

Experience Vision 2019-India Screening Project Report

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Table of Contents

1. From the chair.....	22
2. Foreword	23
3. Key messages.....	24
4. Executive summary	25
4.1. Introduction	25
4.2. Methods	25
4.3. Results	25
4.4. Recommendations	26
5. Calendar of events	26
6. Introduction.....	27
7. Goals.....	27
8. Deliverable.....	28
9. Methods	28
9.1. Phase I- Eye care awareness program	28
9.2. Phase II-Development of school vision screening protocol	29
9.3. Phase III - Optometry career counselling drive	34
10. Results.....	35
10.1. Phase I- Eye care awareness program.....	35
10.2. Phase II- Development of school vision screening protocol.....	19
10.3. Phase III- Optometry career counselling drive	20
11. Impact of the corporate society responsibility activity of Bausch & Lomb India	20
12. Summary and conclusion.....	22
13. Gallery.....	24
14. Way forward	32
15. Acknowledgements	32
16. Testimonies	32
17. References	34
18. Appendix 1: Standard operating procedures for Phase I	35
19. Appendix 1 – IEC Material.....	36
20. Appendix 2 - Optometry School Children Screening Protocol.....	36
21. Appendix 3- Information Education and Communication (IEC) material.....	36

Abbreviations

Abbreviation	Full form
APEDS	Andhra Pradesh Eye Disease Study
IEC	Information Education Communication
IPD	Inter pupillary distance
IVI	India Vision Institute
JCC	Jackson's cross cylinder
LVPEI	L V Prasad Eye Institute
NPCB	National Program for Control of Blindness
OCI	Optometry Council of India
OPD	Outpatient department
VA	Visual acuity
WOD	World Optometry Day

List of figures

Figure 1: Illuminated pocket vision screener. This was 13cm in length and 7.5cm in width excluding the stand. 31

Figure 2: Distribution of males and females of children from private schools of urban cities across four zones of India, who successfully completed the school vision screening with developed protocol ... 19

Figure 3: Distribution of refractive error type with total number and percentage of school children for each type of refractive error 20

Figure 4: Reach the project achieved across India for Phase I and Phase II of the study are indicated by the optometry institutes that took part in the project. The institutional locations are indicated with starts. 21

List of tables

Table 1: The names and the relevant experience of the team of expert that were involved in the development of school vision screening protocol 30

Table 2: Distribution of optometry organizations that participated in eye care awareness and hygiene drive across four zones on India. The no of schools and school children reached per zone are also specified in numbers and percentages..... 35

Table 5: Zone wise distribution of optometry organizations that participate to creat awareness and to educate teachers and student from Government and government aided schools about eye care, refractive error, lighting conditions and common eye ailments..... 18

Table 3: Distribution of total number of students found to have refractive error of the total number of students tested for refractive error in all four regions of India are specified. The percentage of student population for refractive error in each area is indicated too. 19

Table 4: Distribution of refractive error type with total number and percentage of school children for each type of refractive error 20

Table 6: A summary of targets set forward and achieved for all phases 23

List of pictures

Picture 1: Screening protocol meeting held at ... on ...Picture D was taken during IEC material training for Optometrists.	24
Picture 2: OCI board discussion with Bausch & Lomb India held at ... on ...	24
Picture 3: Ms Lakshmi Shinde representing OCI at the Asia Pacific Optometry Conference held in Manila, Philippines during ... to ... Poster titled	25
Picture 4: Distribution of spectacles at spectacle dispensing visits at schools in Phase II of the study.....	25
Picture 5: Pictures of student career counselling that took place at Vadodara. The students can be seen to experience vision of a person with refractive error with help of glasses and lens blank.	26
Picture 6: Newspaper articles about the screening program conducted in ... state and State.	27
Picture 7: As part of the standardization of the screening protocol, the release of the protocol was done by Optom Rajbir Singh Berwal, board member OCI and Mr. Sanjay Bhutani, MD. Bausch & Lomb India on 23rd March on the eve of World Optometry Day.....	27
Picture 8: A photo from awareness drive for taking care of your eyes taken at a school in Vijayawada.....	28
Picture 9: A student from Surat can be seen pasting a poster in Gujarati.	28
Picture 10: An optometrist checking for vision anomalies under Phase-II of the project at Lucknow.....	29
Picture 11: School students can be seen looking after their posters in Marathi from a school at Sangli.	29
Picture 12: An optometrist can be seen testing for Intra-ocular distance for prescribing glasses to school student at Chennai. A Phase-II activity.	29
Picture 13: A colour vision assessment testing examination can be seen in this image taking during Phase-II of the study at Shillong.	30
Picture 14: A Phase-III activity of the project undertaken at a school in Delhi to increase awareness of Optometry as a career option.....	30
Picture 15: A Phase-III activity of the project undertaken at a school in Bangalore to increase awareness of Optometry as a career option.....	31
Picture 16: A Phase-III activity of the project undertaken at a school in Kolkata to increase awareness of Optometry as a career option.....	31

1. From the chair

Undetected vision problems in school children will interfere with child's ability to learn, that directly hampers child's academic performance and can even bring in behavioural issues. The earlier these problems are detected the better it is for intervention. The parents are not well informed or educated to read the early signs of visual disability noticed by the kids. The child herself may be born with the defective vision and hence may not understand the meaning of clarity. India does not have a policy of compulsory eye examination and typically parents would report to the eye care practitioner only after the situation is worsened. In conditions like amblyopia otherwise known as the lazy eye, we lose the critical period of treatment and not much can be done if detected after 7 years of age. Myopia needs regular follow ups and its progression can be controlled to some extent by changing few lifestyle habits and wearing the correct prescription. Untreated infections can lead to corneal blindness. Visual impairment due to uncorrected refractive error is a sad reality in India.



Monica Chaudhry
Chair
Optometry Council of India

Optometry council of India (OCI) has contribute in conducting awareness camps amongst school children, screening camps to timely detect their eye related problems and providing spectacles to those who need it. This activity was conducted with the support of over 30 optometry schools, their students and faculty. Needless to say our initiative was funded by Bausch & Lomb India Pvt Ltd, without whose support this mission could not have been achieved. Our data itself reflects this is a serious issue and 4.4% of students were having defective vision just because they were not wearing a pair of glasses.

This was just a beginning and we need all to join us in advocacy towards elimination of childhood visual impairment by requesting our policy makers to initiate a policy of compulsory eye exam for all school children. OCI also appeal to every Optometrist of the country to come forward to talk about eye health to parents and children and ensure no child has been without an eye exam.

