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Cataract Blindness: Socioeconomic Factors Associated with Treatment Barriers and High Blindness Rates for Women in Rural Regions of Andhra Pradesh

By Kiranpreet Kaur

Abstract

Despite efforts of Vision 2020 in India, the 2001 Andhra Pradesh Eye Disease Study (APEDS) extrapolated that approximately 18.7 million blind people resided in India and projected an increase to 31.6 million blind people by 2020. Within the Andhra Pradesh state itself, the preventable blindness population had increased from approximately 1,143,150 people in 1990 to 1,402,264 people in 2001, against reformation attempts by the National Program for Control of Blindness. Of this, cataracts were consistently the leading cause of avoidable blindness.

Numerous public health studies have been conducted to outline factors that preclude treatment of avoidable cataract blindness in the India. Conclusively, the escalation of cataract blindness can be largely attributed to personal, social, and economic factors that inhibit utilization of available eye-care services. However, the degree and specificity of these respective barriers varies due to the heterogeneity among regions within Andhra Pradesh. Accordingly, no single approach can be implemented to effectively ameliorate eye health. Instead, population-based studies are required to understand individual regions and respective levels of need.

Accordingly, this research is an examination of the female population in rural regions of Andhra Pradesh through the analysis of two major studies (1) the impact of private/non-governmental organizations (NGOs) on economic development and (2) socioeconomic factors engendering lack of utilization of eye-care services, in order to find a correlation between these two seemingly disparate studies.

Overwhelmingly, the presence of private/non-governmental organizations (NGOs) increases the economic status of regions by increasing access to both education and employment opportunities. In comparison to developed, urban areas, NGOs presence in rural regions are significantly limited, leading to discrepancies in economic development and thereafter, lack of opportunity for economic and social growth for

females. Correspondingly, for years, higher incidences of cataract blindness have plagued the female population residing in underdeveloped rural areas of India, especially in comparison to female counterparts in urban areas. I found this to be significantly attributed to an intermittent and cyclic combination of socioeconomic limitations, specifically to lack of education/employment opportunities and cultural restrictions. This in turn, is linked to comparably diminished levels of private/NGO sector involvement.

Only through understanding the correlation between these two aspects can intervention efforts be appropriately pursued to reduce cataract blindness rates in the female population. This work increases our understanding of the limitations that exist in accessing treatment options for females and furthermore, obtained results can potentially be extended to other regions of India to create and implement similar public policies.

Introduction

India contains the world's largest blind population, with vision acuity less than 6/60. Among the 40-45 million total blind population of the world, over 19 million blind individuals reside within India, and up to 80% of this blindness is preventable and/or avoidable with proper screening and eye-care management services. Of varying causes, cataracts are the leading cause of preventable blindness in India and contribute to blindness more than 50% of the time. Cataracts are an age-related condition in which the lens of the eye becomes clouded, leading to decreased visual acuity. Without treatment, cataracts can ultimately lead to blindness.

The National Programme for Control of Blindness survey conducted from 1986-1989 revealed there was a backlog of over 22 million blind eyes, affecting 12 million blind people in India. Moreover, 80.1% of these people were blind due to cataracts. Additionally, within the last decade, immense population growth and increased longevity has also augmented cataract blindness. In "Cataracts in India: Current situation, access, and barriers to services over time," Robert Finger (2007) projected the prevalence of cataracts will continue to rise as India is in demographic transition, with the population growing older, and this demographic group has a higher susceptibility to cataracts (p. 112).

The survey also reported that seven states within India accounted for two-thirds of the blind population in India and one-fourth of the blind population in the world. Andhra Pradesh, a state in South India, was one of these seven states. Despite efforts by World Bank-supported Cataract Blindness Control Project and Vision 2020, a global initiative oriented to eliminate avoidable blindness by the year 2020, cataracts remain the leading cause of preventable blindness in Andhra Pradesh.

However, despite overarching statistics, cataract blindness rates vary significantly within different areas of Andhra Pradesh due to widespread regional variation and varying levels of economic and social development. Effectively, cataract blindness levels are higher for women residing in rural Andhra Pradesh due to lack of employment and education opportunities, and societal and cultural limitations that preclude utilization of treatment services. By encouraging increased NGO/private sector investment in rural Andhra Pradesh, this can promote economic development and social growth for the female population and lead to increased knowledge of eye health and the ability of women to attend eye-care facilities.

