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Prevalence of Dyscalculia and Math Anxiety Among College Students

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Abstract-
Mathematics-related learning difficulties and emotional barriers such as math anxiety are increasingly recognized as significant challenges among college students. The present study aimed to assess the prevalence of dyscalculia and math anxiety among college students. A cross-sectional descriptive research design was adopted, and the study was conducted among 60 undergraduate and postgraduate students aged 18–25 years from arts, science, and commerce streams, selected using a stratified random sampling technique. Data were collected using a self-structured questionnaire designed to assess math anxiety levels and related learning difficulties. Descriptive statistical methods, including frequency, percentage, mean, and standard deviation, were used for data analysis. The results revealed that a substantial proportion of students experienced moderate to high levels of math anxiety, indicating that math anxiety is prevalent among college students. The findings highlight the need for early identification, academic support, and targeted interventions to reduce math anxiety and address learning difficulties related to mathematics. The study emphasizes the importance of creating supportive learning environments in higher education institutions to enhance students' confidence and performance in mathematics.

Keywords- Dyscalculia, Math Anxiety, Learning Disability

1. Introduction

Mathematics competence is essential for success in higher education, influencing academic performance, problem-solving ability, and employability across disciplines. At the college level, students are expected to apply numerical reasoning in coursework related not only to science, technology, engineering, and mathematics (STEM) but also to economics, social sciences, health sciences, and everyday decision-making. Despite this expectation, a substantial number of college students continue to experience persistent difficulties with mathematics, often rooted in earlier, undiagnosed learning problems (Parsons & Bynner, 2005; OECD, 2012).

One significant contributor to ongoing mathematical difficulties is **dyscalculia**, a specific mathematical learning disorder characterized by deficits in number sense, arithmetic fact retrieval, calculation accuracy, and mathematical reasoning. Dyscalculia is classified under Specific Learning Disorders in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) and is considered neurodevelopmental in origin (American Psychiatric Association, 2013). While dyscalculia is commonly identified during primary schooling, evidence suggests that many affected individuals reach higher education without diagnosis or

support, carrying their arithmetic difficulties into adulthood (Butterworth & Laurillard, 2010; Shalev, 2007).

The prevalence of dyscalculia has been estimated at approximately 3–6% in the general population; however, prevalence rates among college students remain underexplored, particularly in non-Western educational contexts (von Aster & Shalev, 2007; Kucian & von Aster, 2015). In higher education, dyscalculia often manifests as slow and error-prone calculations, difficulty interpreting graphs and statistics, and avoidance of quantitatively demanding courses. These challenges can significantly limit academic choices and career trajectories (Geary, 2011; Parsons & Bynner, 2005).

Alongside dyscalculia, math anxiety represents a critical affective factor influencing mathematical performance among college students. Math anxiety is defined as feelings of tension, apprehension, or fear that interfere with mathematical problem-solving and performance (Ashcraft, 2002). Research consistently demonstrates that math anxiety negatively affects working memory, leading to reduced accuracy and efficiency in arithmetic tasks (Ashcraft & Krause, 2007; Beilock & Willingham, 2014). Importantly, math anxiety is highly prevalent in higher education settings, even among students without formally diagnosed learning disorders (Dowker, Sarkar, & Looi, 2016).

Emerging evidence indicates a strong association between dyscalculia and math anxiety. Students with persistent arithmetic difficulties often experience repeated academic failure, which contributes to negative self-beliefs and heightened anxiety toward mathematics (Carey, Hill, Devine, & Szűcs, 2016). This interaction creates a vicious cycle in which cognitive deficits exacerbate anxiety, and anxiety further impairs mathematical performance, particularly under evaluative conditions common in college assessments (Ramirez et al., 2013).

Despite the significant academic and psychological implications, dyscalculia and math anxiety remain largely underrecognized in higher education institutions. Screening and support services are often geared toward literacy-related learning disabilities, leaving mathematical learning disorders insufficiently addressed (Butterworth & Laurillard, 2010). Consequently, many college students struggle silently, experiencing academic stress, reduced confidence, and limited engagement with quantitative learning.