Monica Chaudhari
Chair
Experience Vision Project

2. Foreword

This report has been prepared for summarising the three fold efforts taken towards development of an effective and efficient school vision screening protocol that can be easily adopted across India, and to demonstrate that the involvement of optometrist in actual school vision screening process is essential to provide accurate diagnosis, and finally to address the much needed awareness of Optometry as progressing career option among young lads across pan-India. This document is a product of efforts conducted by the Optometry Council of India (OCI) and reports the outcome of above mentioned structured activities conducted over two years (2017-2019) with the help of generous funding by Bausch & Lomb India Pvt Ltd.



Lakshmi Shinde
CEO, Optometry Council of India

The underlying purpose of health screening initiatives are typically to identify detectable and treatable health related problems, preferably in a set up that allow large population coverage and quick identification of diseased or population at risk. While cost should not be a barrier for implementation of the screening, it must be weighed against the benefits of screening. It is also important to identify the human resource that are equipped with the knowledge to complement the screening goals. Through this report we present evidence obtained via development and validation of a cost effective school vision screening protocol and report the importance of direct involvement of optometrist in the process.

Several vision screening programs are conducted by various organizations on regular basis in India. However there is no recommendation made for a protocol that is developed by experts and that ensures high quality out-come. The OCI project team and associated experts have put together a protocol and have successfully tested it to demonstrate its effectiveness. I hope that these outcomes would positively change the way vision screening programs are conducted in India.

Thank you,

Lakshmi Shinde
CEO, Optometry Council of India,
Bangalore-India

3. Key messages

Currently there is little consistency in who, how and when the school vision screening programs are conducted in India. This report outlines the existing evidence of variation in screening protocol used by various organizations and emphasise on the lack of a standard protocol. The available evidence on the prevalence of common eye conditions among Indian children is inconsistent, even if for similar age groups. These inconsistencies could be attributed to inconsistencies in protocol and the training and experience of the human resource involved in their measurements. It also summarises the recommendations for children's vision screening put forward by the OCI expert advisory group. The expert have recommended that the protocol have methods that help identify hyperopia and associated anomalies without the use of cycloplegic topical medication. The cut-off for prescribing refractive error was set at 0.75D for reporting significant refractive error. Further studies to evaluate the compliance with prescribed spectacles and to check effectiveness of any treatment provided would be beneficial.



Prema Chande
Board Member, OCI
Re-presents ASCO India

The literature review showed a range of professionals that are involved in vision screening such as school teachers, vision technicians, optometrist etc. Although most screening would use referrals for tertiary or secondary eye care centres and ophthalmologist for further care, no data demonstrates the false positive and false negative of the referrals made or the compliance to the advice provided. To ensure the best possible and comprehensive outcome, we demonstrate that the school vision screening programs should be conducted by optometrist for maximum results and accurate and thorough examination of children.

Despite several vision screening programs reported on regular basis, there is little evidence on activities to increase awareness about eye care and hygiene requirements for the eye. Through this report we emphasize that Optometry has a major role in increasing the awareness of eye care and associated hygiene information through targeted awareness drives.

The demand for trained optometrist to cater vision related problems among Indian population is huge. To address this particular issue a drive was conducted to increase awareness about Optometry as a fast growing and fulfilling profession and a great career opportunity for youngsters. Educational material were developed and workshops were conducted to help young students understand the role of optometry in society and career opportunities it provides. Further studies would help assess if the drive was effective in increasing awareness about Optometry among student and if this reflects in final career choices the students have made few months down the line.

Prema Chande
OCI Board Member

4. Executive summary

4.1. Introduction

Screening is an important tool for easy and quick identification of health conditions that need further management. Vision screening are extremely important today, especially considering the increasing prevalence of myopia and related vision anomalies. Early detection has often been identified as crucial to avoid delayed treatment. While it is important to organize screening activity, it is even so important to take efforts to make it comprehensive and accurate with involvement of appropriately trained human resource. In this project we develop a protocol that is comprehensive and demonstrate that important vision anomalies can be detected efficiently if well trained optometrist are involved in vision screening initiatives. We further organised drives to increase awareness about eye care and ocular hygiene among school children and teachers as well as to introduce Optometry as a fulfilling and progressive career option to youngsters in India.

4.2. Methods

Over one and half years the OCI lead project was conducted with structured and focused activities. The goals of the project were identified and a committee of experts and optometry organizations were invited to participate in the process. The project was divided in three mutually independent phases, each focusing on an important aspect. The Phase I of the project focused on eye care awareness and hygiene drive, for this Information Education Communication (IEC) materials were developed (10 Posters) and translated in local languages. Teams of optometrist were trained who conducted this awareness drive through presentations in government and government aided schools across India. The Phase II focused on development and validation of best practice screening protocol for school. This included formation of a panel of experts and finalizing the protocol, ones finalised the protocol was tested among school children. The protocol was unique for its inclusion or exclusion of specific tests through extensive debate and discussion among the panel of experts. Spectacles were dispensed where deemed necessary. Phase III involved career counselling for young children of class 10 and 12. This was done with teams of optometrist, each included one senior optometrist and one optometry intern student. The school children also got an opportunity to experience contact lenses as a mode of vision correction.

4.3. Results

OCI has successfully achieved all the goals set forward. For Phase I, the eye care awareness drive was successfully conducted in 402 (target was 400) government and government aided schools across India. Through this 98,426 children and over 2 thousand school teachers were educated about eye care, refractive error, lighting conditions and common eye ailments. The educational material were translated in 9 languages to cater the local needs. For Phase II, a team of experts gather and prepared a comprehensive school vision screening protocol. This protocol was used to screen 16408 school going children of that the data of 14614 (F: M, 55:45) children were analysed. Of these 4.41% were found to have refractive error. East Indian region showed highest prevalence of refractive error (26%), followed by South at 5%, North at 4% and West at 2%. Females dominated the overall refractive error category at 69% (n=358). About 2% children were identified as colour vision deficient and almost 12% did not meet the set criteria indicating a close to 12% prevalence of binocular anomalies. For Phase III, 30 schools from 6 cities of India were introduced through educational material to

Optometry as a fulfilling career option to young Indians who would soon be making choices towards their career through further education.

4.4. Recommendations

The focused activities for eye care awareness programs are effective when optometry professionals are involved. It is evident from the results of the study that a comprehensive vision screening protocol effectively identifies vision related anomalies that are not only limited to visual acuity assessment but also extend to early detection of colour vision and binocular vision related anomalies. Inclusion of optometrist with the ability and knowledge of assessing these specialised and critically important aspects of vision development, resulted in effective and efficient comprehensive vision assessment. The introduction of optometry as a career choice was done successfully to target identified and we would be interesting to follow up with this group after a couple of years and check the actual career choices the students have made.

