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Prevalence Level and Strategies of Overcoming Dyscalculia Among Primary School Pupils

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Abstract

Dyscalculia is a specific learning disability that impairs mathematical abilities. It presents significant challenges to affected individuals, particularly primary school pupils who struggle with basic arithmetic. This study investigated prevalence levels and strategies of overcoming dyscalculia among primary pupils. The study adopted a descriptive survey research design. Simple random sampling techniques were used to select 116 public primary school teachers in Kwara State, Nigeria. A researcher-self-constructed instrument titled "Prevalence Level and Strategies of Overcoming Dyscalculia Questionnaire" (PLSODQ) was used for data collection, with a reliability coefficient of 0.76. Descriptive statistics were used to answer the research question, while an independent sample t-test was used to test the hypothesis. The findings revealed that the prevalence level of dyscalculia among primary school pupils as perceived by teachers is at an average level. Also, the strategies of overcoming dyscalculia among primary school pupils as perceived by teachers. Primary school teachers agreed that dyscalculia could be overcome by exposing pupils to education and employing an individualized teaching method, among others. Finally, there was no significant difference between male and female primary school teachers' perceived prevalence level of dyscalculia among primary school pupils. It was recommended that seminars and conferences should be organized for teachers.

INTRODUCTION

Background of the Study

Dyscalculia is a specific learning disability that impairs mathematical abilities. It presents significant challenges to affected individuals, particularly primary school pupils who struggle with basic arithmetic, number sense, and other math-related tasks. Individuals with dyscalculia may have difficulty with basic numerical concepts, estimation, and problem solving involving numerical relationships. This neurological condition differs from general mathematical anxiety in that it focuses on difficulties with numerical cognitive processing (Butterworth et al., 2019). Timely identification and focused intervention are essential for assisting individuals with dyscalculia, as they can alleviate adverse impacts on academic achievement and self-worth (Ashkenazi et al., 2019).

Learning disorders impact a significant segment of the global population, affecting children's educational experiences and overall quality of life. According to the World Health Organization (WHO), 10 to 15% of children worldwide suffer from learning disorders such as dyslexia, dysgraphia or dyscalculia. These conditions disrupt specific learning processes and require individual support for children in order to achieve academic success. Dyscalculia a less well-known but significant learning disability that affects between 3 and 6 per cent of school-age children worldwide, causing difficulties in basic mathematical skills such as number understanding, arithmetic operation, and spatial reasoning.

Many countries recognize the importance of addressing learning disabilities, and have implemented early intervention programmers and support education environments in schools to help students facing these challenges (Smythe et al., 2022). Dyscalculia is a significant challenge for educational psychology and child development. According to Butterworth et al. (2019), it is similar to dyslexia but is frequently overlooked and undertreated due to a lack of awareness among teachers and parents. The lack of a diagnosis is concerning because dyscalculia can significantly impede a child's academic progress and limit future career opportunities. Dyscalculia affects approximately 3 to 8% of global population and is frequently associated with emotional and social problems such as low self-esteem and math-related anxiety (Kaplan & Meylani, 2025). In the recent past, global attention and effort has been directed to the creation of evaluating instruments and intervention mechanisms to help children with dyscalculia acquire basic mathematical competencies (Nazari et al., 2022).

Problem of the Study

In Nigeria, dyscalculia and other learning disabilities are receiving recognition as serious learning problems requiring intervention. As Abubakar (2024) reported, these parents were saying that the children struggling with learning disabilities in Nigeria face numerous challenges — only a small proportion, around 10% ever receives some kind of help or even therapy. Diagnosis and access to support are also affected by the sociocultural context which includes stigma and low awareness among parents and teachers. Price and Ansari (2021), indicate that there is wide variability of the symptoms of the disorder, but, the common feature includes the difficulty in perceiving and assigning meanings to numbers, order of numbers and performing simple calculations.

