qualities more than the other family members; hence, they involve in compensation strategies to overcome their children's disability. Mothers of children with different levels of disability tolerate high level of stress. Children with chronic medical conditions cause depression (1) emotional and behavioral problems in their mothers (2).

To deal with the problems of children's chronic medical conditions and different levels of disability, a professional team cooperation is needed to do medical and rehabilitation interventions. Mothers of cerebral palsy (CP) children, as an integral part of the team have

a lot of social and emotional problems. Some studies focused on the status of mothers having CP children. In the study of Ones and his colleagues (3) mothers having CP children had depressive symptoms and lower quality of life, in addition Manual (4) reported 30% of mothers having CP children had the symptom of depression above cutoff on Center for Epidemiologic Studies-Depression (CES-D) Scale Short Form. In a research studied the relationship between child's disability and mother's mental health, Lambornus *et al.* (5) found that the prevalence of depression in 3 groups of mothers having: a) premature infants with the risk for developing CP, b) premature infants without risk of CP and, c) normal infants, was the same at the first year of children's lives. Kuhsali *et al.* (6) compared social adaptation of mothers having mental retarded children

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and mothers of normal children. She indicated that mothers of mental retarded children had a limited social adaptation. The relationship between rearing a mental retarded child and the social interaction of the family investigated by Shariati *et al.* (7). Parents of mental retarded children may have limited leisure time and social interaction. Parents of children with cancer are at risk for depression. Norouzinezhad *et al.* (8) studied 66 parents of children with cancer in Shafa hospital affiliated with Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. They made the diagnosis of depression by BDI-II and clinical assessment. The incidence of depression was as 4 times as normal population. Further, Sharghi *et al.* (9) carried out a study on 294 mothers of children with thalassemia and cancer. The released result showed that there were significant differences in BDI-II scores in case and control mothers. To the best of our knowledge there are no similar studies in the field; in addition, due to the differences in family characteristics of Iranian and non-Iranian families the results of above studies can not be generalized to our community; therefore, there is a need to further studies. This study was designed to evaluate depression in mothers of children with CP and to assess its relation to severity and type of cerebral palsy. Moreover, we believed that early diagnosis of depression and intervention in mothers of CP children may improve the rehabilitation process in CP children.

Patients and Methods

Participants were 120 mothers of CP and normal children. This study drew on population available to the researchers. The sample size was determined based on similar studies. 43 subjects were in case group and 77 in control mothers (3-5). Both case and control groups were recruited to participate in our analytic-descriptive (cross sectional, case-control) study between October 2006 and March 2008 from SABA Education Research and Rehabilitation Clinic (Developmental Disorder Center) affiliated with the University of Social Welfare and Rehabilitation Sciences (USWR), Tehran, Iran. The case group referred to the clinic for developmental delay or CP of their children and the control mothers who referred to the clinic for a reason except developmental delay and CP in their children such as weight or head circumference control. Inclusion criteria for case group were as follows: having 6 months to 8 years CP child with the onset of 6 months; being literate.

Exclusion criteria for case group were as follows: Having a chronic medical condition; having a jobless or

addicted husband; a history of divorce or relative's death; a history of chronic psychological disorder or depression with the onset before the diagnosis of CP.

To reduce the effect of confounder variables the control group matched with case group socio-economically (mother's career, mother's academic status, birth rank, the number of children, possession, home size and the number of family members).

Furthermore, inclusion criteria for control group were: having 6 months to 8 years normal child and being literate. Exclusion criteria for the control group were as the same for the case group. The study had the approval of the ethic committee, University of Welfare and Rehabilitation (USWR). Participants' anonymity and confidentiality were assured by the use of unique identifiers allocated to each participant. Participants were informed of their right to refuse consent and of their right to withdraw consent or discontinue participation at any time without penalty.

Demographic information form was completed by participants for demographic characteristics.

Disability severity was measured with the Gross Motor Function Classification System (GMFCS) by an occupational therapist. Gross Motor Function Measure-66 (GMFM-66) is a measure of 5 gross motor function of CP children [a) lying & rolling, b) sitting, c) crawling & kneeling, d) standing, e) walking, running and jumping]. The original version of the test was designed to assess the gross motor function in CP children. Assessment time is 45-60 minutes and the score of each item is 0-3. The total score is calculated from 0 (minimal physical ability) and 100 (normal physical ability). GMFM-66 is developed eliminating 12 items from the original GMFM-88. The inter-rater reliability for children under 2 years is 55% and for children between 2-12 years is 75%. GMFCS is usable in different cultures since it is not culture dependent (10).