5. Calendar of events

6. Introduction

India is a land of over billion people. With millions of people with uncorrected refractive error. Uncorrected refractive error is still the most common cause of visual impairment and second major cause of avoidable blindness.¹ Although school vision screening programs are the most commonly used model to reach large number of children,² there is no uniformity in ways the programs are conducted to ensure maximum and accurate output for early identification and effective referrals. The underlying rationale for this project was to emphasize that Optometry plays an important role in eye care awareness and eye hygiene information, and school screening programs must include optometrist for maximum out-put, and to introduce this fast growing career option to the young lads of this country.

It is evident that when school screening programs are conducted with the help of school teachers or non-optometry evaluators the conclusions and discussion predominantly emphasize the need of further studies to ensure the ratio of false positive and false negative of the screening out-come for anomalies.³ In order to reduce the efforts to revisit the area screened we advocate the involvement of Optometrist in school screening activities.

Many eye disease have their origin in early ages and if not identified the morbidity may go un-noticed. This would in turn affect the child's overall development. Children in the school-going age group (6-16 years) represent 25% of the population in the developing countries.⁴ It was noted that 30% of Indian population that it blind loss their sight before the age of 20 the important of early detection by appropriate means and quality referrals in undeniable.⁵

7. Goals

The goals of the project are specified below.

- To develop advocacy material on eye ailments, eye hygiene and eye care and to reach this information to 400 government and government aided school
- To develop best practice standard in school screening and community eye screening
- To test the developed protocol in 15,000 government school children and distribute spectacles for those who need
- To develop informative material and workshops for optometry career counselling
- To train Optometrists for providing primary eye care services through developed screening protocol
- Advocacy of myopia and myopia control to parents and teacher through IEC material

8. Deliverable

Deliverables	Aim	Phase
Develop information education communication (IEC) material, for optometrists who will use it to educate students and teachers about eye care, refractive error, lighting conditions and common eye ailments	Qualitative	Phase I
Train team of optometrist regionally who can visit government and government aided schools to increase awareness among teachers and students	Qualitative	Phase I
With the help of Rotary and Round table, visit 400 government schools around India and educate them on eye care	400	Phase I
Develop best practice standards for school eye screening and community eye screening and test the protocol in 5 regions of India. About 15,000 children to be covered through this eye screening and spectacles to be provided. Complete 5 community eye screening to check and validate the protocol	15000	Phase II
To develop material for optometry counselling	Qualitative	Phase III
Optometry counselling to students studying in 10-12th grade. Students also made to experience contact lens as a mode of vision correction	30 schools 6 Cities 2200 students	Phase III
Three teams of 2 optometrists each which will include a senior optometrist and one intern will visit schools and present on optometry and conduct workshops.	Qualitative	Phase III

9. Methods

9.1. Phase I- Eye care awareness program

A call for volunteers were made among OCI members and optometry collages with OCI members for identification of Optometry organizations that were willing to participate in eye care awareness drive. All the participating organizations were required to confirm their commitment in terms of number of target schools they would be approaching for participation for creating awareness about eye care and eye hygiene among government and government aided schools. The call for volunteering was also publicized by OCI under Vision2020 India Forum that lead to inclusion of 2 practitioners. India was divided in four zones i.e. East, West, North and South. Optometry organizations from all zones were encouraged to participate. Through this innovative initiatives Optometry students were encouraged to develop posters and school going children were encouraged to look after them.

Development of Information Education and Communication (IEC) material was first done in English. It included informative posters and a power point presentation. The posters were translated in Assamese, Bengali, Gujarati, Hindi, Kannada, Malayalam, Marathi, Tamil and Telegu. These languages were identified by the volunteering optometry organizations. OCI with the help of translation department at the Manipal University, Mangalore translated posters into 7 of the 9 different languages mentioned above with exclusion of Gujarati and Assamese. These were translated by OCI members. Ones the documents were translated, they were further reviewed and proof read by OCI members who are from the respective region and familiar with language. Contextual and grammatical changes were requested to

be made by the translation department. The final PDF were then printed to be distributed to respective regional organizations. The posters were printed on A3 size pages for better legibility. There were 12 posters in each language which form 1 complete set. The participating educators and participants thought that there was no need to translate the power point presentation as it could be easily used for reference while the content was elaborated in local languages. Also during the training it was emphasized that for Punjab region the English material would be preferred over the Hindi material and hence this region was provided with English material.

The OCI office prepared a standard operating procedures (SOP) for distribution of IEC material to maintain consistency of the procedures. The OCI office held training programme for local optometrist from the volunteering organizations for use of the developed IEC that included a carefully designed, informative and descriptive power point presentation (Appendix 4). These trained local teams of optometrist created awareness and educated teachers and student from Government and government aided schools about eye care, refractive error, lighting conditions and common eye ailments. When necessary, the local bodies of Rotary club India and Round table were approached to collaborate to approach Government and Government aided local schools. A total of 441 sets were printed and sent to respective optometry organizations who initiated the visits in the month of Jan 2018.

Additional notes: As part of World Optometry Day celebration (WOD), OCI sent posters for use in hospital OPDs and also to educate the attendants of patients. Skits were performed to educate the patient's attendants too. Towards these efforts, 29 sets of posters in English were sent to 29 colleges and their hospital partners. The optometrist explained each poster to the attendants waiting in hospital lobbies and performed skits to explain the importance of eye care and common eye conditions. Along with that, on the occasion of WOD, OCI made a collage of all optometrists who contributed to the making of Experience Vision posters and acknowledged their contribution to the same. This was sent to them along with a letter from OCI thanking them for their enthusiasm and efforts.

9.2. Phase II-Development of school vision screening protocol

For the development of a school vision screening protocol, a committee of seven experts was formed. The specific details of the committee members are mentioned below in Table 1.

A meeting of the committee members was arranged to discuss any existing school vision screening protocols the members have used in the past. Ms. Anitha Arvind presented about the government National Programme for Control of Blindness (NPCB) protocol. At the end of the session through discussions and debates, it was concluded that the extensive protocol used by Elite School of Optometry could be used as the demand of the project was to look at optometric screening protocol. This suited the demands of minimal usage of dilatation drops where necessary, laid emphasis on binocular vision, colour vision and diagnosis of the condition at screening site. Although the advantages and disadvantages of testing stereopsis was debated it was finally agreed to not include the same. The aim of this phase of the project was to test this protocol all over India, and to propagate the same to all optometrists as an ideal "optometry" standard protocol for school vision screening. The aim is also not to just visit and screen but also for optometrists to follow up with the screening visit, check

compliance with spectacles and also visit the school again after a year for a follow up screening visit. This build the relationship with the screening site, increases the exposure of optometrist contribution to society and also instils a sense of public health and eye care among young optometrist. The final protocol can be found at Appendix 2. Details of the protocol are specified below.