Rural and Urban Andhra Pradesh: Progression of Cataract Blindness Rates

As a result of the staggering statistics from the 1986-1989 National Programme for Control of Blindness survey, in 1994 the Indian government negotiated with the World Bank for \$117.8 million over a 7-year period to fund the Cataract Blindness Control Project. Due to its high prevalence rates, Andhra Pradesh was one of the states covered under this project.

Dandona *et al.* (2001) conducted the Andhra Pradesh Eye Disease Study (APEDS), an extensive follow-up study for Andhra Pradesh, to monitor the progression of the Cataract Blindness Control Project. In APEDS, Dandona *et al.* (2001) studied four areas located within Hyderabad (urban), the West Godavari district (“well-off” rural), Adilabad (poor rural), and the Mahabubnagar district (poor rural), to obtain a study sample representative of the urban-rural and socioeconomic distribution of the population of this state (p. 909).

Dandona *et al.* (2001) found the blindness population in the Andhra Pradesh had

increased from approximately 1,143,150 people in 1990 to 1,402,264 people in 2001, against reformation attempts by the National Program for Control of Blindness (p. 908). Of this, 714,400 were estimated to have cataract-related blindness (615,600 cataract, 53,200 cataract surgery-related complications, and 45,600 aphakia) (p. 908). In addition, blindness had increased primarily in participants of increasing age (50 years and older), decreasing socioeconomic status, female sex, and residing in rural areas.

In another follow-up study conducted in 2014 in Andhra Pradesh, the “Prevalence and Causes of Blindness and Visual Impairment and Their Associated Risk Factors, in Three Tribal Areas of Andhra Pradesh, India,” Singh *et al.*, found in rural areas, cataracts accounted for 70.3% of severe visual impairment and blindness (p. 3).

Effectively, the number of people with cataract blindness has not reduced even with eye care policy focused solely on cataracts. Conversely, cataract blindness and visual impairment has continued to increase dramatically within Andhra Pradesh in the past decade and has affected rural populations more significantly than urban populations.

Economic Development: Analysis of the Role of Private/Non-Governmental Organizations

Since APEDS, follow-up studies have been conducted in both rural and urban Andhra Pradesh to analyze causations behind the different blindness levels. Andhra Pradesh experiences a range of development and growth within its specific regions. For example, on one end of the spectrum is the capital city Hyderabad, a large urban center in Andhra Pradesh that is one of the most developed cities in all of India. Hyderabad leads in the information technology (IT) industry and houses offices of renowned international companies including Google, Amazon, and IBM. Conversely, on the other end of the spectrum are regions such as Mahabubnagar, which the Indian government named as one of the India’s most backward districts in 2006.

The investment of the private/NGOs in the non-agricultural sector and urban cities is a main reason for the rapid development of this sector. NGOs are independent and private voluntary associations and are created to deliver resources and/or to fulfill a social or political initiative. In India, NGOs have accelerated industrialization,

urbanization, democratization and modernization and have expanded education.

As a result, NGO presence is directly linked to higher education levels, economic development, financial stability, and greater quality of life.

In “Regional disparities in Andhra Pradesh, India,” Dr. Amarender Reddy (2012) assessed urban and rural regions in Andhra Pradesh. Dr. Reddy found that Hyderabad was experiencing exponential growth in per capita income from the non-agricultural sector due to a fast-growing urban population (p. 4). Concomitantly, Reddy (2012) noted faster growth in the non-agricultural sector than the agricultural sector had resulted in a greater concentration of non-agricultural sectors in urban cities and caused regional disparities in income between core, urban centers and remote, peripheral rural regions.

NGO presence is not prevalent in rural areas because these regions contribute almost entirely to the agricultural sector of Andhra Pradesh’s economy. Consequently, for NGOs it is more costly in regards to economic resources and time to invest in these areas. Essentially, the dependence of rural Andhra Pradesh on agriculture for economic sustainability has taken its toll, especially within the past decade, as Andhra Pradesh has rapidly shifted toward modernization and privatization. This economic shift has allowed the non-agricultural sector, which is funded mainly by private companies and NGOs, and Andhra Pradesh’s overall economy to thrive; however, it has come at an expense to underdeveloped, rural districts.

