



# PREVALENCE OF HANDWRITING DIFFICULTY AMONG SECOND GRADE SCHOOL STUDENTS IN SOUTH CHENNAI

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**Abstract:** Handwriting is a complex activity with constant interaction between low-level motor skills and higher-order cognitive processes. It is a medium for communication of perceptions, emotions, and ideas. It is also a common means by which students communicate to teachers about their progress in academics. Handwriting Difficulty can impede a child's academic progress. Therefore this study focuses prevalence of handwriting difficulty among second grade school students in south Chennai with objectives of finding out the prevalence of handwriting difficulty among second grade school students in south Chennai and estimating the Prevalence of Handwriting Difficulty among Second Grade School students in South Chennai. This cross-sectional study was conducted among Second Grade School students in South Chennai. The students were selected based on the selection criteria. Multistage sampling was used. The South Chennai wards were chosen first, and then the areas within them were chosen, using the Table of Random Numbers. The lottery method was used to choose a total of 12 schools. And a sum of 862 students were included. The prevalence of Handwriting Difficulty among Second Grade School students from South Chennai reported to be 42.5% whereas 51.3% were identified to have no Handwriting Difficulty. According to the survey's results, 42.5% of Second grade School students have Handwriting Difficulty out of which 233 male students were found to have a prevalence of Handwriting Difficulty, accounting for 48.7% of the total, and the remaining 245 students did not have Handwriting Difficulty contributing to 51.3%. For male students the 95% confidence interval ranges from 44.23 to 52.27. In comparison with the prevalence of Handwriting Difficulty among both genders, the difference of observation was found to be statistically significant whereas chi square value was 16.778 and p value showed < 0.0001.

## I. INTRODUCTION

### 1.1 Handwriting

Handwriting is a complex activity with constant interaction between low-level motor skills and higher-order cognitive processes. Handwriting is a visuomotor skill that requires continuous visual processing to effectively execute fine movements of the hand. It is a requisite to document knowledge and information. It is also a medium for communication of perceptions, emotions, and ideas. Handwriting is a common means by which students communicate to teachers about their progress in academics. Handwriting has an impact on all areas of education, however in today's scenario, unsupervised exposure of teachers and parents to Handwriting, combined with the growth of contemporary technology, has resulted in Difficulty in Handwriting among children.

### 1.2 Handwriting Difficulty

Handwriting Difficulty can be defined as an inadequate performance related to factors such as: Teachers may misinterpret answers they do not understand as incorrect or inappropriate, making it challenging for them to evaluate answer papers and may assign lower marks etc. Students with Handwriting Difficulty may struggle with taking notes in class and reading them afterwards, taking longer to complete assignments than their classmates, failing to acquire other higher-order writing processes like planning and grammar, and developing a writing avoidance that subsequently contributes to halted writing development. Handwriting Difficulty also impacts a student's success in the classroom and general wellbeing. Handwriting Difficulty are common among elementary school students, especially boys.

### 1.3 Handwriting Difficulty in Primary School Children

Some children, without developmental disorders, must put in extra effort from an early age to learn to write neatly and clearly. Teachers and parents frequently detect difficulty with handwriting during kindergarten, but Handwriting Difficulty (also known as dysgraphia) are frequently identified when the child enters primary school. In school, children frequently struggle with Handwriting patterns such as writing the alphabets from memory in both upper and lower case, dictation, near and far point copying, manuscript-cursive transition, poor writing speed, and inadequate spacing between letters or words, improper or uneven letter shaping, letter reversals, and the use of upper- and lower-case letters

Handwriting Difficulty is one of the top reasons why school children are referred to Occupational Therapy. Most of the clients that paediatric Occupational Therapists see are referred for Handwriting training. They work towards developing and improving Handwriting. Handwriting-specific Occupational Therapy interventions have been found to be effective in enhancing several essential abilities, including visualmotor integration, cognitive, motor, and behavioural abilities, as well as in improving parental and teacher involvement in the intervention process.

## II. OBJECTIVES

- To find out the prevalence of handwriting difficulty among second grade school students in south Chennai.
- To estimate the prevalence of handwriting difficulty among second grade school students in south Chennai.