Table 1: The names and the relevant experience of the team of expert that were involved in the development of school vision screening protocol

Name	Parent Institution	Relevant experience
Dr Anuradha N	Elite school of Optometry, Chennai, Tamilnadu, India	Doctorate on school vision screening programs
Ms. Monica Chaudhry	Chair, Optometry Council of India, Bangalore, Karnataka, India	
Dr Srinivas Maramulla	L V Prasad, Eye Institute, Hyderabad, Telangana, India	A doctorate in public health and the key runner of the much acclaimed Andhra Pradesh Eye Disease Study (APEDS) study
Ms. Prema Chande	Lotus college of optometry, Mumbai, Maharashtra, India	Experienced with multiple vision screening camps for underprivileged and school children
Mr. Nirav Mehta	Harijyot College of Optometry, Gujrat, India.	Experienced with school vision screening programs in association with India Vision Institute (IVI)
Ms. Anitha Arvind	Sankara Collage of Optometry, Bangalore, Karnataka, India	Pursuing PhD in areas related to government and public sector eye care professionals and their competencies
Ms. Saranya	Achuta Institute of Optometry, Tamilnadu, India	

Part 1: Basic Vision Screening

Vision Check for Distance: The pocket Vision Screener is a handy chart with Log MAR optotypes 6/9. It has seven letters in three rows with black bars surrounding the chart for crowding phenomenon.

Testing Protocol:

- Do the procedure in a room with good lighting. Make sure the test chart (pocket vision screener) is kept at the eye level of the child while the test is being done.
- Measure the distance with a measuring tape as 3 meters between the examiner and the child.
- Ask the child to cover the left eye with the palm with the optical correction if any and read the second / middle line of the pocket vision screener (Figure 1) .
- If the child reads more than three (3) letters in the middle row out of the middle five (5) letters they will be considered as "PASS". Children who are not able to read more than three (3) letters are considered to be "FAILED".
- Repeat the test for the other eye and document the findings.



Figure 1: Illuminated pocket vision screener. This was 13cm in length and 7.5cm in width excluding the stand.

Modified Clinical Technique: Children who were found as “PASS” in the pocket Vision testing alone will take this

Testing Protocol

- Ask the child to close the left eye and hold the +1.50 DS lens in front of the right eye
- Instruct the child to read the second / middle line of the pocket vision screener
- If the child reads the second / middle line with the lens in place , they will be considered “FAIL”
- Repeat the procedure for the other eye and document the findings

Torch Light Examination: A pen torch would be used to assess any external ocular abnormalities, media opacities and pupillary abnormalities in the children. Any abnormality in the external eye examination or anterior segment of the eye, the child would be referred to the base hospital for further examination.

Testing Protocol:

- Hold the pen torch at 30-40 cm from the child’s eye
- Examine the external ocular structure – eyelids , eye lashes with eyes closed
- Ask the child to open the eyes and look for any abnormalities in the conjunctiva , cornea and crystalline lens
- If the child has any external ocular abnormalities – eye hygiene would be explained
- Referral to the base hospital would be done for abnormalities in cornea, conjunctiva and lens.

Colour Vision Test: Colour vision screening and counselling for high school children with defects, helps in choosing the right career.

Testing Protocol:

- Colour Vision screening is done using the ESO’s colour vision screener (a mobile based screener-preferably a tablet)

- Testing should be done in a well illuminated room
- The child is asked to read out the number plates shown in the mobile application at a distance of 40cm at an angle of 45 degrees with his/her spectacles binocularly
- Each number in the application would be shown for 3 seconds. The first plate is a demo plate and the plates 2 and 3 are vanishing plates
- There would be 5 sets in the screener ; if the child is not able to comprehend any of the numbers in the first set , second set can be used for rechecking
- If the child reads only 1 or 2 , he is identified as a colour vision deficient
- Children who fail the screening test would undergo a confirmation test with the Ishihara pseudoisochromatic plates. Those children who are confirmed as colour vision deficient would undergo a counselling session along with the parents and teachers

Near Phoria test: Modified Thorington test

The presence of heterophoria and the magnitude of deviation would be measured using the modified Thorington test

Testing Protocol:

- The test is done in a moderately illuminated room ensuring the visibility of the red line produced by the Maddox rod
- The test is done with the child wearing his/her optical correction
- The Maddox rod is placed in front of the right eye with the streaks oriented horizontally to measure the horizontal deviation and vertically to measure the vertical deviation
- The child is then instructed to report the number on which the red streak passes through along with the direction of the line (left , right , up down or centre)
- Heterophoria greater than +/- 4 would be considered for vision therapy
- Cover test would be performed when the child has difficulty in comprehending the modified Thorington test

Near Point of Convergence (NPC)

Near Point of Convergence is measured as a part of minimum battery of tests needed to identify binocular vision anomalies in school vision screening.

Testing Protocol:

- The testing is done in an ambient illuminated room with the child's optical correction
- With red filters in right eye the child is asked to fixate at the pen light from 40 cm
- The pen light is taken closer to the eye 1-2 cm/second; the child is asked to report when he /she sees a red light and an orange light separately (double) and the value on the ruler is noted as the subjective NPC break
- If the examiner observes a loss of fusion , without a subjective report of double , the point at which the examiner observed a loss of fusion is considered the objective NPC break

- Once the break is noted, recovery of fusion should be noted by slowly moving the pen light away from the eyes , the point where the child reports single vision or the examiner noted a recovery of fusion
- The break and recovery would be repeated for three times with an interval of 10 seconds between each paired break and recovery measurements
- NPC values greater than 10cm with pen light and res filter would be considered for vision therapy
- If the break is reported by the child or a loss of fusion is not by the examiner then the NPC break is noted as 1cm

Accommodative flippers: When the child complains of any symptoms associated with near or reading works with receded NPC and significant heterophoria then accommodative flippers would be done to that particular child to identify if there is a problem with accommodation

Part 2: Post glass prescription, refraction and selection of spectacle

If the child is already presenting with spectacles, the power should be measures (hand neutralisation or Lensometer). Details to be documented. Illuminated log MAR chart should be used for measuring the visual acuity. Objective refraction using a streak retinoscopy to be done for power estimation along with subjective acceptance using trial lenses. Children who require cycloplegic refraction will be referred to the base hospital.