In the “Andhra Pradesh Human Development Report 2007,” Dev *et al.* (2008) reported that agricultural growth in Andhra Pradesh was lower than all of India from 1960-1990, and it had continuously decreased with each passing decade (p. 36). Conversely, the contribution of the non-agricultural sector to total gross state domestic product (GSDP) increased continuously, from 50% in the 1960s to 79% in 2005-2006 (p. 36). In correlation, in “Reducing poverty and inequality in India: Has liberalization helped?,” Raghendra Jha (2002) noted continuous stagnation of private investment in the rural sector. Effectively, NGO presence and investment is correlated to economic development of districts.

Moreover, since the growth in agriculture has been minimal, much of the growth in the Andhra Pradesh’s overall economy is due to the growing investment of NGOs in

the non-agricultural sector. Despite the growing of Andhra Pradesh's overall GSDP, there has not been a concurrent increase in employment levels in all the sectors. As a result, the gap in per capita value added per worker between those engaged in agriculture and non-agriculture has also widened over time.

For instance, Dev *et al.* (2008) stated the per capita GSDP value added in agriculture per worker was Rs. 7201 in 1993-94, and this increased to Rs. 9830 in 2004-05, an increase of 36.5% (p. 36). On the other hand, during the same period, the per capita GSDP value added in non-agriculture per worker increased by about 52.4% from Rs. 34077 to Rs. 51924 (p. 36). Dev *et al.* (2008) concluded that unless the high growth in GSDP of non-agriculture resulted in a corresponding growth in employment by absorbing the surplus labor in agriculture, it would not result in an improvement in the conditions of the poor and thereby human development (p. 36). In turn, Andhra Pradesh will continue to have lopsided growth and development as urban areas continue to develop at an accelerated pace while poverty continues to strike rural regions.

In fact, Khanna *et al.*, (2007) in "Blindness and poverty in India: the way forward" found that more than three-fourths of India's population, that are below the poverty, line live in rural areas. Additionally, only a small percentage of this rural population could afford any healthcare (p. 408). For Andhra Pradesh specifically, the percentage of persons living in a rural location that are below poverty line is 10.96%, where the poverty line is 860 rupees per month (p. 408). However, the percentage of persons living in an urban area below poverty line is 5.81%, where the poverty line is 1009 rupees per month (p. 408). As seen, despite the fact that the poverty threshold is higher in urban areas, there is still a lower percentage of persons residing below this threshold in comparison to rural regions.

With regard to medical access, NGOs also affect healthcare needs by funding the development of qualified and functioning private hospital facilities. In "Gaps in health infrastructure in Indian scenario: A review," Dey *et al.*(2013) found that only a small minority of the population have the economic means to afford sustainable eye health services (p.159). Accordingly, qualified private sector doctors and hospitals are not readily available in remote rural areas (p. 159). Populations in these areas where health

care needs are the greatest, have very poor access to functioning government health services or private facilities. Dey *et al.* (2013) extended this argument by finding that unqualified persons provide health care to the poorer segments of the population living in remote rural and tribal areas (p. 159).

Specifically to cataracts, cataract surgery has proven to be the most effective treatment method to ameliorate visual acuity and in vision restoration. However, in “Cataracts in India: Current situation, access, and barriers to services over time,” Finger (2007) assessed both access and uptake of cataract surgery services in India, and found regional imbalance in the distribution of eye specialists and potential patients. Specifically, eye service providers and ophthalmologists were primarily located in developed regions, generally major cities and towns, while a majority of patients who required cataract surgery for vision restoration resided primarily in rural regions, such as villages, leading to inadequate services.

Similar results were found in “Human resources and infrastructure for eye care in India: Current status,” in which Murthy *et al.* (2004) found wide variation in accessibility to ophthalmic care in India. Statistically, while the national ophthalmologist: population ratio was 1:107,000, certain regions in India had a ratio of 1:9000 while in other regions there was only 1:608,000 (p.133). This represents more than a majority of ophthalmologists working in urban areas while rural areas had relatively poorer access to eye care facilities (p. 133).

In an effort to amend this, outreach eye camps, organized by NGOs and district mobile units (DMUs) from the government sectors, have been created in an effort to reach out to the rural regions.

However, Finger (2007) pointed out that the Indian government has increasingly been discouraging service providers from performing cataract surgery at mobile surgery units because visual outcome is generally worse than that of static facilities (p. 114). In accordance with Finger (2007) and Dey *et al.* (2013), in “Role of Outreach Camps in Reducing the Burden of Cataracts in South India,” Nayak *et al.* (2014) found that discrepancies in medical training in cataract surgeons were found primarily in camps providing care for rural regions. As a result, Nayak *et al.* (2014) attributed poor visual

outcome after cataract surgery largely to the paucity of properly trained optometrists and surgeons as well as improper utilization of rehabilitation services after surgery in underdeveloped areas.

