Identifying and Addressing Gross Motor Developmental Delays in Children with Special Needs: A School-Based Initiative in Pune City

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ABSTRACT

Gross motor development is a critical aspect of a child's overall growth, influencing mobility, coordination, and daily functioning. However, children with special needs often experience delays in motor skill development, affecting their physical capabilities and overall quality of life. This study examines the gross motor developmental levels of children with special needs in Pune City, using the Test of Gross Motor Development-2 (TGMD-2). Data was collected from a special children school, where 40 students were selected (boys=29 and girls=11) of age group between 7-11 years which are diagnose with Autism Spectrum Disorder, Learning Disabilities, Attention Deficit Hyperactivity Disorder and Down Syndrome. Descriptive Statistics was used to analyse the gap between chronological age and age-equivalent motor skills, the study identifies key areas of developmental delay. The research also explores the impact of specialized interventions and educational programs in improving motor skills, emphasizing the need for structured physical activities.

Keywords : Gross motor development, Locomotor tests, Object control tests, Special Children, Age equivalent, Quotient mean

Introduction

Gross motor skills are essential for performing everyday movements such as walking, jumping, running, and throwing. These skills not only influence physical activity levels but also play a vital role in social and cognitive development. However, children with special needs, including those with autism spectrum disorder (ASD), Down Syndrome (DS), and Developmental coordination disorder (DCD), often exhibit delays in gross

motor development. These delays can lead to difficulties in balance, coordination, and participation in structured physical activities.

A previous study was conducted on children from the same school, highlighting the need for a deeper understanding of developmental delays. Recognizing this, the researcher aims to assess the initial motor skill levels to better address these challenges and create a foundation for more effective experimental research in the future.

Research Objective:

The purpose of the study is to measure the gross motor development in children with special need and assess specific areas of motor skill deficits that is loco-motor like locomotor and object control.

Research Methodology:

Participants

The study included children of aged 7–11 years with special needs, enrolled at Rewachand Bhojwani Academy. Participants were selected using purposive sampling to ensure a diverse representation of motor development challenges. The sample consisted of children diagnosed with Autism Spectrum Disorder (ASD), Learning Disabilities (LD), Attention Deficit Hyperactivity Disorder (ADHD), and Down Syndrome (DS). A total of 40 children were selected for the study.

Data Collection Tool

Motor skill assessments were conducted using the Test of Gross Motor Development – Second Edition (TGMD-2), a standardized tool for evaluating gross motor proficiency. The assessment included:

- Locomotor Skills: Running, hopping, horizontal jumping, and sliding.
- Object Control Skills: Catching, kicking, overhand throwing, and underhand rolling.

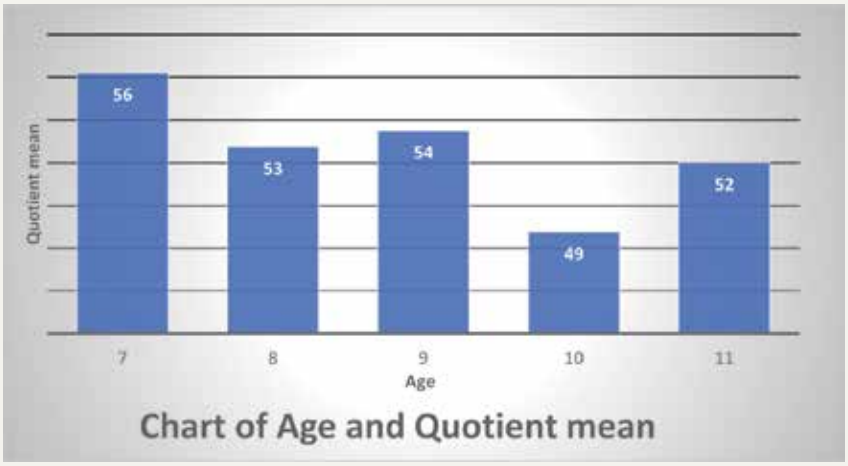
These evaluations provided insights into the participants' motor skill levels, helping identify developmental delays and potential areas for intervention.

Data Analysis

Data was analysed using descriptive statistics and the TGMD-2 test procedures to assess motor skill development and identify patterns of developmental delay

Table No.1 : *Analysis of Age and Quotient mean*

Age	Quotient
7	56
8	53
9	54
10	49
11	52



The table presents the Age and Quotient Mean for children with special needs across different age groups (7–11 years). The Quotient Mean is derived from the sum of standard scores for locomotor skills and object control skills.

