THE QUALITY OF VISION (QoVn) AND QUALITY OF LIFE (QoL) AFTER VISION CORRECTION DUE TO REFRACTIVE ERRORS IN TELANGANA STATE

A thesis submitted during 2023 to the University of Hyderabad in partial fulfilment of the award of a Ph.D. degree in the Health Sciences (Optometry and Vision Science), School of Medical Sciences

By

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CERTIFICATE

This is to certify that the thesis entitled ***The Quality of Vision and Quality of Life after Vision Correction due to Refractive Errors in Telangana State*** submitted by **Lavudi Suresh** bearing Reg. No: **17MOPH03,** in partial fulfilment of the requirements for the award of **Doctor of Philosophy** in the **School of Medical Sciences,** is a bonafide work carried out by him under my supervision and guidance.

This thesis is free from Plagiarism and has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

Further, the student has the following publication before submission of the thesis for adjudication and has produced evidence for the same in the form of an acceptance letter in the relevant area of his research:

1. Suresh, L, Shamanna, BR. (2023) KantiVelugu programme: An epidemiological approach to universal eye health in the state of Telangana. (Manuscript sent to journal 07/02/2023: Accepted on 26/04/2023: Ophthalmology journal).

and

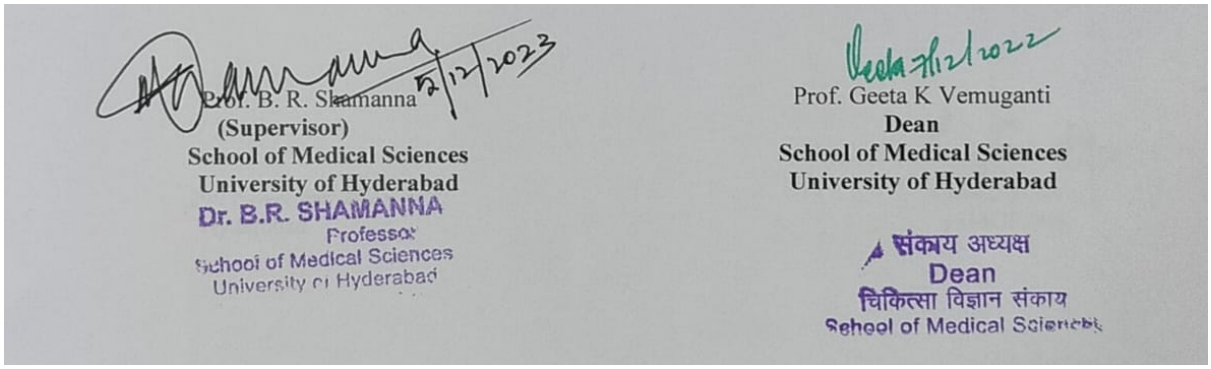
has made presentations at the following conferences:

- "Comparison between NetraKumbh and KantiVelugu – Learning from two Mega Vision Screening Programmes in India" at the First International Conference on Health and Pharma (ICHP-2021) Organised by MSME and MAS NGO on 11th -12th December 2021.

- “Reaching the unreached – Vision care through a state-wide mega Initiative – KantiVelugu experience" presented virtually at the International Conference on Science for Society (ICSS-2022) organized by Kalinga University New Raipur on 11th-12thJanuary 2022.
- "The Quality of Vision and Quality of Life before and after vision correction due to refractive errors in Telangana State" Presented at the International Conference on Innovations in Health Interventions: Traditional, Complementary and Alternative Methods (TCAM) In Holistic Health Care, Organised by the University of Hyderabad on 10th - 11th November 2022.

Further, the student has passed the following courses towards the fulfilment of the coursework requirement for a Ph.D.

Course code	Course Name	Credits	Pass/Fail
OV801	Research methods, including epidemiology	4	Pass
OV804	Qualitative Research in Health Sciences	4	Pass
OV807	Basic Epidemiology	4	Pass



DECLARATION

I **Lavudi Suresh** (17MOPH03) hereby declare that this thesis entitled "***The Quality of Vision and Quality of Life after Vision Correction due to Refractive Errors in Telangana State"*** Submitted by me under the guidance and supervision of **Dr. B. R. Shamanna,** Professor, School of Medical Sciences, University of Hyderabad, is a bonafide research work.

I also declare that it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma.

29th November 2023
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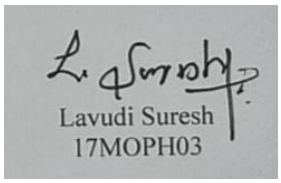

To Guru, for patience and limitless loving memories

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ABBREVIATIONS

Add	Addition
ASHA	Accredited Social Health Activist
ANM	Auxiliary Nurse Midwife
AR	Auto Refractor
APEDS	Andhra Pradesh Eye Disease Study
BEST	Basic eye screening test
BE/OU	Both Eye/Ocular Uterque
CD/CO	Corneal Diseases/Corneal Opacity
CHFW	Commissioner of Health and Family Welfare
CL	Contact Lenses
CHC	Community Health Centre
CSRE	Clinically Significant Refractive Errors
Cd/m²	Candelas per square meter
D	Diopter
DVA/NVA	Distance Visual Acuity/Near Visual Acuity
DV/NV	Distance Vision/ Near Vision
DC/DCyl	Dioptric Cylindrical
DS/DSph	Dioptric Spherical
DEO	Data Entry Operator
DRC	Doctoral Research Committee
(dB)	decibels
DR	Diabetic Retinopathy
DM	Diabetic Mellitus
ECCF	Eye Care Competency Framework

GAP	Green Add Plus
GDP	Gross Domestic Product
GNI	Gross National Income
GHMC	Greater Hyderabad Municipal Corporation
GNM	General Nursing and Midwifery
HOMES	Hyderabad Ocular Morbidity in Elderly Study
IAPB	International Agency for the Prevention of Blindness
IND-VFQ	Indian-Visual Functioning Questionnaire
IEC	Institutional Ethical Committee
INR	Indian Rupee
KV	KantiVelugu
KVP	KantiVelugu Program
LE/OS	Left Eye/Ocular Sinister
LGN	Lateral Geniculate Nucleus
MO	Medical Officer
MoHFW	Ministry of Health and Family Welfare
MLC	Member of a state Legislative Council
MLA	Member of the Legislative Assembly
MPTCs/ ZPTCs	Mandal Praja Parishad and Zilla Praja Parishad Territorial Constituencies
MP	Member of Parliament
mHealth	Mobile Health
N	Sample size or power of the study
NGOs	Non-Government Organizations
nm	Nanometre
NPCB	National Program for Control of Blindness
NPCB&VI	National Program for Control of Blindness & Visual Impairments

NK	NetraKumbh
Optom	Optometrist
OBC	Other Backward Classes
PC	Personal Computer
PECI	Package of Eye Care Interventions
P/CI/OR	Probability/Confident Interval/Odds Ratio
QoVn	Quality of Vision
QoL	Quality of Life
RE/OD	Right Eye/ Ocular Dexter
RAM	Red Add Minus
RAC	Research Advisory Committee
REs	Refractive Errors
ROP	Retinitis of Prematurity
SDEH	Sarojini Devi Eye Hospital
SVL/BF/PALs	Single vision lens/Bi-focal/Progressive addition lenses
SDGs	Sustainable Development Goals
ST	Scheduled Tribes
SC	Schedule Castes
SPSS	Statistical Package for the Social Sciences (IBM)
TS	Telangana State
UP	Uttar Pradesh
UPHC	Urban Primary Health Care
USD	United States Dollar
VRQoL/HRQoL	Vision-related/Health-related Quality of Life
VCM	Vision-related quality of life Core Measure
Vn	Vision

VSC/P	Vision Screening Camp/Program
VA	Visual acuity
VAM	Visual Acuity Measurements
VI/N/D	Visual Impairment/Near/Distance
WHO	World Health Organization
ZPP	Zilla Praja Parishads
λ / (Å)	Lambda/angstrom

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ORGANISATION OF THESIS

This thesis comprises seven chapters:

Chapter 1: Introduction.

This chapter provides an overview of vision screening, highlighting the significance of the visual system and the quality of vision in everyday life. It explores their correlation with visual impairment in India.

Chapter 2: Theoretical foundation and Review of Literature

This chapter consists of a comprehensive review of available literature and studies related to vision screenings and existing Global and Indian health policies in eye care. The chapter also establishes a theoretical foundation for the doctoral research work.

Chapter 3: **Study of various large-scale vision screening initiatives undertaken in Telangana state at the community level.**

The chapter documents various community-level vision screening initiatives in Telangana. It offers an overview of the epidemiological approaches employed in the mass mega vision screening camp of the KantiVelugu programme, utilising secondary data and district-level statistical information.

Chapter 4: Study and understand QoL and QoVn amongst the beneficiaries of the KantiVelugu program.

This chapter presents an overview of the Quality of Life before and after vision correction due to refractive errors in the KantiVelugu program in Telangana. It employs the Indian-Visual Functioning Questionnaire (IND-VFQ33), the Washington Group Questions related to vision disability, and Children-Specific, Female-Related, and Geriatric-Specific Questionnaires to assess pre- and post-treatment visual outcomes in the population who are

beneficiaries of the Programme. A sampled population of 900 individuals out of 966 eligible was studied over six months, examining their experiences with refractive error correction through the KantiVelugu program at Sarojini Devi Eye Hospital, Hyderabad. The assessment encompassed examination of quality of vision and quality of life both before and after the correction facilitated by the program.

Chapter 5: Comparison of KantiVelugu and Netra Kumbh: two large-scale community eye screening programs in India.

This special chapter compares two large-scale mega vision screenings—KantiVelugu and NetraKumbh. The analysis aims to understand the impact of these vision screening programs on beneficiaries and the population, considering one as temporary and the other continuous state supported one. The chapter was as an offshoot of the recommendations of the doctoral committee to understand the mega-screening process.

Chapter 6: **Pilot testing of advocacy material developed for population-based vision screening initiatives.**

This chapter delves into community approaches for the mass mega vision screening program of KantiVelugu in Telangana. Utilising phase 1 and phase 2 data comparisons, it explores the short-term impact of advocacy and education material development through pilot testing.

Chapter 7: Summary and Conclusions.

The final chapter provides a summary of the entire thesis and concludes the research, drawing insights and implications from the findings.

CHAPTER-1

INTRODUCTION

1.1 Overview

This chapter delves into the fundamental concepts surrounding vision screening. In this context, the researcher explores the significance of an efficient visual system and its foundational role in various aspects of our daily lives. Optimal vision plays a pivotal role in performing basic tasks like reading and mobility, as well as more complex activities like driving and education.

Furthermore, the research embarks upon an exploration of the relationship between visual impairment and its occurrence within the specific demographic and healthcare context of India. This involves considering factors such as socio-economic conditions, accessibility to healthcare facilities, and prevalent eye conditions of the patients that contribute to visual impairments. Understanding these intricate connections is essential for formulating effective strategies and interventions to address the visual challenges of the Indian population.

1.2 Introduction

This chapter provides a concise overview of the introduction to the visual system, highlighting key structures linked to it and elucidating its pivotal role in facilitating vision and various visual parameters. As illustrated in Figure 1.1 about vision screening within the community, these structural functions play a crucial role in averting preventable vision impairments, such as glaucoma and other similar eye disorders.

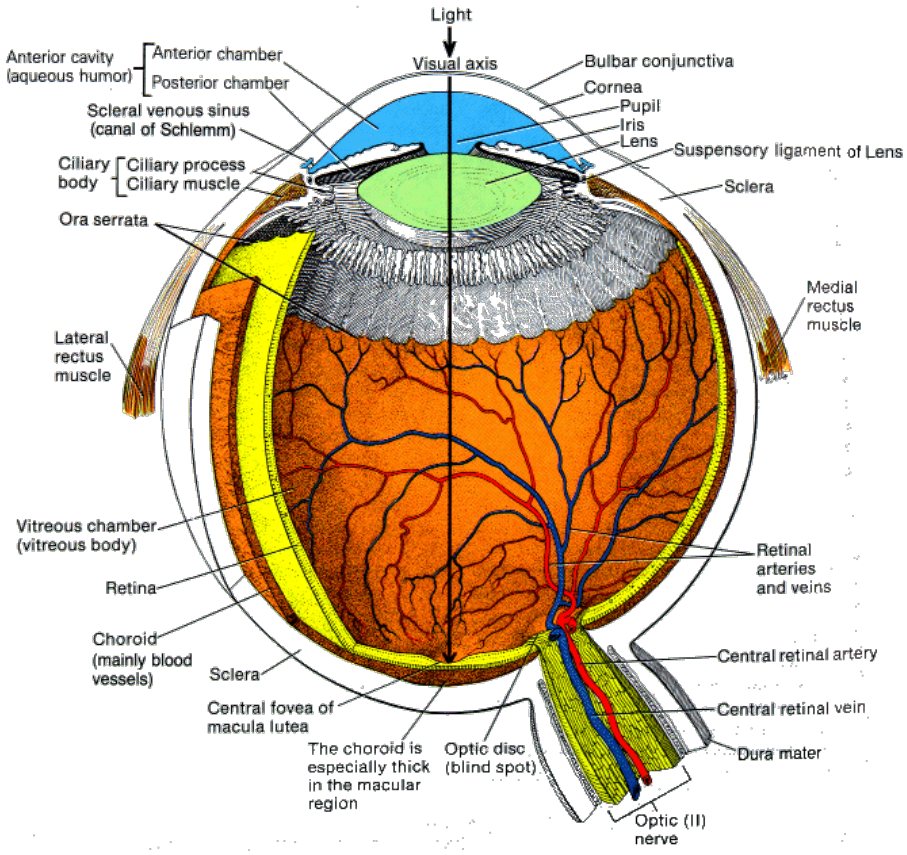


Figure 1.1 An illustration of the Human visual system (Source: Encyclopaedia Britannica)

Table-1.1 Anatomy and physiology of an Eyeball

"Anterior chamber"	"The anterior chamber refers to the frontal segment within the interior of the eye, serving as a conduit for the circulation of aqueous humour. This vital fluid flows in and out of the anterior chamber, facilitating the nourishment of the eye. Its dynamic movement within this region contributes to the maintenance of ocular health, ensuring a constant supply of nutrients essential for the well-being of the eye's various structures."

“Aqueous humour”	"Aqueous humour is a clear and watery fluid enveloping the eyeball. This transparent substance plays a crucial role in maintaining the structural integrity and optimal functioning of the eye. It surrounds the eyeball, providing essential support and nourishment to ocular tissues. The aqueous humour's clarity allows for unimpeded transmission of light, contributing to visual acuity. Its presence is integral to the ocular system, acting as a vital component for ocular hydration, nourishment, and overall optical well-being."
"Blood vessels	“Blood vessels, comprising both arteries and veins, serve as conduits for the transportation of blood to and from the eye. These vascular structures play a pivotal role in facilitating the circulation of blood throughout the ocular region, ensuring the delivery of oxygen, nutrients, and other essential elements necessary for the eye's metabolic processes and overall functionality. Arteries convey oxygenated blood to the eye, providing the necessary sustenance for its various components, while veins carry deoxygenated blood away, facilitating the removal of metabolic by products. The intricate network of blood vessels within the eye is integral to maintaining the ocular environment and supporting its physiological requirements.”