Understanding that “5” means five things or that her fingers should mean five things, becomes a nigh impossible task for such children as does memorizing simple math facts. Because they struggle to comprehend simple ideas, they are always seen counting on their fingers or using other methods to carry out simple calculations and most basic concepts. Children with memory dyscalculia often do not have the ability to remember the elementary facts of mathematics that would allow them to add, subtract, divide and multiply as such they would benefit from revising with an adult. This can render them incapable of executing calculations which involve recalling previous learnt mathematics strategies.

Research’s State of the Art

Loredo et al. (2025) suggested that the likelihood of experiencing dyscalculia may be as a result of family history. Gilmore (2023) state that on the neurological level, the parietal lobe is abnormal and especially the intraparietal sulcus which is responsible for the understanding of numbers and calculating. Environmental factors such as poor adult education, insufficient number-related activities, and adverse learning circumstances are also among the possible factors along with genetic and neurological precursors of dyscalculia. Focus on interactional activities and positive experiences with mathematics in early childhood may help in reducing the chances of developing this specific learning difficulty. Other factors include family income, as lack of appropriate level of education can affect the formation of primary skills necessary for mastering mathematical concepts (Ramirez et al., 2019).

A number of risk factors can increase a child's likelihood of developing dyscalculia. One important risk factor is a family history of learning difficulties, which suggests a genetic predisposition; children who have parents or siblings who struggle with math are more likely to experience dyscalculia themselves (Butterworth et al., 2019). Dyscalculia is more likely to affect children who have co-occurring learning difficulties, such as dyslexia or attention-deficit hyperactivity disorder (ADHD), as

these illnesses often include overlapping cognitive deficits (Das & Biswal, 2025). Low birth weight and premature birth are also linked to a higher incidence of learning problems like dyscalculia.

Research indicates that infants who are born underweight or prematurely are more likely to experience neurological development issues, which can affect their cognitive abilities in mathematics (Smythe et al., 2022). The risk of dyscalculia in children can be raised by environmental factors such as ongoing stress, inadequate instruction, and restricted exposure to numerical learning during early education (Mazzocco et al., 2020). A child's education is significantly impacted by dyscalculia, which also affects their self-confidence and academic progress. While many topics need quantitative reasoning and numerical data, children with dyscalculia may face challenges outside of math classrooms.

Lower academic performance, increased homework anxiety, and a dislike of math-related tasks can all be consequences of this (Caviola et al., 2021). These difficulties may be misconstrued by parents and teachers as a sign of insufficient drive or effort, which can exacerbate the child's displeasure. Reducing these difficulties requires early detection and focused intervention. It has been demonstrated that strategies that include assistive technology, individualized education, and multimodal learning are successful in helping students with dyscalculia (Espinas et al., 2025). Dyscalculia impacts overall development and] social relationships in addition to academic achievement. Kids who have trouble with basic math abilities may not be able to do everyday tasks that include numbers, such handling money, playing certain games, or understanding time. As a result, social connections may become more challenging since children with dyscalculia may feel excluded or alone in activities that their peers enjoy. Social isolation and discontent from these experiences may result in behavioral problems or social disengagement, which may affect the child's emotional and social development, claim Lievore et al. (2025). Adults with dyscalculia may have anxiety that impacts their ability to manage their finances, relationships with others, and job opportunities (Nazari et a., 2022).

Gap Study and Objective

Dyscalculia has been well-known as a long-term mathematical learning disorder that impairs children with the capacity to comprehend numbers and carry out simple arithmetic tasks (Butterworth et al., 2019). It has been estimated that one in three to seven per cent of school-aged children has dyscalculia, and its significance to academic achievement and self-esteem is significant (Haberstroh and Schulte-Korne, 2019). Mazzocco et al. (2020) found that children who have poor numerical cognition tend to have lower fluency in symbolic and non-symbolic number processing, which results in learning gaps in the long term. On the same note, Kaplan and Meylani (2025) highlighted that cognitive and emotional variables, including math anxiety, increase the challenges experienced by pupils with dyscalculia.

