

## IDENTIFICATION OF DYSCALCULICS FROM AMONG ELEMENTARY SCHOOL CHILDREN OF PUNJAB

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### Abstract

*Dyscalculia is a specific learning disability which affects mathematics. Dyscalculic individuals are not unintelligent, but struggle to learn mathematics. Their teachers and parents associate dyscalculia with dislike towards math. Most parents and teachers remain unaware of the problem and overlook it. Often parents and teachers blame each other for the problem. Parents accuse the teachers of wrong teaching practices and teachers accuse parents of not taking interest in the child. The distress caused by this problem is experienced by both parents and the child. A dyscalculic child in spite of having average intelligence is not able to cope with academic tasks in the school whereas in all other areas this child is just like any other normal average child. dyscalculic child with suffers physical, mental, verbal or emotional abuse because his problem is not recognised. In this study an attempt has made to identify dyscalculics from among elementary school students of Punjab. The sample consisted of 300 elementary school students (both urban and rural) of Hoshiarpur district of Punjab. Self-Prepared Dyscalculia Identification Test (DIT) was used to identify dyscalculics. The final draft of the test contains 50 objective type items and the time for the test was fixed as 75 minutes. In this study it was found that 17 out of 300 i.e 5.67% students were dyscalculics*

**Keywords:** *Dyscalculic , Elementary School Students and Identification*



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### Introduction

Dyscalculia is difficulty in comprehending mathematics, such as understanding numbers, Symbols, Patrons, facts in mathematics. Dyscalculia is a lifelong condition that makes it hard for pupils to perform mathematics related tasks. For a dyscalculic, everything that has to do with numbers and mathematical skills is a constant struggle. Butterworth (2003) calls it as Number blindness, it is the condition that affects our ability to acquire arithmetic skills.

Research reveals that the prevalence of learning disability ranges between 5-16%. In Indian context prevalence estimate ranges from 9-39%. The incidence of dyslexia in primary school children in India has been reported to 2-18% of dysgraphia (14%) and of Dyscalculia (5.5%) (Choudhry, 2005; Ramaa, 2000). According to UK studies done by Gross-Tsur and Manor in 1996, 6.5% are dyscalculic. According to Lewis et.al. (1994), 1.3% is dyscalculic while 2.3% dyscalculic and dyslexic - which means that according to this study 3.6% of the world's

population are dyscalculic. Prevalence rate reported in Indian schools is 6% (Ramaa,1990).Christophe, et. al. (2010)conducted a study and found that Developmental Dyscalculia (DD) is a pervasive difficulty affecting number processing and arithmetic. It is encountered in around 6% of school-aged children.Prince and Ansari(2013) refers that 3-6% of people are suffered from dyscalculia.

**Objective of the Study**

To identify dyscalculics from among elementary school students of Punjab

**Sample:**

The sample consisted of 300 elementary school students (both urban and rural) of Hoshiarpur district of Punjab.The investigator used Stratified Random Sampling Technique as the population consists of a number of strata like gender of the student, locality of the school and type of management of the school.The break-up of the actual sample is given in the table 3.1 and school wise distribution of the students in the sample is given in table 3.2.

**Table 1: Break up of actual sample covered:**

Boys	Girls	Rural	Urban	Govt.	Private
150	150	150	150	150	150
	300		300	300	

**Table2: School wise distribution of the students in the sample:**

S.No.	Name of School	Locality		No. of Boys	No.of Girls
		Rural	Urban		
Sch1	G.E.S.Wadesron	28		13	15
Sch2	G.E.S.Jassowal	20		8	12
Sch3	G.E.S.Dadyal	22		12	10
Sch4	G.E.S.Mahilpur		27	12	15
Sch5	G.E.S.Garshankar		28	12	16
Sch6	G.E.S.Hoshiarpur		25	14	11
Sch7	T.P.K.Public School Saila	27		15	12
Sch8	B.S.R. Public School Kitna	28		16	12
Sch9	D.R.P.High School Padrana	25		10	15
Sch10	VidhyaSagar Public School Garshankar		33	18	15
Sch11	Dashmesh Public school Mahilpur		37	20	17
	Total	150	150	150	150

**Tools and Techniques:**

The major tools used in the study were

### **1) Dyscalculia Identification Test (DIT)**

Self-Prepared Dyscalculia Identification Test (DIT) was used. The final draft of the test contains 50 objective type items and the time for the test was fixed as 75 minutes. The final test was prepared in both English and Punjabi. The Split half reliability coefficient was found to be **0.69**. The Content Validity of the test was established by having a discussion with the experts from the field of Mathematics Education. On the basis of experts' opinion, the DIT was found to be valid.

### **2) Coloured Progressive Matrices**

Coloured Progressive Matrices (CPM-1977) by Raven, Court & Raven was used to measure intelligence in the present study.

### **3) Teacher's Opinion**

A strong indication of dyscalculia is present if there is a contrasting difference between the overall general performance and performance in mathematics (Geary, 2004). Therefore, further tools for assessment were used in addition to above tests to determine better whether the child is actually experiencing dyscalculia or otherwise. Teacher's opinion were sought to know whether a student is normal in sensory-visual or auditory functioning, whether he has facility to study at home.

### **4) School records**

School records were seen for his age (9-11 years) and regularity in school (not been absent from school frequently). His annual performance in other subjects as well as in mathematics was seen to ensure whether the child is actually experiencing dyscalculia or otherwise.