“Caruncle”	"The caruncle is a minute, crimson region situated at the corner of the eye, encompassing specialized sebaceous and sweat glands. This small but distinctive area contributes to the ocular anatomy, housing glands that play a role in maintaining the eye's moisture and lubrication. Comprising modified sebaceous glands, the caruncle contributes to the production of oils that assist in preventing desiccation of the eye's surface. Additionally, the presence of sweat glands in this region further contributes to overall ocular comfort and well-being by aiding in the regulation of moisture. The caruncle, though diminutive, holds significance in the intricate balance of ocular health and comfort."
“Choroid”	"The choroid is a slender, vascular membrane positioned between the retina and the sclera, responsible for supplying blood to the outer segment of the retina. This thin, blood-rich layer plays a vital role in ocular physiology by ensuring a robust vascular network that supports the metabolic needs of the retina. Serving as a conduit for oxygen and nutrients, the choroid is integral in maintaining the health and functionality of the outer regions of the retina. Its strategic location and blood-supplying function underscore the choroid's significance in sustaining the visual apparatus and contributing to the overall well-being of the Eye."

“Ciliary body”	"The ciliary body is the ocular component tasked with the synthesis of aqueous humour. Positioned within the eye, this integral structure plays a pivotal role in the dynamic regulation of intraocular fluid. By orchestrating the production of aqueous humour, the ciliary body contributes significantly to the maintenance of optimal intraocular pressure and overall ocular health. This process involves the active secretion of the transparent fluid, which is crucial for nourishing ocular tissues and maintaining the structural integrity of the eye. The ciliary body's central role in aqueous humour production underscores its importance in the intricate physiological mechanisms that support the functionality of the Eye."
“Cornea’	"The cornea is a transparent, domed surface that envelops the anterior portion of the eye. Serving as the eye's outermost layer, this clear and curved structure plays a fundamental role in the visual process. Positioned at the front of the eye, the cornea acts as a protective barrier while also contributing to the refraction of light entering the eye. Its transparent nature allows for the passage of light, enabling the formation of a focused image on the retina. Beyond its optical function, the cornea is pivotal in maintaining the eye's structural integrity and shielding its internal components. The unique characteristics of the cornea make it a critical element in the complex interplay of factors that dictate visual acuity and ocular well-being."

“Iris”	"The iris constitutes the pigmented segment of the eye and plays a crucial role in regulating the amount of light entering the eye. This intricately coloured structure, positioned between the cornea and lens, contributes significantly to the eye's light management. Through its adjustable aperture, known as the pupil, the iris dynamically controls the size of the pupil in response to varying light conditions, thereby influencing the quantity of light that reaches the retina. The pigmentation of the iris adds to its optical function, helping to reduce glare and enhance visual acuity. In essence, the iris stands as a key player in the eye's optical system, contributing to the precise control of light exposure and optimizing visual performance under different environmental conditions."
“Lens”	"The lens, also referred to as the crystalline lens, is a transparent structure situated within the eye that focuses incoming light rays onto the retina. Functioning as a vital component of the eye's optical system, this clear lens plays a pivotal role in the process of visual accommodation. Through its ability to alter shape, the lens ensures the accurate convergence of light onto the retina, facilitating the formation of a sharp and focused image. This dynamic optical element contributes significantly to the eye's ability to adjust its focal point, allowing for clear vision at varying distances. In essence, the lens stands as a crucial determinant of visual acuity, directing and fine-tuning light to optimize the quality of the visual input received by the retina."

“Lower eyelid”	"The lower eyelid, in its closed state, encompasses the skin that envelops the lower portion of the eyeball, inclusive of the cornea. This protective covering serves as a crucial component in safeguarding the eye when the eyelid is in a downward position. Beyond its role in shielding the eye, the lower eyelid contributes to the overall ocular integrity by providing a barrier against external elements. The dynamic movement and closure of the lower eyelid play a fundamental role in ocular health, preventing potential irritants and contaminants from coming into contact with the sensitive cornea and maintaining the ocular surface in a state of protection during periods of rest or reduced visual engagement."
“Macula”	"The macula, positioned at the central region of the retina, serves as a pivotal locus for discerning fine details in human vision. This specialized area is instrumental in the perception of intricate visual information, enabling individuals to distinguish and appreciate small particulars with precision. As the focal point of the retina, the macula concentrates a high density of photoreceptor cells, particularly cones, which are essential for sharp central vision. The unique composition and strategic placement of the macula underscore its crucial role in supporting activities that demand heightened visual acuity, such as reading, recognizing faces, and engaging in tasks that necessitate a keen focus on minutiae. In essence, the macula emerges as a central contributor to the intricate visual processes that underlie the perception of fine details in the human visual experience."

“Optic nerve”	"The optic nerve constitutes a bundle of nerve fibers establishing a vital link between the retina and the brain. This crucial neural pathway serves as the conduit for transmitting impulses related to light, darkness, and colour from the retina to the visual cortex. In this intricate process, the optic nerve facilitates the relay of visual signals, allowing the brain to compile and interpret these signals into coherent images, thereby generating the complex phenomenon of vision. The optic nerve's role in conveying visual information underscores its significance as a fundamental component in the intricate neural network responsible for translating light stimuli into the perceptual experience of sight within the human visual system."
“Posterior chamber”	"The posterior chamber denotes the internal space at the rear of the eye. This anatomical region, situated toward the back of the eye's interior, plays a crucial role in maintaining ocular structure and function. Serving as a significant compartment within the eye, the posterior chamber contributes to the containment and protection of essential ocular components. Its strategic position in the eye's anatomy highlights its role in supporting the intricate network of structures that collectively enable vision. Understanding the dynamics and characteristics of the posterior chamber is fundamental to comprehending the holistic functionality and integrity of the eye's posterior segment."

‘Pupil”	"The pupil refers to the central aperture within the iris through which light gains entry into the eye. Serving as a dynamic gateway for incoming light, this adjustable opening plays a pivotal role in regulating the amount of light reaching the retina. Controlled by the iris muscles, the pupil adapts in response to varying light conditions, contracting in bright environments to limit the influx of light and dilating in dim conditions to enhance light entry. The intricacies of pupil dynamics are fundamental to the eye's ability to adjust to different lighting scenarios, highlighting its significance in the overall process of vision and light modulation within the ocular system."
‘Retina”	"The retina, an intricate nerve layer that coats the interior of the eye's posterior, possesses sensitivity to light and is responsible for detecting visual stimuli. Functioning as a photosensitive membrane, the retina translates incoming light into neural impulses. These impulses are then conveyed to the brain via the optic nerve, initiating the complex process of vision. The retina's unique composition of photoreceptor cells, including rods and cones, enables it to capture and process light signals, facilitating the perception of visual stimuli. A profound understanding of the retina's role in light detection and signal transmission is crucial for unravelling the intricacies of visual perception and the physiological mechanisms that underlie the human visual experience."

“Sclera”	"The sclera, comprising the apparent white portion of the eyeball, is intricately linked to the ocular muscles responsible for the movement of the eyeball. Serving as a protective and structural outer layer, the sclera plays a crucial role in maintaining the eye's shape and integrity. Its connection to the ocular muscles underscores its involvement in facilitating coordinated eye movements, thereby contributing to visual tracking and focus adjustments. The visibility of the sclera not only signifies its protective function but also serves as a visual indicator of ocular health and alignment. A comprehensive understanding of the sclera's anatomical and functional aspects is fundamental for elucidating the mechanisms governing eye movement and overall ocular stability."
“Suspensory” ligament of lens”	"The suspensory ligament of the lens is a complex network of fibres that establishes a connection between the ciliary body of the eye and the lens, serving to anchor the lens securely in its position. This intricate ligamentous structure plays a crucial role in supporting the lens and facilitating its dynamic adjustments. By maintaining the lens in a stable position, the suspensory ligament contributes to the lens's ability to alter its shape, a process integral to the eye's capacity for accommodation and precise focusing. Understanding the characteristics and functions of the suspensory ligament of the lens is pivotal for unravelling the biomechanics involved in the ocular mechanisms responsible for visual acuity and the accommodation of the eye to varying distances."

“Upper eyelid”	"The upper eyelid, in its closed position, encompasses the skin that envelops the upper portion of the eyeball, inclusive of the cornea. This skin covering serves as a protective layer shielding the eye, and its closure is fundamental in safeguarding the eye against external elements. Beyond its protective role, the upper eyelid contributes to the overall ocular integrity by acting as a barrier against potential irritants and contaminants. The dynamic movement and closure of the upper eyelid are essential in maintaining ocular health, preventing foreign particles from coming into contact with the sensitive cornea, and ensuring the ocular surface remains shielded during periods of rest or reduced visual engagement."
“Vitreous body”	"The vitreous body occupies the posterior segment of the eye, constituting a transparent and gelatinous substance that fills the space at the back of the eye. This gel-like material plays a pivotal role in maintaining the structural integrity of the eye and supporting its various components. Comprising water, collagen fibres, and other molecular elements, the vitreous body contributes to the maintenance of the eye's shape and provides a medium through which light can pass unimpeded to the retina. Understanding the characteristics and functions of the vitreous body is essential for comprehending the overall ocular anatomy and the ways in which this gel-like substance interacts with other ocular structures to facilitate optimal vision."

1.3 Human Eyeball Anatomy and Physiology

The human eye possesses a spherical structure with a subtle curvature towards the anterior aspect. The eye is composed of three distinct layers. When aligned in a flat arrangement, these layers collectively constitute the anatomical structure of the eyeball (Perkins, E. S et al., 2023).

- The sclera, an opaque, rigid, and white membrane enveloping the outer surface of the eyeball, provides essential protection, commonly recognized as the "white of the eye". Adjacent to the sclera, positioned anteriorly, lies the cornea-an ultra-thin, transparent, and dome-shaped tissue.
- The choroid, an intermediary layer, is situated between these aforementioned structures. This anatomical region precedes the iris, which is characterized by its distinctive pigmentation. The central aperture of the iris, referred to as the pupil, assumes a circular shape.
- The retina, constituting the anterior two-thirds of the ocular structure, forms the thinnest inner wall. Comprising the sensory retina and the retinal pigment epithelium (RPE), positioned between the sensitive retinal layer and the choroid, it serves as the pivotal interface. Neuronal cells within the sensory retina are responsible for interpreting and transmitting visual stimuli to the cerebral cortex.

The internal structure of the eye comprises three chambers, collectively referred to as divisions.

The anterior chamber, situated between the cornea and the iris, is a pivotal region in the front portion of the eye. The iris regulates the amount of light entering the eye by modulating the

dilation and constriction of the pupil. Muscular fibres within the iris govern the pupil's size, enabling the regulation of light entry through dilation or constriction.

The posterior region is located between the iris and the lens. Positioned behind the iris, the lens, typically transparent, receives light directed by the pupil. The lens is stabilized by delicate zonules, which emerge from the eye's inner layer. Demonstrating remarkable adaptability, the lens can be manipulated by tiny muscular fibres connected to it, facilitating the focus on objects of varying sizes. Accommodation, the ability to focus on objects at different distances, is achieved by adjusting the shape of the lens through the controlled contraction and relaxation of these muscles.

The vitreous chamber is located between the lens and the retina. The retina, constituting the posterior two-thirds of the vitreous chamber's inner surface, is composed of highly sensitive nerve cells that convert light into nerve impulses. Nerve fibres from the retina through the optic nerve, establishes a vital connection to the brain for the transmission of these impulses. The macula, situated in the frontal region of the eye towards the central retina, provides a precise and detailed field of vision for foreground focus.

The remaining portions of the retina contribute to peripheral vision, facilitating the perception of objects without fine detail. Veins and arteries within the retina ingress and egress from the eye via the optic nerve. The majority of the eye's interior is filled with fluid. Aqueous humor, a transparent, watery fluid, occupies the anterior and posterior lobes of the lens. The vitreous chamber, positioned behind the lens, contains a dense, gel-like substance known as vitreous humor or vitreous gel. These fluids exert intraocular pressure, contributing to the maintenance of the eye's structural integrity. The eye's function parallels that of a camera.

Light is admitted through the cornea and pupil at the anterior aspect, while the lens focuses it onto the retina at the posterior.

Subsequently, light undergoes reflection by the lens and cornea as it traverses the vitreous gel within the posterior chamber, ultimately converging onto the retina. Within the retina, light is converted into electrical impulses. These impulses are then transmitted via the optic nerve to the brain, which interprets them into the visual images perceived by the observer.

Vision holds paramount significance throughout the lifespan of an individual, encompassing all processes and functions of the visual system (Philip M. Lewis et al., 2015). According to the World Health Organization, an estimated 153 million individuals are affected by uncorrected distance refractive error (Afari, C. 2014). Globally, over 285 million people, including 246 million with impaired vision and 39 million who are blind, grapple with visual impairments (Ajuwon, P. M., & Ruth Bieber, B. S. W., 2014).

Ocular disorders are surprisingly pervasive, with nearly every individual encountering at least one eye ailment throughout their lifespan (Sarki, R., et al., 2020). Currently, over 2.2 billion people across the globe grapple with visual impairment or blindness, and of these, a significant portion, approximately 1 billion, suffers from preventable forms of visual impairments(Kiruki, B.W., 2018).

The visual system encompasses the ocular apparatus and the intricate neural pathways that link them to the visual cortex and various cerebral regions (Fig 1.2). The neurological signals, subject to processing by the retina, traverse the optic nerves via the axons of ganglion cells. Subsequently, these signals bifurcate and partially cross over at the optic chiasm before progressing to the lateral geniculate nucleus via the optic tracts (LGN).

The journey of these signals extends further, culminating at the primary visual cortex, where advanced stages of visual processing take place (Stone, J., 2013).

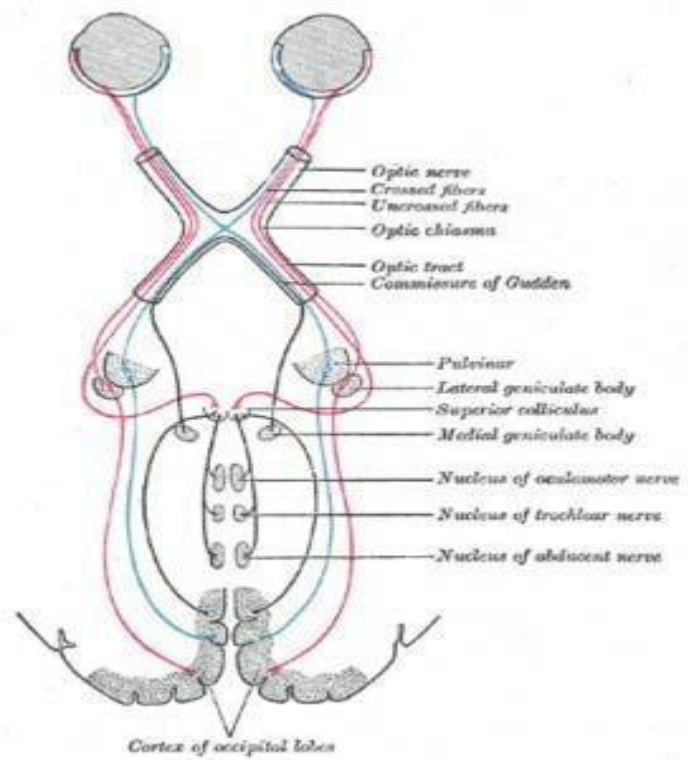


Fig 1.2 Visual Pathways (Source: Henry Gray 1918)

"The visual system is constituted by the ocular apparatus and the neural pathways that interconnect them with the cerebral cortex and other regions of the brain. The illustration provided depicts the mammalian visual system(Schiller, P. H., &Tehovnik, E. J., 2015).)."