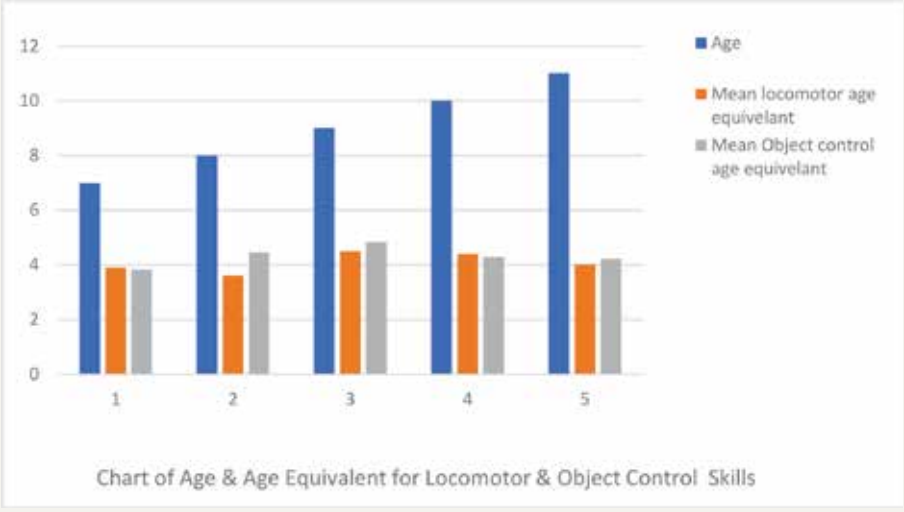
In the corresponding bar chart:

- The X-axis represents the five age groups (7–11 years).
- The Y-axis represents the Quotient Mean.
- The bars illustrate the Quotient Mean for each age group:
    - Age 7: 56
    - Age 8: 53
    - Age 9: 54
    - Age 10: 49
    - Age 11: 52

The data indicates variations in motor skill development across age groups, highlighting a decline at age 10 (49) before a slight recovery at age 11 (52). This trend suggests the need for targeted interventions to support motor skill development in children with special needs.

Table no.2 : *Analysis of Age, Mean locomotor age equivalent and Mean object control age equivalent*

Age	Mean locomotor age equivalent	Mean Object control age equivalent
7	4	4
8	4	4
9	5	5
10	4	4
11	4	4



Interpretation of the Graph:

This chart presents data on the chronological age, locomotor skill age equivalent, and object control skill age equivalent of children with special needs. The X-axis represents five age groups (7–11 years), while the bars illustrate different measures: chronological age (blue), locomotor skill age equivalent (orange), and object control skill age equivalent (grey).

The analysis, based on the TGMD-2 test procedures, highlights a noticeable gap between chronological age and motor skill development. While children in the youngest age group (7 years) exhibit nearly equivalent developmental levels, the gap widens in older age groups, indicating that motor development has not progressed in line with chronological age. This suggests that with access to specialized education or targeted physical activity programs within their schools, these children may have had greater opportunities for motor skill development.

Summary

This study examines the gross motor development of children with special needs in Pune City using the Test of Gross Motor Development-2 (TGMD-2). Conducted at Rewachand Bhojwani Academy, the study included 40 children (29 boys, 11 girls) aged 7–11 years, diagnosed with Autism Spectrum Disorder (ASD), Learning Disabilities (LD), Attention Deficit Hyperactivity Disorder (ADHD), and Down Syndrome (DS). Using descriptive statistics, the study identified significant gaps between chronological age and motor skill development.

Results from the locomotor and object control tests revealed that while 7-year-olds exhibited near-equivalent motor skills, older age groups showed increasing developmental delays. The Quotient Mean analysis also indicated inconsistencies, with the lowest score observed at age 10 (49), suggesting a decline in motor development before a slight recovery at age 11 (52).

The findings highlight the need for structured physical activity programs and specialized interventions to support motor skill development in children with special needs.

Conclusion

The study underscores the importance of early identification and intervention for gross motor developmental delays in children with special needs. The widening gap between chronological age and motor skill age-equivalents suggests that without targeted support, these children may struggle to develop essential motor competencies.

Introducing structured physical education programs, occupational therapy, and school based interventions could play a crucial role in enhancing locomotor and object control skills. Future research should focus on experimental interventions to assess the effectiveness of various training programs in improving motor proficiency. Strengthening inclusive education and adaptive physical activities could provide these children with better opportunities for physical, social, and cognitive growth.

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