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Methodology to investigate the impact of blindness control activities in the southern Indian population

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ABSTRACT

To describe the methodology used to investigate the impact of blindness control activities in the southern Indian State of Andhra Pradesh. The blindness control activities in Andhra Pradesh have been implemented since 1976 through the National Program for Control of Blindness (NPCB) by the Government of India through District Blindness Control Societies (DBCS). Besides Government eye care facilities, many local, national, international Non Governmental Organizations (NGOs) and private sector eye care facilities are active in controlling blindness in the state. In the year 2002 Andhra Pradesh Right to Sight Society (APRTSS) was established as part of a global initiative of VISION 2020 The Right to Sight to coordinate the efforts of various stakeholders in eye care. The present study investigated the impact of blindness control activities in the state of AP in general and with special reference to the activities of APRTSS. The study was based on the six building blocks of the health care system for all the stakeholders in eye care. The baseline data for the year 2002-03 were collected from sources such as State Blindness Control Society, District Blindness Control Societies and major stakeholders in eye care in the state and also by questionnaire to managers of eye care facilities and eye care professionals. The current data are being collected for the year 2012-2013. Interviews based on Strength, Weaknesses, Opportunities and Threat (SWOT) analysis were conducted with policy makers in the Government, Managers of the eye care facilities and NGOs. The outcomes of the study will provide information regarding the trends in blinding eye diseases, human resources and infrastructure facilities in the last decade and information on the deficiencies in eye care service delivery that may provide the basis to formulate strategies for implementation of the VISION 2020 program in the state for coming years.

Keywords: Methodology, Blindness, Impact, Southern Indian population.

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INTRODUCTION

Blindness and vision impairment are major public health problems as they not only affect the individual's quality of life but also have implications for their education and employment opportunities. The global estimates of people visually impaired in the world is 285 million, 39 million blind and 246 million having low vision¹. In comparison to developed countries, the burden is disproportionately clustered in developing countries where 90 percent of world's visually impaired people live including India². Disability from vision impairment is mostly preventable with appropriate eye health promotion intervention programs addressed holistically by involving individuals, families, the community, and eye care professionals. Given this context, the present study aimed to investigate the impact of implementation of blindness control activities in the southern Indian state of Andhra Pradesh. During the study period (2011-2015) the Andhra Pradesh State has been bifurcated into Andhra Pradesh and Telangana States (2014), so the term Andhra Pradesh (AP) refers to the now combined state of Andhra Pradesh before bifurcation

Andhra Pradesh has a population of 84.6 million from the census of India 2011³. The Andhra Pradesh Eye Disease Study⁴ was a population based study done in the state to determine the prevalence and causes of blindness and visual impairment. The common causes of blindness are Cataract – 44%, Refractive Error – 16.3%, Retinal Disease – 10.9%, Glaucoma – 8.2%, Corneal Disease – 7.1%, Optic Atrophy – 6%, Amblyopia – 4% and others – 3.3%. Cataract and uncorrected refractive errors which were responsible for a large proportion of blindness and moderate visual impairment^{5,6} are easily treatable by simple cost effective interventions with good visual recovery.

Blindness Control Activities in Andhra Pradesh

The National Program for Control of Blindness (NPCB) has been implemented in the state since 1976 through the State Government eye care facilities⁷. For proper functioning of the program Blindness Control Societies were established in all 23 districts of the state. The main purpose of the program is to plan, implement and monitor blindness control activities in the districts as per the priorities of NPCB. From 1999 to 2002, World Bank assisted cataract blindness project was implemented to reduce the cataract blindness in the state⁸. The project was implemented in 7 states in India including Andhra Pradesh. 15.35 million cataract operations were performed and the intra-ocular lens implantation percentage was increased from 3% to 42% because of this project.

In addition, many Non-government Organizations (NGO) and private eye care facilities are also active in providing eye care in the state. In the year 2002 the Andhra Pradesh Right to Sight Society was established as part of the global initiative of VISION 2020 to coordinate

the activities of the major stakeholders in eye care in the state and has been implementing the strategies of VISION 2020 since then.

