Research Paper

Physical Activity, Function, and Well-being in Mothers with Disabled Children

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ABSTRACT

Purpose: This study aimed to evaluate the physical activity, functional capacity, and psychological well-being of mothers with physically and mentally disabled children and mothers without disabled children.

Methods: A total of 105 mothers living in Gaziantep city participated in this study. The mothers' ages ranged from 23 to 59 years. The physical activity levels of the mothers were assessed using the international physical activity qquestionnaire-short form (IPAQ-SF), their functional capacities were measured using the 6-minute walk test (6-MWT), and their psychological well-being was evaluated using the Beck depression inventory (BDI).

Results: At the end of the study, the IPAQ total metabolic equivalent (MET) scores and 6-MWT walking distances were similar between groups (P>0.05). When comparing the total BDI scores, the psychological well-being scores of mothers with non-disabled children were significantly lower than those of mothers with disabled children (P<0.05).

Conclusion: Mothers of physically or mentally disabled children had similar scores in terms of physical activity and functional capacity compared to mothers without disabled children; however, their psychological well-being scores were worse.

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Highlights

• When grouped according to their children's disability status, no significant differences were observed in education level, employment status, or consanguineous marriage rates among the groups.

• No differences were observed between the groups in terms of total MET values from the IPAQ questionnaire and the 6-MWT distances.

• Mothers of non-disabled children exhibited significantly lower BDI scores compared to mothers of children with intellectual disabilities.

Plain Language Summary

This study focused on mothers of children with physical disabilities, intellectual disabilities, and no disabilities. The average age of the mothers was approximately 39 years, and nearly half were between 34 and 45 years old. A significant proportion (73.3%) of them were unemployed, and a substantial number (43.8%) had only a primary school education. Additionally, 39% of the patients were in consanguineous marriages. The results showed that mothers had similar physical characteristics and activity levels, regardless of their child's disability status. However, mothers of physically disabled children tended to be more active than those of children with intellectual disabilities or no disabilities. The severity of the children's disabilities also varied: most children with physical disabilities had moderate limitations, while most children with intellectual disabilities had only mild impairment. One of the most crucial findings was that mothers of children with disabilities experienced higher psychological distress compared to mothers of non-disabled children. Mothers of children with intellectual disabilities reported the highest distress levels, while those with physically disabled children had similar distress levels. This suggests that raising a child with a disability can be emotionally challenging, even if a mother's physical activity and daily routines seem unchanged. These findings underscore the importance of providing more psychological support and community resources for families raising children with disabilities. Supporting mothers' mental well-being not only benefits them but also helps improve the overall family environment and the quality of care they can provide to their children.

Introduction

It has been reported that 10% of the population worldwide consists of people with disabilities, and 500 million of these individuals are children. This situation is expected to become a public health problem, and the number of disabled people may increase [1, 2]. Although it varies among societies, individuals with disabilities face significant challenges in their lives. They must fight to integrate themselves and their disabled children into society. While catering to the needs of their disabled child, they must also meet societal roles and expectations [3]. Mothers primarily take on the role of caregiving, development, and meeting the needs of a disabled child [4]. This poses a risk to the health of mothers [1]. The emotional well-being of individuals in families with disabled members is adversely impacted. Parents of children born with any disability experience higher levels of stress and depression compared to parents of healthy children [5, 6]. The risk of physical inactivity is also high among parents of disabled children [7], with particular emphasis on the fact that the parent primarily responsible for caregiving has a lower level of physical activity [8]. Considering the physical inactivity, psychosocial health, and depression scores of mothers with disabled children, it is evident that their functional capacities may also be negatively affected [1, 5-7]. Upon reviewing the literature related to our research topic, we observed that very few studies were available [9]. Furthermore, no studies have been found that compared the psychological well-being, functional capacity, and physical activity levels of mothers of children with different types of disabilities. Therefore, this study aims to address this gap and draw attention to this issue.

Materials and Methods

This cross-sectional and descriptive study was conducted between January 2020 and November 2021 with mothers whose children attended various facilities for special education and rehabilitation centers in the city of

Gaziantep and mothers without disabled children who were affiliated with schools under the Gaziantep provincial directorate of national education The inclusion criteria included willingness to participate in the study, age between 18 and 65 years, no history of orthopedic surgery, and being a mother without any disabilities. The exclusion criteria included failure to meet at least one of the qualifying conditions, lack of interest in study participation, desire to withdraw from the study for any reason, chronic diseases, and pregnancy.