## III. REVIEW OF LITERATURE

### 3.1 Prevalence of Handwriting Difficulty

**Kiran Sharma et.al., (2020)** conducted a cross sectional study to find out the prevalence and the pattern of handwriting difficulty among school going children. A total of 1296 students aged 7-12 years were included in the study. The overall prevalence of Handwriting Difficulty was found to be 34% out of which 67% were boys and 33% of girls had Handwriting Difficulty.

**Pooja Pankaj Mehta (2019)** conducted a single-arm interventional study. Single arm of 10 children (9 boys and one girl), between 6 and 10 years of age, were recruited for the study using convenience sampling. The gender difference, with boys more affected than girls, was consistent with Indian prevalence and interventional studies.

### 3.2 Handwriting Difficulty among second grade school students

**Naser Havaei et.al., (2021)** conducted a cross sectional study to find out the status of handwriting among Iranian primary school students. A total of 1262 Persian language primary government school students aged 8 - 10 from second and third grades were included. The study found statistically significant differences in handwriting components (both copying and spelling domains) between second and third grade students, except for word size a text grade variable. The speed of handwriting in the copying domain, text slant in the copying and spelling domains, and spelling errors were not substantially different between boys and girls.

### 3.3 Screener of Handwriting Proficiency

**Tricia Van Regenmorter et.al., (2019)** A comparative study was conducted on the effect of technology on handwriting in kindergarteners. In this study, the screener of handwriting proficiency was used. The assessment targeted four important skills: spelling names, writing lowercase and uppercase letters, writing numbers, and writing sentences. The four main skills include memory, orientation, placement, and suggestion skills.

**Andrew Cole (2022)** conducted a scoping review to determine the effectiveness of using Occupational Therapy interventions for Handwriting Deficit in elementary school children and to compare the mode of Occupational Therapy service delivery for how long and how much should be given. The study reviewed 8 articles, out of the 8 articles, 5 articles were curriculum base programs and involved using taskoriented approach and 2 studies reviewed using devices. The study concluded that whether Occupational Therapy intervention is given directly or indirectly, it improves the Handwriting of children.

## IV. METHODOLOGY

This cross-sectional Study was approved by the ethics committee for student's proposal [CSP/22NOV/118/565], Sri Ramachandra Institute of Higher Education and Research (Deemed to be University)

### 4.1 Subject Recruitment

The samples were recruited from schools in South Chennai.

### 4.2 Site of Study

Schools in South Chennai.

### 4.3 Study Design

Cross - Sectional Study Design

### 4.4 Period of the Design: 4 Weeks

### 4.5 Sample Size : 779 Second Grade School Students

### 4.6 Sampling Method : Multistage Sampling

### 4.7 Inclusion Criteria

- Second-grade students
- 7 - 8 years of age
- English medium schools (private schools)