The APRTSS supported cataract surgeries and distribution of spectacles to deal with the major causes of blindness and visual impairment in the state. The APRTSS sponsored the training of all categories of eye care professionals to improve the knowledge and skills in modern techniques of ophthalmic surgery. The APRTSS has supplied state of the art equipment to eye care facilities both in Government and NGO sectors. It has been active in advocating the importance of prevention of eye diseases and their management to all stakeholders in eye care and has also conducted programs to create awareness of eye diseases in the general public. (Table 1)

Table 1: Activities of Andhra Pradesh Right to Sight Society

Sl. No.	Activity	Beneficiaries	Support in US \$ (Millions)
1	Disease Control Grand in aid for Cataract surgeries (No. of cataract surgeries supported in bracket) Free spectacle distributed (No. of spectacles in bracket)	People below poverty line School children in Government, and aided schools/ people below poverty line aged >40/ poor handloom workers	3.02 (265821) 0.60 (320274)
2	Infrastructure Development Cost of equipment supplied to Government Institutions and NGOs Expenditure incurred under annual maintenance of equipment supplied to Government institutions	Eye Departments in Government. Medical Colleges	2.10 0.35
3	Human Resource Development Training of all categories of ophthalmic personnel	All categories of ophthalmic personnel in Government sector	0.45
4	Advocacy Activities	All stakeholders in eye care and general public	0.08
5	Department For International Development (DFID) Tribal Eye Care Project	Tribal people living in underserved areas	0.25

Rationale for the study:

Not many studies have been conducted on the impact of the blindness control activities in the state. The present study will investigate the impact of blindness control activities in the state with special reference to the activities of APRTSS.

The outcomes of the study will provide information regarding the trends in cataract blindness, human resources (HR), infrastructure in eye care, eye health information, eye health finance and governance over the last 10 years.

The study will help in identifying critical success factors for the positive outcomes and outputs in eye care and provide information to give directions to the APRTSS to implement the VISION 2020 program in the coming 10 years

Methods:

The Ethics Committee of the LV Prasad Eye Institute, Hyderabad, India approved the present study, which followed the tenets of the Declaration of Helsinki.

Study Design: This is a cross sectional descriptive study with data being collected through questionnaires and interviews

Study Area: Entire geographical area of Andhra Pradesh and Telangana comprising of 23 districts (Figure 1).

Figure 1 – Study Area – Andhra Pradesh and Telangana states in Southern India

Baseline data: Baseline data (April 2002 – March 2003) were collected through questionnaires (Appendices 1 to 5) and from the documents available with the State Blindness Control Society, District Blindness Control Societies and from major eye care facilities in Government, NGO and private sectors and also from professional bodies like Andhra Pradesh Ophthalmological Society, Andhra Pradesh Para Medical Ophthalmic Association.

Current Data: Data (April 2012 – March 2013) are being collected by questionnaires (Appendices 1 to 5) from the Government, Non-government and private eye care facilities, ophthalmologists, mid-level ophthalmic personnel, managers of the eye care facilities and the NGOs.

Appendix 1 - Data on Eye Care Facilities

- Questions 1 to 6 – Name and details of eye care facility, year of establishment and nature of eye care services
- Questions 7 to 13 - Details of outpatient services
- Questions 14 to 23 - Details of inpatient services
- Questions 24 to 33 - Details of outreach activities

Questions 34 to 96 - Details of Human Resources, training, education & research

Questions 97 to 128 - Details of infrastructure

Questions 129 to 134- Details on Health information

Questions 135 to 142- Details on Health Finance

Questions 143 to 154- Details on Leadership & Governance

Questions 155 to 161- Details of support from APRTSS and its impact

Questions 162 to 169- Demographic details of the person who filled the questionnaire

Appendix 2 - Data on Ophthalmologists

Questions 1 to 22 - Details of experience, skill level & research activity of the person

Questions 23 to 41 - Details of the training sponsored by APRTSS and its impact

Questions 42 to 49 - Demographic details

Appendix 3 - Data of MLOPs

Section A- (Optometrists, Refractionists, Ophthalmic Officers & Eye Bank Technicians)

Questions 1 to 21 - Details of experience, skill level & research activity of the person

Questions 22 to 27 - Details of the training sponsored by APRTSS and its impact

Section B – (Ophthalmic Nurses) 2014

Questions 28 to 43 - Details of experience, skill level & research activity of the person

Questions 44 to 51 - Demographic Details (MLOP's)

Appendix 4 - Data on DBCSs (Section A), NGOs (Section B) and International NGOs (Section C)

Questions 1 to 11 - Details of the activities of the DBCS and recommendations for effective functioning of the DBCS

Questions 12 to 20 - Details of activities of NGO's and recommendations for effective functioning of DBCS and APRTSS

Questions 21 to 41 - Details of activities of International NGO's and recommendations for improvement of eye care services

Question 42 to 49 - Demographic details

Appendix 5 - KAP study questions

1. Name any three eye diseases that cause visual defects?

- a.
- b.
- c.

