

Teachers' Awareness Of Factors Responsible For Dyscalculia Among Primary School Students In District Mardan, Pakistan

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Abstract:

Dyscalculia, a disorder that is probably as common as other learning disorders, is receiving more attention today. Primary school education that provides a foundation for a child's learning experiences plays an important role in dealing children with learning disabilities. The responsibility to teach children effectively and help them successfully cope with their struggle in environment also rests on primary school teacher. The present study aimed to explore primary school teachers 'awareness of the factors responsible for Dyscalculia among students in District Mardan, Khyber Pakhtunkhwa (KP), Pakistan. The study was descriptive in nature for which data were collected through survey method. Using stratified random sampling technique, a sample of 364 primary schools teachers was selected. The study was delimited to the subject of mathematics. The instrument "Evaluation of the perception of dyscalculia by educators"(Dias, deBritto Pereira & Van Borsel, 2013) was adapted and used for the collection of data in this study. The mean score of Mathematics Anxiety Problems in Students was 2.68, S.D, 0.74 which shows teachers were found aware of the factors responsible for dyscalculia among primary school students whereas the least mean score (2.13), S.D. (0.41) shows poor teaching methods, lack of instructional material and improper curriculum content. It shows teachers are less aware of the factors responsible for dyscalculia. The study recommends teacher training programs may focus on the use of Information and Communication Technology (ICT) in the teaching of mathematics for pre-service teachers. Similarly, the curriculum of mathematics for primary school students must include interesting contents. Moreover, holding frequent seminars and workshops are also recommended.

Keywords: Dyscalculia, Awareness, Mathematics, Factors, Primary School.

1. INTRODUCTION

Mathematics is a key subject in all schools curricula both at primary and secondary school level in Pakistan. Mathematics is considered as one of the most difficult subjects and has generated fear and hatred in students. In Pakistan, students have been facing high rate of failures in examinations. These issues pertaining to learning and understanding mathematics called dyscalculia. Dyscalculia is

a common learning problem that influences kids' ability to do calculations. It not only affects children at school but also creates difficulties for them in their daily life. For instance, most of them get confused while buying or selling things during shopping (Farooq and Shah, 2008).

About 6.7% of the world's population affects from dyscalculia (Hancock and Janet, 2004). Although dyscalculia is far less recognized by

teachers, parents, educational authorities and scientists. Women and men at the age of 30 with poor number skills are more likely to be unemployed and depressed. In schools, dyscalculia is leading to low self-esteem, distress, guilty and disruptive behavior in class. (Reder & John, 2008). Teachers as the drivers and imparters of knowledge are aware that dyscalculia, a mathematical disability, poses serious problems to individuals' development. Dyscalculia can disrupt a child foundation leading to problems in learning numbers, comparing and contrasting, matching and recognizing numbers as well as sorting objects by groups and patterns. Students with dyscalculia cannot understand basic operations such as decimals, fractions and percentages, multiplication of whole numbers and other measurement skills (Campbell & Jamie, 2005). Shaywitz and Fletcher (1995) explained that students with dyscalculia are weak in organizing and sequencing concepts. Brown (2000) found that learning disabilities such as dyscalculia also influence professional choice and success. Such individuals often feel that their job opportunities are confined. They sometimes feel worried about courses and training needed for certain vocation. Most of students affected with dyscalculia may have been told by their teachers that they just do not have the ability to learn mathematics. All this can lead to frustration, anger, alienation and loss of self-confidence in students. Erinosh (2013) explained that in most schools the problem of dyscalculia is the order of the day. In Pakistan, students are found avoiding mathematics classes. This is the result of mathematics anxiety, causing students to freeze up when they encounter mathematics problems. Westwood (2017) studied that some factors that may be responsible for dyscalculia contains lack of instructional materials, improper curriculum content, attitude of teachers towards students, teacher's expertise, memory problems and level of intelligence. Teachers are aware that most students when asked to choose subjects that will lead to their futures career end up choosing subjects that have less or nothing

to do with calculations. Due to this specific learning disability called dyscalculia most students run away from mathematics. Most of the students who are influenced with this disability are trying to grasp mathematics concept and also have problem in developing mathematics skills.

Dyscalculia covers a wide range of mathematical disabilities such as disability to comprehend the meaning of numbers and their quantities. Students of dyscalculia cannot understand basic operations of additions, subtraction, multiplication and division and complex mathematical problems (Butterworth & Yea, 2004). Landerl & Bevan (2004) found that students with learning disabilities like dyscalculia are seen as less capable than they are, but they may have general capability to learn more than their peers however they commonly have specific weakness in many ways in some areas of calculation except with proper special designed instructions.

