International Journal of Research in Medical Sciences
Kumaresan V et al. Int J Res Med Sci. 2023 Jan;11(1):90-93
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20223274

Original Research Article

Cross sectional analyses on the prevalence and usage of braille among blind children

Vinisha Kumaresan*, Astha Prem, P. Anuradha

Department of Ophthalmology, Saveetha Medical College and Hospital, Chennai, Tamil Nadu, India

Received: 17 November 2022
Revised: 01 December 2022
Accepted: 02 December 2022

***Correspondence:**
Dr. Vinisha Kumaresan,
E-mail: vinisha3004@gmail.com

ABSTRACT

Background: Childhood blindness is a serious issue which has to be dealt with importance because the disability adjusted life years (DALY) loss in a blind child is much more than that of adults with blindness. The ability to read and write in any one language improves their confidence and makes them more independent. It gives them hope not just to live but also to make a living. This study was done to emphasize on the importance of braille. This study analyses the prevalence and utilization of braille among blind children and its impact on education and overall quality of life.
Methods: The data required was collected from the ophthalmology outpatient department (OPD), Saveetha Medical College and Hospital, Thandalam. The children were asked to answer questions based on a questionnaire after taking informed consent from them and their parents.
Results: According to the data collected from 50 blind children over 6 months, only 12% used only braille for their educational purposes, 58% used only other assistive technologies, and 30% used both braille and other assistive technologies.
Conclusions: This study shows that there is more inclination towards using assistive technology than Braille for education and practical purpose as it is easy to learn. But it is important that the government encourages schools to teach Braille to all students and also incorporate Braille in the public forum as its advantages are many which cannot be replaced by other assistive technologies.

Keywords: Blind children, Braille, Usage, Impact on life

INTRODUCTION

Globally, minimum 2.2 billion people have near or distance vision impairment.[1] Global estimates on childhood blindness shows that around 1.42 million and 17.52 million children are suffering from blindness and moderate to severe visual impairment, respectively.[2] The projected rate of prevalence of blindness in India is 0.45%.[3] In Tamil Nadu, the prevalence of blindness is 4 per 1000 population.[4]

The International Classification of Diseases 11 (2018) classifies vision impairment into two groups, distance and near presenting vision impairment.

Distance vision impairment includes: mild –visual acuity <6/12 to 6/18, moderate –visual acuity <6/18 to 6/60, severe –visual acuity <6/60 to 3/60, and blindness –visual acuity <3/60.

Near vision impairment, near visual acuity worse than N6 or M.08 at 40 cm.

The disability adjusted life years (DALY) loss in a blind child is far more than that of adults with blindness therefore childhood blindness is one of the priorities in vision 2020: the right to sight. The ability to read and write in any one language improves their confidence to a greater extent and makes them more independent.

Assistive technologies include braille, smartphone assistance and technical software.

Braille is a universally accepted tactile reading and writing system which consists of raised dots and is read by passing fingers over them. Bharathi braille is a national standard script that is used to write 11 languages of India including Tamil.

There are various braille input and output devices available in India. Annie, a braille literacy device, consists of refreshable braille display, digital braille slate and braille keyboard.

Alternative assistive technology and assistive products commonly used are screen readers, and dictation software.

This study was done to know the current utilization of braille which has unmatchable advantages over other assistive technologies to improve the quality of life.

METHODS

Study type

It was a questionnaire based cross-sectional study.

Study place

The study was conducted at the department of ophthalmology, Saveetha Medical College, Kuthambakkam, Tamil Nadu.

Study period

The study was conducted between 10 April 2022 and 16 October 2022.

This study was conducted among 50 blind people in the age group of 15-18 years who presented to the ophthalmology OPD at Saveetha Medical College. Here, the best corrected visual acuity below 3/60 for the better eye since childhood is taken for the study. Informed consent was taken from all the people participating and also from their parents. The best corrected visual acuity was checked individually. The study was conducted using pretested semi-structured questionnaire from which the questions were dictated for them. All the questions were asked and answered by the child in the presence of a consenting guardian. All the answers were based on the best of their knowledge. The average time of interviewing each person was 10 minutes. The data obtained was analysed using statistical package for the social sciences (SPSS) software to assess the prevalence and usage of braille among the blind children and its impact on the overall quality of life was also studied.

This study was carried out after the approval by the ethics committee of Saveetha Medical College and Hospital.

RESULTS

Among the 50 people, 60% (n=30) were males and 40% (n=20) were females. All of them were below 3/60 BCVA and all of them were enrolled in a blind school. The average age of the children in the study was 16.31+ or -1.13 (Table 1 shows the frequency distribution of base line characteristic features of the subjects).

Table 1: Frequency distribution of base line characteristic feature of the subject.