2. Have you heard about cataract?

- a. Yes
- b. No

3. What is a cataract?

- a. A White spot
- b. A Lens change where Lens become Opaque
- c. White Membrane growing over the eye
- d. An age related process leading decrease in vision

4. How is it treated?

- a. By surgery
- b. By medicine
- c. Don't know
- d. Others

5. Is it possible to get back vision from cataract blindness?

- a. Yes
- b. No

6. Do you know about intra ocular lens implantation?

- a. Yes
- b. No

7. Have you heard about Crossed Eye/Squint?

- a. Yes
- b. No

8. Have you heard about refractive error?

- a. Yes
- b. No

9. Have you heard about Glaucoma?

- a. Yes
- b. No

10. Do you know that diabetes can affect vision?

- a. Yes
- b. No

11. Have you heard about age related macular degeneration?

- a. Yes
- b. No

12. Do you wear glasses?

- a. Yes
- b. No

If No skip the next 2 questions

13. If Yes: Are you wearing glasses for?

- a. Distant Vision
- b. Near Vision
- c. Both

14. How long have you had glasses (in years)?

- a. For distant vision
- b. For near vision
- c. For both distant vision & near vision
- d. Don't know

15. How do you rate your eye sight?

- a. Excellent
- b. Very good
- c. Good
- d. Bad
- e. Worse

16. Did you have an eye examination in last 2 years?

- a. Yes
- b. No.

If no, skip the next 2 questions

17. If Yes: were you examined by

- a. Ophthalmologist
- b. General Physician

- c. Physician of alternate medical system
- d. Unqualified or traditional healer

18. If Yes: were you told that you have an eye condition or disease?

- a. Yes
- b. No

19. Have you heard about Eye Donation?

- a. Yes
- b. No

20. Do you know when eyes are to be donated?

- a. Before Death
- b. After Death within 6 hours
- c. After death within 12 hours
- d. After death within a day
- e. Don't know

21. Are you willing to donate your eyes?

- a. Yes
- b. No

22. Do you know how far from your place to the nearest eye care facility?

- a. Yes
- b. No

If No skip the next question

23. The distance in Kilometers to eye care facility from your place

24. Have you heard about free cataract surgeries done in Government and NGO eye care facilities?

- a. Yes
- b. No

25. Do you have insurance to cover cataract surgery expenses?

- a. Yes
- b. No

26. Would you pay for eye surgery?

- a. Yes
- b. No

27. Places where you heard or seen reports on eye health and disease

- a. TV

- b. Radio
- c. Newspaper
- d. Online
- e. Doctors office
- f. Relative or friend
- g. Workplace
- h. Drug store / supermarket
- i. Magazine or Newsletter
- j. Educational pamphlet
- k. Health information hotline
- l. Religion or social organization
- m. Advertisement hoardings
- n. Have not heard anything

28. Name

29. Gender

30. Year of Birth

31. Address

32. Educational Qualification

33. Occupation

Inclusion Criteria:

1. All government eye care facilities.
2. All NGO and private eye care facilities having > 10 in-patient beds and/or 100 cataract surgeries per annum – 23 districts
3. All government, NGO and private eye care professionals
4. International and national NGOs who are active in eye care services in Andhra Pradesh (n=10)

Exclusion Criteria

1. All voluntary and private eye care facilities with < 10 inpatient beds or doing less than 100 cataract surgeries per annum.

The estimated sample size for current data on eye care facilities is given in Table 2. It was estimated to cover 100% of all government tertiary eye care facilities because their number is limited and is easily accessible, but for other eye care facilities the coverage estimated will be 80%.

Table 2: Estimated sample size

	No. Present	Target
Government Sector		
Tertiary eye care centers	16	100%
Secondary eye care centers	65	80%
Primary eye care centers	400	80%
NGO Sector		
Tertiary eye care centers	4	100%
Secondary eye care centers	80	80%

Primary eye care centers	120	80%
Private Sector		
Tertiary eye care centers	60	80%
Secondary eye care centers	500	80%

Questionnaire:

The Questionnaires were developed based on the six building blocks of the health care system⁹ as described in the Everybody's Business: Strengthening Health Systems to Improve Health Outcomes, WHO's framework for action published in 2007. The questionnaires were designed in such a way that the information obtained as per the topics mentioned in the six building blocks of the healthcare system⁹ (Figure 2)

- Eye Care Services →
- Eye Care Work Force →
- Eye Care Infrastructure →
- Eye Health Information →
- Eye Health Financing →
- Eye Health Leadership &

Governance →

Figure 2 – The six building blocks of health care system and co-relation to questions in eye care service delivery

Questionnaire 1 contains questions to elicit information of eye care facilities (Appendix 1)

Questionnaire 2 contains questions for ophthalmologists to elicit information on their knowledge, experience, skill level and also the impact of training (if undergone) sponsored by APRTSS (Appendix 2).

Questionnaire 3 is for mid-level ophthalmic personnel (MLOP) to elicit information on their knowledge, experience, skill level and also the impact of training if they have participated in a program sponsored by APRTSS (Appendix 3).