Testing Protocol:

- Unaided or vision with previous glasses measured
- Objective refraction using retinoscopy followed by subjective acceptance using trial lenses
- Spectacle prescription given to children whose vision improves on subjective refraction

Prescribing Guidelines

Refractive Error	Prescribing Guidelines
Myopia	>-0.75 DS
Hyperopia	>+1.00 DS
Astigmatism	>1:00 D

Selection of Spectacle:

- Measure the Inter Pupillary Distance (IPD) with a PD ruler or Pupillometer.
- Allow the children to select their own frames.
- Make sure the frames fit well on their faces before final decision

Part 3: Referral

Those children whose vision does not improve with spectacles will undergo ocular evaluation with direct ophthalmoscope to identify any media opacity and other retinal problems. Obvious ocular problems like Ptosis, Squint etc. any ocular disease like conjunctivitis, blepharitis etc. colour vision deficiency, Binocular vision anomalies should be referred to the base hospital for further evaluation and counselling.

Distribution of Spectacles

- Spectacles will be distributed within 3 weeks after screening
- Same team should visit the school to distribute the spectacles
- Children should be demonstrated the handling of spectacles

Part 4: Follow Up

- The school students have to be visited by the optometrist after 6 months.
- To check the compliance of spectacle wear, a surprise visit should be done by the team
- Class teachers to be enquired regarding the spectacle wear
- Children who are found to be compliant, should be appreciated during the Morning Prayer.
- The school which is found to be most compliant would be given an overall award for “Best Compliant School”

LIST OF INSTRUMENTS

- Measuring tape that is longer than 3meters
- Double sided sticky tape to stick and secure any materials e.g. charts on the wall
- Charger / Battery for the retinoscope, ophthalmoscope or any other electric device
- Plus 1.50 DS lens from the trial set
- Torchlight / Pen Torch
- Colour vision screening plates (mobile/tab)
- MIM (Modified Thorington) Card / Pocket Vision Screener card
- Maddox Rod, Red filter
- Measuring scale for the measurement of near point of accommodation and near point of convergence
- Trial lens box with trial frame
- Pin hole
- Block
- JCC
- Retinoscope
- IPD ruler / Pupillometer
- Lensometer
- Demo frame
- Pen / Stickers / Mirror / Referral card / spectacle prescription pad
- Banners / Standees / Camera (Promotional)
- Tissue boxes / Sterillium hand rub (Consumables)

9.3. Phase III - Optometry career counselling drive

Education material was developed for increasing awareness of Optometry as a fast progressing and fulfilling career option. The material included a power point presentation, a video clip describing optometry as a career choice, a workshop that enables students to experience vision with uncorrected refractor/of a person with squint, and a flyer that outlines, “Who an optometrist is”.

Seven cities from various region of India were selected that included Pune, Bangalore, Kolkata, Delhi and NCR, Vadodara, Ahmedabad and Siliguri. Each cities were required to include at least 5 private schools for their region. The drive was conducted in private school for students who are in 10th class or 12th class. The trained optometrist were representing OCI for career counselling. Each workshop was conducted for 3 hours by a team of optometrist that involved one senior optometrist and an optometry intern. The workshop was designed to have following step in same sequence.

- Step 1: A power point presentation was delivered by Optometry team to school students
- Step 2: A video clip was shown on optometry as a career choice
- Step 3: A workshop enabling students to experience uncorrected refractive error and squint
- Step 4: Distribution of flyers describing, “Who is an Optometrist”

10. Results

10.1. Phase I- Eye care awareness program

A total of 400 schools were targeted across four zones of India and the team was able to achieve the target and more. Table 2 demonstrated the summary of the optometry organizations that participated from all four zones of India and the total number of children covered by them. About 457 schools were identified and approached, and of these the team could complete awareness drive activities in 402 schools successfully. The south region dominated in terms of no of optometry organizations that participated (45%) and also for the number of students covered (58%). This was followed by West, North and East zones respectively at 23%, 19% and 13% for optometry organization’s participation and 18% school children coverage each for West and North region and 6% of coverage for the East.

Table 2: Distribution of optometry organizations that participated in eye care awareness and hygiene drive across four zones on India. The no of schools and school children reached per zone are also specified in numbers and percentages.

Zone	Optometry organizations participate (n, %)	Schools approached	Schools completed	No of students covered (n, %)
East	4 (13%)	45	28	6135 (6%)
North	6 (19%)	125	118	17424 (18%)
South	14 (45%)	203	182	57102 (58%)
West	7 (23%)	84	74	17765 (18%)
Total	31 (100%)	457	402	98426 (100%)

The details of the optometry organizations that took part in the awareness drive along with the total number of school children that were covered through their individual efforts are specified in Table 3.

Experience Vision 2019-India

Table 3: Zone wise distribution of optometry organizations that participate to creat awareness and to educate teachers and student from Government and government aided schools about eye care, refractive error, lighting conditions and common eye ailments.

Sr No	College Name	Zone	No of schools committed	Language	No of schools completed	No. of Students
1	NSHM , Kolkata	East	10	Bengali	10	3,311
2	Bansara College of Optometry	East	10	English	10	1200
3	Vidya Sagar College of Optometry	East	5	Bengali	4	1,188
4	Sankar Dev Netralaya	East	20	Asamese	4	436
5	Era University	North	35	Hindi	35	1,900
6	UPUMS , Saifai , Lucknow	North	30	Hindi	30	6,178
7	Sitapur Eye Hospital	North	10	Hindi	4	311
8	Ansal College of Optometry	North	10	Hindi	8	3,756
9	SJ Vision Foundation	North	10	Hindi	10	896
10	Sadguru Seva Sangh- Trust, Netra Chikitsalaya, Anandpur	North	30	Hindi	31	4,383
11	Ahaliya College of Optometry , Pallakad , Kerala	South	30	Malyalam	25	3,997
12	Sri Ramachandra College of Optometry, Chennai	South	12	Tamil	11	3,241
13	Sri Prakash College of Optometry	South	10	Tamil	10	5,360
14	SRM University - Department of Optometry	South	8	Tamil	8	1080
15	Sankara College of Optometry	South	5	Kannada	5	1,089
16	Manipal College of optometry	South	20	Kannada	13	2009
17	Susruta College of Optometry	South	10	Malyalam	8	755
18	Nethradhama College	South	10	Kannada	5	706
19	Eye Foundation, Coimbatore	South	6	Tamil	3	2,489
20	Elite School	South	30	Tamil	35	21,034
21	Pushpagirir Eye Hospital	South	20	Telegu	20	2,859
22	OCI - Kannada	South	3	Kannada	3	354
23	Acchutha Institute of Optometry	South	10	Tamil	7	1,740
24	Dilip Optical Co.	South	29	Telegu	29	10,389
25	HV Desai , Pune	West	20	Marathi	20	1,694
26	Lotus College of Optometry , Mumbai	West	14	Marathi	7	2,435
27	Bharatimaiya College of Optometry , Surat	West	10	Gujarati	10	6,016
28	Harijyot college of Optometry	West	10	Gujarati	10	2,228
29	Bharati Vidyapeeth College of Optometry , Pune	West	10	Marathi	3	3258
30	Bharati Vidyapeeth College of Optometry , Sangli	West	10	Marathi	10	969
31	Laxmi College of Optometry	West	10	Marathi	14	1,165
			457		402	98,426