Abubakar (2024), discovered in the Nigerian setting that learning disabilities awareness and diagnosis are low, with less than 10 per cent of the affected pupils receiving specific assistance. Olorukooba et al. (2020), also found insufficient teacher training and the lack of inclusive instruction methods to be the key obstacles to early intervention. The research in Malaysia and India also demonstrates different levels of prevalence, moderate to high, based on the awareness of teachers and the availability of resources (May et al., 2021; Goel, 2021; Kaur et al., 2024). These results suggest that sociocultural and institutional influences have a strong impact on the way teachers perceive dyscalculia and their capacity to deal with it successfully.

Intervention-based studies indicate that multisensory learning, personalised teaching, and technology-based teaching can enhance mathematical understanding in learners with dyscalculia (Jadhave et al., 2025). Similarly, educational games and digital animations encourage learning and retention in mathematics classes (Lazo-Amado et al., 2022). Regardless of these findings, literature has rarely investigated the prevalence of how teachers can overcome dyscalculia, especially in Nigerian primary schools. Additionally, the gender disparity in the perception of teachers towards dyscalculia has not been extensively studied within Nigeria. Hence, this study aims to: 1) Identify the level of

prevalence of dyscalculia among primary school students as perceived by teachers in Kwara State, Nigeria; and 2) Determine the approaches that teachers have used to overcome dyscalculia in primary school students.

METHOD

Type and Design

The study investigated the prevalence level and strategies of overcoming dyscalculia among primary school pupils; a quantitative descriptive survey research design was adopted for this study. This was adopted because the researchers sought teachers' views regarding the prevalence level of dyscalculia among primary school pupils and strategies for overcoming these learning disabilities.

Data and Data Sources

Primary data was the source of the study's data, with the study population comprising of all public-school teachers in Ilorin South Local Government Area of Kwara State. At the same time, the target population is class teachers teaching basic mathematics to elementary school pupils. Based on the Kwara State annual school census report (2020), there are 1166 teachers in Ilorin South Local Government Area which comprises 280 male and 886 female teachers. Simple random sampling techniques were used to select one hundred and sixteen primary mathematics teachers who participated in this study. Of the 116 teachers, 23 were male and 93 were female.

Data Collection Technique

A researcher self-constructed instrument titled "Prevalence Level and Strategies of Overcoming Dyscalculia Questionnaire" (PLSODQ) was used for data collection. PLSODQ was subdivided into three sections: section A comprises the demographic distributions of the respondents based on gender, section B consist of 10 items on a Likert scales of Always, Sometimes and Never measuring the prevalence of Dyscalculia while section C comprise of 8 items on a Likert scale of Strongly agree, Agree, Disagree and Strongly disagree measuring strategies of overcoming Dyscalculia. PLSODQ was validated by three lecturers in the Faculty of Education, University of Ilorin, Kwara State, Nigeria. To establish the reliability of the PLSODQ, the test-retest reliability method was used. Twenty-five copies of PLSODQ were administered twice within the interval of two weeks to teachers who are not part of the original sample used for this study. Data obtained from the two administrations were correlated using Pearson Product-Moment Correlation, and a reliability index of 0.76 was established.

Research Hypothesis

H_{01}: There is no significant difference between male and female primary school teachers Perceived prevalence level of Dyscalculia among primary school pupil.

Data Analysis

Data collected from this study were analysed using descriptive and inferential statistics. Demographic distribution and the research question were analysed using descriptive statistics of frequency, percentage, mean, and standard deviation, while the hypothesis was analysed using inferential statistics of the independent sample t-test at the 0.05 level of significance.

RESULTS

The data presented in Table 1 shows that of the 116 participants, 23 were male, making up 19.8% of the sample, and 93 were female, making up 80.2%. This suggests that female teachers made up the majority of the respondents.