### 4.8 Exclusion Criteria

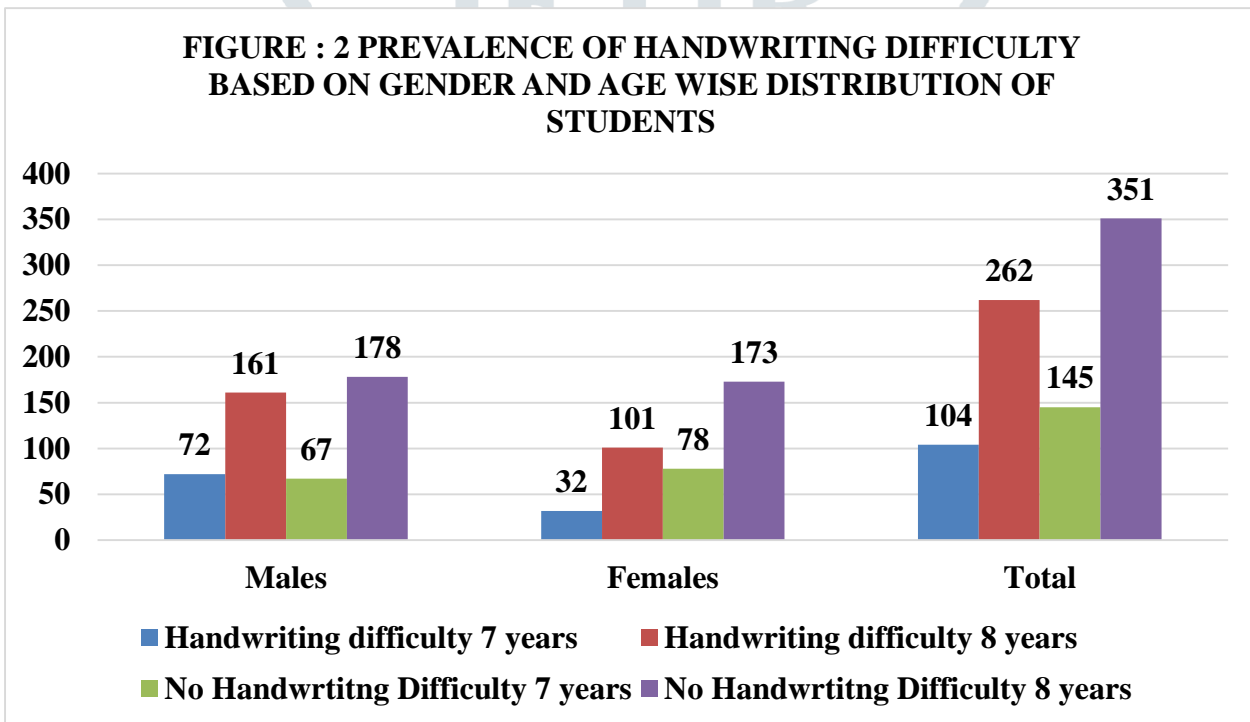
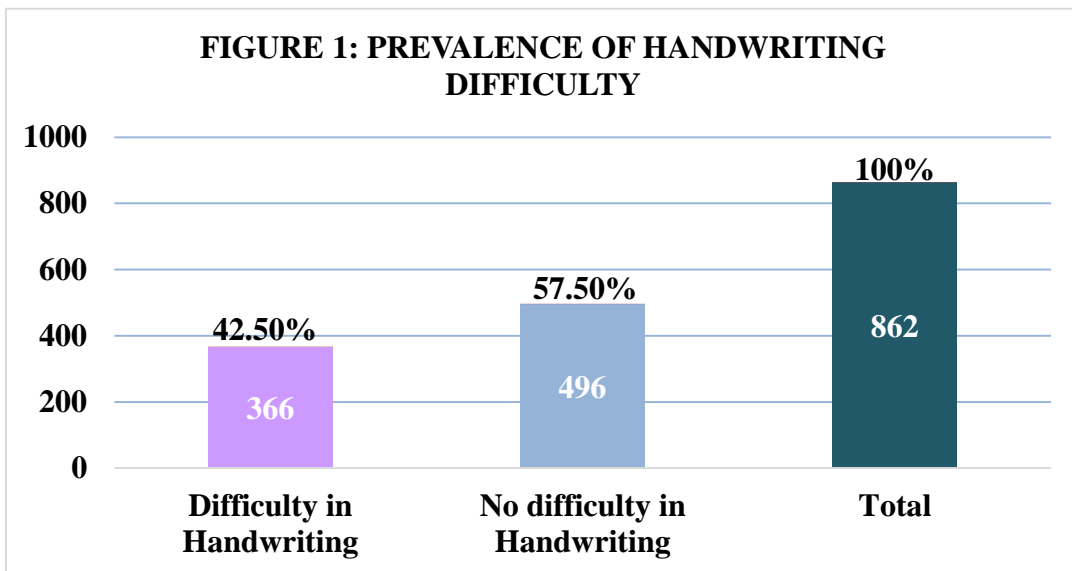
- Any neurological, developmental, congenital, psychiatric, and orthopaedics (upper extremity and trunk related) conditions.
- More than 13 errors in the memory component (score = N/A)

### 4.9 Procedure

This cross-sectional study was conducted among Second Grade School students in South Chennai. The students were selected based on the selection criteria. Multistage sampling was used. The South Chennai wards were chosen first, and then the areas within them were chosen, using the Table of Random Numbers. The lottery method was used to choose a total of 12 schools. And a total of 862 students were included. Prior to the child's participation in the study, the parents' consent was then obtained. Then the Screener of Handwriting Proficiency, student assessment sheet was administered to all the participants. The collected data was analysed and results were inferred.