10.2. Phase II- Development of school vision screening protocol

The developed school vision screening protocol was tested on more than 16,000 school going children in private schools located in six different cities. The target was to reach out to 30 schools and was achieved by the team, however out of seven cities that were ought to be reached the target was achieved within six cities and hence the seventh city was not covered.

Refractive error found to be the most commonly reported eye anomaly across all four regions of India. More than 14,614 children (M: F, 46%:55%), data of 14,139 was available for refractive error analysis. Of these a total of 623 children at 4.41% were found to have refractive error. Table 4 shows the distribution of refractive error across all four regions of India and demonstrates that east Indian region showed highest prevalence of refractive error at around 26%, followed by South at 5%, North at 4% and West at 2%. Females dominated the overall refractive error category at 69% (n=358).

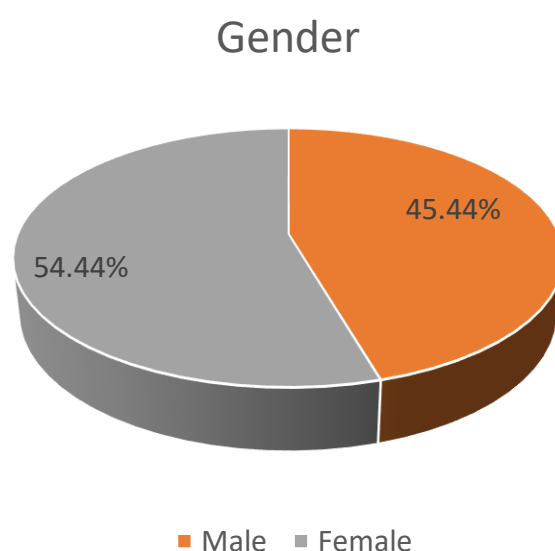


Figure 2: Distribution of males and females of children from private schools of urban cities across four zones of India, who successfully completed the school vision screening with developed protocol

This group was further classified based on the type of refractive error and it was found that Myopia contributed to 40% of the total refractive error while myopic astigmatism was at 39%. Hyperopia and hyperopic astigmatism contributed to a huge sum of around 6%. Anisometropia and simple astigmatism contributed to almost 9% and 7% respectively.

Table 4: Distribution of total number of students found to have refractive error of the total number of students tested for refractive error in all four regions of India are specified. The percentage of student population for refractive error in each area is indicated too.

Region	With refractive error (n)	Total screened (n)	Contributed to (%)
North	158	3556	4.44
South	216	3834	5.63
East	105	393	26.72
West	144	6356	2.27
Total	623	14139	4.41

Table 5: Distribution of refractive error type with total number and percentage of school children for each type of refractive error

Type of refractive error	Total No of students	Percentage contribution
Myopia	274	40.18
Myopic astigmatism	265	38.86
Hyperopia and hyperopic astigmatism	38	5.57
Anisometropia	60	8.80
Simple astigmatism	45	6.60
	682	100.00

Type of refractive error (%)

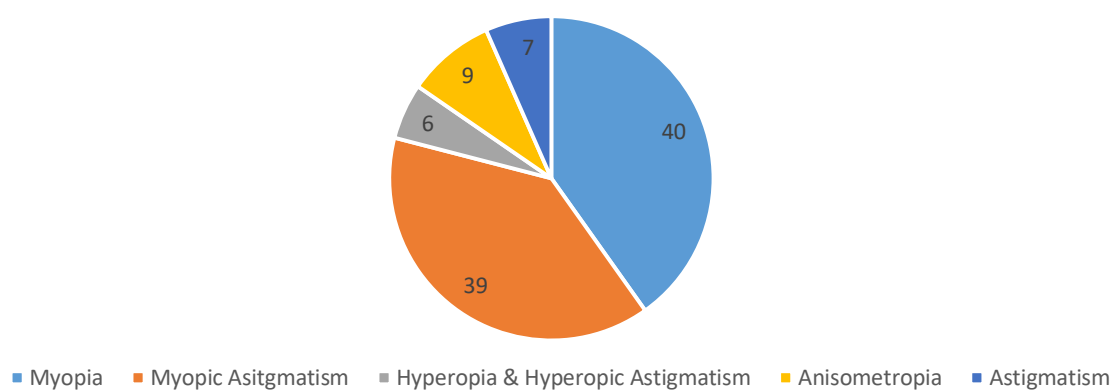


Figure 3: Distribution of refractive error type with total number and percentage of school children for each type of refractive error

Colour vision was successfully tested in 13,298 children, of which a total of 238 (1.8%) failed the test and were identified as colour vision deficient. Of 11746 children where NPC was tested 1389 (11.8%) did not meet the set criteria indicating a close to 12% prevalence of convergence insufficiency related issues.

10.3. Phase III- Optometry career counselling drive

The optometry career counselling was completed for students of class 10th and 12th from 30 schools spread across 6 cities of India.

11. Impact of the corporate society responsibility activity of Bausch & Lomb India

It is evident from the results above that the activity was very impactful through all three phases. Although number speak for themselves it is worth looking at the qualitative impact this activity has created. A standard protocol was developed with the help of experts and was successfully used to screen in various schools. The Optometrist from all over India were trained to use the protocol and helped them implement is successfully. There was huge number of students and their academic staff were made aware of taking care of their eyes and common eye anomalies. The children who needed glasses with provided with them that would lead to better vision and hence better education that is not hampered by un-corrected

refractive error. Children that were found to have colour vision anomalies with counselled about the condition.

Apart from this the branch Bausch & Lomb was appreciated in all activities and that created awareness and image building for the brand among young India and optometrist across India. Figure 4 below shows the impressive reach achieved through Phase I and Phase II of the study. OCI is proud to have created this impact and appreciate the financial support provided by the Bausch & Lomb India.

