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Assessment of Individuals with Special Needs in Motor Development Presenting to the Pediatric Disability Health Board

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Abstract

Background: Developmental assessments are crucial for identifying moderate and severe special needs in children, ensuring their needs are recognized early and supported through Special Needs Reports for Children (SNRFC). This study aimed to evaluate the characteristics of pediatric patients with special needs in motor development who applied to the disability health board, focusing on their age, diagnoses, and the most common associated or accompanying disorders and the relationship between these terms.

Methods: A retrospective analysis was conducted on patients evaluated at the Pediatric Disability Health Board Polyclinic and the Physical Medicine and Rehabilitation Health Board Polyclinic.

Results: Among 1,507 patients admitted to the Pediatric Disability Health Board, 420 patients (6.57 ± 4.86 years) had varying levels of special needs related to motor development. Of these 420 patients, 147 patients (6.89 ± 4.74 years) were classified as having the most severe disability (HSCN), and 151 patients (5.19 ± 4.71 years) were categorized in the mildest disability group (HSN), with the remainder distributed across five intermediate levels in between. Cerebral palsy was the most frequent diagnosis in the HSCN. Other common diagnoses included epilepsy, specific motor developmental disorder, microcephaly, and hydrocephalus. Among the HSCN group, 60 individuals were also assessed as having severe disabilities in cognitive development. Trisomy 21 was the most common diagnosis, followed by specific motor developmental disorders and cerebral palsy in the HSN.

Discussion: The evaluation of individuals applying to the Pediatric Disability Health Board revealed that the largest group of patients in motor development had the HSN, followed by those with the HSCN. Cerebral palsy was the predominant diagnosis in the HSCN group, while trisomy 21 was most common in the HSN group. Additionally, patients with severe motor disabilities frequently had concurrent cognitive and nervous system impairments.

Conclusion: These findings provide valuable insights for physicians working in Pediatric and Physical Medicine and Rehabilitation Health Boards, facilitating more comprehensive evaluations of comorbid conditions and guiding the preparation of SNRFC for better patient management. Early recognition and documentation of special needs through these assessments play are critical in ensuring children receive timely developmental and educational support. This process helps address immediate and long-term needs, improving outcomes for children with disabilities.

Keywords: Health board, pediatric disability, motor development

INTRODUCTION

Disability is described as the inability to participate in regular daily activities and meet basic needs, as well as insufficient physical, mental, intellectual, and social capacities due to congenital or acquired diseases (1). Having a broader coverage, the term "having special needs" has started to supplant the word "disabled" in recent years. "Special need" refers to the requirement for educational, healthcare, rehabilitation services, assistive devices such as orthoses or prostheses, and environmental modifications. These needs, along with various social and economic rights and services, enable children with physical or functional differences from their typically developing peers to participate equally in

social life (2).

The early identification of motor disabilities and associated conditions is crucial for directing appropriate rehabilitation and therapeutic interventions. According to the World Health Organization (WHO), developmental disabilities, including motor disorders, impact nearly 200 million children globally, with the highest prevalence in low- and middle-income countries (1-3). Children with disabilities typically participate in fewer school, recreational, and social activities than their non-disabled peers, and as they become older, the diversity of their participation declines. Children with movement disorders represent a particularly vulnerable subgroup, as these disorders frequently affect not only motor function but also cognitive and sensory systems, which can lead to more complex care requirements (4,5).

Developmental assessments in pediatric populations are vital for the early detection and management of special needs, to help guide interventions, particularly for children with motor disabilities. Identifying such needs allows for the timely provision of appropriate interventions and services, improving overall outcomes and quality of life (3-6). In Turkiye, the Special Needs Report for Children (SNRFC) plays a central role in documenting these developmental challenges and ensuring access to resources. This report facilitates tailored support for children by categorizing their developmental challenges, including physical, cognitive, linguistic, and psychosocial needs (7,8).

As outlined in the SNRFC regulation, which took effect in February 2019, special needs levels are classified based on the severity of the condition. These levels include: “has special needs (HSN)” (20-39%), “mild special needs” (40-49%), “moderate special needs” (50-59%), “severe special needs” (60-69%), “very severe special needs” (70-79%), “significant special needs” (80-89%), and “has special condition needs (HSCN)” (90-99%). The classifications “very severe special needs,” “significant special needs” and “HSCN” all indicate a severe level of disability (9,10).