Table 1.2 List of vision parameters

Parameter	Definition	Measurement units
Visual acuity	clarity of image example: - sharp, fineness	Feet, Meter's, Logmar, Cycles per degree.
Visual field	seeing central and peripheral	Degrees, decibels (dB)
Contrast sensitivity	the contrast between the object and background	cd/m², or candelas per square meter
Colour perception	difference emission of light and their colours	angstrom (Å), unit of length, equal to 10^{-10} meters, or 0.1 nanometres (nm or λ lambda)
Vernier acuity	detecting patterns	seconds of arc
Stereo acuity	depth perception	seconds of arc
Dark-adapted visual threshold	able to see the low light	Log units in threshold and Minutes in length of time

1.4 Refractive errors

Refractive errors denote a visual impairment characterized by difficulties in achieving clear vision. They arise from anomalies in the eye's configuration, hindering the precise convergence of light onto the retina, the photosensitive layer at the posterior aspect of the eye.

Among visual impairments, refractive errors are most prevalent. Notably, a substantial portion of the American populace, exceeding 150 million individuals, contends with refractive anomalies, thus encountering challenges in visual acuity (Zhou, T.E., 2017). Consequently, routine ophthalmic evaluations assume paramount importance in this context. For individuals afflicted with refractive issues, optometric intervention often involves the

recommendation of corrective measures such as prescription lenses or spectacles, aiming to optimize visual clarity and acuity.

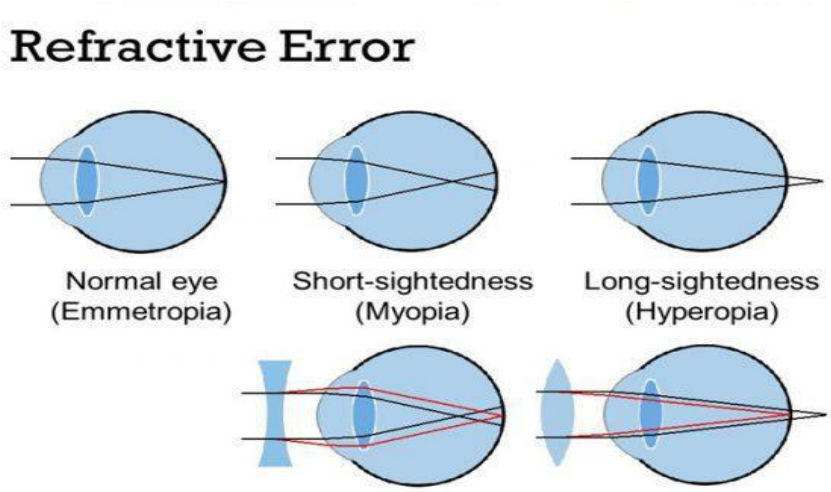


Figure 1.3 Types of refractive errors (Source: Mayurjawale)

The predominant symptom of refractive errors is blurred vision.

Other notable indicators include:

- Double vision
- Cloudy vision
- Perception of halos or glare around intense light sources
- Squinting
- Headaches
- Ocular fatigue (resulting from reading or prolonged screen use, leading to discomfortand weariness of the eyes) and associated difficulty in sustaining focus (Ma'roef, V. X, et al., 2023).

It is important to note that some individuals may not readily recognize the symptoms of refractive errors. Thus, routine ocular examinations are imperative to enable the ophthalmologist to ascertain optimal visual acuity (Campos, J. L, et al., 2019).

In cases where these symptoms persist and corrective measures such as contact lenses or glasses are utilized, a reassessment of the prescription may be necessary. Seeking prompt consultation with an ophthalmic specialist and scheduling an eye examination is advised for individuals experiencing visual challenges. In the context of children, refractive errors and their consequent impacts exert a substantial influence on their overall development, notably affecting scholastic and psychological growth. It is worth noting that refractive errors represent the foremost cause of global vision impairment (Thompson, S. J., 2014)

Studies in India have unveiled varying prevalence rates and incidence of myopia and hyperopia in children (Priscilla,J.J., et al., 2021) These investigations have highlighted the significant number of children requiring vision correction through spectacles. Notably, in rural India, nearly 86% of children were found without prior detection of refractive errors (Nangia, V.,et al., 2010).

Across numerous nations, uncorrected refractive errors emerge as a prominent contributor to vision impairment. Nevertheless, effective refraction services can pose challenges to people from economically disadvantaged regions. The extent of a nation's eye care service development can be assessed by evaluating the percentage of visually impaired or blind children attributed to refractive abnormalities. Thus, it is imperative to align the objectives of a vision screening program with its intended outcomes. If the aim is early detection and intervention, the program should focus on preschool-aged children with conditions conducive

to amblyopia, including refractive errors, ocular pathologies, and strabismus (Akuffo, K. O., et al., 2020).

Prevalence of Refractive Errors: The prevalence of refractive errors exhibited a range of 29.7% to 33.5% in the aggregate. Specifically, myopia demonstrated a prevalence ranging from 28.3% to 30.1%, hyperopia from 3.4% to 4.1%, and astigmatism from 2.8% to 3.5 %(Maake, M. M., 2015).

Table 1.3 National Blindness and Visual Impairments survey India 2015 to 2019- A summary report

Key findings

Indicators	**Percentage (%)**
Prevalence of Blindness & Visual Impairment	
Prevalence of blindness in all age groups	0.36
Prevalence of blindness in population aged ≥ 50 years	1.99
Prevalence of severe visual impairment (SVI) in all age groups	0.35
Prevalence of severe visual impairment (SVI) in population aged ≥ 50 years	1.96
Prevalence of moderate visual impairment (MVI) in all age groups	1.84
Prevalence of moderate visual impairment (MVI) in population aged ≥ 50 years	9.81
Prevalence of early visual impairment (EVI) in all age groups	2.92
Prevalence of early visual impairment (EVI) in population aged ≥ 50 years	12.92
Prevalence of moderate-severe visual impairment (MSVI) in all age groups	2.19
Prevalence of moderate-severe visual impairment (MSVI) in the population aged ≥ 50 years	11.77
Prevalence of visual impairment (VI-Blindness+MSVI) in all age groups	2.55
Prevalence of visual impairment (VI-Blindness+MSVI) in population aged ≥ 50 years	13.76
Major Causes of Blindness in the population aged ≥ 50 years	
Cataract	66.2
Corneal opacity (including trachomatous)	8.2
Cataract surgical complications (including PCO)	7.2
Posterior segment disease (excluding DR & ARMD)	5.9

Glaucoma	5.5
Major Causes of Visual Impairment in population aged ≥ 50 years	
Cataract	71.2
Refractive error	13.4
Cataract surgical complications (including PCO)	5.9
Major Causes of Blindness in the population aged 0-49 years	
Corneal opacity	37.5
All globe/ CNS abnormality (Amblyopia)	25.0
Phthisis	12.5
Other/undetermined	25.0
Major Causes of Visual Impairment in population aged 0-49 years	
Refractive error	29.6
Cataract	25.4
All globe/ CNS abnormality (Amblyopia)	15.5
Corneal opacity	14.1
Cataract Surgical Coverage (persons) in population aged ≥ 50 years	
Visual Acuity<3/60	93.2
Visual Acuity<6/18	74.0
Cataract Surgical Coverage (eyes) in population aged ≥ 50 years	
Visual Acuity<3/60	80.2
Visual Acuity<6/18	57.2
Proportion of IOL Cataract Surgery in population aged ≥ 50 years	
With IntraOcularLense	94.2
Visual Outcomes (BCVA) after Cataract surgery in population aged ≥ 50 years	
Very good (can see 6/12)	73.4
Good (cannot see 6/12 but can see 6/18)	10.5
Borderline (cannot see 6/18 but can see 6/60)	7.6
Poor (cannot see 6/60)	8.5

Adapted from (NB&VI Survey India 2015-2019)

1.5 Presbyopia:

Presbyopia signifies the gradual diminishment of the eyes' capability to focus on objects in close proximity, constituting a natural yet often vexing facet of the ageing process. Notably, presbyopia typically becomes perceptible in the early to middle stages of one's forties and progresses until the approximate age of 65 (Padmanaban, N., 2020).

Presbyopia manifests in five distinct forms:

- ❖ Premature Presbyopia: Onset of presbyopia before reaching the age of 40.
- ❖ Progressive Presbyopia: The initial stages of presbyopia are characterized by increased difficulty in reading small print.
- ❖ Functional Presbyopia: Individuals experience heightened challenges in their near vision.
- ❖ Absolute Presbyopia: Eyes exhibit an inability to focus on objects in close proximity.
- ❖ Nocturnal Presbyopia: In low light conditions, the eyes face impediments in focusing on nearby objects.

1.6 Vision Assessment Overview:

A comprehensive vision assessment involves the evaluation of various aspects related to visual function, perception, and overall eye health. This process is crucial in understanding and addressing any potential issues that may affect an individual's vision. The key components of a vision assessment include:

Visual Acuity: Visual acuity measures the clarity and sharpness of vision. It is typically assessed using an eye chart to determine how well a person can see at various distances.

Refraction: Refraction testing helps determine the need for corrective lenses (glasses or contact lenses). This assesses the way light bends as it passes through the cornea and lens to focus on the retina.

Ocular Health Examination: This involves a thorough examination of the external and internal structures of the eye. It includes an assessment of the cornea, iris, lens, retina, and optic nerve. Ophthalmoscopes and other specialized tools are used for this examination.

Eye Movements and Alignment: Evaluating how well the eyes work together and move is crucial. This includes assessing eye muscle coordination, convergence, and the ability to track moving objects.

Colour Vision: Colour vision testing checks the ability to distinguish different colours. This is particularly important for certain occupations and can also identify colour vision deficiencies.

Visual Field Testing: Assessing the entire scope of vision, including peripheral vision, helps identify any blind spots or abnormalities that may indicate conditions such as glaucoma.

Binocular Vision and Stereopsis: Binocular vision examines how well the eyes work together to create a single, three-dimensional image. Stereopsis assesses depth perception.

Visual Processing Skills: Assessing higher-level visual processing skills involves evaluating how the brain interprets and makes sense of visual information. This includes visual memory, visual-motor integration, and visual perception.

Patient History: Gathering information about the patient's medical history, family history, and any current visual symptoms or concerns is essential for a comprehensive understanding of their visual health.

Specialized Testing: Depending on the individual's needs and specific concerns, additional testing may be conducted. This could include contrast sensitivity testing, low vision assessments, or other specialized evaluations. In summary, a thorough vision assessment involves a combination of tests and examinations to evaluate visual acuity, eye health, eye movement, and visual processing skills. This holistic approach helps eye care professionals

diagnose vision problems, prescribe appropriate corrective measures, and address any underlying eye conditions.

1.7 Vision Screening:

A vision screening, commonly known as an eye test, is a quick assessment designed to identify potential vision issues and ocular conditions. The screening is typically carried out during routine check-ups, primary care providers and school nurses often conduct these screenings for children. It's essential to understand that these screenings are not diagnostic; rather, they serve as a preliminary step. If any concerns arise during the screening, individuals are advised to consult a specialized eye care professional for a more thorough examination and appropriate treatment. A comprehensive eye examination by this specialist can effectively address various vision-related disorders through interventions such as corrective lenses, minor surgeries, or other therapeutic approaches.

Classification of Blindness and Vision Impairment:

Vision impairment exerts a substantial economic impact on the global financial system. Approximately US$411 billion is annually attributed to productivity losses associated with vision impairments (Alsultan, O. K. T & Mohammad, M. T., 2023). Untreated refractive errors and cataracts stand as the primary causes of vision loss and blindness. Although individuals experiencing blindness or vision impairment are typically aged 50 and above, it is imperative to acknowledge that loss of vision can affect individuals of any age. Globally, around 2.2 billion individuals experience either near- or far-sightedness (Krösl, K., et al., 2023). Notably, nearly half of these cases, approximately one billion individuals, might have averted the onset of vision impairment with timely intervention.

Table 1.4 Definitions of Blindness and Visual Impairment adapted from (NB&VI Survey India 2015-2019)

Blindness	Presenting visual acuity < 3/60 in the better eye with available correction
Severe visual impairment (SVI)	Presenting visual acuity < 6/60 – 3/60 in better eye with available correction
Moderate visual impairment (MVI)	Presenting visual acuity < 6/18 – 6/60 in better eye with available correction
Early visual impairment (EVI)	Presenting visual acuity < 6/12 – 6/18 in better eye with available correction
Moderate severe visual impairment (MSVI)	Presenting visual acuity <6/18-3/60 in better eye with available correction
Visual impairment (VI)	Presenting visual acuity < 6/18 in the better eye with available correction
Functional low vision	A person with impairment of visual functioning even after treatment and/or standard refractive correction, and a visual acuity of less than 6/18 to light perception, or a visual field of less than 10 degrees from the point of fixation, but who uses, or is potentially able to use, vision for planning and/or execution of a task.
Blindness (BCVA/Pinhole <3/60)	Best corrected visual acuity <3/60 in the better eye

1.8 Visual Impairment (VI)

The International Classification of Diseases 11 (2018) classifies vision impairment into two groups, distance and near vision impairment (Rachburee, N., &Punlumjeak, W., 2021) and Weiss, J. N., 2022).

Distance vision impairment:

- Mild vision impairment– Presenting Visual Acuity (PVA) worse than 6/12 to better than or equal to 6/18
- Moderate vision impairment– PVA worse than 6/18 to better than or equal to 6/60
- Severe vision impairment– visual acuity worse than 6/60 to better than or equal to 3/60
- Blindness vision impairment– visual acuity worse than 3/60

Near vision impairment:

- Near visual acuity worse than N6 or M.08 at 40cm

Perceptions of visual impairment in individuals are subject to a myriad of influencing factors. These encompass the availability of therapeutic and preventive interventions, the efficacy of personal aids (such as white canes or corrective lenses), as well as the individual's capacity to navigate their environment and access pertinent information (Stellefson, M., 2011). These elements collectively contribute to an individual's overall appraisal of their visual challenges.

1.9 Prevalence

Globally, approximately 2.2 billion individuals grapple with varying degrees of visual impairment, whether it pertains to near or distant vision(Do, Q. V., 2017). Notably, a staggering one billion of these cases could have been prevented or corrected but, unfortunately, were not. Among these affected populations, one billion contend with moderate Age-Related Macular Degeneration (ARMD), followed by cataracts (94 billion cases annually), ARMD itself (8 million cases annually), glaucoma (7.7 million cases annually), retinopathy (3.9 million cases annually), and near vision impairment attributable to untreated presbyopia (826 million cases annually)(Poostchi, A., 2023). These conditions collectively culminate in severe distance vision impairment or outright blindness. From a

geographical perspective, distant vision impairment is projected to be four times more prevalent in low- and middle-income nations compared to their high-income counterparts. Alarmingly, in Sub-Saharan Africa's western, eastern, and central regions, over 80% of near vision challenges remain unaddressed, in stark contrast to less than 10% prevalence in high-income regions such as the United States, Australia, Europe, and the Asia-Pacific region (Yamey, G., 2022).An impending surge in the risk of vision impairment is anticipated, driven by population expansion and the inevitable effects of ageing (Dyson, T., 2001). This demographic shift underscores the imperative for concerted efforts in preventative and corrective ocular healthcare on a global scale.

1.10 Causes

Globally, the major causes of visual impairment are age-related macular degeneration, cataracts, retinopathy, glaucoma, and uncorrected refractive problems. There is a significant variety in the reasons within and within nations depending on the availability of eye-care services, their cost, and the populations' level of eye-care literacy (Shang, J. &Sargeant, A., 2017). For instance, compared to wealthy nations, middle- and low-income countries have greater rates of vision impairment caused by cataracts. Glaucoma and age-related macular degeneration are substantially more prevalent in high-income nations.