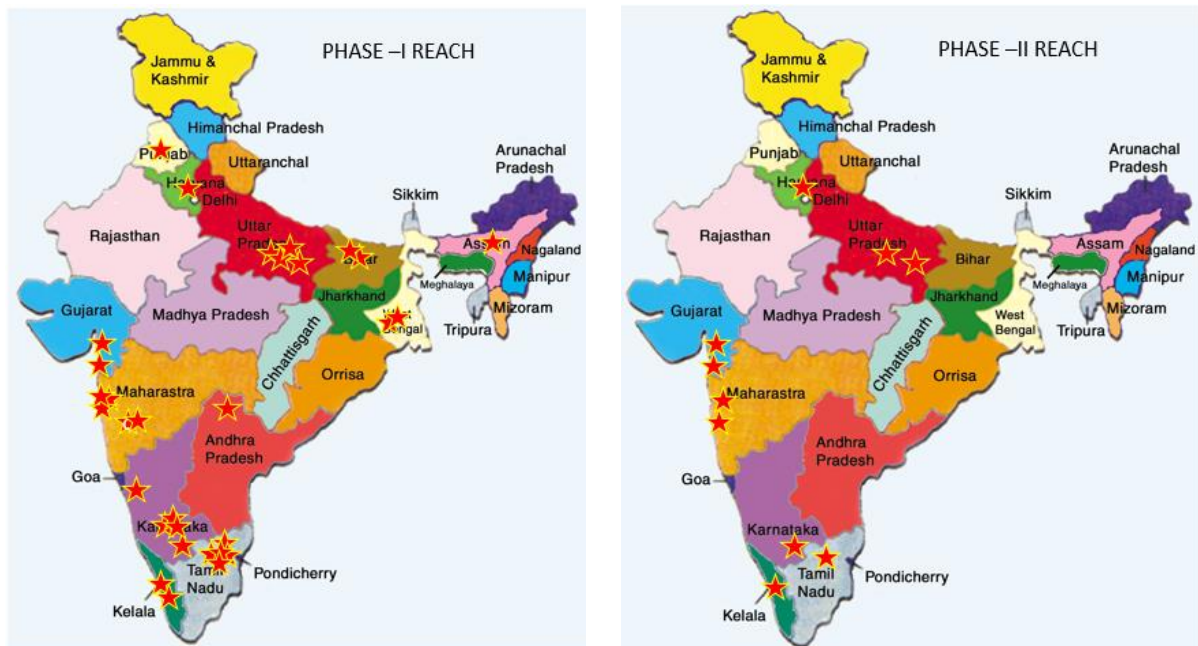


Figure 4: Reach the project achieved across India for Phase I and Phase II of the study are indicated by the optometry institutes that took part in the project. The institutional locations are indicated with stars.

12. Summary and conclusion

The projects was extremely successful in its conduct and all the deliverables were met comfortably. The awareness drive reached to more than 100,000 people that included students and educators. The protocol was successfully developed and tested on over 16,000 school children and the awareness of optometry as a career options was completed in 30 target schools. All these activities were completed in the short span of 1.5 years and covered all regions of India. The projects was successful in bringing together optometrist from all parts of India and work towards a common goal as a team. Together the team had achieved the goals of the project that are summarised below.

The prevalence of refractive error at 4.5% found in our study is in accordance with reports by Padhey et al⁶ who reported it at 5%. However a meta-analysis study done by Sheeladevi et al² indicated that the average prevalence of refractive error through school screening activities was found at 10% i.e. on a higher side. This difference could be attributed to variety of population tested among the studies selected in systematic analysis by the authors.

Our study was effective in determining prevalence of the binocular vision anomalies that may be associated with ocular convergence at almost 2% as well as colour vision defects were seen in an astonishing 12% school children. In our study we found that females were more prevalent to colour vision anomalies compared to the men. These children would have gone un-noticed if the protocol developed was not used. Identification of anomalies and early management saved these children from potential vision developmental issues. A follow up visit to these schools to ensure that the students have achieved the right management for their respective conditions would be benefitted. It would also be beneficial to make the protocol available for all to use for school vision screening activities.

The Myopia in the refractive error group dominated at 40%, this was similar to the results from Sudhan et al³. Hyperopia and hyperopic astigmatism contributed to a huge sum of around 6%, this was also in accordance with the previously published studies done in similar age group.³ Anisometropia and simple astigmatism contributed to almost 9% and 7% respectively. The girls were found to have more refractive error compared to the boys and this pattern too was similar to the ones reported earlier.² The prevalence of myopia was highest in east Indian region and hence further studies that focus of this geographic region are recommended.

Table 6 indicates the deliverables for each of the three phases and from the study and their type. It shows that all the quantitative deliverables were met and more.

Table 6: A summary of targets set forward and achieved for all phases

Phase No	Deliverables	Type of deliverable	Aim	Achieved
PHASE I	Development of Information Education Communication (IEC) material	Qualitative	Preparation	Prepared
	Train local teams of optometrist to create awareness and to educate teachers and student from Government and government aided schools about eye care, refractive error, lighting conditions and common eye ailments	Quantitative	Not specified	1,00,152
	With the help of Rotary Club - India and Round table visit, government schools around India and educate them on eye care	Quantitative	400	402
PHASE II	Develop best practice standards for school eye screening and community eye screening	Qualitative	Preparation	Prepared
	Test best practice standard for school screening protocol	Qualitative	Preparation	Prepared
	Test best practice standard for community eye screening protocol	No of regions of India to be covered	5	5
		No of children screened	15000	16408
		No of spectacles dispensed	NA	752
PHASE III	To develop material for Optometry career counselling	Qualitative	Preparation	Prepared
	Use of developed material for career counselling for class 10 and class 12 students	No of schools	30	30
		No of cities	6	6
		No of students	2200	
	Students got an opportunity to experience contact lenses as a mode of vision correction	No of students	2200	
	Presentation and workshops by optometry teams (1 senior optometrist + 1 intern per team) in schools about optometry as a career in India	No of schools	30	30

13. Gallery

(Phase I -4 languages + couple of photos of optometry presenting)



Picture 1: Screening protocol meeting held at ... on ...Picture D was taken during IEC material training for Optometrists.



Picture 2: OCI board discussion with Bausch & Lomb India



Picture 3: Ms Lakshmi Shinde representing OCI at the Asia Pacific Optometry Conference held in Manila, Philippines during ... to ... Poster titled



Picture 4: Distribution of spectacles at spectacle dispensing visits at schools in Phase II of the study.



