CHAPTER - V

SUMMARY OF FINDINGS

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5.0 Introduction

The summery and findings of this chapter is the most broadly comprehend part of the study because it recapitulates the information that has been presented in the previous sections of the report.

5.1 Major Findings

The findings of the study can be broadly categorized into the following areas such as the findings to:

1. On the basis of classification of vision loss which included blurred vision loss, central vision loss and peripheral vision loss.
2. Pertaining to the visual efficiency of low vision boys and girls.
3. In relation to visual skills by comparing the three classification of vision loss.
4. In relation to optical visual functioning.
5. In relation with perceptual visual functioning.
6. Comparison of optical and perceptual visual functioning.
7. Findings in relation with analysis of comparing the blurred, central and peripheral vision loss.
8. Findings in relation with analysis of optical and perceptual visual functioning with respect to low vision girls and boys.
9. Comparing the pre and posttest mean scores of visual efficiency of low vision children.

The findings covering the above categories are presented as follows:

1. There were total of 60 low vision students clinically certified as low visions (having visual acuity less than 6/18) were selected for the study.

2. Among 60 students 75% reported having blurred vision loss, 12% with central vision loss and 13 % children with peripheral vision loss. Hence it is found that the prevalence of blurred vision loss is higher than central vision loss and peripheral vision loss.
3. Among the sixty children with low vision, 56% were boys and the remaining 44% were girls. It was found that the prevalence of low vision among boys is higher than that of girls.
4. It was found that the highest percentage (45%) of children with low vision fall under the age group of 9 & 10 years than 22% between6-8 years and 35% between 11-12 years respectively
5. While analyzing the parent's educational qualification 58% of the parents studied up to school level, 36% of them were illiterates and only 6% of the parents were graduated.
6. It is understood that 20% of students were belongs to Joint family system and 80% of them belongs to Nuclear family system.
7. While analyzing the marital status of parents it is found that the major cause of low vision i.e 75% due to consanguineous marriage.
8. While analyzing the employment status of the parents of the low vision children, it is apparent that the majority (31%) of them were employed in the non government sectors. Only 7% of them were employed in the government sectors. And the remaining 6% were doing their own business / self employment.
9. The study reveals that the main causes of low vision was found to be (30%) lens disorder and refractive error (17%), followed by problems with corneal disorder (14%) and Retinal disorder (12%) and other etiologies includes genetic disorder and macular problems accounting for (10%) respectively and optic atrophy (1%), Glaucoma (1%) and cone dystrophy (5%).
10. Optical devices enhanced the visual acuity of students with blurred vision, central vision and peripheral vision loss. The prescribed Spectacles for Distant Vision (Spectacles), 78% students (47

students out of 60) were benefitted through spectacles which enhanced their visual acuity and it helped to improve their functional visual efficiency. Only 13 students (22%) were observed that there is no improvement or not benefitted with optical devices. These results were confirm by the study of Victoria, G. and Tyagi, S.K (2007) that low vision students on the whole benefited with the use of optical devices.

11. From the table it is clear that the visual acuity of low vision children were improved after refraction, 50% of them improved to 6/60<6/18, (mild low vision), 32% of them improved to 3/60<6/60 (moderate low vision) and 16% of them were reported with 1/60<3/60 (sever low vision) and 2% children improved to normal vision
12. The above table clearly indicates that 78% of children's vision was corrected with spectacles which promoted better visual acuity. The near vision devices helped 58% children performed better in near vision tasks.
13. With regard to near vision it is observed that, about 58% of them were benefitted through near vision devices (near vision spectacles, magnifiers) which enhanced their visual efficiency and with that they were able to perform the post tests effectively. Whereas 42% of them were not benefitted by near vision devices.
14. With reference to field of vision, Out of 60 students 43% of them field of vision were severely restricted, 52% of them having restricted field of vision and only 5% of students having normal field of vision.
15. Comparing the children with 3 types of vision loss, the children with blurred vision showed better performance in all visual tasks followed by central vision loss then peripheral vision loss.
16. Pertaining to optical and perceptual visual functioning, children secured higher score in optical functioning than perceptual functioning.