There are considerable regional differences in the causes of childhood visual impairment. For instance, congenital cataract is the primary cause of retinal prematurity in low-income nations, but retina prematurity is more common in middle-income countries. Similar to adults, uncorrected refractive error is the main factor in children's visual impairment globally.

1.11 Effects of eyesight loss

Individual influence

The physical, linguistic, psychological, social, and cognitive Early-onset severe visual impairment may cause developmental delays in young children, which might have long-term effects. Children who struggle intellectually in school may often have eye problems (Bornstein, M. H., 2008).

Visual impairment significantly affects the quality of life in people. People with vision impairment often have lower rates of engagement in the labour market and productivity, as well as higher rates of hopelessness and anxiety.

Older people with visual impairment are more likely to experience social isolation, mobility issues, fractures from falls, and early inclusion into nursing or care facilities.

Monetary effects

The cost of vision loss to the global economy is enormous, with an estimated annual loss of $411 billion in output, adjusted for purchasing power parity (He, M., Wang, W. & Huang, W., 2017) This figure surpasses the estimated cost gap of $25 billion required to fulfil the unmet demand for individuals with visual impairment.

Mitigating Vision Impairment: Strategies for Addressing Ocular Challenges

While pre-emptive measures can forestall a spectrum of ocular conditions, encompassing infections, injuries, hazardous traditional remedies, prenatal maladies, diet-related disorders, and the improper administration of topical treatments, complete prevention is not always achievable. Each ocular ailment necessitates a bespoke and timely intervention. It necessitates a multifaceted approach, incorporating awareness, prevention, treatment, and rehabilitation, culminating in efficacious modalities tailored to the specific exigencies of

ocular issues and visual impairment (Koch, L. C.&Rumrill Jr, P. D., 2016). Notably, several of these interventions are among the most economically viable and realizable healthcare endeavours. For instance, uncorrected refractive anomalies may be rectified through surgical intervention or the prescription of corrective lenses, with the potential for vision restoration. Certain ocular afflictions, such as blepharitis, conjunctivitis, and dry eye syndrome, though not inherently deleterious to vision, can engender discomfort and pain. These conditions must be addressed promptly. The focal objective in their treatment is twofold: ameliorating symptomatic distress and forestalling the progression towards more severe pathologies. Individuals grappling with enduring vision impairment due to conditions like macular degeneration, glaucoma, trauma, and age-related retinopathy stand to derive substantial benefit from visual rehabilitation efforts. This holistic approach aims to optimize residual vision, enhance adaptability, and facilitate an improved quality of life for those contending with sustained visual challenges.

1.12 WHO response

The World Health Organization (WHO) has responded to the imperative of universal access to vision care through its Universal Feature on Visual (2019) proposals and the forthcoming resolutions centred on "Integrated, people-centred eye care, including preventive blindness and vision impairment." These concerted efforts are poised to gain official endorsement at the 73rd World Health Assembly in 2020. A central recommendation arising from this comprehensive research and resolution framework is the establishment of integrated people-centred eye care (IPEC) as the preferred paradigm of treatment, to ensure its broad implementation (Depla, A. L., 2023). This strategic undertaking is anticipated to serve as a pivotal instrument in aiding Member Nations, along with their collaborative partners, in attaining the ambitious Goals for Sustainable Development (SDGs), with a specific emphasis

on SDG 3.8, which pertains to universal healthcare (Cerf, M. E., 2018). Furthermore, the envisioned impact of this initiative extends to a reduction in the prevalence of eye ailments and visual impairments, thereby alleviating the associated public burden on health. This initiative represents a significant stride towards advancing ocular health on a global scale.

WHO initiatives and efforts in addressing blindness:

The pursuit of the 2030 global objectives for integrated, patient-centric eye care, involves ongoing collaborative endeavours with Member Nations and other field partners This endeavour involves vigilant monitoring and assessment of progress towards the specified targets. Moreover, an annual commemoration of World Sight Day is championed, serving as a pivotal platform for advocacy and awareness in the realm of ocular health. Incorporating eye care into healthcare systems is facilitated through a diverse array of technological tools. Among these resources is the "Eye Care in healthcare systems" manual, a comprehensive guide tailored for Member States to adeptly prepare for and implement recommendations outlined in the Global Report on Vision. Additionally, the "Package of Eye Care Interventions" (PECI) serves as an invaluable resource for the allocation of budgets and strategic planning for eye care within the broader healthcare framework. The "Eye Care Competency Framework (ECCF)" is a competency-driven planning tool designed to optimize human resources within the eye care domain. The Myopia Mobile Health Toolkit stands as an essential resource, fostering health literacy and raising awareness regarding preventable risk factors, the potential long-term ramifications of myopia, the necessity of eyewear, and the importance of regular eye examinations. Furthermore, meticulously designed assessment tools have been devised to empower nations in evaluating the efficacy of eye care service delivery. These tools encompass an evaluation instrument for eye care services and a dedicated tool for assessing diabetic and retinopathy services. Additionally, methodologies

have been established to gauge the quality of services in glaucoma and refractive care, as well as a device for evaluating systems and services pertinent to rehabilitation (Burr, J. M., 2007). These initiatives collectively represent a conscientious and multifaceted approach towards enhancing the accessibility, quality, and efficacy of eye care services on a global scale, aligning with the overarching aspirations for improved ocular health outlined in the 2030 agenda.

1.13 Leading causes of blindness and its impact on the society

As per the survey's revelations, it is observed that over a quarter of individuals in India aged 50 and above exhibit visual impairments, characterized by a presenting visual acuity (PVA) of 6/12 or worse in the better eye. Notably, the prevalence of blindness stands at 1.99%(Gupta, N., et al., pp.33-56).Advanced age and high literacy exhibit a pronounced correlation with this condition. The primary culprits behind cases of blindness include cataracts (66.2%), corneal opacity (CO), complications arising from cataract surgery (7.2%), posterior segment diseases (5.9%), and glaucoma (5.5%) (Hoyt, C., 2007).Furthermore, a substantial proportion of visual impairment (92.9%) and blindness (97.4%) can be attributed to factors amenable to preventive measures (Mahesh, K. M., 2015). These findings underscore the critical importance of targeted interventions and public health initiatives in mitigating the burden of avoidable visual impairments and blindness within this demographic cohort.

1.14 Vision 2020: The Right to Sight (V2020)

The Vision 2020 refers to a global initiative aimed at eliminating avoidable blindness and enhancing overall eye health by the year 2020(Steinmetz, J. D., et al., 2021). The initiative was launched in 1999 by the World Health Organization (WHO) in collaboration with various international and national partners. The primary goal of Vision 2020 is to reduce the

prevalence of avoidable visual impairment and blindness, especially in low-income and developing countries with limited access to eye care services.

Key components and strategies of Vision 2020:

Disease Control: Targeting the major causes of avoidable blindness, such as cataracts, trachoma, onchocerciasis (river blindness), refractive errors, and diabetic retinopathy. Efforts are made to provide preventive measures, early detection, and treatment for these conditions.

Human Resource Development: Training and building the capacity of eye care professionals, including ophthalmologists, optometrists, and other healthcare workers. This is crucial for increasing the availability of skilled personnel to provide eye care services.

Infrastructure Development: Improving and expanding eye care facilities and infrastructure, particularly in underserved areas. This includes the establishment of eye clinics, surgical facilities, and the distribution of essential equipment and medicines.

Community Participation: Engaging communities and promoting awareness about the importance of eye health. Community participation is crucial for the success of Vision 2020, as it helps in early detection, treatment adherence, and the prevention of eye diseases.

Advocacy and Partnerships: Advocating for policies that support eye health and building partnerships with governments, non-governmental organizations (NGOs), and other stakeholders. Collaborative efforts are essential for mobilizing resources and implementing effective eye care programs.

Research and Surveillance: Conducting research to better understand the prevalence and causes of visual impairment and blindness. Surveillance systems are established to monitor progress and identify emerging issues in eye health.

Technology and Innovation: Incorporating new technologies and innovative approaches to enhance the efficiency and effectiveness of eye care services. This includes the use of telemedicine, mobile health (mHealth), and other advancements to reach remote or underserved populations. The Vision 2020 initiative was nearing its target year, and progress had been made in various regions globally. While the specific goals of Vision 2020 may not be fully achieved by the year 2020, the initiative has laid the groundwork for sustained efforts to combat avoidable blindness and improve eye health worldwide. Additionally, efforts to address global eye health challenges have extended beyond 2020, with new initiatives and goals being set to continue the progress made under Vision 2020.

1.14 KantiVelugu programme and its characteristics

In pursuit of the laudable objective of achieving a state of "avoidable blindness-free Telangana" the government has formulated a comprehensive strategy encompassing universal eye screening, denominated as "KantiVelugu" aimed at covering the entire populace of the state. Kanti means an Eye and Velugu means Light source. This ambitious program, officially inaugurated on August 15th, 2018, in the Gajwel constituency of Telangana, signifies a significant milestone in the government's commitment to public ocular health. The program's scope extended to screening an extensive network of 12,751 villages, constituting a populace of approximately 3.50 crore individuals. The active involvement of public representatives emerged as a pivotal factor in ensuring the program's effectiveness. It was deemed imperative that these representatives affirm their presence and actively participate in the initiative to encourage broader public engagement and utilization of the services provided. The degree of their participation is anticipated to play a decisive role in gauging the overall success of the "KantiVelugu" initiative. To guarantee the robust engagement of public representatives, a series of district-level meetings were meticulously convened. This forum encompassed

esteemed individuals, including Honourable MLAs, MLCs, heads of Zilla Parishads and municipalities, mayors, leaders of government corporations, Zilla Parishads Territorial Constituencies (ZPTCs), Mandal Parishads Territorial Constituencies (MPTCs), as well as state officials. These deliberations served as a platform for rallying support and fostering a collective dedication to the triumphant realization of the "KantiVelugu" program's objectives.

The program delineates its objectives across five distinct categories:

a. To administer comprehensive eye examinations and vision assessments for every resident within the state.

b. To provide complimentary eye examinations, corrective lenses, and eyewear to eligible beneficiaries.

c. To facilitate cost-free surgical interventions and other requisite medical interventions for qualifying individuals.

d. To dispense necessary medications for prevalent ocular conditions.

e. To disseminate pertinent information to individuals on preventative measures against debilitating ocular afflictions.

1.15 NetraKumbh programme and its characteristics

In preparation for the Kumbh Mela of 2019, the NetraKumbh initiative was organized from January 12th to March 4th, 2019. This noble endeavour was initiated to offer complimentary eye examinations and screenings to the multitude of visitors and pilgrims converging upon Prayaagraj for this monumental spiritual and humanitarian gathering. The Prayaagraj Mela Pradhikaran took special measures to orchestrate the NetraKumbh, dedicating an expansive area of approximately 14,000 square meters in sector 6^{th} of the Kumbh Mela precinct. Here, an impressive pavilion comprising nine distinct tents was erected. A team of approximately

400 Ophthalmologists and 600 Optometrists were diligently appointed for the purpose of screening an estimated one million individuals over the span of fifty one days during Netra Kumbh. Notably, this initiative aimed to conduct over 10,000 cataract surgeries, a testament to the commitment towards ocular health. Furthermore, a commendable endeavour was made to distribute in excess of 100,000 spectacles, thereby enhancing visual acuity for those in need. In the broader context, it is imperative to acknowledge that a staggering 46 million individuals in India grapple with Corneal Blindness, underscoring the gravity of this public health concern. Consequently, NetraKumbh sought to galvanize efforts towards advocating for Eye donation amidst the fervour of the Kumbh Mela. The underlying ethos of NetraKumbh is rooted in the provision of medical services, with a particular emphasis on ocular care, to the yatris participating in the Ardh Kumbh. This is particularly pertinent in light of India's preparations for the world's largest human congregation at Prayagraj. The RashtriyaSwamyam Sevak Sangh devised a comprehensive plan to deliver ocular care services to yatris hailing from every corner of the nation. The potential for transformative impact on the lives of visually impaired individuals is substantial, and NetraKumbh stands as an instrumental vehicle in endeavouring to make India an Avoidable Blindness-free nation. The prevailing statistics reveal an approximate population of five million visually impaired individuals in India, a significant proportion of who suffer from suboptimal visual acuity. It is within this context that the concept of NetraKumbh emerged, with the aspiration to screen a substantial population, ranging from two to five lakhs, and to provide 1.5 lakh pairs of spectacles. However, it is noteworthy that the execution of surgical interventions in screening camps has presented logistical challenges. This obstacle was surmounted when hospitals, institutions, and medical colleges proactively stepped forward to conduct essential surgeries for NetraKumbh patients necessitating such interventions.

1.16 Rationale – Theoretical Framework

In this context, this study thoroughly examines the impact of refractive errors on the quality of life and vision among individuals in Telangana state, aligning with its state-wide initiative. Refractive errors, including myopia, hyperopia, and astigmatism, are highly prevalent and, often, overlooked visual impairments that can significantly hinder a person's daily activities, productivity, and overall well-being. Despite their widespread occurrence, there exists a notable dearth of region-specific research on post-correction outcomes in terms of both vision and quality of life. By delving into this crucial aspect, the researcher aims to understand the effectiveness of vision correction interventions, such as eyeglasses, contact lenses, refractive surgery, and cataract surgery in the context of Telangana state and its KantiVelugu program. Furthermore, this study seeks to provide valuable insights for healthcare practitioners, policymakers, and stakeholders, enabling them to make informed decisions regarding vision care services and interventions in the region. Ultimately, the overarching goal of the study is to examine and understand the vision and health-related quality of life of the beneficiaries of this program in Telangana state.

1.17 Background

The Community Eye Care programs under the NPCB&VI recognized the need to address various factors contributing to avoidable blindness, such as cataracts, refractive errors, and other eye diseases. These factors were often more prevalent in rural and remote areas where access to quality healthcare and specialized eye care services was limited.

In Phase 1 of KantiVelugu (15/08/2018-2019), large-scale vision screening camps, diagnosis and treatment of various eye conditions including refractive errors, cataracts, and other vision impairments were successfully conducted. The initiative made significant progress in reducing avoidable blindness through targeted interventions and awareness campaigns.

The Phase 2 KantiVelugu initiative (January 18, 2023 - June 15, 2023) was anticipated to play a critical role in educating communities about eye health. This, in turn, aimed to foster active involvement in vision screening programs conducted over 100 days. By equipping individuals with the information needed for early intervention, Phase 2 aimed to further reduce the prevalence of avoidable vision impairment in Telangana state.

These two phases of the KantiVelugu Program, distinguished by their specific objectives and timelines, collectively represent a comprehensive approach to addressing vision-related challenges in Telangana. Phase 1 focused on widespread screening and treatment, while Phase 2 emphasized education and advocacy to strengthen the impact of vision care efforts in the region.

1.18 Aim and Objectives of the study:

The main aim of the present study is to study the effectiveness of Quality of Vision (QoVn) and Quality of Life (QoL) after vision correction amongst the beneficiaries of the KantiVelugu program in Telangana state.

The objectives of the study are:

- To study various large-scale vision screening initiatives undertaken in Telangana state at the community level.
- To Study and understand QoVn and QoL amongst the beneficiaries of the KantiVelugu program.
- To Compare KantiVelugu and Netra Kumbh: two large-scale community eye screening programs in India.
- To Pilot test advocacy material developed for population-based vision screening initiatives.

The study received ethical approval (UH/IEC/2019/216) from the University of Hyderabad Institutional Ethical Committee renewed further on 16/03/2022 to carry out this research.