Picture 5: Pictures of student career counselling that took place at Vadodara. The students can be seen to experience vision of a person with refractive error with help of glasses and lens blank.





అవగాహన కల్పిస్తున్న వైద్యురాలు అయేషా తదితరులు

అజిత్ సింగ్ నగర్, న్యూస్ టుడే : విద్యార్థులకు కంటి సమస్యలపై అవగాహన కలిగి ఉండాలని వైద్యురాలు అయేషా సూచించారు. గురువారం ఆషా సంస్థ ఆధ్వర్యంలో పాఠశాల పుచ్చలపల్లి సుందరయ్య పాఠశాలలో ఉచిత వైద్యశిబిరం నిర్వహించారు. ఆయేషా చూట్ల దుకూ విద్యార్థులు పాఠ్యాంశాలను ఎలా చూసి చదవాలి, టీవీలు, ఫోన్లు ఎలా చూడాలి అనే అంశాలపై అవగాహన కల్పించారు. కంటి సమస్యలున్న వారికి ఉచితంగా మందులు పంపిణీ చేశారు. ప్రధానోపాధ్యాయుడు మోహనరావు, సైన్స్ ఉపాధ్యాయులు మైసం హుస్సేన్ తదితరులు పాల్గొన్నారు.



Picture 6: Newspaper articles about the screening program conducted in ... state and State.



Picture 7: As part of the standardization of the screening protocol, the release of the protocol was done by Optom Rajbir Singh Berwal, board member OCI and Mr. Sanjay Bhutani, MD. Bausch & Lomb India on 23rd March on the eve of World Optometry Day



Picture 8: A photo from awareness drive for taking care of your eyes taken at a school in Vijayawada.



Picture 9: A student from Surat can be seen pasting a poster in Gujarati.



Picture 10: An optometrist checking for vision anomalies under Phase-II of the project at Lucknow



Picture 11: School students can be seen looking after their posters in Marathi from a school at Sangli.



Picture 12: An optometrist can be seen testing for Intra-ocular distance for prescribing glasses to school student at Chennai. A Phase-II activity.



Picture 13: A colour vision assessment testing examination can be seen in this image taking during Phase-II of the study at Shillong.



Picture 14: A Phase-III activity of the project undertaken at a school in Delhi to increase awareness of Optometry as a career option.



Picture 15: A Phase-III activity of the project undertaken at a school in Bangalore to increase awareness of Optometry as a career option.



Picture 16: A Phase-III activity of the project undertaken at a school in Kolkata to increase awareness of Optometry as a career option.

14. Way forward

A follow up for activities from all three phases would be highly beneficial to evaluate the effect these drives have made possible in various levels of the community. Like every large scale studies, there were missing data in the Phase-II and further evaluation and perhaps modification in training would benefit the future studies towards accuracy and completeness of data acquired.

While paediatric and adolescent group was targeted in this project, another part of community that is on geriatric side also has specific vision assessment requirement that also need structured attention.

15. Acknowledgements

We greatly appreciate the funding provided by Bausch & Lomb Pvt Ltd India under their companies' community and social responsibility initiative. Team OCI acknowledges contribution of all the optometry organizations that participated in this project. Special thanks to the team of experts that contributed towards development of best practice screening protocol for school vision screening and community screening of children for India. We also acknowledge the contribution and support from the Rotary Club and Round Table for their help with reaching out to government and government aided schools. We would like to acknowledge the contribution made by Dr Kalika Bandamwar towards writing this report.

16. Testimonies

The project was multifactorial and a range of individuals were benefitted from it. The testimonies of some of the Optometrist who actively participate in the project are mentioned below.

Ms. Paula (Operations manager for Experience Vision project): "As an Optometrist and being a primary eye care professional, working at community level has always been an integral part. But, working as a "project manager" was a different experience all together. The "Experience Vision" project was an entirely Optometry driven project starting from writing the proposal, forming protocols, creating SOP's, training fellow Optometrists, maintain records & data, managing financial transactions and co-ordinating with all participants PAN India. The successful completion of the project is a reward for all the hard work that all my fellow optometrists have put together and I had a great learning experience from this project. Thanks and regards-Paula"

Optom Divya from SRM, Chennai: "We visited a deaf and dumb school and the school teacher translated our speech and what we had to inform the students. This experience was such a learning for us both as optometrist and as a health care provider. It gave us such an immense sense of satisfaction"

Optom Saranya Erode from Achutha College of optometry: "the school children students took responsibility of the posters. Each one was saying, "don't touch it will get dirty. My poster looks more colorful than yours...". Such a great feeling to be part of this wonderful program'.

Experience Vision 2019-India

Optom Aesha, Vijaywada: "it's been such a great pleasure to be part of this eye care awareness campaign. Thanks for giving me the opportunity to be part of it"

One of the members did such good work that it was also published in the local newspaper in Vijayawada.

Ms. Vibha: "Respected Sir/Madam, It was great for me to be the part of experience vision through which I could interact with students, could make them aware about my wonderful profession, 'OPTOMETRY' as the program's name "Experience Vision "itself justifies lots of experiences associated with this and I felt all those after doing the sessions in different schools. Students were very happy and satisfied after each sessions and even teachers also highly appreciated the work done by us. Every students were eager to know about the colleges which offers Optometry and other details of optometry. After seeing all these I felt fortunate to join Experience Vision and I am grateful to OCI and Optom. Lakshmi Ma'am & other team members for arranging this project and giving me the wonderful opportunity through which I could contribute a bit for Optometry. I will be very happy in doing such kinds of activities in future too. Thank you very much. Kudos!!! To all teams for successful completion of the project.

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18. Appendix 1: Standard operating procedures for Phase I

Standard Operating Procedure – for IEC materials
In School Eye Health Program

Getting permission from the District Collector / Department of Education and Health regarding EYE HEALTH EDUCATION in all Government schools in that district



Explain the process of Information Education and Communication (IEC) material distribution and show samples to the respective person



Fix appointment with the School Head master / Asst. Head master. Explain to the concerned, about identifying visible areas for sticking 10 posters inside the school premises



Fix half a day program, to speak with the school teachers and students regarding EYE CARE



EYE HEALTH and EYE CARE to be explained by a presentation. In case projector is not available in school premises use own laptop or innovative props.



Instruct students of the same school to stick the IEC posters in places where they are visible to other students



Assess impact of IEC materials (through survey sheet sent by OCI)

19. Appendix 1 – IEC Material

20. Appendix 2 - Optometry School Children Screening Protocol

21. Appendix 3- Information Education and Communication (IEC) material