Most of students with learning disabilities seem hyperactive and disturbed each time they have a subject that has involve calculation (Hardoman, Drew & Egan, 1987). "They also find it difficult to engage in calculation for a longtime. Students with dyscalculia also displays withdrawal syndrome. They often refuse to join others to carry out any activity inside or outside the classroom. There is also a lack of focus as they are not able to pay attention or listen to their teachers. Every lesson may look difficult to them. As a result they easily get distracted. Students with dyscalculia always leaved a mathematics oriented task easily. They lose hope and give up attempt to accomplish their goals (DeRuiter & Wansart, 1982).

2. STATEMENT OF THE PROBLEM

Mathematics is one of the compulsory subjects at the primary and secondary school levels in Pakistan. It is compulsory for all students who intend to further their studies. But for most students it is difficult to solve and learn mathematics related problems. It is leading to low performance in Mathematics at internal and

external examinations. In tertiary institutions this has made most students to select for courses that do not require a lot of mathematical skills. This can be proved in the most students who seek admission in Arts and Humanities related courses compared to science and related courses in the universities and other higher institutions.

As Dyscalculia is a prevailing learning problem that affects most children and even adults' ability to do mathematics and solve mathematics related problems, if it is not identified and handled properly in early life it can create problems in day- to- day life and activities. It is, therefore, necessary to assess primary school teachers' awareness about Dyscalculia. The problem of dyscalculia has been a major problem in our education system which indicates that teachers are not very much aware of the factors responsible for it and they themselves may even have been victims of it hence there is a need to investigate into teachers' awareness of factors responsible for Dyscalculia among primary school students in District Mardan.

3. RESEARCH METHODOLOGY

The study was carried out using survey research design. The researcher intends to find out the factors responsible for Dyscalculia among primary school students in district Mardan.

4. Population of the Study:

The population of this study was comprised of all the government primary school teachers in government primary schools of District Mardan. According to EMIS (2017-18) Report, there are 6343 primary school teachers in all the 1419 government primary schools of District Mardan as given in the flow-chart, Fig-1:

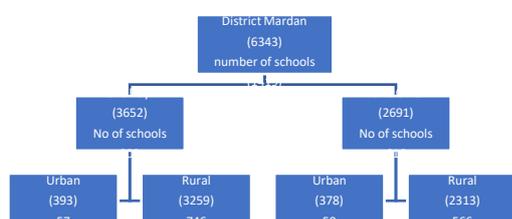
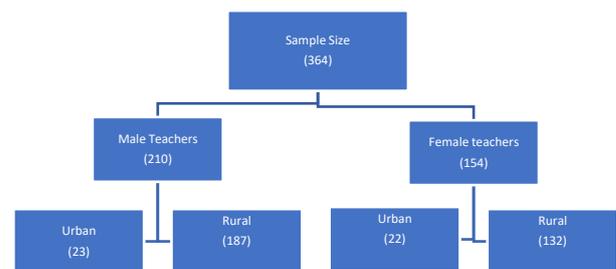


Fig-1. Flow-chart showing data of the primary schools and the corresponding teachers in District Mardan.

4. Sample and Sampling Technique:

The stratified random sampling technique was used for the selection of sample in this study. The stratification was based on gender (male and female), and type of locality (urban and rural). According to Krejcie and Morgan Table 364 primary school teachers were included in the sample. Detail is given in the following chart, Fig-2:

Fig-2 .Flow-chart showing data of the respondent teachers (sample), in District Mardan.



5. Data Collection Tool

Questionnaire having two sections: section A and section B were used for data collection. Section A comprised of personal data of the respondents while section B were consist of items designed to measure teachers awareness of factors responsible for dyscalculia. The items were constructed on a five point likert scale of Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD) and Neutral

6. Data Analysis

The data were analyzed through appropriate statistical procedures. Descriptive and inferential statistics were used for analysis and interpretation of data. The analyses were presented through tables along with necessary interpretations. The study outcomes and conclusions were based on data analysis. Recommendations were framed on study

outcomes. Inferential and descriptive statistics were used to analyze the data. To determine the factors that cause Dyscalculia in primary school

students, mean and standard deviation were calculated.

Table 1: Factors responsible for Dyscalculia among Primary school students

Factors responsible for Dyscalculia	Mean	S.D.
Teachers' Level of Expertise	2.48	0.44
Poor Teaching Methods, Lack of Instructional Material and Improper Curriculum Content	2.13	0.41
Role of Parents and Teachers	2.56	0.54
Mathematics Anxiety Problems in Students	2.68	0.74
Individual Differences in Students	2.26	0.59
Lack of Confidence in Students to Solve Mathematics Problems	2.60	0.80
Lack of Motivation in Students	2.34	0.59
Attitude of Teachers Towards Students	2.46	0.51
Lack of Usefulness	2.43	0.54
Lack of Students Interest in Mathematics	2.64	0.58

7. FINDINGS AND DISCUSSION

Table 1 shows Mean score of Mathematics Anxiety Problems in Students is 2.68; S.D. is 0.74 which is high. It shows that teachers are highly aware of Mathematics Anxiety Problems in Students that is responsible for dyscalculia among primary school students whereas the least mean score is 2.13, S.D with 0.41 with Poor Teaching Methods, Lack of Instructional Material and Improper Curriculum Content this shows that teachers are not aware of these factors.