## V. DATA ANALYSIS

Data analysis was done using the excel sheet (MICROSOFT EXCEL 2019) and (SPSS software version 16) for data storage, tabulation, and the generation of descriptive statistics. The result is statistically significant if the p value is less than 0.05.



**VI. Results**

This study sought to discover the Handwriting Difficulty among Second grade school students in South Chennai. A total of 862 students were recruited as study participants in order to determine the prevalence of Handwriting Difficult Handwriting Difficulty was identified in 366 students out of 862 in this study, with a prevalence of 42.5%.

It was found that out of 882 students, 233 male students were found to have a prevalence of Handwriting Difficulty whereas out of 384 female students, 133 students were found to have Handwriting Difficulty. Results also showed that male student outnumbered the female students who had Handwriting Difficulty. Students with Handwriting Difficulty were found to have difficulty with writing the letters backwards, memory retrieval, sentence errors etc.

**VII. Discussion**

The results of the study revealed that out of 862 second grade school students, 366 of them were identified to have Handwriting Difficulty, contributing to 42.5% of prevalence of Handwriting Difficulty among second grade School Students in South Chennai. This result is supported by Anita M Franken in 2021 that the prevalence of Handwriting Difficulty among second grade students, based on teachers' opinion was identified as 11.11% and Handwriting Difficulty based on SEMs was 12.70%. This result is also supported by Mahfuzah zainol in 2022 that the prevalence of children having Handwriting Difficulties worldwide ranges between 5 and 35%, according to the pertinent literature. The results of this study showed that boys experienced more Handwriting Difficulty compared to girls, out of 478 boys 233 were identified to have Handwriting Difficulty contributing 48.7% of prevalence and 384 girls out of which 133 were identified to have Handwriting Difficulty accounting for 34.6% of prevalence. The result is supported by Kiran Sharma in 2020 who found that a greater number of boys had Handwriting Difficulty than girls.

It was identified that most of the students used cursive writing style more than manuscript writing style, cursive Handwriting style may be preferred over manuscript. This result is similar to Celia Morales Rando in 2021, highlighted that although the use of cursive

Handwriting was preferred among first and second grade students, it was clear that the students made more errors when using manuscript than cursive. It was identified in the study that students with Handwriting Difficulty struggled with memory retrieval of upper- and lower-case letters, where they wrote upper case letters instead of lower case and vice versa, as well as numbers. Memory errors were also caused by omitting letters and numbers, writing unrecognizable letters, writing the wrong letter or number, and writing the letters I and j without the dot. The most frequently reversed or backward letters were b, d, h, j, p, n, t, l, and z, all of which led to the orientation errors. This result is supported by Kiran Sharma in 2020 who found out that students made common errors in the letters mentioned above. There were limited placement errors. Sentence errors included not using capital to begin the sentence, mixing upper case and lowercase letters, putting too much space between letters in a word, words running together in the sentence, forgetting ending punctuation.[10] Errors were not marked for name writing and concerns (formation, size, neatness, speed, posture, pencil grip and helper hand) and did not contribute to the final score of each individual student. The Handwriting of primary school students can be affected due to the ergonomic factors such as size of the table and chair/bench, surface of table, placement of the book, posture etc which was not assessed in this study. These factors that contribute to Handwriting Difficulty were not assessed in this study. [3] This study supports the evidence of the common errors and Difficulty in Handwriting faced by primary school students which provides Occupational Therapists strong evidence that early detection of Handwriting Difficulty and providing handwriting skill training is specifically necessary for primary school students.

## XI. CONCLUSION

According to the current study's findings, 42.5% of second grade students were identified to have Handwriting Difficulty as determined by the Screener of Handwriting Proficiency. This study found that Handwriting Difficulty was more common in boys than in girls.

Overall, this study demonstrated the need for frequent Handwriting training in primary schools as well as early identification of Handwriting Difficulty and interventions for the same. To help students with Handwriting Difficulty at an early stage, Occupational Therapy interventions must be implemented in the curriculum and at the school level. Also, there is a growing need for school based Occupational Therapists.

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