Base line characteristic feature of the subject	Frequency	Percentage
Age (16.31±1.13)		
15	16	32
16	11	22
17	12	24
18	11	22
Gender		
Male	30	60
Female	20	40
Education qualification		
8th Standard	09	18
9th Standard	19	38
10th Standard	11	22
11th Standard	05	10
12th Standard	06	12
BCVA		
1/60	07	14
2/60	10	20
3/60	05	10
CFCF	05	10
HM	11	22
NPL	05	10
PL	07	14

In our study, 12% of students were using only braille, 58% students were using other assistive technology (other than braille) and 30% students were using braille along with other assistive technologies (Table 2 and Figure 1).

Table 2: Frequency distribution of students using only braille, students using only assistant technology and students using both braille with other technical assistant in the study.

Technique	Frequency	Percentage
Braile alone	6	12
Technical assistant only	29	58
Both braile and technical assistant	15	30

On comparing the age and education qualification between students using different study medium, it is observed that, for those studying only with braille there is a greater delay in achieving the educational qualification appropriate for

their age when compared to the other two groups (Table 3 and Figure 2).

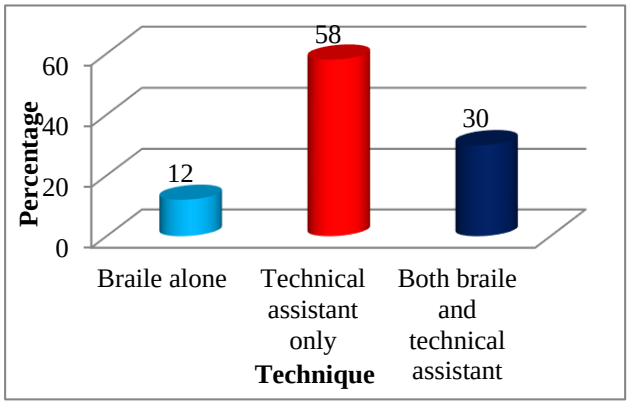

Figure 1: Frequency distribution of technique used among the blind subject in the study.

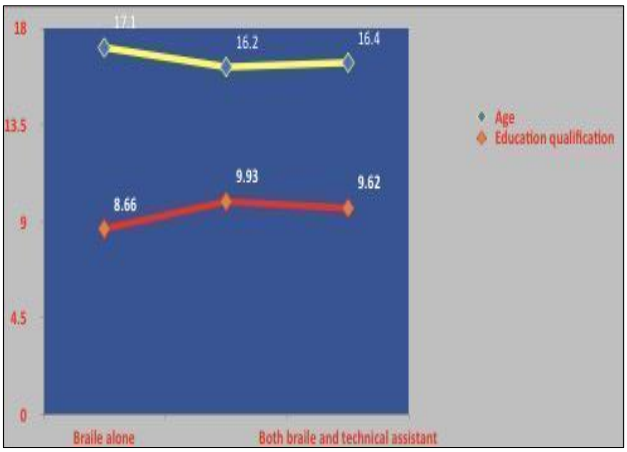

Figure 2: Comparison of age and education qualification between Braille alone, technical assistant alone and both braille and technical assistant.

Table 3: Comparison of age and education qualification between students using Braille alone, technical assistant alone and both braille and technical assistant by using one way – ANOVA.

Parameter	Braille alone Mean±SD, n=06	Technical assistant only Mean±SD, n=29	Both braille and technical assistant Mean±SD, n=15	F value	P value
Age	17.1±1.16	16.4±1.15	16.2±1.26	1.421	0.252 (ns)
Education qualification	8.66±0.516	9.62±1.23	9.93±1.33	2.349	0.107 (ns)

Values are expressed in mean±SD; SD-standard deviation; *p<0.05- **p<0.001-statistically significant, ns-not significant

DISCUSSION

According to the results of this study, the percentage of people who are using braille has come down in recent years due to the rise in other digital assistive technologies.

There is a lag in the educational qualification appropriate for their age in those students who are using only braille as compared to those who used other technical assistance or combined usage of both.

According to a study published by Senjam et al. Assistive technology for students with visual disability in schools for the blind in Delhi. The results showed that most students used tactile based techniques such as braille books (96.4%) and for writing braille stylus and slate (96.8%).[5]

This is in contrast to our study where the majority of the students (88%) tended to use alternative assistive technology for learning whereas students using Braille was only 52%.

This could be because of the recent "digital revolution" which has made the availability of smart technologies such as text to speech and speech to text technology more accessible. This means that most blind students rely on audio aid more than tactile based technologies. Blind schools are more predisposed to teach via alternate assistive technologies other than braille because of the lack in the availability of up-to-date braille books and lack of qualified teachers. Government agencies responsible for disability rehabilitation are also of the mindset that digital technologies can or is slowly replacing braille.