CHAPTER-2

THEORETICAL FOUNDATION AND REVIEW OF LITERATURE

2.1 Overview

This section serves as the intellectual foundation of previous studies, offering a comprehensive analysis of relevant literature and studies related to vision screenings. It encompasses a comprehensive survey of global and Indian healthcare policies in the realm of eye care. By synthesizing a diverse array of scholarly sources, this chapter establishes a robust framework for doctoral research. It not only elucidates the fundamental theoretical principles but also outlines the methodological approaches that will be employed in subsequent phases of the study. Moreover, it offers a critical assessment of prevailing health policies related to eye care, identifying areas of potential enhancement. This evaluative exercise not only informs the forthcoming research but also contributes to the broader discourse on vision health, particularly in the context of India. Overall, Chapter 2 serves as an essential link between the existing body of knowledge and the original research undertaking, establishing a well-informed and academically rigorous foundation for this thesis.

Mark W. Preslan et al.'s 1996 study serves as a pivotal contribution to the understanding of visual health challenges faced by inner-city children. Their cross-sectional investigation illuminated an elevated prevalence of amblyopia, strabismus, and refractive errors in this demographic, subsequently validated by follow-up screening. The research also brought attention to the significant compliance issues surrounding prescribed treatments, particularly spectacle-wearing. These findings emphasize the critical need for tailored interventions and improved accessibility to vision care services within urban communities, focusing on addressing the unique barriers to treatment adherence.

Matthew Ehrlich et al.'s 1983 qualitative study constitutes a pivotal contribution to the understanding of vision screening programs targeting minority preschool children in the United States. The research underscores the critical importance of early intervention in cases of amblyopia and strabismus, conditions with significant implications for visual health outcomes. The identification of the Random Dot E stereogram test as the most effective screening tool offers valuable guidance for program development. Additionally, the study's estimation that only a fraction of preschool children undergo vision screening emphasizes the pressing need for comprehensive, widespread initiatives in this demography. The limited number of states mandating such screening underscores the necessity for policy changes on a broader scale.

According to Sean P. Donahue, Robert W. Arnold, et al. in 2003, the updated guidelines put forth by the American Association for Paediatric Ophthalmology and Strabismus Vision Screening Committee represent a pivotal advancement in the field of preschool vision screening. By incorporating recent research findings and technological advancements, these guidelines aim to enhance the accuracy and effectiveness of screening protocols. Emphasizing early detection and intervention, along with age-specific criteria and standardized reporting, these guidelines are poised to significantly improve the efficacy of preschool vision screening programs.

Amruta S. Padhye, Rajiv Khandekar, et al.'s 2009 cross-sectional study provides significant insights into the prevalence and determinants of uncorrected refractive error among school children in urban and rural Maharashtra, India. The findings emphasize the critical importance of targeted interventions and timely corrective measures to address refractive errors. Tailored strategies for urban and rural schoolchildren are warranted, recognizing the unique challenges faced by each demographic. By implementing comprehensive screening

programs and ensuring accessibility to corrective measures, we can substantially improve visual health outcomes for these children.

Shelly Hopkins, Geoff P. Sampson, et al.'s 2013 review article offers a comprehensive exploration of the landscape of children's vision screenings in Australia and internationally. The analysis underscores the ongoing discourse surrounding the cost-effectiveness, composition, and optimal age for implementing such screenings. The absence of a standardized methodology in Australia is attributed to a dearth of compelling data supporting their efficacy. Furthermore, the lack of consensus on additional visual conditions warrants attention. The heterogeneity in screening programs across Australia highlights the imperative for improved coordination and communication to ensure the equitable provision of validated vision screening services. This collaborative approach holds the potential to significantly enhance early diagnosis and intervention for a range of paediatric visual issues.

M. Mathers, M. Keyes, and M. Wright's 2010 review article provides a comprehensive examination of the effectiveness of vision screening programs for children. The study emphasizes the critical importance of early intervention, particularly between the age of 18 months and five 5 years, for optimizing visual outcomes. While the benefits of screening are evident, the review highlights the need for further research to better integrate quality-of-life considerations into cost-effectiveness assessments. This review serves as a valuable foundation for enhancing and tailoring current vision screening programs to yield more impactful outcomes.

The study by N.A. Frost, J.M. Sparrow, J.S. Durant, et al. in 1998 stand as a significant contribution to the understanding of vision-related quality of life and the development of a tailored measurement tool for individuals facing visual impairments. The comprehensive

methodology employed, encompassing interviews, expert consultations, and pre-testing, ensured the creation of a robust questionnaire pool. The selection of ten pivotal items in the VCM1 core questionnaire demonstrated high validity and reliability, providing a valuable tool for assessing the impact of vision-related conditions on various aspects of an individual's life. This research underscores the broad relevance of vision conditions in influencing quality of life and highlights the importance of employing a modular approach for comprehensive evaluation across diverse clinical contexts.

Rishita Nutheti, Bindiganavale R. Shamanna, et al.'s 2006 cross-sectional study offers valuable insights into the impact of eye disorders and visual impairment on the quality of life of older individuals in southern India. The adapted HRQOL instrument demonstrated excellent reliability and validity. The findings highlight the significant associations between specific eye conditions, visual acuity, and overall QOL scores, emphasizing the multifaceted nature of visual health's influence on quality of life. Additionally, the study indicates that addressing uncorrected refractive errors may not lead to significant improvements in visual impairment or QOL. These findings hold important implications for developing targeted interventions to enhance the well-being of individuals affected by eye disorders and visual impairment.

The study conducted by Rakhi Dandona et al. in 2001 assessed awareness and knowledge of eye disorders in urban Hyderabad, India. The Andhra Pradesh Eye Disease Study involved 2522 participants, with 1859 respondents aged 15 and above. The study found varying levels of awareness for different eye conditions, with cataracts and night blindness being more recognized compared to diabetic retinopathy and glaucoma. Age, gender, socioeconomic status, education, and religious affiliation were identified as significant factors influencing awareness levels. Family members, friends, and relatives impacted participants'

understanding of eye conditions. This study emphasizes the importance of targeted health education to improve awareness and knowledge of eye disorders in the population, ultimately reducing visual impairment prevalence.

The systematic review conducted by Liam L Smeeth and Steve Iliffe in 2006 assessed the impact of adding a visual component to comprehensive screening for older individuals. The review analysed data from five trials involving 3494 participants over two to four years. Self-reported visual impairment measurements were used in all experiments. Results showed no significant difference in reported visual issues between the intervention and control groups. Additionally, a cluster randomized study involving 1807 patients aged 75 and above found no substantial variation in visual acuity or visual function scores between universal and targeted screening strategies. This review suggests that adding a visual component to multicomponent screening may not yield significant improvements in visual outcomes for older adults.

The study by H.T. Lim and Y.S. Yu in 2004 aimed to evaluate a new model of preschool vision screening in metropolitan Seoul. The screening involved a stepped approach, beginning with home screening using image cards and a questionnaire. Children who failed this initial stage underwent retesting with standard vision charts at local healthcare facilities. Referral criteria for visual acuity varied by age. Of the 36,973 kindergarteners screened, 19.2% failed the home screening, and 28.9% of those were referred. Ultimately, only 43.4% of the referred children underwent ophthalmological examination. Refractive errors were identified in 1.6% of the children, with astigmatism being the most common type. Refractive error was the primary cause of amblyopia, observed in 0.4% of the children. The positive predictive value of the screening program for detecting any ophthalmological condition was 0.77, and for severe abnormalities requiring treatment, it was 0.49. While the screening strategy successfully identified various ocular conditions, the low percentage of referred

children attending ophthalmological examinations highlights the need for program enhancements.

The study by Khandekar R and Parast N in 2009 Iran's annual vision screening program for children aged three to six, initiated in 1996, demonstrated effectiveness. Utilizing Snellen's chart and torchlight examination, instructors identified visual issues. Optometric assessment was recommended for those with vision below 20/30. Specialized care was provided for children diagnosed with strabismus or amblyopia. The program, overseen by provincial managers, examined 67% of Iranian children in 2005. Amblyopia, strabismus, and uncorrected refractive error were the most prevalent conditions. The screening showed high sensitivity and specificity. Costs for amblyopia screening and treatment were $1.5 and $245 respectively. The program's yield was 1:21, indicating effective screening and intervention. Despite successes, there is room for improvement in managing children with visual issues.

The study by David S. Friedman and Sandra D. in 2013 assessed the effectiveness of vision screening procedures in identifying individuals in need of eye care. Visual acuity testing and a questionnaire were employed in a free health clinic setting. Of the 3004 individuals screened, 46% showed positive results for visual acuity or related questions. Among these, 81% received referrals for eye exams, with 50% attending. About 33% had issues requiring attention. Refractive error was the most common problem, often leading to significant vision improvement. Other prevalent issues included glaucoma, cataracts, and diabetic retinopathy. Sensitivity for identifying specific eye disorders varied, but no single question-and-acuity test combination proved highly effective. The study suggests on-site eye tests may enhance efficiency, given that over half of those who tested positive failed to attend follow-up appointments.

The study conducted by Saxena R. and Vashist P. in 2015 assessed the effectiveness of school instructors in screening for subnormal vision in students, comparing their performance with primary eye care workers. The research, involving students from various Delhi schools, utilized the ETDRS vision chart for assessment. Among 10,114 enrolled children, 9,838 were analysed. The study showed that teachers achieved sensitivity and specificity rates of 79.2% and 93.3% respectively using the 6/9.5 optotype, and 77.0% and 97.1% using the 6/12 optotype. Older students and those from private schools demonstrated higher sensitivity but lower specificity. The findings suggest that utilizing school instructors in the screening program is effective and adopting the 6/12 optotype could enhance program efficiency.

According to the study by Kemper A R and Helrich A. et al. in 2012, school nurses play a crucial role in identifying substantial refractive errors in students. The research assessed screening results for first, third, and fifth graders in ten North Carolina schools. Among the 2,726 children screened, 7.7% were found to have abnormalities, with 89% included in a comprehensive database for follow-up. Of these, 35% did not receive further evaluation. Among participants with complete eye test data, 54.7% had myopia, 22.6% had hyperopia, 11.3% had astigmatism, 1.9% had anisometropia, and 9.4% had normal vision. The study underscores the significance of high-quality, school-based visual screening programs, identifying three cases per 100 children evaluated.

As per Elise B Ciner, Velma Dobson, et al.'s 1999 study, an investigation into state policies and practices for preschool vision screening reveals that 15 states currently mandate vision screening for some preschool-aged children, while 34 states provide guidelines for such screening. The responsibility for these programs lies with the Departments of Public Health and Education in 26 and 13 states, respectively. Various professionals and lay individuals are involved in conducting these tests, with nurses participating in 22 states. Screening protocols

cover refractive error in eight states, visual acuity in 30 states, eye alignment in 24 states, and colour vision in 10 states. A combination of screening exams is recommended in 24 states, but 45 states do not require screening for all pre-schoolers. Consequently, despite existing laws and guidelines, a substantial number of pre-schoolers lack access to vision screening programs.

The study by Joseph F. Griffith, Rhonda Wilson, et al. (2016) presents data from a well-established mobile screening program catering to children in the amblyogenic age range, conducted over 12 years in Cleveland, Ohio. The program utilized state-of-the-art examination techniques. The assessments covered various aspects, including visual acuity, stereo acuity, ocular alignment, motility, and external abnormalities. Children meeting specific referral criteria received further examinations, including cycloplegic refraction. Among the 63,841 assessments conducted, 10% of the children were identified with conditions like strabismus, amblyopia, or refractive defects. Notably, the prevalence of amblyopia and strabismus remained consistent over the 12 years. The study underscores the importance of continuous vision testing and accessible care services for young children, particularly in underserved communities, which can be effectively facilitated, through a school-based mobile screening approach.

The study conducted by Ai-Hong Chen and Nurul Farhana Abu Bakar, et al. (2019) assessed the implementation of mass paediatric vision screening programs worldwide. A review of data from 18 nations across five continents revealed that most countries employed chart-based testing, with a focus on distance visual acuity. High-income countries initiated screening earlier and adopted a more comprehensive approach, addressing various eye-related issues beyond impaired eyesight. The scarcity of qualified eye care professionals led to the involvement of non-eye care individuals as vision screeners. However, resource

constraints posed challenges for the development of effective screening tests. The study emphasized the pressing need for an affordable screening instrument capable of accurately diagnosing diverse visual conditions.

The study by Xinxing Guo, David S. Friedman, et al. (2021) assessed the effectiveness of a school-based vision program in Baltimore, Maryland. Among 4,972 students, a significant portion exhibited clinically significant refractive errors (CSRE). These students experienced substantial improvements in visual acuity, particularly in their worse-seeing eyes. Notably, older, Black and Hispanic students showed a higher likelihood of improvement. Overall, the program successfully addressed clinically significant vision impairments, highlighting its positive impact on children's visual health.

The study led by Olivia J. Killeen, Yunshu Zhou, et al. (2022) investigated the effectiveness of a school-based comprehensive eye program in a low-income high school. Among 429 first visits, the majority of students had Medicaid, were Black, and were female. Significant disparities were observed, with Hispanic students less likely to have prior eye exams, and Black students exhibiting worse visual acuity compared to White students. The clinic successfully provided glasses to 74% of the participants and identified the need for specialist referrals. The study underscores the crucial role of school-based eye clinics in addressing uncorrected refractive errors and addressing racial and ethnic disparities in access to eye care.

The preceding study delineates the multifaceted elements encompassing vision screening camps across age groups, from paediatric to geriatric. After a comprehensive analysis of previous research, a distinct research gap becomes apparent concerning KantiVelugu program beneficiaries, logistical approaches, and broader aspects related to vision both pre- and post-intervention. Additionally, a comparative analysis between the expansive vision

screening initiatives of KantiVelugu and NetraKumbh, as well as an evaluation of advocacy materials crafted for population-based vision screening endeavours, remains conspicuously absent from existing literature. This underscores the need for a comprehensive investigation into these pivotal facets within the context of vision screening programs.

2.2 Methodology

S.NO	Objectives	Methods	Variables	Analysis
1	Study of various large-scale vision screening initiatives undertaken in Telangana state at the community level	Review of existing literature including grey literature, case studies and survey methods used to understand each vision screening programme and its compliance amongst the people of Telangana state	Screening duration No. of people screened. No. of diagnoses and prevalence. Geographical location Socioeconomic factors and Satisfaction levels	Descriptive statistics
2	Study and understand QoL and QoVn amongst the beneficiaries of the KantiVelugu program.	A questionnaire-based survey of beneficiaries of the KantiVelugu program.	QoL and QoVn before and after vision correction following the KantiVelugu screening program.	Chi-square test, inferential statistics for before and after tests of significance mean QoL and QoVn.
3	Comparison of KantiVelugu and NetraKumbh: two large-scale community eye screening programs in India.	Descriptive study design. Observation and comparison of the two screening programs.	Spectacle compliance rate Compliance factors Prevalence of ocular morbidities. Screening procedure and workflow.	Descriptive statistics.

4	Pilot testing of advocacy material developed for population-based vision screening initiatives.	Qualitative and quantitative methods were employed to analyse the feedback. This could involve thematic analysis for qualitative data and descriptive statistics for quantitative data	Demographic variables Advocacy materials effectiveness Feedback categories	Descriptive statistics.