Table 1. Distribution of participants based on Gender

Gender	Frequency	Percentage
Male	23	19.8
Female	93	80.2
Total	**116**	**100**

Research Question One: What is the prevalence level of Dyscalculia among primary school pupils as perceived by teachers.

Table 2. Prevalence level of Dyscalculia among primary school pupils as perceived by teachers

ITEMS	Always	Sometime	Never	Mean
My pupils easily lose interest in mathematics	20 (17.2%)	84 (72.4%)	12 (10.3%)	2.07
My pupils have problems comprehending numbers, shapes, capacity, adding and subtracting	20 (17.2%)	68 (58.6%)	28 (24.1%)	1.93
My pupils finds it hard to understand word problem	26 (22.4%)	68 (58.6%)	22 (19.0%)	2.03
My pupils encountered some issues executing mathematics operations	24 (20.7%)	67 (57.8%)	25 (21.6%)	1.99
My pupils finds it difficult working with signs (-, +)	25 (21.6%)	40 (34.5%)	51 (44.0%)	1.78
My pupils often have issues identifying shapes and patterns	38 (32.8%)	60 (51.7%)	18 (15.5%)	2.17
My pupils find it difficult solving word problem	14 (12.1%)	68 (58.6%)	34 (29.3%)	1.83
My pupils often had difficulty recalling multiplication tables	21 (18.1%)	69 (59.5%)	26 (22.4%)	1.96
My pupils often get tired of learning mathematics	28 (24.1%)	63 (54.6%)	25 (21.6%)	2.03
My pupils often fail class assessment	5 (4.3%)	86 (74.1%)	25 (21.6%)	1.83
Weighted Mean				**1.96**

Decision Rule: Low level *(1.00 – 1.49)* **Average Level** *(1.50 – 2.49)* **High level** *(2.50 – 3.00)*

Table 2 reveals the prevalence level of dyscalculia among primary school pupils as perceived by teachers. The respondents reveals that their pupils sometimes do the following: easily lose interest in mathematics (2.07), have problems comprehending numbers, shapes, capacity, adding and subtracting (1.93), finds it hard to understand word problem (2.03), encountered some issues executing mathematics operations (1.99), finds it difficult working with signs (-, +) (1.78), have issues identifying shapes and patterns (2.17), find it difficult solving word problem (1.83), often had difficulty recalling multiplication tables (1.96), usually get tired of learning mathematics (2.03) and frequently fail class assessment (1.83). The weighted mean of 1.96 is within the average level of prevalence range, implying that the level of dyscalculia among primary school pupils is at an average level.

Research Question Two: What are the strategies of overcoming Dyscalculia among primary school pupils as perceived by teachers?

Table 3. Strategies of overcoming Dyscalculia among primary school pupils as perceived by teachers

ITEMS **In my view,** Dyscalculia could be overcome by:	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Rank
Utilizing number lines to help pupils understand number concepts	41 (35.7%)	70 (60.9%)	2 (1.7%)	3 (2.6%)	3.28	2nd

ITEMS **In my view,** Dyscalculia could be overcome by:	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Rank
Employing an individualized teaching method to cater for each students needs in learning.	42 (36.%)	67 (57.8%)	4 (3.4%)	3 (2.6%)	3.28	2nd
Exposing pupils to educational games to enhance their mathematics skills	46 (39.7%)	60 (51.7%)	10 (8.6%)	0 (0.0%)	3.31	1st
Using the mother tongue to facilitate the rate of learning mathematics concepts among pupils	47 (40.5%)	43 (37.1%)	26 (22.4%)	0 (0.0%)	3.18	6th
Utilization of real-life experiences to enhance the learning of mathematics among pupils	40 (34.5%)	67 (57.8%)	9 (7.8%)	0 (0.0%)	3.27	4th
Organizing teachers' training programs	37 (31.9%)	67 (57.8%)	9 (7.8%)	3 (2.6%)	3.19	5th
Utilization of digital animations	34 (29.3%)	59 (50.9%)	18 (15.5%)	5 (4.3%)	3.05	8th
Utilization of multisensory materials	36 (31.0%)	60 (51.7%)	11 (9.5%)	9 (7.8%)	3.06	7th