17. The study revealed that low vision skills such as visual closure, visual fixation and spatial relation and form constancy a majority of the children showed poor performance than other visual skills.
18. There is no effect of gender, age group and grade level on the visual skills of children with low vision.
19. The indigenous low vision kit was found to be effective in improving the visual skills of low vision children.
20. The training imparted to the special educators was helped to impart effective functional vision training to their respective low vision students.
21. It was found that the posttest mean scores of functional visual skills of low vision children with **blurred vision** have been significantly increased comparing with the mean scores in pretest. The calculated t- value is greater than the table value 2.69 at 1% level of significance pertaining to all visual skills.
22. It was found that the posttest mean scores of functional visual skills of children with **Central vision loss** have been significantly increased comparing with the mean scores in pretest. The calculated t-value is greater than the table value 3.71 at 1% level of significance pertaining to all visual skills.
23. It was found that the post mean scores of functional visual skills of children with **Peripheral vision loss** have been significantly increased comparing with the mean scores in pretest. The calculated t- value is greater than the table value 3.50 at 1% level of significance pertaining to all visual skills except the skill of visual focusing.
24. It was found that the posttest mean scores of functional visual skill of low vision boys have been significantly increased comparing with the mean scores in pretest. The calculated t- value is greater than the table value is 2.73 at 1% level of significance pertaining to all visual skills.

25. It was found that the posttest mean scores functional visual skills of low vision girls have been significantly increased comparing with the mean score in pretest. The calculated t- value is greater than the table value is 2.79 at 1% level of significance pertaining to all visual skills.

26. While referring the pre and posttest mean scores of optical visual functioning and perceptual visual functioning of children with **Blurred vision, Central vision loss and Peripheral vision loss** the calculated t-value is greater than the table value at 1% level of significance.

27. The ANCOVA source table indicates that the main effect gender has no statistical significance in the visual functioning. Both boys and girls showed approximately equivalent scores.

28. Based on the results of analysis of variance the posttest mean scores of three conditions of visual loss compared by taking any two groups and Scheffe's 'F' test was applied to test the significant difference in adjusted mean scores. It is inferred that the posttest scores of blurred and central vision loss do not differ significantly. However, the difference between blurred and peripheral vision groups and central and peripheral vision groups were found to be significant at 5% level. This shows that blurred vision group's adjusted mean is 10 which is significantly higher than adjusted mean of peripheral group (9.20). Similarly, central vision group adjusted mean is 10 which found significantly higher than the peripheral vision group of adjusted mean 6.83.

29. Majority of the teachers viewed that visual efficiency training should be developed at the early years in a systematic way which will help the children to use their remaining vision better in their classroom and emphasized that the training to parents is essential because with the coordination of parents in the right time the visual skills could be developed.

30. The teachers expressed that the interaction of low vision children with non disabled children in the inclusive set up would positively improve their visual efficiency in an effective manner.
31. Teachers and students unanimously felt that the field trips to various places would facilitate in vision training through firsthand experience. It will help to develop visual efficiency by means of visual, auditory, and through tactual experience. This might have created an inhibition to understand naturally. Also they felt that the difficulty in relating time to distance is mostly because of the lack of real experience.
32. The important finding in the present study is that 100% of children with low vision were attending regular schools and the most commonly reported difficulties were related to their studying/reading habits like copying from the blackboard, reading textbook at arm's length, and writing along a straight line, differentiating pictures, to identify distance objects, assuming or measuring distance. It was interesting to observe that a statistically significant improvement occurred in the visual efficiency which was related to their academics, that is, there was a significant decrease in number of children who were unable to do their routine activities due to not able to use their remaining vision. This is a very important inference of the study since a timely intervention could help in maximizing their academic output.

5.2 Discussion

Vision is the most important sense for interpreting the world around us and it helps us to perceive and to understand the world. **Sight** is the ability to look at something (one might say that this is at the level of the eye). Vision is the learning of what is seen by the eye (this is at the level of the brain). A blind person is unable to use sight for learning. A low vision person has some useful vision / sight. People who have moderate, severe or profound problems with sight are considered to have low vision.