In the SNRFC framework, special needs are categorized into 23 distinct areas, encompassing physical structure, systems, functions, activities, life participation limitations, and diseases. Among these areas, movement development and rheumatology fall within the domain of physiatrists. According to current literature, movement development disorders rank as the second most common cause of disability in children, following psychiatric and cognitive conditions. This underscores the critical role of physiatrists in the SNRFC evaluation process, given their expertise in managing movement-related disabilities (9-12). Despite the critical importance of early developmental assessments in identifying and addressing the diverse needs of children with motor disabilities, there remains a paucity of comprehensive studies specifically examining the characteristics and comorbidities of pediatric patients seeking SNRFC (13).

In this study, a retrospective analysis for a detailed examination of the patients’ diagnoses and special needs levels, providing valuable insights into their developmental challenges was conducted on pediatric patients who applied for SNRFC at a major healthcare facility. This study focuses on evaluating the characteristics of pediatric patients with special needs in motor development who applied to the disability health board for a SNRFC assessment, focusing on their age, diagnoses, and the most common associated or accompanying disorders and the relationship between these terms. The findings of this research are expected to offer insights for clinicians and policymakers in pediatric healthcare and rehabilitation, promoting early and comprehensive care for children with motor disabilities.

METHODS

Participants

A retrospective analysis was conducted on patients evaluated at the Pediatric Disability Health Board Polyclinic and the Physical Medicine and Rehabilitation Health Board Polyclinic of Istanbul Kanuni Sultan Süleyman Training and Research Hospital between January 1, 2023, and December 31, 2023. Pediatric patients who applied for Special Needs Report for Children (SNRFC), aged 0-18 years that attended the Physical Medicine and Rehabilitation Outpatient Clinic were included. Applications related to age determination, status reports, and transfer procedures were excluded.

Data for this study were retrospectively extracted from the hospital’s electronic computing system, ensuring a comprehensive and accurate collection of patient records. Since all patient data were systematically documented within this digital platform, there were no missing data in the dataset, allowing for a complete analysis of the study population.

The results of the SNRFC assessments were analyzed in terms of sociodemographic characteristics, reasons for admission, and diagnoses related to the movement system, special needs levels, and areas of special needs.

Disability Assessment

The reports included in this study were based on evaluations conducted in accordance with the “Regulation on Special Needs Assessment for Children” published in the Official Gazette on 20.02.2019, issue number 30692 (7).

The assessment of movement development includes an evaluation made by an expert physiatrist through a comprehensive process involving a detailed review of the patient’s medical history, relevant imaging studies,

and a thorough physical examination. The findings from these assessments are meticulously documented in the patient's file and entered into the hospital's electronic computing system for accurate record-keeping and further analysis. The assessment of the movement development encompasses six specific categories. These categories include:

1. Gross motor development,
2. Fine motor development,
3. Amputations,
4. Fractures,
5. Congenital or acquired deformities of the locomotor system, infections, and other locomotor issues arising from diseases or treatments affecting the locomotor system,
6. Pain, which was assessed separately.

For gross and fine motor development, children are further categorized by developmental stages starting from birth to allow for a more detailed evaluation. In cases of amputations and fractures, the assessment accounts for both upper and lower extremities, as well as unilateral or bilateral involvement (7).

Ethical Approval

Ethics committee approval for this study was granted by the Istanbul Kanuni Sultan Süleyman Training and Research Hospital Clinical Research Ethics Committee (approval no: KAEK/2024.09.190), in compliance with the Declaration of Helsinki. All patient data were anonymized to maintain confidentiality, ensuring that no identifiable information was used in the analysis. Since this was a retrospective study, formal consent from patients was waived, but all data were collected and handled following institutional guidelines to ensure ethical integrity.

As the study included the reports of all patients admitted between January 1, 2023, and December 31, 2023, the entire population was retrospectively incorporated into the analysis. Consequently, no additional sampling was performed, and the study was based solely on the existing study population (study group). Since the goal was to include the entire population, a sample eligibility test was deemed unnecessary.

STATISTICAL ANALYSIS

The data collected from all participants in the study group were analyzed using IBM SPSS (Version 21.0, Armonk, NY: IBM Corp.). Initially, a normality analysis was conducted, with the Kolmogorov-Smirnov test applied to assess the distribution of special needs levels and proposed special needs between boys and girls. To evaluate gender-based differences in the prevalence of motor disabilities, a chi-square test was applied. Descriptive statistics, including mean and standard deviation, were used to evaluate the data and presented in tables. Proportional data were shown as percentages (%), numerical data as counts (n), and normally distributed data as mean ± standard deviation. Statistical significance was set at $p<0.05$.