However, unlike Finger (2007), Nayak *et al.* (2014) asserted that the source and location of surgery was not the most important determinant of visual outcome, but rather the quality of spectacles and the type of surgery were critical determinants (p. 2). Instead, they claim that efforts should be directed to training more surgeons in IOL techniques, as IOL implantation has proved to be the most effective method in treating cataracts. Moreover, to enhance post-operative cataract surgery care, an adequate infrastructure to ensure proper follow up services for the ICCE operated individuals is required. Conclusively, Nayak *et al.* (2014) repudiated the idea that mobile surgery units were directly causing poor visual outcome and instead, pointed that the discrepancies in the quality of the surgery units largely contributed to the low cataract surgery success rates.

Murthy *et al.* (2004) proposed that in order to ameliorate the eye care system in India, the production and retention of appropriately skilled ophthalmologists and allied personnel must be enhanced, considering the major causes of blindness are primarily avoidable or preventable. Treatment is critically dependent on well-qualified, efficient ophthalmologists that are geographically and culturally accessible to support eye care infrastructure (p. 134). Similar to Nayak *et al.* (2014), Murthy *et al.* (2004) stated the key to success would depend not merely on increasing the workforce but on also bettering the skills and efficiency of available personnel and eye care infrastructure (p. 134).

Furthermore, Nayak *et al.* (2014) extended their stance by arguing that NGO-funded modern eye camps will play a pertinent role in decreasing cataracts. At traditional eye camps, as noted by Finger (2007), cataract surgeries were performed at the campsite itself and aphakic spectacle correction was provided. However, the role of modern outreach camps is to educate the population about cataract surgery and to examine the eyes. After patients are both educated and assessed, they are brought to a static facility for cataract surgery in operation theatres with aseptic precautions. Moreover, postoperatively, they are provided topical medications free of cost and called for follow-up (p. 2). Accordingly, outreach campsites, which are funded primarily by

private organizations, are progressing toward ameliorated treatment methods for rural populations.

Rural Andhra Pradesh Females: Effects of a Patriarchal Society

A patriarchal society and the lack of autonomy prevails rural Andhra Pradesh's society. In "Women's Autonomy in India and Pakistan: The Influence of Religion and Region," Jejeebhoy and Sathar (2001) claimed the cultures of South India are largely gender stratified, characterized by patrilineal descent, patrilocal residence, inheritance, and succession practices that exclude women, and hierarchical relations in which the patriarch or his relatives have authority over family members (p. 687).

In "Gender Socialization: Differences between Male and Female Youth in India and Associations with Mental Health," Ram *et al.* (2014) noted gender inequality is often entrenched at all levels of society and that households are a primary site in which male privilege and control over women are expressed. In fact, from an early age, Indian girls are told that their proper place is in the home, fulfilling domestic duties and attending to the needs of men, whereas males learn that they are superior to women and must exercise authority over them (p. 1). Moreover, as these restrictions are condoned by political and legal systems, essentially women and girls become powerless to protect themselves from harm and are made vulnerable to diseases, mental disorders, and death (p. 1).

Due to less NGO presence in rural regions, there are already depressed education and employment opportunities. In reference to women residing in such areas, the ability to access these two things are virtually non-existent. In "Women in development: Perspectives from selected states of India," Devi (1998) found that progress in girls' education has been linked with the highest dropout rates among girls and reduced higher education for women. Moreover, Devi (1998) noted that illiteracy is higher for females in rural areas. In support of this, the 2011 Census of India reported that in Andhra Pradesh, the literacy rate of 7+ year urban females was 74.35% while the literacy rate of 7+ year urban females was 52.54% (p.1).

Deeply rooted patriarchal beliefs embed rural society. Males are the sole wage earners. With virtually no emphasis on education, and gender roles clearly drawn out,

children are brought up under such rigid beliefs and social structures, leading to lack of opportunity for economic and social growth for females. Instead, tradition and cultural conservatism has led to social and economic stagnation and exacerbated health issues for females.

Comparative Analysis: Economic Underdevelopment, Females, and Cataract Blindness

In “The Impact of Successful Cataract Surgery on Quality of Life, Household Income and Social Status in South India,” Finger *et al.*(2012) found a correlation between economic underdevelopment and poverty in rural areas and increased blindness levels. Moreover, in “Blindness in the Indian state of Andhra Pradesh,” Dandona *et al.*(2001) found blindness was more likely in females residing in rural areas in comparison to their female counterparts in urban regions.