Given these concerns, examining the prevalence of dyscalculia and math anxiety among college students is essential to understand the magnitude of the problem and inform inclusive educational practices. Identifying the co-occurrence of these conditions can aid educators, counsellors, and policymakers in developing early screening mechanisms, targeted interventions, and supportive learning environments. Therefore, the present study aims to assess the prevalence of dyscalculia and math anxiety among college students and explore their implications for higher education outcomes.

Objective of the Study-To assess the prevalence of dyscalculia and math anxiety among college students.

2. Research Methodology

2.1 Research Design

A cross-sectional descriptive study design was adopted to assess the prevalence of dyscalculia and math anxiety among college students. This design is appropriate for estimating prevalence and examining associations between variables at a single point in time.

2.2 Study Population-

The study population comprised undergraduate and postgraduate college students enrolled in arts, science, and commerce streams. Students aged 18–25 years were considered eligible for participation.

2.3 Sample Size and Sampling Technique

A sample of college students was selected using a stratified random sampling technique, ensuring representation across gender and academic streams. Stratification was done based on faculty (arts, science, commerce) to reduce sampling bias. Total 60 students were selected for the study.

2.4 Tool of the Study

The study employed a self-structured questionnaire designed to assess the prevalence of dyscalculia and math anxiety among college students.

2.5 Inclusion Criteria: Undergraduate college students aged 18–25 years, enrolled in arts, science, or commerce streams, who have completed formal mathematics education up to the secondary level and provided informed consent.

Exclusion criteria: Students with diagnosed intellectual disability, neurological or severe psychiatric disorders, sensory impairments affecting assessment, or those unwilling to participate or providing incomplete responses.

3. Results and Discussion-The results indicate that a considerable proportion of college students experience moderate to high levels of math anxiety, highlighting it as a prevalent academic concern. These findings underscore the need for timely identification and supportive strategies to address mathematics-related difficulties in higher education.

Table 1: Demographic Profile of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–20	22	36.7
	21–23	24	40.0
	24–25	13	21.6
	>25	1	1.7
Total		**60**	**100**

Table 1 presents the age-wise distribution of the study participants. Out of 60 college students, the majority belonged to the age group of 21–23 years (40.0%), followed by 18–20 years (36.7%). Students aged 24–

25 years constituted 21.6% of the sample, while only 1.7% were above 25 years of age. This distribution indicates that most participants were within the typical college-going age range, which is considered developmentally appropriate for examining academic emotions such as math anxiety during higher education (Eccles & Wigfield, 2002).

Table 2: Descriptive Statistics of Math Anxiety Scores

Variable	N	Mean	Standard Deviation	Minimum	Maximum
Math Anxiety Score	60	35.20	12.82	15	68

Table 2 shows the descriptive statistics of math anxiety scores among college students. The mean math anxiety score was 35.20 with a standard deviation of 12.82, indicating a moderate level of math anxiety with substantial variability among students. The wide range of scores (15–68) suggests marked individual differences in emotional responses to mathematics. Similar variations in math anxiety levels among college students have been reported in previous research, highlighting math anxiety as a common yet heterogeneous phenomenon (Ashcraft & Krause, 2007; Hembree, 1990).

Table 3: Prevalence of Math Anxiety Levels

Math Anxiety Level	Score Range	Frequency (n)	Percentage (%)
Low Anxiety	≤ 25	16	26.7
Moderate Anxiety	26–40	24	40.0
High Anxiety	> 40	20	33.3
Total		**60**	**100**

Table 3 depicts the prevalence of different levels of math anxiety among the participants. The findings indicate that 40.0% of students experienced moderate math anxiety, while 33.3% exhibited high math anxiety, and only 26.7% reported low levels of math anxiety. Overall, 73.3% of students demonstrated moderate to high math anxiety, suggesting that math anxiety is highly prevalent among college students. This aligns with earlier studies which report that math anxiety persists into higher education and can adversely affect academic performance, self-efficacy, and career choices (Richardson & Suinn, 1972; Ashcraft, 2002).

Conclusion-

The present study concludes that math anxiety is highly prevalent among college students, with a majority exhibiting moderate to high levels of anxiety toward mathematics. These findings highlight the importance of early screening, academic support, and anxiety-reducing instructional strategies to improve students' mathematical confidence and learning outcomes in higher education.

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