RESULTS

The data were determined to be normally distributed, allowing for the use of parametric statistical methods. Between January 1, 2023, and December 31, 2023, a total of 1,507 pediatric patients, with a mean age of 9.11 ± 2.53 years, applied to the Pediatric Disability Health Board seeking the Special Needs Report for Children (SNRFC). Among these patients, 48.2% (n=727) were first-time applicants, 18.4% (n=277) were appeal cases, and 33.4% (n=503) were renewals. The majority of the patients, 93.6% (n=1,412), were diagnosed with at least one condition falling under a special needs category.

Motor Development-Related Special Needs

Out of the total 1,507 patients, 420 (27.8%) were identified as having varying levels of special needs related to motor development, with a mean age of 6.57 ± 4.86 years. Among these 420 patients, 47.8% (n=201) were female, and 53.2% (n=219) were male. A statistically significant difference was found between the levels of special needs in boys and girls ($p<0.02$).

The classification of these 420 patients based on the severity of motor disabilities revealed that 35% (n=147) were categorized as having the most severe disability (HSCN), while 35.9% (n=151) were placed in the mildest disability group (HSN). The remaining patients were distributed across five intermediate disability levels. Results are presented in **Table 1.**

Table 1. Distribution of special needs among patients

Category	Motor Development Special Needs Patients (N=420)	Percentage
Gender Distribution		
Boys	201	47.8%
Girls	219	53.2%
Special Needs Classification		
HSCN (Most Severe)	147	35%
HSN (Mildest)	151	35.9%
Intermediate Disability Levels	122	29.1%

HSCN Group (Most Severe Disability)
The average age of the 147 patients classified as having the most severe disability (HSCN) was 6.89 ± 4.74 years. Cerebral palsy was the most common diagnosis in this group, affecting 57.8% of the patients. Other prevalent diagnoses included epilepsy (12.9%), specific motor developmental disorder (10.9%), microcephaly (6.8%), and hydrocephalus (6.1%).

A notable finding was that 40.8% (n=60) of the patients in the HSCN group also had severe cognitive developmental disabilities in addition to their motor impairments, highlighting the frequent overlap between motor and cognitive disabilities in this population.

HSN Group (Mildest Disability)
In the mildest disability group (HSN), consisting of 151 patients, the mean age was 5.19 ± 4.71 years. Trisomy 21 (Down syndrome) was the most common diagnosis in this group, accounting for 29.8% of cases. This was followed by specific motor developmental disorder (23.1%) and cerebral palsy (6.6%). The relatively high prevalence of developmental delays in children with trisomy 21 and other mild motor impairments underscores the need for early intervention and ongoing developmental support.

Overall Distribution of Diagnoses
Across the entire cohort of 420 patients who had a special need in motor developmental assessment, cerebral palsy was the most frequent diagnosis, followed by trisomy 21, specific motor developmental disorder, epilepsy, and microcephaly. The findings are shown in Table 2.

DISCUSSION

TThe results of this study highlight the diverse spectrum of motor development-related special needs among pediatric patients applying for the SNRFC assessment. Notably, 27.8% of the 1,507 patients exhibited varying levels of disability relevant to motor development, underscoring the importance of early and comprehensive assessments. Among these children, the distribution between the most severe and mildest disability groups (HSCN and HSN, respectively) reveals a wide range of motor impairments, with significant implications for clinical management and intervention strategies.

A key finding in this study is the significant gender difference in motor disabilities, with boys presenting a higher prevalence compared to girls. This aligns with existing literature suggesting that boys are more commonly affected by certain neurodevelopmental and motor disorders, such as cerebral palsy (9,12). Research into gender differences in motor developmental disabilities suggests that both biological and environmental factors play a crucial role in shaping these disparities (14).

Studies indicate that motor development may follow distinct patterns in boys and girls, with boys often exhibiting delayed motor milestones compared to girls (15). These differences have led to the recommendation of gender-specific norms for clinical assessments to ensure more accurate diagnoses and intervention plans. Additionally, the response to stimulating activities, such as physical therapy or play-based interventions, has been found to differ between genders, with boys and girls benefiting from tailored approaches that align with their developmental trajectories (16). This highlights the importance of individualized therapeutic strategies that account for gender-specific needs, ultimately improving the efficacy of early interventions (17).