Table 3 reveals the strategies of overcoming dyscalculia among primary school pupils as perceived by teachers. Primary school teachers agreed that dyscalculia could be overcome by: exposing pupils to educational games to enhance their mathematics skills (3.31), employing an individualized teaching method to cater for each students needs in learning and utilizing number lines to help pupils understand number concepts (3.28), utilization of real-life experiences to enhance the teaching of mathematics among pupils (3.27), organizing teachers training programs (3.19), using the mother tongue to facilitate the rate of learning mathematics concepts among pupils (3.18), utilization of multisensory materials (3.06) and utilization of digital animations (3.05).

H_{O1}: There is no significant difference between male and female primary school teachers' perceived prevalence level of Dyscalculia among primary school pupils.

Table 4. The difference between male and female primary school teachers' perceived prevalence level of Dyscalculia among primary school pupils

Gender	N	Mean	Std. Dev.	t	df	Sig	Remark
Male	23	19.26	4.19	-.481	114	.631	Not Significant
Female	93	19.70	3.84				

Table 4 shows that there was no significant difference between male and female primary school teachers' perceived prevalence level of Dyscalculia among primary school pupils (t -.481; df = 114; p>631). The hypothesis is therefore retained based on the significant value of (.631), which implies that there is no significant difference between male and female primary school teachers' perceived prevalence level of Dyscalculia among primary School pupils**.**

DISCUSSIONS

The results of this research showed that the level of prevalence of dyscalculia among primary school students as perceived by the teachers is moderate, which means that some students have difficulties with mathematical concepts, while students manage fairly well. This aligns with the reports of May et al. (2021), who examined the perceptions of Malaysian primary teachers towards dyscalculia and reported that the level of prevalence of dyscalculia among Malaysian pupils was medium. It is also consistent with the results of Yoong et al. (2022), who discovered that the issue of dyscalculia among primary school students is moderate. Nevertheless, the result is opposite to Goel (2021), who also stated that the prevalence of dyscalculia among Indian primary school children was low. On the same note, Kaur et al. (2024) established that arithmetic disability was less common than other learning disabilities. Conversely, Sardauna (2023) in Northern Nigeria found that the rate of dyscalculia among students was quite high because of the lack of teacher training and the absence of a good classroom support system. This difference implies that the socio-cultural background, the readiness of teachers, and teaching materials play a major role in determining the cases of dyscalculia in pupils and their perception.

These results directly respond to the first research question on the perceived prevalence level of dyscalculia among primary school pupils. The moderate prevalence suggests that dyscalculia is an increasing issue that needs to be addressed in the early math education. This finding supports the findings of other international researchers like Butterworth et al. (2019), who suggested that the problem of dyscalculia is underdiagnosed in the world because of the lack of consistency in the awareness of teachers and the insufficiency of screening instruments. In corroboration, Haberstroh and Schulte-Körne (2019) estimated that dyscalculia affects approximately 3-7% of school-aged children globally, a prevalence consistent across countries when standardized diagnostic criteria are used.

The study established that teachers proposed a wide range of strategies such as use of educational games, individualized instruction, use of number lines, use of real life experiences, teacher training programs, mother tongue instruction, multisensory learning, and digital animation. This is in line with Alamro (2019), who pointed out that constant professional training was necessary to prepare teachers with inclusive techniques. On the same note, Nneka (2020) confirmed that conceptual knowledge improves real-life experience, where as Rulyansah (2023) suggested the use of reconnecting strategies to promote the number sense of pupils. Moreover, Olorukooba et al. (2020), emphasized the importance of culturally responsive instructional strategies that combine common language and situations to enhance mathematical understanding among Nigerian students. It is also similar to the findings of Lazo-Amado et al. (2022), who proved that digital animations and visual representations can greatly enhance the engagement and retention of pupils in mathematics. Similarly, Mazzocco et al., 2020, discovered that multisensory methods (visual, tactile, and auditory) enhanced mathematical fluency in pupils with the symptoms of dyscalculia.