Instruments

Table 1 presents the characteristics of the mothers. The participants' physical activity was evaluated using the international physical activity questionnaire short form (IPAQ-SF). IPAQ-short consists of seven questions divided into four sections. The inquiries covered physical exercises conducted for a minimum of 10 minutes within the last 7 days. The metabolic equivalent (MET) method was used to assess physical activity levels [10]. The sedentary or inactive group included participants who engaged in <600 MET-minutes/week of physical activity; the moderately active group comprised individuals who performed between 601 and 3000 MET-minutes of physical activity per week, while the physically active category involved those exceeding 3000 MET-minutes of exercise weekly [11]. An investigation was conducted to confirm the Turkish adaptation's correctness and coherence [12]. All tests were administered by a research physiotherapist who asked the mothers the questionnaire questions in face-to-face interviews to ensure accurate responses.

The functional capacities of the individuals were assessed using the 6-minute walk test (6-MWT). The 6-MWT is a quick and cost-effective field test method used to measure physical function by having individuals walk a predetermined distance within a set time [13]. A 30-meter walking area was marked for the test, with markers placed every 3 m. Orange traffic cones indicated turning points. Participants were informed before the test to wear appropriate, comfortable clothing and shoes. The pre-test instructions included advice to eat a light meal before the test and to avoid any heavy physical activity within 2 hours before the test. The total distance walked by the patient was recorded in meters [14]. Research in healthy populations suggests that the 6-MWT distance should range between 400 and 700 m [15]. The 6-MWT was administered by a research physiotherapist who provided the necessary instructions and guidance.

The psychological well-being of the individuals was assessed using the Beck depression inventory (BDI) [16]. Turkish adaptation of the BDI is available [17]. The scale consists of 21 items, each presenting four options (0-3) that reflect increasing severity of depressive symptoms. The overall score on the scale ranges from 0 to 63, where 0 represents the minimum and 63 represents the maximum achievable score. In studies conducted using this scale in Turkey, scores are interpreted as follows: Scores of 0-10 points are considered normal, while scores above 40 indicate severe depression. The cutoff point for the scale is specified as 17 [16, 17]. The BDI was administered to all participants through face-to-face interviews with a research physiotherapist.

Statistical analysis

The number of participants to be included in the study was calculated as 35, considering a moderate effect size (approximately 0.25), a significance threshold of α=0.05, and a statistical power of 1-β=0.80. The data obtained from the participants were analyzed using SPSS software, version 24.0. Frequencies and percentages were provided for categorical variables, while Means±standard deviations were presented for numerical variables. The Shapiro-Wilk test was used to assess normality, the Kruskal-Wallis test was applied for group comparisons, and the Mann-Whitney U test was used for parameters that were non-normally distributed. A significance was set as $P<0.05$ [18, 19].

Results

The average age of the mothers participating in the study was 38.61±8.49 years, with the majority (51.4%) falling within the 34-45 age range. When the mothers were grouped according to the disability status of their children, the physical properties were similar ($P>0.05$) (Table 1).

It was observed that the majority of the participating mothers, 43.8%, were primary school graduates, 73.3% were unemployed, and 39.0% were in a consanguineous marriage. When the mothers were grouped according to the disability status of their children, it was found that their education level, employment status, consanguineous marriage, and severity of their children's disabilities were similar ($P>0.05$). Among mothers with physically disabled children, 51.43% had children with a moderate level of physical disability. For mothers of children with intellectual disabilities, the most common severity of the disability was mild (74.28%, $P<0.05$) (Table 2).

Table 1. Comparison of mothers by physical properties

Groups	Mean±SD (Min-max)			
	Age (y)	Height (cm)	Body Weight (kg)	Body Mass Index (kg/cm²)
Mothers without disabled children	40.89±9.33 (26-59)	164.26±4.96 (155-174)	70,29±10.26 (53-92)	26.17±4.43 (18-36)
Mothers with physically disabled children	38.20±9.04 (23-56)	163.30±4.95 (15 0-174)	72.23±10.46 (58-95)	26.51±4.27 (18-39)
Mothers with mentally disabled children	36.74±6.52 (23-52)	162.40±5.19 (150-172)	68.77±11.23 (48-95)	26.03±4.30 (18-39)
P	0.19	0.238	0.453	0.367

PHYSICAL TREATMENTS

Table 3 presents a comparison of total MET values from the IPAQ questionnaire, total distances recorded during the 6-MWT, and BDI scores among mothers of children with intellectual disabilities, physical disabilities, and those with non-disabled children. No statistically significant differences were observed among the three groups in terms of total MET scores from the IPAQ and total walking distances measured in the 6-MWT (P>0.05). However, a significant difference was detected in BDI scores between the groups (P<0.05). Mothers of non-disabled children exhibited significantly lower BDI scores compared to mothers of children with intellectual disabilities (P<0.05). Furthermore, the BDI scores of mothers of children with both intellectual and physical disabilities showed no significant difference (P>0.05) (Table 3).