Braille is far more advantageous than dictation techniques as braille is the equivalent of written word and the terminology is much more complex. Braille can provide the reader with spelling, punctuation and grammar all of which cannot be given from audio assistance alone, thus a blind person learns and retains more information in braille than from simply listening. The need for braille arises more in subjects that cannot be studied by listening such as mathematical equations and computer code.

According to a study published by Dr. Ruby Ryles, a blindness researcher at Louisiana Tech University, braille education in childhood is vital in establishing literacy. She further concluded that those who learned braille at a younger age had more chances of keeping up with their sighted counterparts than those who learned braille at an older age.[6] According to a study published by Li et al in American Academy of ophthalmology, children who suffer from visual morbidity are more likely to exhibit early symptoms of depression and anxiety.[7]

Learning braille can give them access to vital information such as names on medication bottles, labels on clothes and common home appliances and make them more competent

in doing everyday tasks that are essential for independent living. Labelling of bank cards, letters that are printed in braille and labelling of food items in a supermarket are also significant in promoting self-sufficient living. Braille in public places such as lifts, escalators and doors of most buildings and public places such as airports and bus stands and supermarkets can enable them to move around more efficiently.

Challenges in braille literacy

There is a general shift from braille to other assistive technologies especially towards build-in text to speech technologies such as Siri. The advent of the modern digital era has made the accessibility of smartphones, tablets and computers easier and affordable to the masses and more and more people tend to rely on screen readers which enables them to surf the Internet, read articles and take part in social media platforms. Cost is a major barrier in implementing braille labels, and most manufacturers of food items and medications especially in developing countries such as India will be reluctant to do so. General disregard from government agencies responsible. A lack of qualified teachers, lack of general awareness and education centers, and low accessibility of high-tech braille devices such as refreshable braille display, braille printer, electronic braille note takers and other braille software are all obstacles in achieving higher rates of braille literacy in India.

Limitations

The study has a small sample size. Since this is a cross-sectional study, the findings in this study needs to be corroborated by prospective studies to know the impact of braille in improving the overall quality of life.

CONCLUSION

There is notable lag in the educational qualification for those students who used only braille as compared to those using both. This study has brought to light the fact that the knowledge and usage of Braille among the blind is less when compared to other assistive technologies. This is because learning via Braille is difficult and time consuming. In spite of putting in all the effort and time to learn via Braille most people don't find it useful for public interaction or day to day activities since it is not much incorporated in the public forum. Incorporating Braille in the sign boards, notice boards, lift keypads or door handles will be very useful for the blind to be independent when they are out by themselves. Braille labels on everyday items, medicines will ease their lives to a greater extent and give them the confidence to face life independently which would provide them more employment opportunities and eventually improve the quality of their lives. Government should ensure that Braille is incorporated in the public forum that could give them their independence in shopping, navigating, and booking tickets. Schools should be encouraged to teach students to rely on braille along with other assistive technologies to all blind students, thereby, improving their performance, confidence and overall quality of their lives.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. World Health Organization. Global initiative for the elimination of avoidable blindness. Programme for the Prevention of Blindness and Deafness. Geneva: WHO. 1997. Available at: https://apps.who.int/iris/handle/10665/63748. Accessed on 05 October 2022.
2. Wadhwani M, Vashist P, Singh SS, Gupta V, Gupta N, Saxena R. Prevalence and causes of childhood blindness in India: A systematic review. Indian J Ophthalmol. 2020;68(2):311-5.
3. Directorate General of Health Services, Government of India. National Programme for Control of Blindness and Visual Impairment (NPCB&VI). Available at: 11804362.https://dghs.gov.in/content/1354_3_NationalProgrammeforControlofBlindnessVisual.aspx. Accessed on 05 October 2022.
4. Health & Family Welfare Department, Government of Tamil Nadu. Tamil Nadu State Blindness Control Society. Available at: https://tnhealth.tn.gov.in/tngovin/blindnesscontrol/blindnesscontrol. Accessed on 05 October 2022.
5. Senjam SS, Foster A, Bascaran C, Vashist P, Gupta V. Assistive technology for students with visual disability in schools for the blind in Delhi. Disabil Rehabil Assist Technol. 2020;15(6):663-9.
6. The National Federation of the Blind Magazine for Parents and Teachers of Blind Children. Future Reflections. Available at: https://nfb.org/images/nfb/publications/fr/fr18/issue2/f180213.htm. Accessed on 05 October 2022.
7. Li D, Chan VF, Virgili G, Piyasena P, Negash H, Whitestone N, et al. Impact of Vision Impairment and Ocular Morbidity and Their Treatment on Depression and Anxiety in Children: A Systematic Review. Ophthalmology. 2022;129(10):1152-70.

Cite this article as: Kumaresan V, Prem A, Anuradha P. Cross sectional analyses on the prevalence and usage of braille among blind children. Int J Res Med Sci 2023;11:90-3.