### **Criteria set for identification of Dyscalculic students**

#### **Inclusion criteria**

- 1) Children score below 30% on Diagnostic Test of Dyscalculia
- 2) Children scoring above 25th percentile on Coloured Progressive Matrices by Raven. Court & Raven
- 3) Children without sensory handicaps
- 4) Children of age between 9 and 11
- 5) Children who are regular in school
- 6) Children having adequate facility at home

#### **Exclusion criteria**

- 1) Children score above 30% on Diagnostic Test of Dyscalculia

- 2) Children scoring below 25th percentile on Coloured Progressive Matrices by Raven. Court & Raven
- 3) Children having sensory handicaps
- 4) Children less than 9 or more than 11 years of age
- 5) Children who are absent frequently in school
- 6) Children who doesn't have adequate facility at home

**Procedure for data collection:**

After finalising the sample and tools to be used, the investigator contacted the heads of selected schools and explained to them the purpose of study. After getting permission from 11 schools, the investigator had discussions with them in order to fix a schedule for administering the tests. The schools were requested to make available of the service of the class teacher or Mathematics teacher during the time of the test. The school authorities cooperated fully with investigator in fixing the schedules and to conduct the test. The tests were administered for students of standard IV from each school selected. In most of the schools, the test was arranged in the morning session. The investigator together with the respective teacher spent 15 minutes for preparing the students for tests, explaining the objective of tests, the precautions to be observed, mode of responding in the answer sheet and timing of the test. The test was conducted in big class rooms or in a hall so that students could be seated at either end of a bench so that mutual consultation, copying etc. can be prevented. The following steps were followed in administering the tests. The first part of the study was intended to identify Dyscalculic students among elementary school students. For this the investigator administered the Dyscalculic Identification Test for the selected sample. After giving necessary instructions, the investigator distributed the test booklets. Separate answer sheets were also provided to write the answers. After the stipulated time of Seventy five minutes, test booklet along with the answer sheets were collected back. After an interval of 30 minutes the investigator administered Coloured Progressive Matrices (CPM) by Raven. Separate response sheets were given to the students and they were made familiar with the response sheets and the mode of entering the responses. All the necessary instructions were given before answering the test. A maximum of 25 minutes were given to answer the test. After the test, the test booklets along with the response sheets were collected back.

After the collection of data, the investigator analyzed the data and eliminated those students who scored above 30% in DIT or were below average in CPM. Then the investigator sought

teacher's opinion to know whether a student is normal in sensoryvisual or auditory functioning and has facility to study at home for eliminating or retaining the student to be a dyscalculic.

### **IDENTIFICATION OF DYSCALCULICS FROM ELEMENTARY SCHOOL STUDENTS OF PUNJAB**

The first objective was to develop and standardize Dyscalculia Identification Test (DIT) whose description has been given in fourth chapter. The second objective was to identify dyscalculics from elementary school students of Punjab. The data related to this objective was analyzed using inclusion – exclusion criteria and its interpretation has been done in the Table 5.1

**Table 3: Children excluded for not meeting the criteria in course of identification of Dyscalculic students**

S. No.	Reasons	No. of students eliminated	No. of students retained
1.	Scoring above 50% on the DIT	245	55
2.	Below normal intelligence (CPM)	20	35
3.	Not normal in sensory-visual or auditory functioning (Teacher's opinion)	6	29
4.	With serious emotional disturbance (Teacher's opinion)	2	27
5.	Below 9 or above 11 years of age (School records)	3	24
6.	Absent from school frequently (School records)	4	20
7.	Not having facility to study at home (Teacher's opinion)	3	17
Total Dyscalculic students			17

From the table 5.1, it is clear that in the process of identification of Dyscalculic students from 300 children, 245 children who scored above 50% in DIT were eliminated and 55 students who scored below 50% were selected. From these 55 students, 20 students who were below normal intelligence by CPM were eliminated and 35 who were above or had normal intelligence by CPM were selected. From these 35 students, 6 were not normal in sensory-visual functioning, 2 were with some serious emotional disturbance according to teacher's opinion, 3 were found not to be between 9 and 11 years of age, 4 had been absent from school frequently as per school records and 3 had not adequate facility to study at home. Such students were eliminated. Finally 283 students were eliminated at different steps

and only 17 could be retained finally. These 17 students are considered as Dyscalculic students as they met all the specified criteria. The school wise distribution of dyscalculic students

**Table 4: School wise detail of students eliminated and dyscalculic students**

S.No.	Name of School	Total Students	Students Eliminated	Dyscalculic students	%age Of Dyscalculic
Sch1	G.E.S.Wadesron	28	25	3	10.71%
Sch2	G.E.S.Jassowal	20	19	1	4.76%
Sch3	G.E.S.Dadyal	22	21	1	4.54%
Sch4	G.E.S.Mahilpur	27	25	2	7.40%
Sch5	G.E.S.Garshankar	28	27	1	3.57%
Sch6	G.E.S.Hoshiarpur	25	24	1	4%
Sch7	T.P.K.Public School Saila	27	24	3	11.11%
Sch8	B.S.R. Public School Kitna	28	26	2	7.14%
Sch9	D.R.P.High School Padrana	25	24	1	4%
Sch10	VidhyaSagar Public School Garshankar	33	32	1	3.03%
Sch11	Dashmesh Public school Mahilpur	37	36	1	2.70%
Total		300	283	17	5.67%

**Results and Discussion:**

It was found that 17 out of 300 i.e 5.67% students were dyscalculics.which is consistence with previous studies like Rama(1990)—6%, Christophe et.al.(2010)---6% and Prine and Ansari---3-6%.It is clear from the above results that dyscalculic children are found in every classroom anywhere in the world.

**Implications:**

The results of the study revealed that 5.77% of school going children areDyscalculic. This situation implies that government administrators, policy makers and authorities should take necessary steps toidentifyDyscalculic students and special attention should be given to such students.The incidence of learning disabilities in the population has important educational implication, as it would affect the resources that need to be allocated, framing of educational policies by central and states governments &others attitude towards dyscalculia

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