

The Prevalence of Challenging Behaviors in 6-11 Years Old Children with Cerebral Palsy

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Abstract

Introduction: Addressing behavioral problems helps facilitate social interactions and community acceptance of children with cerebral palsy. This study examines the prevalence of behavioral challenges in children with cerebral palsy. **Materials and Methods:** A hundred children with cerebral palsy {mean age (\pm SD)=8.47 (\pm 1.86) years} took part in this study. To measure behavioral disorders, Rutter's children's behavior questionnaire was used. Raven test was employed to measure IQ of the children. Spearman correlation coefficient was used to investigate the relationship between behavioral disorder with IQ and age. One-way ANOVA test was applied to evaluate the types of behavioral disorders in 4 groups of cerebral palsy. **Results:** The results have not shown any significant relationship between the total score of the Rutter form with intelligence and age ($r = 0.08$ and 0.09 $P > 0.05$). Aggression, hyperactivity, and attention deficit disorders between the athetoid group and different groups of cerebral palsy were shown to be significant. There was no marked difference in depression, social incompatibility, and antisocial behaviors among different groups of cerebral palsy. **Conclusion:** The results of this study show that there is a disparity in challenging behaviors in different groups of cerebral palsy. To improve the quality of life of these groups of children, further studies are recommended to figure out intervention processes to address their challenging behaviors as much as possible.

Keywords: Cerebral Palsy, Behavioral Disorders, Children

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Introduction

Cerebral palsy is considered as a disorder which influences movement and body condition and caused by injury during brain development (1-3). In addition to motor and emotional complications, the lesion may occur before or shortly after birth, which may be accompanied by various behavioral problems (4, 5). Behavioral disturbances represent a condition in which one or more characteristics emerge over a period of time and often include hyperactivity disorder, attention and concentration deficit, violence, and anxiety. These behavioral problems can ultimately affect the learning and educational performance of children with cerebral palsy. Students with behavioral characteristics are people who

behave in a different way against social norms in comparison with their peers (6-8). Of course, a few studies have been conducted on the prevalence of behavioral disorders in children with cerebral palsy. Children with cerebral palsy are the most referred rehabilitation services clients. In these children normal motor development is disturbed due to damage to the central nervous system. Cerebral palsy is one of the disorders affecting not only the child but also his/her family members (9-11).

In addition to motor impairment, most children with cerebral palsy, have complications such as limited attention, seizures, uncontrollable behaviors, and cognitive-behavioral problems, which eventually affect their educational capability (12, 13). Behavioral problems negatively affect a child's personal

Table 1. Mean (SD) of Rutter form score in different Cerebral Palsy group (n=100)

Diagnosis	AG.HYP	DEP.ANX	ODD	OCD	DES.NOAT
Spastic	23.97 (27.81)	42.45 (22.28)	32.85 (18.57)	21.62 (11.90)	46.42 (26.48)
Hypotonic	24.26 (21.65)	44.43 (22.22)	39.00 (12.09)	25.35 (14.73)	46.00 (20.62)
Athetoid	49.04 (27.37)	28.23 (13.98)	40.00 (27.34)	22.91 (22.18)	77.08 (21.56)
Ataxic	13.56 (12.67)	29.71 (19.60)	31.50 (12.68)	18.56 (13.19)	31.50 (14.96)
Total	29.20 (26.67)	35.32 (20.35)	36.28 (19.27)	22.19 (16.45)	51.92 (27.16)

*DES.NOAT: Attention Deficit; *OCD: Conduct Disorder; *ODD: Oppositional Defiant Disorder; *DEP.ANX: Anxiety and Depression; *AG.HYP: Aggression and Hyperactivity

Table 2. Results of One-way ANOVA

Dependent Variable	Diagnosis (I)	Diagnosis (J)	Mean Difference (I-J)	Sig
Aggressive and Hyper activity	Spastic	Hypotonic	-6.27	0.744
		Athetoid	-33.99	0.000
		Ataxic	3.14	0.985
	Hypotonic	Athetoid	-27.72	0.000
		Ataxic	9.41	0.433
		Athetoid	37.14	0.000
Defective Attention	Spastic	Hypotonic	-5.20	0.865
		Athetoid	-42.17	0.000
		Ataxic	6.40	0.775
	Hypotonic	Athetoid	-36.97	0.000
		Ataxic	11.60	0.313
		Athetoid	48.57	0.000

and social development. Facilitating cognitive skills and challenging behaviors to consolidate social interaction and community acceptance of children with cerebral palsy are one of the most important goals of rehabilitation (14). To address this issue, the present study examines a number of behavioral problems such as disturbance in concentration, incompatibility, and fear in children with cerebral palsy.