CHAPTER 3:

STUDY OF VARIOUS LARGE-SCALE VISION SCREENING INITIATIVES UNDERTAKEN IN TELANGANA STATE AT THE COMMUNITY LEVEL

3.1 Overview

This chapter embarks on a thorough exploration of the extensive vision screening initiatives implemented at the community level in Telangana state. Focusing on the KantiVelugu program, the discussion revolves around the epidemiological methodologies employed during mass mega-vision screening camps. This involves a meticulous analysis of secondary data, encompassing the entire process from screening to the delivery of spectacles. Furthermore, district-level statistical information is examined to offer a detailed and nuanced understanding of the program's impact and efficacy. Through scrutiny of these initiatives, valuable insights are sought into the broader landscape of eye care in the community context, with particular emphasis on the Telangana state. This chapter not only sheds light on the practical implementation of large-scale screening programs but also contributes to the ongoing discourse on optimizing vision care in similar settings.

3.2 Introduction

In the 2019 report on blindness by the World Health Organization, it was revealed that more than 2.2 billion individuals grapple with either near sightedness or farsightedness. Of these cases, over one billion, constituting more than half could have been prevented, and a significant number are currently undergoing treatment. Approximately 88.4 million people face moderate or severe distance vision impairment or blindness caused by uncorrected refractive errors, while 94.1 million individuals suffer from cataracts. Age-related macular degeneration affects 8 million people, glaucoma affects 7.7 million, and diabetic retinopathy affects 3.9 million (amounting to a total of 826 million cases). Notably, countries such as

India and China contribute to around 50% of global blindness and visual impairment resulting from uncorrected refractive errors(Steinmetz, J. D., et al., 2020).

According to APEDS's projections, the number of blind individuals in India increased from 18.7 million in 2000 to 24.1 million in 2010 and is expected to rise to 31.6 million by 2020(Dandona, R. &Dandona, L., 2001). The economic cost of blindness is substantial; in 1998, it was estimated that 67.8 percent of all cases of blindness were preventable or treatable (Shamanna, B. R., et al., 1998). According to the most forecasts in 2021, the total loss of GNP due to blindness has almost tripled in the last two decades. The estimated productivity loss owing to eyesight impairment is INR 646 billion (USD 29.4 billion) (Mannava, S., Borah, R. R. &Shamanna, B. R., 2022).

The problem of vision impairment persists, especially in the rural areas of Telangana. To mitigate the future burden of blindness in Telangana, it is imperative to implement comprehensive eye care programs, given that more than 90% of the impairment is preventable (Marmamula, S., 2016). Hence, there is a necessity for a substantial undertaking to deliver future services that cater to the needs of the entire state, ensuring they are available, accessible, acceptable, and cost-effective. Recognizing the predicament, the Telangana government launched a state-wide eye screening and services programme called “KantiVelugu” which provides universal eye health throughout the state. Vision is a widely understood human requisite that aids in making existence possible(KV-2022).

In this chapter, an attempt is made to evaluate the viability of the Telangana KantiVelugu program. This involves utilizing secondary data to scrutinize the program's sustainability, with a specific focus on documenting the process and noteworthy outcomes of the 'Telangana KantiVelugu' program model.

The set of objectives delineated under the KantiVelugu program is fivefold.

- ❖ To conduct eye screening & vision tests for all citizens of the state.
- ❖ To provide refractive error correction and spectacles free of cost
- ❖ Arrangements for surgeries and other treatments at free of cost.
- ❖ Provide medicines for common eye ailments
- ❖ Educate people on the prevention of serious disabling eye diseases

3.3 Methods

Data sources and collection

The researcher obtained approval from key stakeholders and officials participating in the KantiVelugu program to officially document the data submitted to the Telangana government. Following this, secondary data was collected from various sources, including print media and the Internet, as illustrated in Figure 3.1

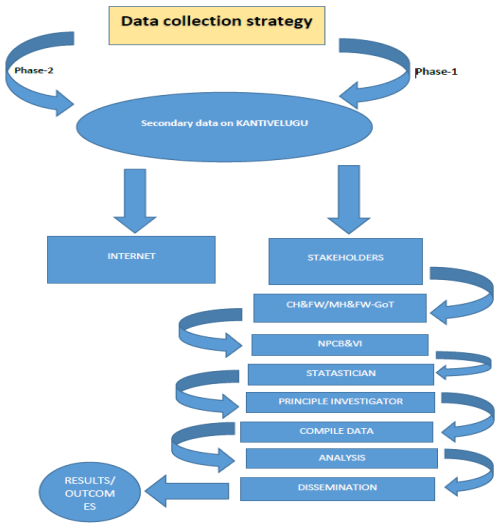


Figure-3.1. Data collection flowchart

In this category, the statistical data from various districts of Telangana state was gathered from the respective stakeholders, following proper permissions and consent.

The district-level implementation plan is constituted with certain preparatory activities to ensure the complete efficacy of the program. Activities have been designed by the authority by analysing the trajectories that ensure beneficiaries from every stream and category of the state's population.

To optimize the program's effectiveness, the primary objective for the organizing members of the KantiVelugu program is grassroots-level participation. The designated campsite was strategically chosen to be a building, such as schools, community centres, GP buildings, or other government structures.

The visitation schedule planned was widely publicized to guarantee that people are aware of the camp well in advance and that there is healthy attendance. The phase-wise preparatory activities delineated under the program are as follows.

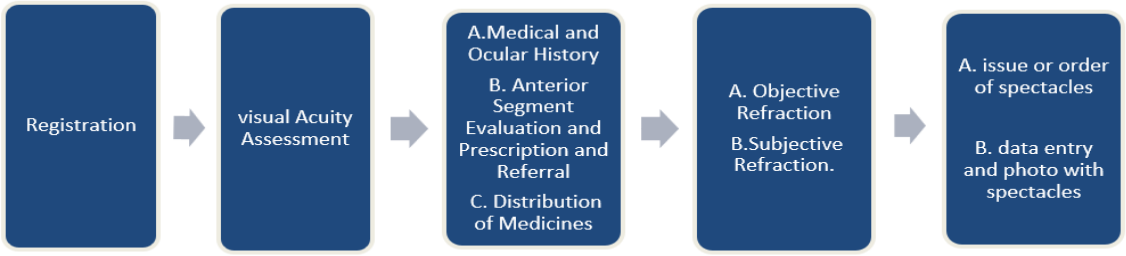


Figure-3.2 Phase-wise preparatory activities delineated under the programme

- PHC-based camps were hosted in rural regions, whereas ward-based camps were held in the GHMC area and other urban locations. A Medical Officer, an Optometrist, and 6–8 support staff members, such as ANMs, Supervisors, and ASHAs, were assigned to each camp team. A full-time vehicle is to be provided for each squad to efficiently work with time.

- In one camp, around 250 rural and 300 urban individuals' wardsare anticipated to undergo screening, with roughly 40% of those individuals needing treatment. To be deployed in case of emergency, each district will have a buffer team of 4-6 medical officers and optometrists. The names of the MO and Optometrist camps, as well as the camp schedules (village-by-village dates of visits), are prepared by the organizing team.
- 940 medical officers, 1000 optometrists, and roughly 8000 support personnel make up a total of 799 teams. All recruited employees have received training. It is assured that every PHC has at least one MO and that their regular operations are unaffected when employees are deputed to the camps.

Services

The camps provide the following examinations & services:

- A preliminary eye exam using the Snellen chart to measure unaided visual acuity along with the detailed eye examination (Objective refraction & Subjective refraction). With the aid of a specialized software application created for this purpose, the full screening procedure, including the distribution of glasses and follow-up surgeries, will be carried out.
- The provision for distributing appropriate medicine for eye problems and spectacles. On the same day, reading glasses will be provided within the camp for minor refractive defect adjustments. After 3 to 4 weeks, prescription glasses will be sent since they need to be produced according to the prescription power.
- Referring patients to designated institutions for follow-up care and surgery. Patients who need additional care and surgery will receive free care at designated secondary

and tertiary hospitals. The authority has selected over 114 Government, private, and non-profit hospitals that can provide benefits through the scheme. The ophthalmology departments in 30 District Headquarters hospitals, Sarojini Devi Eye Hospital, Hyderabad and Regional Eye Hospital, Warangal have given primary importance to availing benefits for the beneficiaries.

- Material / equipment shown below is procured and sent to districts to be deployed in each camp:
- Trial lens' sets, Auto-Refractor, Vision/Snellen's' Charts, Spectacles, Mirrors, Medicines, Two Tablet PCs, Tape, Torch, IEC materials
- Additionally, District Collectors are urged to include crucial Departments for coordination, assistance, and other purposes at the District and Mandal levels. They were also in charge of releasing the budget of the program.

3.4 Results and interpretations:

Table-3.1 KantiVelugu programme final statistics

Parameters		**KantiVelugu**
Coverage		Telangana State
Districts covered		30 districts
Total Screening		35 million
Spectacles		4 million
	Reading glasses	2.2 million
	Prescription glasses	1.8 million
Surgeries		0.4million
Total Referrals		0.9 million
Secondary Referrals		0.6 million
Tertiary Referrals		0.2 million

Population studied

In the present investigation, the approximate population targeted for screening under the "KantiVelugu" program was examined. A comprehensive total of 35 million individuals underwent screening, and 4 million spectacles were distributed throughout Telangana. As shown in Table 3.1 and Figure 3.3

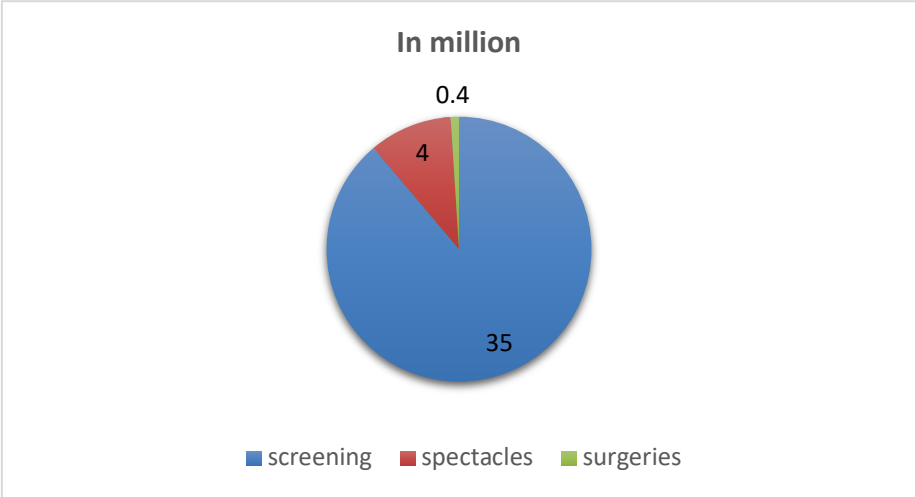


Figure 3.3 shows the estimated coverage of the screening population, spectacle distribution and surgery conducted under the KantiVelugu program.

Beneficiary percentages in various districts of the Telangana state.

The effectiveness of the KantiVelugu program in Telangana is evident in its extension to the Hyderabad region. Given its status as the state capital, Hyderabad and the Ranga Reddy district have dedicated substantial efforts to ensure the program's successful implementation. Across 90 wards included in the initiative, a total of 8, 92,256 individuals were screened, with 42% of the beneficiaries receiving attention, underscoring the program's success as shown in Figure 3.7.

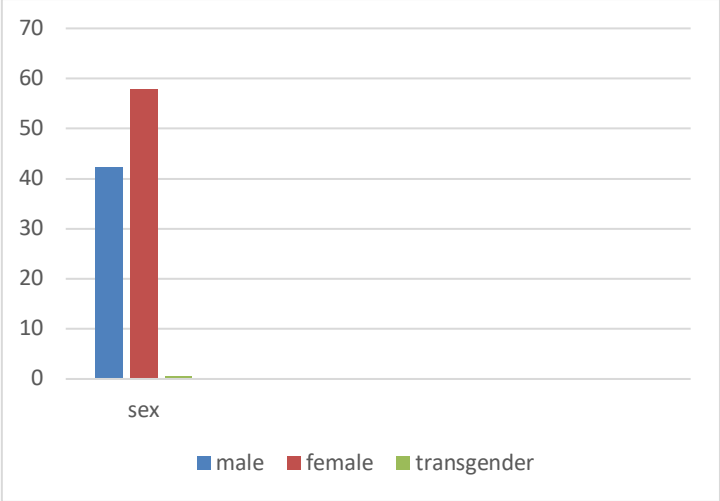


Figure 3.4: Gender wise number of people screened in Hyderabad R.R district

Despite the KantiVelugu scheme being designed to be inclusive and encompassing the transgender population, their involvement is noticeably lower compared to their actual population in the Hyderabad & Ranga Reddy district. In Hyderabad, a higher number of female participants derived benefits compared to males and transgender individuals. The scheme screened a total of 3, 76,475 males (42.19%), 5, 15,714 females (57.8%), and 67 transgender individuals (0.01%).

Table 3.2: Statistical data of services in the Hyderabad and R.R district, Telangana KantiVelugu program.

S.No.	**Particulars**	**Cumulative**
1	Number of Reading Glasses Handed Over	1,40,229
2	Identified for Prescription Spectacles	1,35,997
3	Identified for Referrals	62,714
4	Grand Total - People Given Service / Identified for Follow-Up	3,38,940
5	People with no eye-related issues.	5,53,316

According to the Government of Telangana's KV data for Hyderabad and Rangareddy district, among the 1,40,229 individuals who underwent screening and subsequently received reading glasses, 26,883 are below the age of 40, while the remaining 1,13,346 are aged 40 and above. This statistical information underscores the increasing prevalence of eye problems with advancing age. Out of the beneficiaries identified for prescription spectacles, only 1, 05,003 have received them, leaving 30,994 yet to be provided.

The beneficiaries earmarked for referrals are further divided into 30,067 secondary referrals and 32,647 tertiary referrals. Currently, out of this total, 60,000 individuals have been referred to other centres for additional examinations and cataract surgeries. However, only 8,000 beneficiaries have undergone these surgeries free of cost.

3.5 Discussion

The KantiVelugu program employs the 'Basic Eye Screening Test' (BEST) protocol, (Marmamula S., 2020) designed to empower community-based health professionals to conduct primary eye screenings conveniently at the doorsteps of community members. This protocol is cost-effective, time-efficient, and functions as a triage system, guiding patients to more advanced levels of treatment. Particularly beneficial for large-scale community screening initiatives, the BEST protocol not only provides information on noticeable external eye conditions like pterygium and evident corneal scars but also helps assess the prevalence of both distant and near vision impairments. The systematic implementation of the BEST protocol by ASHA workers has played a crucial role in the success of the KantiVelugu program. The four steps of the BEST protocol are as follows. As shown in Figure 3.6

Fig-3.5 The four-step of BEST protocol

Eye screening initiatives aimed at diagnosing and addressing uncorrected refractive errors have been previously implemented on both international and national platforms. While KantiVelugu is not the inaugural eye screening program initiated by a government, it distinguishes itself through its enduring beneficiaries and extensive grassroots reach. For instance, the establishment of the Refractive Error Program Committee by the International Agency for the Prevention of Blindness (IAPB) represented a strategic effort to eradicate vision impairment resulting from uncorrected refractive errors, with a focus on geographic distribution and beneficiaries outlined in the epidemiological map of Telangana state. As shown in Figure-3.7

On a national scale, the Indian Government's School Eye Screening, part of the National Program for Control of Blindness, underscores the importance of preventing visual impairments from childhood. Children, being a vulnerable group, are particularly at risk of facing detrimental effects on their learning potential due to uncorrected refractive errors.