Table 2. Comparison of sociodemographic characteristics of the mothers

Characteristics		No. (%)			P
		Mothers Without Disabled Children (n=35)	Mothers With Physically Disabled Children (n=35)	Mothers With Mentally Disabled Children (n=35)	
Child's disability level	Mild level	-	8(22.86)	26(74.28)	0.000*
	Moderate level	-	18(51.43)	6(17.14)	
	Severe level	-	9(25.71)	3(8.57)	
Disabled children	1 child	-	32(91.43)	30(85.71)	0.000*
	>1 child	-	3(8.57)	5(14.29)	
Consanguineous Marriage	Yes	15(42.86)	13(37.14)	13(37.14)	0.906
	No	20(57.14)	22(62.86)	22(62.86)	
Mother's employment status	Working	11(31.43)	5(14.29)	12(34.29)	0.145
	Not working	24(68.57)	30(85.71)	23(65.71)	
Mother's education level	Illiterate	3(8.57)	-	2(5.71)	0.094
	Primary school graduate	15(42.86)	18(51.43)	13(37.14	
	Middle school graduate	7(20.0)	13(37.14)	8(22.86)	
	High school graduate	3(8.57)	4(11.43)	6(17.14)	
	College graduate	1(2.86)	-	1(2.86)	
	University graduate	6(17.14)	-	5(14.29)	

*P<0.05 "chi-square test".

PHYSICAL TREATMENTS

Table 3. Comparison of mothers' 6-MWT durations, BDI, IPAQ total MET, and activity level scores

Groups	Mean±SD (Min-max)			IPAQ Activity Level, No. (%)			
	6-MWT	BDI	IPAQ Total MET	Inactive	Minimally Active	Very Active	Total
Mothers without disabled children	550.49±84.12 (385-665)	10.74±8.44 (0-30)	6521.71±4986.27 (462-22890)	5(14.29)	20(57.14)	10(28.57)	35(100.0)
Mothers with physically disabled children	548.46±88.75 (405-784)	19.14±9.77 (0-43)	10500.19±8340.55 (0-27642)	4(11.43)	11(31.43)	20(57.14)	35(100.0)
Mothers with mentally disabled children	512.71±95.93 (330-676)	20.57±8.30 (6-40)	6866.66±4637.00 (462-24192)	6(17.14)	12(34.29)	17(48.57)	35(100.0)
P	0.151	0.000* a,b	0.193	0.128c			

*P<0.05, [a] Mothers without disabled children - mothers with mentally disabled children, [b] Mothers without disabled children - mothers with physically disabled children, [c] Chi-square test.

Abbreviations: 6-MWT: 6-minute walk test; BDI: Beck depression inventory; MET: Metabolic equivalent; IPAQ: International physical activity questionnaire-short form.

Discussion

The results revealed that mothers of children with disabilities experienced a greater impact on their psychological well-being compared to those with non-disabled children. However, physical activity levels and functional capacities were comparable between the two groups. Regarding demographic variables, a general resemblance was observed between mothers with and without disabled children. A notable similarity was observed in the educational background, particularly among individuals with lower educational levels, such as those who are illiterate or have completed primary school. This consistency is likely influenced by the fact that all participating mothers resided in the city of Gaziantep. Most participants, both mothers of children with disabilities and those without, were primary school graduates.

In the present study, 44% of mothers of childeren with disabilities had completed primary school. The education levels of the mothers were compared with those of other national studies. In a study conducted by Öztürk, which focused on the needs of families raising children with disabilities, the percentage of primary school graduates was reported as 48%. Similarly, Albayrak's study identified this rate as approximately 36%. Another study by Şahin Varol, which explored the relationship between social support and depression in mothers of children with disabilities, indicated that 32% of participants had a primary school education. Despite being conducted in different regions, these studies present results on maternal education levels that are largely consistent with the findings of this study [12, 20, 21].

The employment status of the mothers involved in this study was examined, revealing that the majority across all three groups were unemployed and primarily engaged as housewives. Although the groups showed similarities, the highest unemployment rate was observed among mothers of physically disabled children. This trend may be linked to the increased caregiving demands often required for children with physical disabilities, as care needs can differ depending on the type and severity of the disability [22, 23]. It is suggested that the more intensive care requirements of physically disabled children could contribute to this pattern. The study findings showed that a significant proportion (66%) of mothers raising children with intellectual disabilities were not employed. Similarly, research by Karadağ, which compared parents of children with intellectual disabilities to those of typically developing children, found that 83% of mothers caring for children with disabilities were not engaged in formal employment, with the majority being homemakers [24] aligning closely with the current findings. Furthermore, two separate studies documented unemployment rates among mothers of disabled children ranging from 83% to 85%. The 86% unemployment rate among mothers of physically disabled children identified in this study is consistent with these earlier results [25, 26].