Questionnaire 4 elicits information on the impact of the activities of the APRTSS on functioning of DBCSs & NGOs (Appendix 4).

Questionnaire 5 is on awareness of eye diseases (Knowledge, Attitude and Practices) for the general public (Appendix 5). The estimated awareness of cataract in the urban population, according to Andhra Pradesh Eye Diseases Study was 70%.¹⁰ The sample size was estimated with the following parameters.

Estimated awareness in urban population	-	70%
Design effect	-	1.5
Confidence level	-	95%
Margin of error	-	4%
Sample size	-	867 subjects

Structured interviews based on SWOT analysis (Table 3) will be administered to persons who are connected in eye care to assess the critical success factors in eye care service delivery. Fifty individuals who are connected with eye care, such as policy makers in the government (Secretaries in Health Department, Director of Health, etc.) managers of the major eye care facilities both in NGO and private sectors, District Program Managers (DPM) who are responsible for planning the district eye care plans. The questionnaire will be administered using a digital voice recorder and responses will be analyzed by qualitative analysis using Nvivo software to know about the critical success factors for quality eye care service delivery.

Table 3: SWOT Analysis Questionnaire

Sl. No	Strengths
1	What advantages your organization has in eye care delivery?
2	What do you do better than other stakeholders in eye care?
	Weakness
1	What could you improve?
2	What should you avoid?
	Opportunities
1	What good opportunities can you spot?
2	What changes in your organization policy can improve eye care services?
	Threats
1	What obstacles do you face?
2	Do you have less resource for eye care?

Data Analysis: The Statistical Package for Social Sciences (SPSS) software will be used to generate percentages and proportions as required. The eye care personnel to population ratios will be calculated and compared with VISION 2020 recommendations. Logistic regression analysis will be done to elucidate the association between the variables such as number of eye care professionals available, output of cataract surgeries per ophthalmologist.

Written informed consent was obtained from all the participants.

RESULTS AND DISCUSSION

A pilot study was completed from 1st May to 30th June 2014. The hard copies of the questionnaire were sent to eye care facilities, ophthalmologists, midlevel ophthalmic personnel, District Program Managers and the general public. Fifty five questionnaire booklets were distributed and 39 responses received. For the sample study of the questionnaire respondents were interrogated on the clarity of the questions, relevance of the questions, overall design of the questionnaire and the time required to complete the questionnaire. The questionnaire was modified using the comments received by the respondents during the pilot study. Alterations were made pertaining to the length of the questionnaire. The percentage of responses from eye care professionals and managers of eye care facilities were encouraging, whereas the 20% response rate from the DPMs was unsatisfactory (Table 4).

Table 4: Response Rate of Pilot Study

Type of questionnaire	No. of questionnaires distributed	No. of responses received	Rate of response (percentage)
Eye care facilities	5	4	80.0
Ophthalmologists	15	11	73.3
Midlevel ophthalmic person	20	17	85.0
District program manager	5	1	20.0
General public	10	6	60.0
Total	55	39	70.9

The study will look at the impact of the blindness control activities under various headings such as the cataract surgical rate, human resources, infrastructure, health information, health finance and governance. In terms of cataract surgical services the change in the percentage of intra-ocular lens implantation in cataract surgeries, visual acuity outcomes after surgery will be assessed. The change in the number of the spectacles distributed to students will be known. In human resources the change in the number of ophthalmologists, how many are operating, a change in the number of midlevel ophthalmic personnel, their knowledge and skill levels and impact of training will be assessed. In infrastructure the change in the number of eye care facilities offering surgical services and the types of equipment the facilities are using will be assessed. The type of information system the health facilities are using for reporting the activities will also be known and the funding pattern for eye care facilities will be detailed in the study. The people who are governing the eye care facilities, their knowledge and experience will also come out of this study. The study will also document the critical success factors for eye care service delivery and also the recommendations for effective functioning of DBCS.

Limitations of the study: Being a cross sectional study and the questionnaire is self administered it is prone to errors in the information. The purpose of the study is to examine the impact of the specific program conducted in the state of Andhra Pradesh and therefore the results cannot be generalized for the similar programs being conducted elsewhere.

CONCLUSION

The outcomes of the study will provide information regarding the trends in the cataract blindness, human resources and infrastructure facilities in the last 10 years. It can also give information on the deficiencies in the eye care service delivery in the state. The study may provide the basis to re-formulate the strategies for implementation of the blindness control programs in the coming years in the state and in that process to provide directions for the APRTSS for effective implementation of the VISION 2020 program. The information obtained from the present study can guide or open new ways to deal with the problem of

blindness and visual impairment in the state and also gives the opportunity to disseminate the information with regard to critical success factors identified from the study.

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