Another illustration is the NetraKumbh, an eye mega vision screening program launched from January 12 to March 4, 2019. Leveraging the significant impact of the Kumbh Mela, many organizations choose to launch their initiatives during this event. NetraKumbh, as an initiative to provide free eye check-ups and screenings for Kumbh visitors, tested a total of 2, 02,020 individuals, and 1, 56,020 of them received free spectacles. It's noteworthy that

NetraKumbh achieved a Best Corrected Visual Acuity (BCVA) of 6/6, whereas KantiVelugu's BCVA is set at 6/12 as per the WHO guidelines.

Figure-3.6 An epidemiological map displaying the "KantiVelugu programme" beneficiaries from 2018 to 2019. in all the 30 districts of Telangana.

NetraKumbh provides prescribed power glasses within an hour, while KantiVelugu, in certain cases, takes almost three months to deliver the prescribed power spectacles. However, both screening programs managed to offer on-the-spot (Reading glasses) delivery of power spectacles during camp dispensing sessions. The notable distinction between KantiVelugu and NetraKumbh is evident in their processing patterns. NetraKumbh spanned 51 days, focusing more on ametropic correction and less on presbyopia correction, screening 2, 02,020 individuals at various Kumbh Mela locations. In contrast, KantiVelugu, covering six months,

concentrated more on presbyopia correction, screened 12,751 villages, and reached 37 million beneficiaries.

Scientific research evidence on vision impairment prompted stakeholders to recognize the exacerbated impact of uncorrected refractive errors on vision impairment and avoidable blindness. Developing a robust eye care program that accommodates all segments of the population posed a significant challenge for officers. Nonetheless, they successfully included a maximum number of people in the scheme by raising awareness about addressing 'uncorrected refractive errors'

Media publicity, both offline and online, enhanced the reach of the KantiVelugu program to the grassroots level of the state. The active involvement of people's representatives fostered trust in the program, attracting more participants and enabling them to avail themselves of the benefits of KantiVelugu. Despite being a social welfare model addressing a major public health concern, the sustainability of the program depends on its simplicity, adaptability, and continuity. Spectacle distribution and surgery incentives are considered the most attractive services of the program. The coordination between an Ophthalmologists and Ophthalmic assistants in determining the appropriate power of corrective spectacle lenses is a crucial stage of the scheme.

The swift distribution of medicine by staff nurses and medical officers within two minutes of screening, along with the effective assessment of objective and subjective refraction by optometrists and supportive staff, facilitated the systematic organization of acquired data. Throughout the process, the KantiVelugu program has consistently maintained a systematic approach, contributing to its reachability in Telangana.

CHAPTER – 4

STUDY AND UNDERSTAND QoVn AND QoL AMONGST THE BENEFICIARIES OF THE KANTIVELUGU PROGRAM

4.1 Overview

This chapter delves into an in-depth analysis of the Quality of Vision (QoVn) and Quality of Life (QoL) among the recipients of the KantiVelugu program. It provides a comprehensive overview of how vision correction, specifically targeting refractive errors, impacts the overall well-being of beneficiaries in Telangana state. The study employs a range of assessment tools including the Indian-Visual Functioning Questionnaire (IND-VFQ33) and Washington Group questions on Vision disabilities and different demographic groups. An in-depth study was conducted on a sample population of 900 beneficiaries out of 966 eligible sampled individuals over six months. This examination encompassed both the period before and after their engagement with refractive error correction through the KantiVelugu program at Sarojini Devi Eye Hospital in Hyderabad. This chapter scrutinizes the outcomes of quality of vision and quality of life, offering valuable insights into the transformative effects of the program on the visual health and overall well-being of beneficiaries.

Aim: - To explore the changes in the quality of vision and quality of life among beneficiaries of the KantiVelugu program, administered by the Government of Telangana, both before and after vision correction for refractive errors.

4.2 Objectives

The specific objectives guiding the investigation are:

- Evaluate the effectiveness of the KantiVelugu program in identifying and addressing vision impairments at the community level in Telangana state.

- ❖ Assess the reach and accessibility of the vision screening camps within different districts of Telangana, focusing on their coverage across diverse demographic groups.
- ❖ Analyse the quality and accuracy of vision screening methods employed in the KantiVelugu program, considering both sensitivity and specificity in detecting various vision disorders.

4.3 Introduction

Vision holds significant importance in all stages of life. According to the World Health Organization (WHO), 153 million individuals are affected by uncorrected distance refractive errors globally (Holden, B., 2014). On a global scale, at least 2.2 billion people experience vision impairment or blindness, with 1 billion facing preventable vision impairment (Xu, Y., et al., 2022). In India, nearly 5 million people are blind, including 0.24 million blind children, and 35 million individuals are visually impaired (Das, T., 2021, Wadhwani, M., 2021 &Mannava, S., 2022)

Uncorrected refractive error stands as the primary cause of moderate to severe visual impairment worldwide particularly impacting children (Hom, G. L., Yang, X., & Steinmetz, J., 2021). The consequences of uncorrected refractive errors have a profound effect on the overall development of children, especially in terms of education and psychosocial development (Sheeladevi, S., 2018 &Marmamula, S., 2020). Regional variations in the prevalence of myopia and hyperopia among children in India are notable, with a higher need observed in rural areaswhere 86 percent of children require refractive error correction (Gopalakrishnan, A., et al., 2022).

Uncorrected refractive errors contribute significantly to visual impairment in many countries, including India (Parameswarappa, D.C., et al., 2023), leading to a substantial economic

burden associated with blindness and vision impairment (Mannava, S., et al., 2022). Presently, the utilization of spectacles among older age groups is at a prevalence of 28.8%. Bifocal lenses are the predominant form of spectacles, constituting 56.3% of the total. Private eye clinics play a primary role as service providers, serving 70.3% of the population, and the coverage of spectacles is recorded at 53.6 % (Marmamula, S., 2017).

QoVn (Quality of Vision)

Quality of vision refers to not only the level of visual acuity, clarity, and sharpness of vision but also the subjective perception of vision by an individual. It can be affected by a range of factors, including refractive errors (such as nearsightedness, farsightedness, or astigmatism), cataracts, glaucoma, other eye diseases, and psychological factors (Hopkins, S., 2020). Quality of vision is important for the individual in performing everyday tasks, such as reading, driving, and working, as well as for overall quality of life (Fallowfield, L., 2009). Measurement of QoVn provides valuable insights into a treatment outcome on the subjective perception of the individual's QoVn post-treatment (Hirneiss, C., 2014).

QoL (Quality of Life)

There are various ways to define QoL. Quality of life may refer to an individual's overall sense of well-being and satisfaction with their life. It encompasses physical, emotional, and social aspects of life, including health, relationships, finances, and personal fulfilment (Fallowfield, L., 2009). Good quality of life is associated with improved mental and physical health, greater life satisfaction, and increased productivity. QoL is specific to individual domains, such as Health-Related Quality of Life (HRQoL) is used to measure the effect of health on an individual's quality of life specifically towards physical, social, functional, and emotional wellbeing(Felce, D., & Perry, J., 1995). Vision Related Quality of Life (VRQoL) measures the effect of vision on QoL(Chun, Y. S., 2022).

Refractive Errors (RE)

It is a common eye problem that occurs when the eye cannot focus on the images of an object. The result of refractive errors is blurred vision (Coakes, R. L., 2013), which is sometimes so severe that it causes visual impairment

Classification of Refractive Errors

- Emmetropia: no refractive error
- Ametropia: Presence of refractive errors
  - ❖ Myopia-(nearsightedness): difficulty in seeing distant objects clearly, it is corrected with minus lenses.
  - ❖ Hypermetropia-also known as Hyperopia (farsightedness): difficulty in seeing close objects clearly, it is corrected with plus lenses.
  - ❖ Astigmatism: distorted vision resulting from an irregularly curved cornea, the clear covering of the eyeball, it is corrected with plus or minus cylindrical lenses.

Presbyopia: This leads to difficulty in reading or seeing at 40cm; it is an age-related factor, which is corrected with reading glasses that are plus spherical lenses (Wolffsohn, J. S., 2019).

4.4 Review of literature (RoL)

Refractive errors are the most common ocular problems affecting all age groups. They are considered a public health challenge (Naidoo, K. S., et al., 2012). Recent studies and WHO reports indicate that refractive errors are a major cause of visual impairment and the second cause of visual loss (blindness) worldwide as 43% of visual impairments are attributed to refractive errors. In a review study, Naidoo et al., (2016) showed that uncorrected refractive errors were responsible for visual impairment in 101.2 million people and blindness in 6.8 million people in 2010. 810 million people require near vision correction globally.

According to the World Health Organization's 2019 World Report on Vision, at least 2.2 billion individuals struggle with either near or farsightedness (Al Balushi, S). One billion of these instances, or over half, might have been averted, and many are still being treated. Around 88.4 million individuals have moderate or severe distance vision impairment or are blind because of uncorrected refractive error; 94.1 million people have cataracts; 8 million people have age-related macular degeneration; 7.7 million have glaucoma, and 3.9 million have diabetic retinopathy (826 million)(Aljied, R., 2018). Countries like India and China account for approximately 50% of global blindness and visual impairment due to uncorrected refractive errors (Schneider, J., 2010).

According to APEDS's projections, the number of blind individuals in India increased from 18.7 million in 2000 to 24.1 million in 2010 and is expected to rise to 31.6 million by 2020. The economic cost of blindness is substantial; in 1998, it was estimated that 67.8 percent of all cases of blindness were preventable or treatable (Pallerla, S. R., 2018). According to the most current forecasts in 2021, the estimated net loss of GNI due to vision impairment is INR 646 billion (Int$ 29.4 billion)

The literature cited shows a high prevalence of vision impairment in rural Telangana. The future burden of blindness in Telangana must be addressed by extensive eye care programs focusing on vision impairment as over 90% of the impairment is preventable(Kocur, I., &Resnikoff, S., 2002). Hence, there is a need to provide sustainable, accessible, affordable, and equitable eye care. Recognizing this predicament and to address uncorrected refractive error and cataracts, the Telangana government launched a state-wide eye screening and services program called "KantiVelugu" which provides universal eye health throughout the state. Visual impairment is prevalent, and a significant portion of it can be prevented among the elderly population of Telangana (Marmamula, S., 2021).

4.5 Methods:

Study design:A Questionnaire-based descriptive Cohort study was done in Telangana state. The data collection spanned one year, beginning from the post-COVID-19 lockdown period. All data was sourced from the Sarojini Devi Eye Hospital (SDEH), Regional Institute of Ophthalmology in Hyderabad.

A meticulously developed and validated 75-item questionnaire was administered to a sample size of 900 individuals both before and after the KantiVelugu Program (KVP) intervention. The 75-item questionnaire was provided to 900 samples as per the OpenEpi software for sample size calculation before and after the intervention of KVP 900/966 Responses were collected, recorded, and analysed using SPSS software, employing chi-square analysis for frequency and valid percentages to determine statistical significance. Notably, 66 participants were lost to follow-up during the study.

Inclusion and exclusion criteria

Table 4.1 Inclusion and exclusion Criteria

Inclusion	**Exclusion**
Ametropes	Emmetropes
Spectacle wearers	No spectacle wearers
Subjects should know Telugu, Hindi and English languages	Other languages & Ocular disabilities and other anomaly
Age group of 08 to 65 years	age group of below 08 and above 65 years

Study Participants

This study was conducted on a population of N=900 comprising both male and female participants among adults and children, and the protocol was reviewed and approved by the Institutional Ethics Committee (IEC) of the University of Hyderabad (UH/IEC/2019/216)

reviewed on 16/03/2022. Both informed consent and assent forms from children's and adult population were taken before enrolling in the study and all the participants participated in the study.

Sample size

Open Epi, epidemiological software was used for finalizing the required sample for the current study design and 1=95, 1-β = 95, Estimated OR=2.5, Risk prevalence ratio= 2.3 and when applied these parameters to the Total KantiVelugu beneficiary population size 350 lakhs, following recommended sample sizes were observed Kelsey method n=912, Fleiss with continuity correction = 966. Fleiss community correction method was used for an N=966 patients 'data. 66 participants lost in the follow-ups (n=900).

Development of Questionnaire

The study involved distinct groups, with the IND-VFQ33 questionnaire being applicable across all. For specific demographics, such as children (both male and female) engaged in indoor and outdoor activities, as well as adults (both male and female) in the geriatric age group, tailored questions were administered. The primary outcome measure ranged from 0 to 5, assessing the impact of refractive error correction on both vision quality and overall quality of life, demonstrating significant improvements.

Data encompassed socio-demographic details, a general functioning questionnaire, a visual symptoms scale, and a psychosocial impact scale (IND-VFQ33), augmented with three questions from the Washington Group on Vision. The questionnaire, comprising 75 items, underwent development, pilot testing on a sample of n=45, validation, and finalization in English. Due to the expertise of the committee in English, translation into local languages (Telugu and Hindi) followed. Demographic information, collected over 16 questions, was succeeded by 59 questions related to general visual functioning. Responses were gathered

both prior to and following the provision of spectacles through KVP. Notably, participants exhibited substantial enhancement in both vision quality and overall quality of life post-spectacle acquisition.

Data from 900 subjects were acquired from Sarojini Devi Eye Hospital, Mehdipatnam, Hyderabad a referral hospital covering the entire state. Follow-up assessments were conducted after six months, capturing participants' experiences through questionnaires. The non-normally distributed data were analysed using nonparametric statistical tests, with responses before and after intervention tabulated separately in M.S Excel. Frequencies and valid percentages were calculated, and SPSS software was employed, utilizing Chi-square tests for data analysis.

Demographic characteristics of participants

According to Figure 4.1, participants' age-wise distribution where school children's age group of 8 years-20 years were 300(33.3%), and young adults 21 years to 30 years were 20(2.2%), and 41 years to 50 years 180(20%), and 51 years to 60 years was 140(15.5%) and 61 years to 70 years were 260 (28.9%). Participants aged between 8 and 65 years were included, while those below 8 years and above 65 years, as well as individuals with other ocular morbidities, were excluded. The majority of the 900 participants were elderly people aged between 61-70.