In this study, it was identified that 83% of the mothers with disabled children were older than 30 years. Consistent with previous studies, it has been observed that most mothers caring for children with disabilities are typically over the age of 30 [27, 28].

In this study, the weekly energy expenditure levels among mothers in all three groups, measured by the Total MET score for physical activity, were similar. Pandemic-related restrictions may have contributed to physical inactivity, even among mothers without disabled children. When average energy expenditure was examined individually for each group, although the differences were not statistically significant, mothers without disabled children displayed the lowest energy expenditure levels. Tonga et al. examined the factors contributing to back pain among mothers of children with disabilities. It was noted that only half of the non-ambulatory children utilized wheelchairs at home. Additionally, 65% of mothers regularly lifted children weighing >20 kg. The study highlighted that as the severity of the child's disability intensified, mothers often faced greater physical demands, including lifting, carrying, transferring, and pushing, which increased their physical strain [29]. Additionally, activities, such as transporting children with both intellectual and physical disabilities to therapy sessions, special education centers, and medical appointments may have contributed to the observed energy expenditure. The higher energy expenditure levels among mothers of physically disabled children in this study align with these factors and existing literature.

Functional capacity refers to an individual's ability to generate sufficient aerobic energy for performing daily life activities effectively [30]. A key objective of this research was to evaluate and contrast the functional capacity of mothers raising children with physical or intellectual disabilities and those without disabled children. The observed similarity in weekly energy expenditure levels among the groups my have influenced these findings. Due to the pandemic conditions, the 6-MWT was administered only once to all mothers without prior practice, which may have contributed to lower walking distances in the groups.

Research has demonstrated that mothers of children with disabilities face a higher risk of psychological challenges compared to those with non-disabled children [31, 32]. Uğuz et al. identified elevated levels of depression mothers of disabled children compared to their counterparts without disabled children [6]. Similarly, Aysan and Özben found significantly higher depression scores in mothers caring for disabled children. Their findings suggested that compromised psychological well-being in these mothers could be attributed to limited external support, their caregiving role within the family, and a self-identity closely tied to child and family care responsibilities [33]. The findings of the current study align with these results, as mothers of disabled children demonstrated significantly poorer psychological well-being compared to mothers without disabled children. Another noteworthy observation, though not statistically significant, was that mothers of physically disabled children exhibited slightly better psychological well-being scores compared to those caring for children with intellectual disabilities. It is believed that the additional physical demands associated with the daily care and personal needs of physically disabled children might contribute to more pronounced depressive symptoms in these mothers.

Conclusion

This study highlights the benefits of providing psychosocial support to mothers caring for children with disabilities. Most mothers, regardless of their child's disability status, were unemployed, had a primary school education, and had similar physical activity levels. While mothers of children with intellectual disabilities and non-disabled children were mostly inactive, those caring for physically disabled children were highly active. Weekly energy expenditure and functional capacity were similar across groups, but BDI scores indicated higher psychological well-being in mothers of children with disabilities.

Limitations and suggestions of our study are that it was conducted in only one province. More comprehensive studies evaluating mothers of disabled children living in different socioeconomic regions in terms of physical activity, functional capacity, and depression levels, and comparing them with mothers of non-disabled children, will contribute more significantly to the field of pediatric rehabilitation. Due to the COVID-19 pandemic, which affected the world during the study period, we were unable to include a larger sample size. Since the research was conducted with mothers of disabled and non-disabled children in the province of Gaziantep, and socio-cultural structures can vary from province to province, the results cannot be generalized to all of Turkey. It would be beneficial for mothers of disabled children to be referred to public institutions and organizations providing mental health services, as well as to non-governmental organizations, associations, and foundations, for regular assessments of their psychological well-being scores and to receive the necessary support.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of SANKO University, Gaziantep, Türkiye (Code: 2020/9 dated 07.07.2020). This study was conducted by the guidelines of the Declaration of Helsinki and the ethical principles applied in research involving human participants at SANKO University.

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Authors' contributions

Research concept and design, collection and/or assembly of data, data analysis and interpretation: Kasim Çelik and Arzu Demirgüç; Writing the article and final approval of the article: All authors; Critical revision of the article: Arzu Demirgüç and Engin Ramazanoğlu.

Conflict of interest

The authors declared no conflict of interests.

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