The characteristics of children with low vision may vary from person to person. A great majority of the low vision learn to read, write, and watch TV by using their remaining vision and a significant number of children with low vision has irreversibly impaired vision (Vijayan. P 2004).

The functional vision assessment checklist developed by **Vijayan.P** and **Victoria. G (2006)** was used to find out the visual efficiency of low vision children.

Causes of Low Vision

The present study revealed that the major causes of low vision are due to uncorrected refractive errors such as myopia, hyperopia or astigmatism is 43% un operated cataract, 33% and glaucoma, 2% and this result is supported with WHO 2014.

Further Titiyal, J.S. and et.al.,(2004) in their study stated that 703 school children studding in 13 blind school of Delhi to identify the primary Causes and temporal trends of blindness and severe visual impairment in children in schools for the blind in North India and explored the chronological trends in the major causes is identified that from the different age group of 5-8 years, 9-12 years, and 13-15 years is due to retinal disorder, cataract and mostly because of insufficiency of vitamin A. And the study states that, about 50% of the children can be cured or they are under treatable condition. Hence early identification is advisable.

Early identification

The study of **Gary Heiting, OD (2015) and** The **American Optometric Association** (AOA) stressed that, Eye exams for school going children are extremely important, because 5 to 10 percent of preschoolers and 25 percent of all school-age children have vision problems early identification of a child's vision problem is very important because it is easy to provide treatment when problems are diagnosed early. And it is appropriate and necessary that infants should have their first complete eye

examination before they attain the age of six months and they need further eye examination before they enter into the first grade or at the age of 5-6 years. The findings of the study also stressed that early identification, refractive correction, and visual efficiency trainin should go simultaneously.

Uncorrected refractive errors

Uncorrected refractive error is a major cause of unilateral and bilateral visual impairment in developing countries. The prevalence is due to uncorrected refractive errors as 17% in the current study which is similar to other developing populations. Although most refractive errors may be fully corrected using spectacles with relatively low cost, a significant proportion of the population remains largely uncorrected.

Prevalence and etiology

The study of **Sight Savers (1995)** coincide with the findings of the present study, It reports that, in India a study was undertaken to find out the main reason for blindness and for the vision impairment in children enrolled in two inclusive education programmes in Orissa and Chhattisgarh. It is found that in Orissa about 54% of children were identified with cataract and corneal diseases and in Chhattisgarh the main cause of blindness in due to retinal problem.

Further the of study of **Adedamola, L et.al., (2012)** confirms the present study that “Etiology of blindness and low vision in the 86 students studied in the schools for the blind in Oyo State” it reveals that, 55% of the visual impairments due to congenital or with developmental cataract, 37 % with optic atrophy and 9% were identified with retinitis Pigmentosa.

Optical and non optical devices

The study of **Nikhil Pal (2006)** and his team supports to the present study on the “Need for optical and low vision services for children in schools and it reveals that, about 20% of the children were improved their functional vision after refraction and about 35% improved with spectacles particularly

the children with aphakia, coloboma, refractive error and microphthalmos students benefited from spectacles and 41% of the children were able to read N10 size with the help of spectacle magnifiers. By this study they concluded that the children with aphakia, congenital anomalies were benefitted out of refraction and with low vision devices.

While refereeing the study of **Nagomi, G. and Tyagi, S.K** which is supporting the present study that the Efficacy of Optical Devices in Increasing the Reading Speed of Students with Low Vision (2007). They identified that the optical devices were enhanced their reading speed of students with blurred vision, central vision and peripheral vision loss and they found that there was a significant impact of optical devices on critical print size of low vision students. And from the result it is understood that the reading speed of students using low power magnification was better than that the using of higher power magnification.

To conform the present study the **Sight Savers (1995)** states that In India, the assessments of vision impairment in children enrolled in education programmes in Chatisgarh mentioned previously found that 76% of children could potentially benefit from low vision devices, but only 2 children were previously using them. This study played an important role in establishing systems for children to be properly assessed for visual function and low vision before enrolment in the inclusive education schools, so that they receive the most appropriate support. It has also been used to develop stronger systems for the provision of assistive technology, to ensure that children benefit from the necessary low vision devices.