Materials and Methods

In this descriptive-analytical study, 100 children with cerebral palsy (mean age 8.48) participated in this study. Inclusion criteria were the following: 1) to be diagnosed with cerebral palsy based on physician's report; 2) age range of 6-11 years; and 3) understanding the questionnaires in the Persian language. Challenging behaviors were assessed by Rutter Students' behavior assessment tool. For this purpose, an occupational therapist who has 5 years' experience in working with disabled children completed the form by interviewing child's teacher or caregiver. Moreover, Raven test was used to measure IQ of children by a trained occupational therapist.

All participants read and signed consent form before starting the project, and ethical approval was obtained from the Occupational Therapy Research Committee (IUMS).

The Rutter's children's questionnaire contains 30 items (in 5 domains: aggression and hyperactivity, anxiety and depression, conduct disorder, oppositional defiant disorder, and attention deficit) completed by the therapists. Each question takes 0 to 2 scores. A score of 0 indicates the lack of desired behavior and a score of 2 indicates the complete existence of the desired behavior. A child who receives a score of more than 9 has a behavioral disorder. The validity and reliability of this form have been tested by several studies (15, 16).

Statistical analysis

Shapiro-Wilk test revealed that data distribution was normal ($P_{i>0.05}$)(17). Descriptive statistics were used for measuring mean and standard deviation. Spearman correlation coefficient was used to investigate the relationship between behavioral disorder and age. For Spearman coefficient, a value of 0.50 or above was considered as high, a value of 0.30-0.35 as moderate, and a value less than 0.30 as weak correlation (18). One-way ANOVA test was performed to evaluate the types and distribution of behavioral disorders in those 4 groups of children with cerebral palsy. The significance level was less than 0.05. Statistical calculation was conducted in IBM SPSS (version 18) software (19).

Results

Based on the demographic data, 100 children (4 groups; 25 children per group) with cerebral palsy in the age range of 11-6 years [with mean age (\pm SD)=8.47 (\pm 1.86) years; 44 females and 56 males] were studied (spastic, hypotonic, athetoid, and ataxia).

Table 1 shows the types of behavioral disorders in different groups based on the Rutter form score. The results did not show a significant relationship among the total score of the Rutter form and intelligence and age ($r=0.08$ and 0.09 , $P>0.05$, respectively).

In table 2, 5 groups of behavioral disorders are presented separately in 4 groups of cerebral palsy affected children. Our findings revealed that anger, hyperactivity, and attention disorder between the athetoid group ($P<0.001$) and other groups [spastic ($P>0.01$), hypotonic ($P>0.01$), and ataxia ($P>0.01$)] are significantly different. No significant difference in depression, social incompatibility, and antisocial behaviors was observed among different groups ($P>0.01$).

Discussion

The aim of this study was to investigate the types of challenging behaviors in 6-11 years old children with cerebral palsy. The results of this study established that attention deficit disorder scored the highest and the antisocial behavior disorder scored the lowest. Our finding is corroborated by several studies related to this area. In children with cerebral palsy, due to neurological damage in high cortical brain centers, attention and concentration impairment were noted (20-22).

Because of the perceptual and motor characteristics among these children, they need more empathy and seem to be more fragile in comparison with their normally developed peers. As a result, aggressive and hyperactive behaviors in children with cerebral palsy are less common than in children with normal development. Antisocial behaviors are also less common among these children due to motor restriction. As motor and mental capability are limited among these children, social interactions such as the inability to perform activities of daily living, perception-movement activities, and play may be affected. As a consequence, anxiety and depression may be seen among these children (23-25).

Aggression and hyperactive disorders are more common in the athetoid group than in other groups when they were compared in 4 groups of children with cerebral palsy. This result can stem from the involvement of extra pyramidal pathway which relevant to the maladaptive movement. In addition, due to the involvement of the core nucleus and its association with the

thalamus, self-control skills are not developed enough in children with cerebral palsy and minimum stimulation can cause anger (26). This also comes true aggregation and hyperactive disorder to the higher prevalence of attention deficit in this group of cerebral palsy (27, 28).

The results of this study did not show a significant relationship between the behavioral related forms and age. According to the Jones theory, in children with cerebral palsy, the more the ages, the more is the behavioral stability. The findings of this study are in contrast with previous reports (29-31). Probably the low number of samples in this study has resulted in this consequence (32). There is also no significant relationship between the score of behavioral disorders and intelligence. The limitations of the present study include parents' inadequate information on their children's behavioral problems, and small sample size. Lack of matched healthy subjects to compare the results was the limitation of this study, so it is suggested that they should be considered in the future studies.

Conclusion

The results of this study showed that various types of behavioral disorders are diverse in different types of cerebral palsy cases, which could be considered for more effective intervention planning.

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Conflict of interest:

None

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Authors' contributions:

All authors made substantial contributions to conception, design, acquisition, analysis and interpretation of data.

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