In rural Andhra Pradesh, only a small minority of the population has the economic means to access and afford sustainable eye health services, as many are entirely reliant on the agriculture economy that exists in these regions. Many career and job opportunities in these areas revolve around hard labor and agriculture. However, as the agricultural sector has declined progressively, these populations are directly affected. Moreover, the declining economy in combination with the nature of these jobs, makes agricultural workers and laborers spend much of their time in their workplaces while pay may not be sufficient to sustain a family, let alone pay for medical bills. This then results in limited accessibility and affordability of health-care services, contributing to the increase in preventable blindness trends. Consequently, a cycle of poverty in these rural regions exists.

Furthermore, this cycle of poverty entrenches generations of families. In urban areas, which are generally more developed and economically stable, education plays a central role in society, especially for young boys and girls. As a result, availability of government or private schools and strict education standards is significantly higher in these areas.

However in rural areas where poverty is rampant, such luxuries are not readily

available. Instead, agriculture plays a predominant role in families, and effectively, in children's lives. Accordingly, children from a young age, are used to working in these agricultural environments to increase crop output and garner more money. With increased time spent on farms, education and school play secondary roles. For females, higher education is virtually non-existent. This is exemplified in the 2011 Census of India, for the "Andhra Pradesh Profile," which reported the literacy rate of the 7+ years rural population was 60.45% compared to the 80.09% literacy rate of the 7+ years urban population. As a result, often, rural children end up spending all of their lives in a singular area, with no exposure to other lifestyles that exist.

Additionally, Finger *et al.* (2012) acknowledged a cyclic relationship also exists between poverty and blindness, as these two components mutually influence the other. In fact, poverty can be considered both a cause and effect of blindness. In regards to causation, only a small minority of the rural population has the economic means to afford sustainable eye health services and accordingly, qualified private sector doctors and hospitals are not readily available in remote rural areas. In combination with a deprivation of educational opportunities and a lack of knowledge of eye health, preventable blindness inevitably increases.

In regards to poverty being an effect of blindness, blindness often leads to unemployment, which leads to loss of income, higher levels of poverty and hunger and low standards of living. All of these together lead to early mortality and loss of economic productivity of a nation as a whole. Finger *et al.* (2012) further stipulated that visual impairment leads to a reduced quality of life (QoL), poorer general health, lower social status and increased mortality (p. 1).

Effectively, economic underdevelopment has led to a lack of education and employment opportunity for women, which has resulted in a low awareness and accessibility of eye care services and cataract surgery procedures. These limitations contribute to the higher blindness rates in women living in rural regions in comparison to women living in urban areas. Murthy *et al.* (2005) supported this in a study investigating estimates of blindness in India, in which they supported findings that both rural residents and females had a higher risk of developing blindness.

Such results are mirrored in follow-up studies, such as in “Prevalence and Causes of Blindness and Visual Impairment and Their Associated Risk Factors, in Three Tribal Areas of Andhra Pradesh, India,” in which Singh *et al.* (2014) noted the odds of visual impairment and blindness was significantly higher in female subjects. Social, economic, and cultural barriers imposed on females severely limit health care access for women, in turn restricting early detection and treatment, which could have prevented or at the least, limited vision loss.

In “Epidemiological study of patients availing free cataract services of national programme of control of blindness,” Joshi (2015) confirmed the findings of Murthy *et al.* (2014) and reported that despite the increased rate of surgery performed in the last 10 years, cataract remains a leading cause of blindness in India, particularly among women. Furthermore, he attributed this trend to a lack of knowledge and affordability.

In regards to cataract surgery facilities, in “Visual outcomes after cataract surgery and cataract surgical coverage in India,” Bachani *et al.* (1999) introduced another dimension: utilization of specific treatment locations. Specifically, Bachani *et al.* (1999) found that males more often used static facilities whereas females more commonly used eye camp facilities, which have shown to be less effective in ameliorating visual acuity. This is generally due to societal limitations against females as generally they can only travel to nearby eye camps rather than the comparatively more distant static facilities.