In the most severe disability group (HSCN), cerebral palsy was the most common diagnosis, in consistence with global trends where cerebral palsy is recognized as the leading cause of physical disability in children (18). Additionally, many patients (%40.8) in the HSCN group exhibited comorbid cognitive disabilities, further complicating their developmental trajectory and necessitating a multidisciplinary approach to care. The high rate of comorbidity suggests that comprehensive evaluations of both motor and cognitive functions are essential to develop targeted interventions that address the full spectrum of impairments (1,6,8).

In contrast, the mildest disability group (HSN) was dominated by children with trisomy 21 (Down syndrome). While children with Down syndrome typically have mild to moderate motor impairments, early interventions can significantly enhance their motor development. The presence of the diagnosis of "specific motor developmental disorder" in both severe and mild disability groups highlights the complexity and variability in motor development, even within similar diagnostic categories. This finding also underscores the importance of individualized care plans that account for both the severity of the disability and the specific needs of the child (6,19,20).

Table 2. Diagnoses in different special needs groups of special needs among patients

Diagnosis	HSCN Group (n=147)	HSN Group (n=151)	Overall (n=420)
Cerebral Palsy	57.8 %	6.6 %	27.8 %
Trisomy 21	0.2 %	29.8 %	13.8 %
Specific Motor Development Disorder	10.9 %	23.1 %	17.2 %
Epilepsy	12.9 %	3.2 %	7.7 %
Others	18.2 %	37,3 %	33.5 %

HSN; Has Special Needs, HSCN; Has Special Condition Needs

The overall results emphasize the role of physiatrists and other specialists in the comprehensive assessment and management of disability relevant to motor development. With movement-related disorders being the second most common cause of pediatric disability after psychiatric and cognitive conditions, physiatrists play a critical role in evaluating and managing these patients. The significant overlap between motor and cognitive impairments, especially in severe cases, further highlights the necessity of a multidisciplinary approach that includes pediatricians, neurologists, and mental health professionals to ensure holistic care (3,6,21).

Developmental assessments in pediatric populations are crucial for the early detection and management of special needs, guiding targeted interventions, especially for children with motor disabilities. The findings of this study will help identify such needs, facilitating timely access to appropriate interventions and services, ultimately enhancing overall outcomes and quality of life for affected children. Early intervention has been well-documented to play a pivotal role in improving the long-term prognosis for children with conditions such as cerebral palsy, Down syndrome, and other motor developmental disorders. In the most severe cases, such as those classified under HSCN, initiating therapy, rehabilitation, and multidisciplinary support early in life can significantly enhance motor skills, cognitive function, and overall quality of life. For children with less severe disabilities, early interventions can potentially prevent the progression of secondary complications, such as musculoskeletal deformities, and foster greater independence in daily living (22,23).

This study's strengths lie in its comprehensive and inclusive approach, evaluating all patients who applied for the SNRFC assessment within the specified timeframe. As a retrospective cohort study, it provides valuable insights into the characteristics and distribution of disabilities in motor development without the introduction of selection bias typically associated with prospective studies.

Limitations

The retrospective nature of the study also presents certain limitations. The reliance on existing records may introduce inconsistencies or omissions in the data. Additionally, while the study benefits from a large sample size, it is constrained by its observational design, which limits the ability to establish causality or control for potential confounding variables. Despite these limitations, the study offers important insights into the prevalence and severity of disabilities in motor development, contributing to the understanding and management of pediatric special needs.

CONCLUSION

This study provides valuable insights into the characteristics of pediatric patients with disabilities relevant to motor development who applied for SNRFC assessments. The findings reveal a wide spectrum of motor impairments, with a significant portion of patients experiencing severe disabilities, often accompanied by cognitive impairments. The gender-based differences in motor disabilities call for gender-sensitive approaches to both assessment and treatment. Additionally, the high rate of comorbidities, especially in severe cases, underscores the importance of multidisciplinary care models. Future research should focus on developing a more comprehensive assessment scheme as well as the long-term effects of early interventions, personalized rehabilitation strategies, and the integration of social and cognitive support provided by these schemes to enhance patient outcomes.

DECLARATIONS

Conflict of interests: The authors declare that they have no potential conflict of interest regarding the investigation, authorship, and/or publication of this article.

Ethical Approval: This study was approved by University of Health Sciences Istanbul Kanuni Sultan Suleyman Training and Research Hospital with the Approval No. 2024.09.190.

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