Maternal depression was assessed with Beck Inventory Depression-II (BDI-II), a 21-question instrument which designed for individuals aged 13 and over. The BDI-II, a 1996 revision of the original instrument, is developed during 35 years based on the American Psychiatric Association's publication of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, 1994) to screen depressive symptoms and to measure severity of depression. The cutoff is 0-13 for minimal depression and 29-63 for severe depression. This measure has been found to have construct validity (11). The data was analyzed using SPSS (version 11.5). The descriptive features were mean and standard deviation, percentages, frequencies.

Table 1. The Beck Inventory Depression-II (BDI-II) scores of mothers in 2 groups

	Control Mean (SD)	Case Mean (SD)	P-value	t-value
BDI-II Scores	12.36 (8.80)	17.79 (12.98)	0.003	-2.719

The *t*-test used for independent groups, Chi Square for non-parametric variables and the correlation were explored with Pearson correlation test.

Results

Forty-three subjects in the case group and 77 in the control group were studied. The mothers' average ages in the case and control group were 34.9 (SD=6.2) and 32.9 (SD=5.2) years, respectively (*P*=0.013) as well as average ages of children in the case and control group were 42.2 (SD=26.2) and 25.4 (SD=21.2) months, respectively (*P*<0.001). Twenty- three (53.3%) of case group were boys and 20 (46.7%) of them were girl as well as 44 children (57.1%) of control group were boys and 33 (42.9%) of them were girls which were no significant differences (*P*=0.499). In addition, there were no significant differences in case and control mothers in the followings: mother's job (*P*=0.064), mother's academic status (*P*=0.061), birth rank (*P*=0.017), the number of children (*P*=0.059), possession (*P*=0.043),

home size (*P*=0.057), and the number of family members (*P*=0.064).

BDI scores in mothers having CP children and control mothers were 17.79 (SD=12.98) and 12.36 (SD=8.80) respectively. There was a significant difference in BDI scores in two groups (*P*= 0.003) (Table1). It was also shown that having a child with CP increases the risk of developing depression in mothers as much as 2.26 times (OR=2.26).

Twenty-four (55.8% of) mothers in the case group and 57 (74%) in the control group did not have depression whereas 10 (17.3% of) mothers in the case group and 3 (3.9%) in the control group were severe or more depressed (Table 2).

No significant correlation between the severity of disability and the severity of depression for mothers having CP children was observed (R = 0.24).

There were no significant differences in BDI scores between mothers having different types of CP (*P*=0.339) (Table 3).

Table 2. The severity of depression in mothers of 2 groups

Depression Severity	Control N (%)	Case N (%)
No Depression	57(74)	24(55.8)
Mild	9(11.7)	5(11.6)
Moderate	8(10.4)	5(11.6)
Severe	2(2.6)	6(14)
Very severe	1(1.3)	4(3.3)
Total	77(100)	43(100)

Table 3. The correlation between depression scores of mothers in case group with the type of cerebral palsy in their children.

Type of CP	N	Mean score of depression	SD	P-value	F-value
Spastic Diplegic	23	20.00	2.78	0.339	1.72
Spastic Quadriplegic	5	15.40	3.35		
Athetoid	4	13.75	6.02		
Spastic Hemiplegic	3	27.00	20.22		
Others	8	11.50	13.22		
Total	43	17.79	12.98		

Discussion

The result of this study showed mothers having CP children have more depressive symptoms, which supports results of previous studies.

In a study from Turkey (3) quality of life, anxiety and depression and their relationship with disability severity were studied. Mothers of children with CP had lower quality of life and high level of depression. The instrument to evaluate depression was BDI-II.

A study conducted (4) on 270 children with CP reported that 30% of mothers having CP children had the symptoms of depression above cut off on Center for Epidemiologic studies Depression (CED) Scale Short Form; however, the severity of disability did not anticipate mother's depression. Social support is effective in moderating the relationship between children's functional status and the maternal depression. Although above studies carried out on non-Iranian mothers, with different familial and cultural characteristics, support the result of this study.

Another study (5) showed that after the first year of children's lives, mothers of premature infants with risk for developing CP in comparison with mothers of infants considered not to be at risk for CP had equal level of depression. The study was conducted in the first year of life of infants; maybe there was necessary more time for developing CP in high risk premature infants and therefore depression in their mothers.

Chronic health conditions of children such as mental retardation, speech disorders and autism also may lead to maternal psychosocial problems. Gotz and Gotz (1) reported some emotional processes are predictable in parents having children with chronic health condition. The first phase is getting shocked about having CP children which totally changes their lives then, they experience denying, sadness and disappointment respectively. Mothers having mental retarded children have problems in social interaction and neglect their own social needs. The severity of mental retardation has a direct relationship with their leisure time and social interaction (7). Kuhsali *et al.* (6) observed that mothers of children with mental retardation had limited social adaptation. In one study (12) the relation between speech disorders and mother's depression as well as anxiety were evaluated. Depressive symptoms were significantly more than control group; however, the maternal anxiety did not have the same results.