Relatively, these interventions found represent a combination of conventional and technology-based interventions, implying that educators are adjusting to the current trends in inclusive education. Nonetheless, the results of the study are slightly different compared to Bugden and Ansari (2019), who discovered that Singaporean teachers use mostly drill-based teaching methods but not experiential or online learning resources. This disparity can be attributed to the difference in the availability of resources, training of teachers, and flexibility of the curriculum in different countries. The tested hypothesis showed that there was no significant difference between male and female primary school teachers perceived prevalence level of dyscalculia among primary school pupil, which means that both genders have the same awareness and perception of dyscalculia. This observation confirms May et al. (2021) and Sousa et al. (2017), who have both concluded that the gender of teachers does not have a significant impact on knowledge or perception of dyscalculia. Similar results were also stated by Bugden and Ansari (2019), where both male and female teachers showed the same amount of empathy and care to learners with mathematical problems. Large-sample survey data also show

widespread knowledge gaps and misconceptions about dyscalculia among teachers, underscoring the need for targeted professional development (Szűcs & Devine, 2020).

More generally, the implications of these findings opine that a systemic teacher professional development is necessary to enhance early diagnosis, instructional differentiation, and intervention support of pupils with dyscalculia. The combination of mother-tongue teaching, interactive games, and technologies-based interventions aligns with the best practices in the international community suggested by Butterworth (2021), who promote the early, evidence-based interventions. The results also suggest that education ministries and teacher training institutions should focus propagating dyscalculia awareness and inclusive pedagogy in teacher education curricula, particularly in such a setting as Nigeria where such opportunities are scarce. Evidence confirms that the perceived level of the prevalence of dyscalculia among primary pupils is moderate, but the effects of the latter can be alleviated with the help of individualized, multisensory, and contextually based teaching techniques. Further comparative research in various cultural and educational systems will enhance the knowledge of dyscalculia and will contribute to the optimization of interventions to be applied to young learners.

CONCLUSION

This paper examined the level of prevalence and strategies to overcome dyscalculia among primary school students from the perspectives of teachers. Results showed that the rate of occurrence of dyscalculia among pupils is moderate. This implies that the condition is neither a rare nor universal occurrence within the classroom environment. The teachers found effective strategies to in treating dyscalculia to include the use of educational games to improve their mathematical skills, individualized teaching to meet the needs of different learners, number lines to build their number sense, real life experiences to make learning more meaningful, multisensory materials and digital animations. Other strategies like the constant professional development of teachers and mother tongue teaching were also discovered to enhance mathematical concepts understanding. Moreover, the research did not show any significant difference between male and female teachers in their perceptions of the prevalence of dyscalculia, indicating that gender does not affect how teachers are aware or perceive pupils with learning problems in mathematics. In contrast to the past research that primarily looked at general learning disabilities, this research gives a more general and more practical insight into how teachers think and act upon dyscalculia in early mathematics classrooms. These lessons could be useful to teachers, curriculum developers and policy makers who want to enhance early intervention programs and inclusive teaching in primary schools. The study offers valuable contributions but has several limitations, including a small sample size of 116 participants, the exclusive use of private schools that limits diversity of teacher perspectives, and the use of a quantitative descriptive design that restricts deeper insight into teachers' lived experiences with pupils who have dyscalculia. Future research should therefore employ mixed-method or qualitative approaches, include teachers from public schools and various regions for broader representation, and consider longitudinal designs to capture changes in teacher awareness and instructional strategies over time. Based on the findings, the study also recommends that teachers engage in continuous professional development on dyscalculia, schools implement ongoing monitoring and early support for students with mathematical difficulties, teachers and parents collaborate in applying effective instructional strategies, and policymakers integrate dyscalculia awareness and intervention training into teacher education programs.

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