Dr. Kuldeep Dole (2013) spoke about a cross-sectional survey that was given out to a population of 1,890 patients attending a tertiary hospital to assess the enabling factors and barriers to cataract surgery. He affirmed the findings of Bachani *et al.* (1999) by noting that high charges of modern cataract techniques (microincision phaco and intraocular lens implantation) and distance of private facilities were barriers, and that families were inclined to invest on men as they were the breadwinners of the family. Moreover, Dole (2013) revealed that women waited longer than men to have surgery, sought help only when vision is truly a problem and more often considered eye check-ups not a priority compared to other health issues.

As a result of their inability to access healthcare and lack of formal education regarding eye health, rural women often turn to home and cultural remedies, specifically

traditional eye medicines. In “Use of traditional eye medicines by patients with corneal ulcer in India,” Choudhary *et al.* (2015) investigated traditional eye medicine (TEM) use in Andhra Pradesh and found that in patients that had frequently applied TEMs users were consistently linked with low visual acuity and blindness as well as inhabitants in rural areas and low economic status. Accordingly, both culture and economic characteristics of a region can mutually influence the onset and causation of blindness.

Moreover, often, people residing in rural regions place higher importance to TEMs rather than actual medicine. The perceptions that these TEMs are working/beneficial in combination with their reluctance to receive medical attention all add to the nature of cataract, ultimately leading to vision problems and loss of visual acuity. Choudhary *et al.* (2015) found that TEM-related poor ophthalmic outcomes were attributed to delay in uptake of eye care services, which irreparable damage to ocular and or adnexal structures due to TEM toxicity, and microbial contamination from the TEM agent or procedure (p. 1002).

Conclusively, Finger (2007) attributed lack of knowledge/misinformation as perhaps the number one reason in poor uptake of services, as this encompasses patients with lack of experience or misconceptions with successful cataract surgery as well as traditional beliefs/cultural stigmas. Finger (2007) noted that predisposing characteristics, notably low socioeconomic status, sex, or rural residence, were not barriers in and of themselves, but markers for other barriers mostly related to enabling resources, citing women’s limited access to financial records (p. 116). Essentially, though being a woman itself isn’t a barrier, the culture and norms that exist in Andhra Pradesh regarding a woman’s place in society make sex a notable barrier.

Conclusion

Combating predisposing characteristics, notably sex and area of residence, is beyond the reach of programs currently in Andhra Pradesh. However, decreasing the lack of disease awareness and encouraging utilization of eye-care services and treatment options in female patients is possible. In many investigations regarding the utilization of eye care facilities in rural India, main reasons cited by women for not using available

services was distrust of the offered services, a lack of easy accessibility, reputation of the facility, competence of staff, free service, and proximity to facilities. Essentially, there is a lack of communication between patients and eye-care service providers. NGOs can serve as the link between these two disparate groups.

In “Improving cataract services in the Indian context,” Murthy *et al.* (2014) noted three main criteria were required in order to improve utilization of cataract surgical services in Andhra Pradesh: awareness, accessibility, and affordability. Firstly, people must become aware of the eye conditions and the respective treatment options. Secondly, people must have access to services that do exist and are within reasonable distance. Also, family members must be willing to support or allow the person to undergo cataract surgery, and any other barriers to attending for surgery must be successfully addressed (e.g. for people with disabilities or women). Finally, people must be able to afford cataract surgery and associated costs including transportation and post-operative rehabilitation.

For females, traditional gender roles lead to a lack of knowledge of eye health and a lack of utilization of healthcare services. The inability of women to access already limited available services is further augmented by limited education and employment opportunities, which is connected to low levels of private sector entrepreneurship.

Fostering greater NGO presence in rural regions can facilitate the achievement of the three main criteria proposed by Murthy *et al.* (2014). NGOs have shown to enhance financial stability of urban areas. The establishment of these private organizations can ameliorate social and economic development in rural regions and accordingly, create education and employment opportunities for females. This can lead to greater awareness and knowledge of cataract blindness. Moreover, enhancement of female’s economic role within the families can ameliorate their social roles in both the household and community, which can lead to greater autonomy and accessibility to eye-care facilities. Concurrently, NGOs will present rural regions the opportunity to break the cycle of poverty and allow affordability.

The impact of private/NGOs on economic development and on socioeconomic factors that preclude lack of utilization of eye-care services in females must be evaluated

over a longitudinal period to monitor process and to make systematic and adaptive changes. By thoroughly understanding the correlation between Andhra Pradesh's economic variation and cultural norms to blindness levels, a byproduct of this research proposal is to extend obtained results to other Indian states and to implement similar public policies to effectively target blindness reduction in India overall.

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