The factor wise analysis was conducted to support the findings. The majority of primary schools' teachers of District Mardan are aware that their students have Dyscalculia. Most teachers believe that a variety of factors are responsible, including teachers' levels of expertise, lack of confidence in students' ability to solve mathematics difficulties, the roles of parents and teachers, math anxiety problems in students, individual differences in students, lack of motivation, teachers' attitudes toward students and lack of students' interest.

Findings show that majority of the teachers are aware of the factors that caused Dyscalculia in primary school students. This corresponds to the findings of a study conducted by Karasakal

(2018) in the context of Ankara, Turkey that majority of primary school teachers were not aware of the concept of Dyscalculia. As a result, they lacked the knowledge and skills to deal effectively with Dyscalculia children. Similarly, Nfon (2016) found that sequential counting, lack of confidence, and the computation of mathematical facts have significant effects on primary school pupils' achievement. This is supported by the report of Longjohn & Sililayefa (2019) that in Nigeria students have difficulty in mathematics because, they have difficulty understanding and retrieving concepts, formulas, facts and procedure and lacked the ability to visualize mathematics problems and concepts.

8. Summary

This study revealed the analysis on the basis of factors that government primary schools teachers are highly aware that factors such as mathematics anxiety problems in students, lack of students' interest in mathematics, lack of confidence in students to solve mathematics problems, role of parents and teachers, lack of usefulness, teacher's level of expertise, attitude of teachers towards students, lack of motivation in students and individual differences are some

factors that are responsible for dyscalculia in students. However, the teachers have low level of awareness of the factors are poor teaching methods, lack of instructional materials and improper curriculum content in the teaching of mathematics can lead to Dyscalculia in students. On the whole majority of government primary schools teachers are aware of the factor responsible for Dyscalculia.

9. Recommendations

1. Teachers who have not received special needs education in-service training should be required to do so. Teachers will receive the necessary training to identify students with math disabilities.
2. Encourage Dyscalculic students to have a clear understanding of basic mathematical principles, concepts, vocabulary, symbols, and formulas, as well as the sequence of steps for calculation, at a younger age.
3. All aspiring teachers should be required to take some basic mathematics courses and learn how to teach mathematics using current teaching methods and technology.
4. The teacher and the students should have a close relationship. As a motivator, the teacher should pay close attention to each student and design classroom activities that allow students to freely share personal experiences that cause learning difficulties and clarify their doubts. Encourage them and approach them so that they believe they have the ability to solve arithmetic problems.
5. The Ministry of Education should plan and organize frequent seminars and workshops for all teachers in order to keep them up to date on current instructional strategies that are appropriate for all learners, particularly those with math disabilities.
6. The government should review the mathematics curriculum and make it easier for children to understand at each level, so that even those who are not strong in mathematics can grasp the concepts.
7. Math experts should meet on a regular basis to revise the curriculum and write text books for different class levels, using language, illustrations, and exercises that are easily understood by both teachers and students.
8. Rather than being taught by every classroom teacher, mathematical education should be left to those who specialize in the subject. As a result, some math teachers have led students astray in some basic procedures, making the subject difficult and uninteresting to students. Some teachers even tell their students that mathematics is a difficult subject, which discourages many students from pursuing it.
9. More research on Dyscalculia is needed, according to this researcher, in order to find ways to make mathematics teaching and learning easier beginning in elementary school. This will also encourage more students to pursue science and mathematics-related fields of study, which most students avoid due to their fear of mathematics.
10. If the recommendations are implemented, they will go a long way toward improving mathematics teaching and learning in schools, as well as reducing the incidences of Dyscalculia in children at a young age.

10. Suggestions for further research

1. The study was delimited to government primary schools' teachers due to a lack of resources, time, and feasibility concerns. The study covered only one district. A similar study should be replicated in other district of provinces and also over Pakistan.
2. The study was delimited to only government primary schools. There is need to do a similar study in high level in public and private schools using mix method. Primary school teachers' awareness of Dyscalculia as a condition was determined using a questionnaire method. According to the findings, the majority of teachers are aware of Dyscalculia as a condition. As a

result, the next research project should concentrate on ways reducing Dyscalculia.

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