In other studies (13-15) it was indicated that mothers of autistic and mental retarded children had depressive symptoms based on BDI-II.

Hoar (16) in a study of mothers of mental retarded children reported they are at risk of stressors.

Glasscoe *et al.* (17) in study of mothers of children with cystic fibrosis reported that mothers' BDI scores were significantly higher than control mothers.

The other study (9) carried out in Iran on 3 groups of mothers of children with thalassemia, blood cancer and control mothers showed that, there was a significant difference between maternal depression and the mentioned chronic health conditions. The instrument used to assess depression was BDI-II.

In current study there were no significant differences between disabilities severity, the type of CP and maternal depression. The study by Ones (3) and Manual (4) supports this findings. In conclusion, it seems that having a CP child may lead to maternal depression; therefore, to improve rehabilitation processes of CP children support of mothers who play a key role in treatment and rehabilitation of children with CP is needed.

Hence, psychological status of mothers should be considered by health professionals and treatment or prevention of depression of mothers is recommended for improving the rehabilitation process and achieve better results in these children. This study was conducted on mothers and fathers are neglected. As fathers have a significant role in family, examining the fathers' status may also improve the quality of interventions.

This study was cross-sectional; whereas doing interventional studies and evaluating the improvement rate of mothers' psychological problems may improve the process of CP children's rehabilitation.

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References

1. Götz I, Götz M. Cystic fibrosis: psychological issues. *Paediatr Respir Rev* 2000;1(2):121-7.
2. Bristol MM, Gallagher JJ, Schopler E. Mothers and fathers of young developmentally disabled and nondisabled boys: adaptation and spousal support. *Dev Psychol* 1988;24(3): 441-51.

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- Ones K, Yilmaz E, Cetinkaya B, Caglar N. Assessment of the quality of life of mothers of children with cerebral palsy (primary caregivers). *Neurorehabil Neural Repair* 2005;19(3):232-7.
- Manuel J, Naughton MJ, Balkrishnan R, Paterson Smith B, Koman LA. Stress and adaptation in mothers of children with cerebral palsy. *J Pediatr Psychol* 2003;28(3):197-201.
- Lambrenos K, Weindling AM, Calam R, Cox AD. The effect of a child's disability on mother's mental health. *Arch Dis Child* 1996;74(2):115-20.
- Kuhsali M, Mirzamani SM, Mohammadkhani P, Karimlou M. Comparison of social adaptation between mothers of educatable mental retarded children with mothers of normal children in Kashan. *J Rehabil Psychol Dis* 2007;40-6.
- Shariati N, Davarmanesh A. The effects of mental retardation of child on family. Welfare Organization of Iran, 2005.
- Norouzinezhad GH. The evaluation of Depression incidence and severity in parents of children with cancer. *Khordad Med J* 2004;55:40-60.
- Sharghi A, Nabaie B, Perak M, Farokhi A. Depression in mothers of children with Thalassemia or hematologic cancers in Child Medical Center. *TUMJ* 2003;63(7):599-606.
- Palisano R, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol* 1997;39(4):214-23.
- Sadock BJ, Sadock VA. Kaplan and Sadock's Synopsis of psychiatry: Behavioral Sciences and Clinical Psychiatry. 9th ed. Philadelphia: Lippincott Williams & Wilkins; 2002. p. 1161-79.
- Rudolph M, Rosanowski F, Eysholdt U, Kummer P. Anxiety and depression in mothers of speech impaired children. *Int J Pediatr Otorhinolaryngol* 2003;67(12):1337-41.
- Olsson MB, Hwang CP. Depression in mothers and fathers of children with intellectual disability. *J Intellect Disabil Res* 2001;45(Pt 6):535-43.
- Reddon JE, McDonald L, Kysela G. Parental coping and family stress; Resources for and functioning of families with a preschool child having a developmental disability. *Early Child Dev Care* 1992;83(1):1-26.
- Warfield ME, Krauss MW, Hauser-Cram P, Upshur CC, Shonkoff JP. Adaptation during early childhood among mothers of children with disabilities. *J Dev Behav Pediatr* 1999;20(1):9-16.
- Hoare P, Harris M, Jackson P, Kerley S. A community survey of children with severe intellectual disability and their families: psychological adjustment, carer distress and the effect of respite care. *J Intellect Disabil Res* 1998;42(Pt 3):218-27.
- Glasscoe C, Lancaster GA, Smyth RL, Hill J. Parental depression following the early diagnosis of cystic fibrosis: a matched, prospective study. *J Pediatr* 2007;150(2):185-91.