Functional Vision Training

Many studies were conducted in the area of prevalence, etiology, various causes of low vision and low vision devices but every few studies in the past have highlighted in the area of functional vision training in relation with visual skills.

The present research study favors the study of **Suma Ganesh and et.al., (2013)** concluded that there is a significant improvement in post visual rehabilitation especially it enhance the activities related to academic performance. Also it is necessary to have an early visual rehabilitation which will help to improve and enhance the learning abilities of children with low vision.

The above discussion throw lights on the early identification and visual efficiency training with adapted devices and environment for promoting effective leaning and social integration of children with low vision.

Class Room Management

As a supportive hand for our present study, the study of **Taha A. Labib, Mohamed A. El Sada, (2009) and et.al.,** reveals that the prescribed distance and near vision aids were improved the visual acuity and the visual needs of every sample. All of them in the age group 5-7 years were integrated in mainstream schools. The remaining samples that were already integrated in schools demonstrated greater independency regarding reading books and copying from blackboards. Also confirmed that low vision aids could play an effective role in minimizing the impact of low vision and improving the visual performance of children with low vision, leading to maximizing their social and educational integration.

5.3 **Recommendations**

1. The training of general teachers at pre-service and in-service levels should address the issues of education of children with disabilities, so that teachers are better equipped to work in an inclusive environment.
2. A well qualified and trained Special educators should be available at block level to support the children with low vision
3. Need for early childhood education care and programmes (from 0-6 years) sensitive and responsive to the special needs of children, including training of Anganwadi workers in identification of needs of

the children with disabilities, use of age-appropriate play and learning materials and the counseling of parents.

4. All inclusive schools should have the provision of appropriate barrier free environment will enhance more admission and retention.
5. Ensuring the availability of support services in the form of ICT, teaching learning materials and suitable assistive devices.
6. Consider all special teachers are full-fledged members of the school and need to create awareness among the administrators, head of the institutions, parents and community about the importance of education for the children with special needs.
7. Build partnerships with institutions of higher learning, governmental organizations, and NGOs to promote education an rehabilitation.
8. To address the need for refractive correction, the number of screening centers in both rural and urban areas should be increased. Adequate correction of refractive errors may lead to marked improvement in visual function and quality of life.
9. There is a great need for support of government, eye hospitals and Non Governmental organizations for capacity building, and setting up low vision rehabilitation services across India. Also need strong community participation in view with identification, counseling and provision of services to ensure best possible quality of life envisioned by the Vision 2020.

5.4 **Suggestions for further research**

Further Investigation may be carried out on:

1. The impact of intervention carried out at secondary level for children with low vision.
2. A research may be carried out on functional vision training with the use of ICT facilities.

3. A research study may be conducted on functional vision training through using various play way method.
4. A comparative study may be followed on the visual skill development of children enrolled in special and inclusive schools.
5. An explorative study could be carried out to identify the problems faced by the regular teachers while teaching children with low vision in the inclusive setting.
6. A study may be carried out to identify the problems faced by the students for procuring low vision devices.
7. A study can be carried out to identify the problems faced by the parents of low vision children.
8. Research study may be carried out on the employment opportunities available for children with low vision.

5.5 **Conclusion**

To summarize, early identification and intervention is the best means to minimize the eye defects associated with low vision. Despite enormous challenges encountered by the children with low vision in day to day activities, they can also achieve great deals in their life through the use of cent percent remaining vision which facilitate to promote inclusion of these children in the mainstream schools.

Thus the research carried out, created awareness among the parents and teachers of children with low vision to understand the importance of child's eye condition, early assessment, refractive correction and need for functional vision training. It is the responsibility of the parents, teachers and caretakers and peer group to assist the child in meeting the challenges of education and employment to lead a happy and purposeful life.

Lets us join together;

We can make a difference in the life of children with low vision.