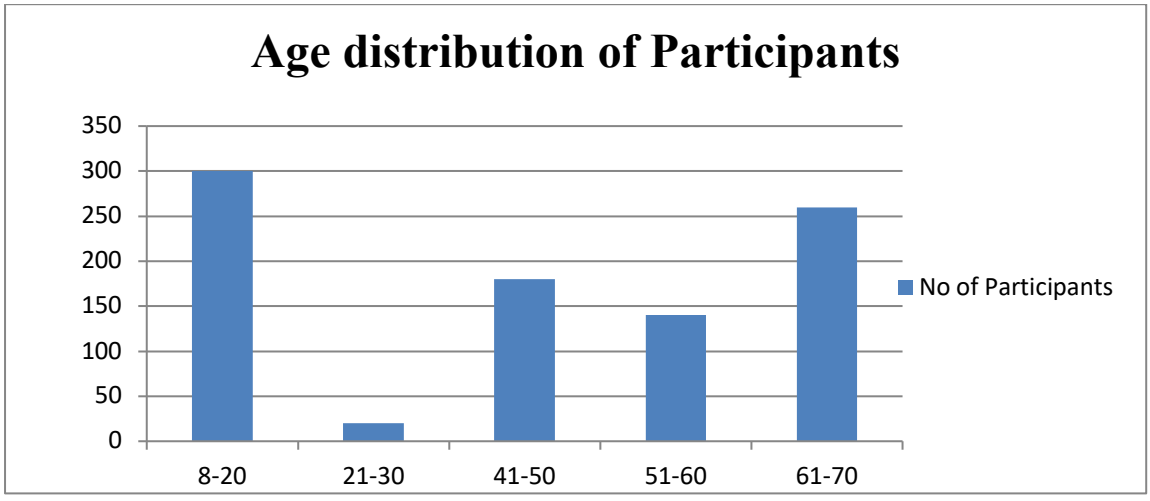


Figure-4.1. Age distribution of the participants

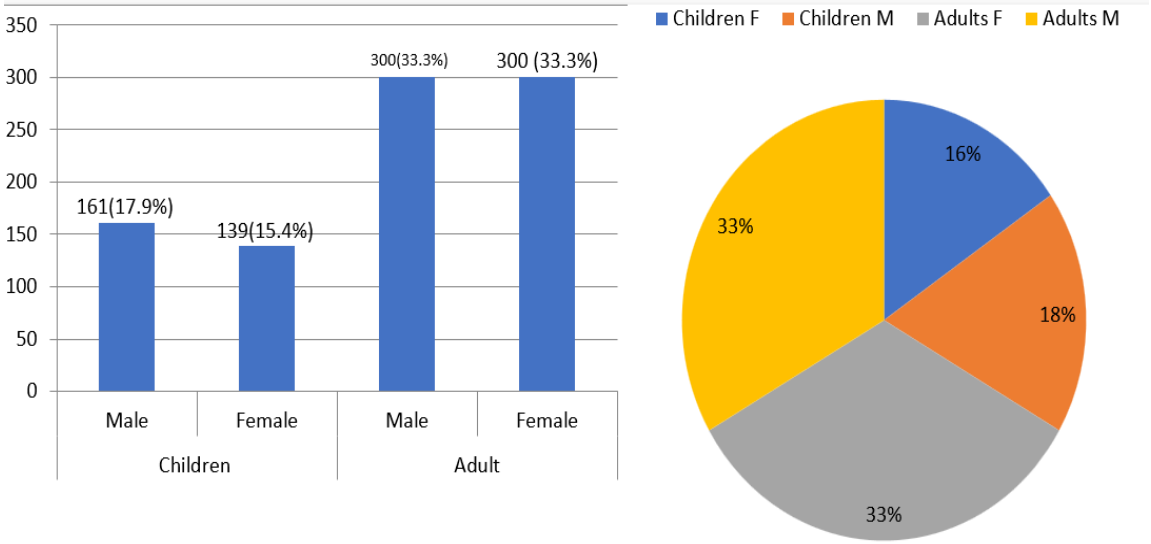


Figure-4.2. Gender distribution

The research is inclusive enough to accommodate the refractive errors and presbyopic correction for both genders-males and females. The number of Female children was N=139(16%) and Male children were N=161(18%). In the adult population, the distribution includes: Female adults N=300(33%) and Male adults was N=300(33%). The total number of participants, encompassing both genders, underwent screening as beneficiaries of the KantiVelugu program. Questionnaire data were collected before and after vision correction at Sarojini Devi Eye Hospital, Hyderabad.

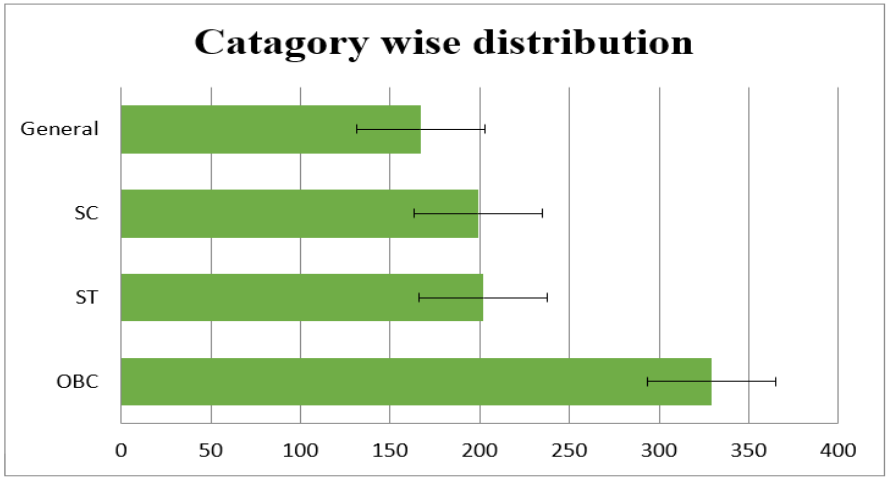


Figure-4.3. Category distribution

According to Figure-4.3, the screened population under the KantiVelugu program for refractive error corrections is categorized by the number of participants as follows: OBC category - 329 (36.5%), SC category - 199 (22.1%), ST category - 202 (22.4%), and General category-167 (18.5%). The study predominantly included individuals from the OBC and other backward communities

Analysis of questionnaire responses includes frequencies and valid percentages both before and after the intervention, along with the results of the non-parametric Chi-Square statistical test. **Table 4.5 to 4.11.**

Table:-4.2 & 4.3 Comparing with Pre and Post vision.

Distance vision (DV) Pre and Post Correction (children's)

V. A	Pre-Correction N=300	N%	Post Correction N=300	N%
6/6 to 6/9	45	15%	168	41%
6/9 to 6/12	40	13.3%	34	11.3%
6/12 to 6/18	65	21.6%	16	5.3%
6/18 to 6/24	60	20%	29	9.6%
6/24 to 6/36	25	8.3%	22	7.3%
6/36 to 6/60	40	13.3%	6	2%
PL+PR/HM/CF @MTRS	25	8.3%	25	8.3%
TOTAL	**300**	**100%**	300	100%

Near vision (NV) Pre and Post Correction (adults)

V.A	Pre-Correction N=600	N%	Post-Correction N=600	N%
N6 to N9	124	20.6%	282	47%
N/9 to N12	116	19.3%	91	15.2%
N12 to N18	133	22.16%	90	15%
N18 to N24	67	11.16%	65	10.8%
N24 to N36	112	18.6%	24	4%
N36 to N60	48	8%	48	8%
TOTAL	**600**	**100%**	600	100%

Significant enhancements were observed in both near and distance visual acuity

measurements post-intervention, showcasing substantial improvement compared to baseline measurements. This improvement highlights the effectiveness of the intervention in positively influencing visual acuity outcomes.

Table-4.4. Types of refractive errors

Types of Refractive Errors	Frequency Responses(N-900)	Responses valid percentage (%)
	FREQUENCY	PERCENTAGE
Myopic/Hyperopic/Astigmatism	302	33.4%
Presbyopic/Astigmatism	598	66.6%
TOTAL	900	100%

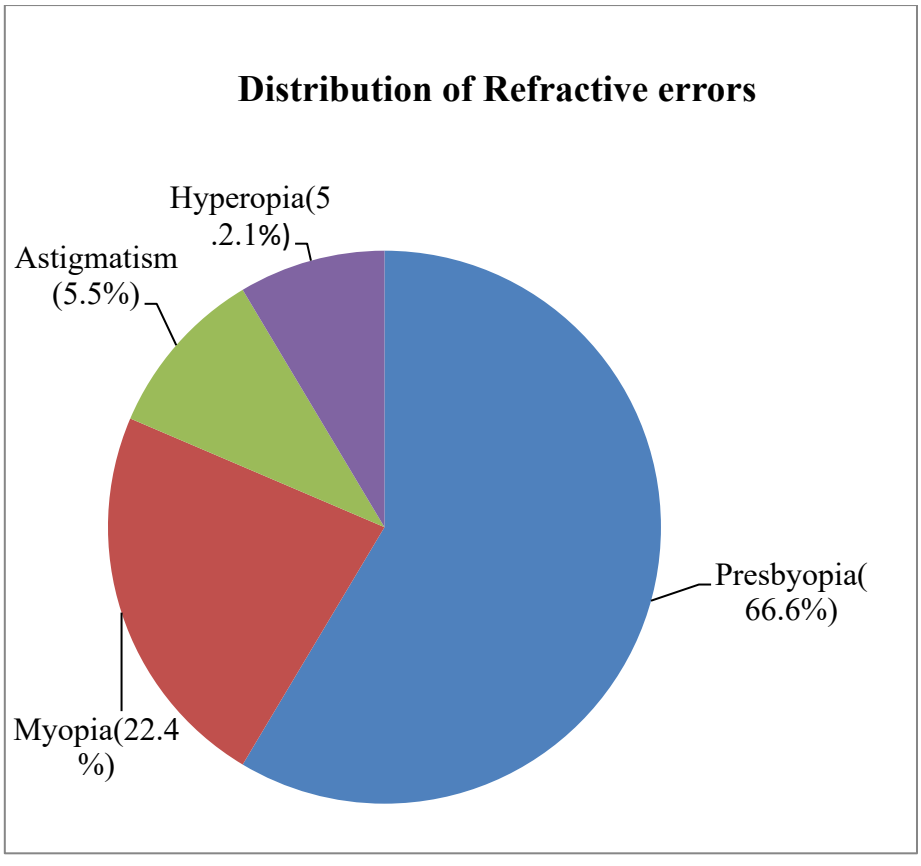


Figure 4.4- Distribution of Refractive errors

A pie diagram-4.4 and table-4.4 have been utilized to depict the entire population included in the study, with 100% coverage. Notably, within this population, 66.6% of the geriatric demographic require presbyopic correction, while the remaining 33.4% have undergone refractive error correction. This information is presented graphically and tabulated as a comprehensive representation of the study's population characteristics.

Total refractive errors

Refractive errors	Frequency(N=900)	Valid percentage (N %)
Myopia	200	22.4%
Hyperopia	50	5.5%
Astigmatism	50	5.5%
Presbyopia	600	66.6%
Total	**900**	**100%**

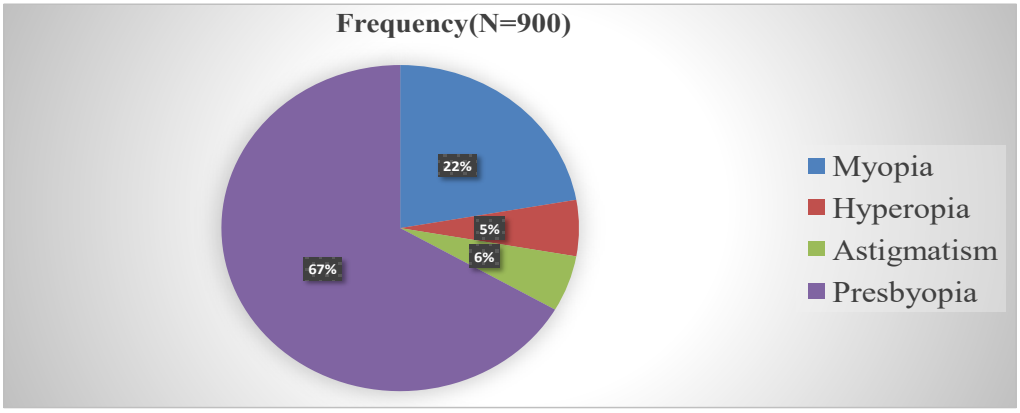


Table-4.5. Analysis of responses and percentage distribution before and after the KantiVelugu program on factors related to Visual Function and Outdoor Activities.

A.Visual function-outdoor activities	**Before QoVn&QoLResponses(N)**	**Before QoVn& QoLResponses (%)**	**After QoVn&QoLResponses(N)**	**After QoVn &QoLResponses(%)**	**Chi-Square analysis**		
	N=900	**N%**	**N=900**	**N%**	**χ^2**	**df**	**p-value**
Climbing stairs					14.96	14	0.038
Not at All	0	0	880	97.7%			
A little	20	2.2%	20	2.2%			
Quite a bit	160	17.8%	0	0			
A lot&cannot do this because of my sight	720	79.9%	0	0			
Problem during walking							
Not at All	0	0	840	93.2%			
A little	0	0	60	6.7%			
Quite a bit	240	26.6%	0	0			
A lot&cannot do this because of my sight	660	73.3%	0	0			
Seeing animals or Vehicles while walking							
Not at All	0	0	820	91%			
A little	0	0	80	8.9%			
Quite a bit	260	28.9%	0	0			
A lot&cannot do this because of my sight	640	71%	0	0			
Problems in attending social functions and gatherings							
Not at All	0	0	820	91%			
A little	20	2.2%	80	8.9%			
Quite a bit	260	28.9%	0	0			
A lot&cannot do this because of my sight	620	68.8%	0	0			

Problem during Night activities							
Not at All			800	88.8%			
A little	20	2.2%	100	11.1%			
Quite a bit	240	26.6%					
A lot&cannot do this because of my sight	640	71%					
Problem during using public transport facilities							
Not at All	0	0	460	51.1%			
A little	0	0	400	44.4%			
Quite a bit	240	26.6%	40	4.4%			
A lot&cannot do this because of my sight	660	73.3%	0	0			
Seeing in bright sunlight							
Not at All	0	0	740	82.1%			
A little	20	2.2%	160	17.8%			
Quite a bit	280	31.1%	0	0			
A lot&cannot do this because of my sight	600	66.6%	0	0			
Problem in currency identification							
Not at All	0	0	400	44.4%			
A little	20	2.2%	460	51.1%			
Quite a bit	240	26.6%	40	4.4%			
A lot&cannot do this because of my sight	640	71%	0	0			
Problem and fear of hitting people, animals, and objects							
Not at All	20	2.2%	840	93.2%			
A little	60	6.7%	40	4.4%			
Quite a bit	180	20%	20	2.2%			
A lot&cannot do this because of my sight	640	71%	0	0			
Problem in moving night		.					
Not at All	0	0	560	62.2%			

A little	0	0	340	37.7%			
Quite a bit	280	31.1%	0	0			
A lot&cannot do this because of my sight	620	68.8%	0	0			
Identifying distant objects ie; TV scrolls, Bus numbers etc.							
Not at All	220	24.4%	840	93.2%			
A little	80	8.9%	40	4.4%			
Quite a bit	180	20%	20	2.2%			
A lot&cannot do this because of my sight	420	46.6%	0	0			

*$p<0.05$ is considered as level of significance

Table-4.6. Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to Visual Function in Indoor Activities.

B. Visual function-In door activities	**Before QoVn&QoLResponses (N)**	**Before QoVn&QoLResponses (%)**	**After QoVn&QoLResponses (N)**	**After QoVn&QoLResponses(%)**	**Chi-Square analysis**		
	N=900	**N%**	**N=900**	**N%**	**χ^2**	**df**	**p-value**
Problem in finding ways					12.83	12	0.039
Not at All	0	0	760	84.4%			
A little	0	0	120	13.3%			
Quite a bit	260	28.9%	20	2.2%			
A lot&cannot do this because of my sight	640	71%	0	0			
Problem with Face recognition							
Not at All	20	2.2%	760	84.4%			
A little	20	2.2%	120	13.3%			
Quite a bit	320	35.5%	20	2.2%			
A lot&cannot do this because of my sight	540	59.9%	0	0			
Problem in locking & closing door							
Valid	20	2.2%	20	2.2%			
Not at All	20	2.2%	740	82.1%			
A little	60	6.7%	120	13.3%			
Quite a bit	320	35.5%	20	2.2%			
A lot&cannot do this because of my sight	480	53.3%	0	0			
Problem in searching for things at home							
Not at All	0	0	760	84.4%			
A little	80	8.9%	140	15.5%			
Quite a bit	220	24.4%	0	0			
A lot&cannot do this because of my sight	600	66.6%	0	0			

Problem in sunlight							
Not at All	0	0	340	37.7%			
A little	20	2.2%	540	59.9%			
Quite a bit	340	37.7%	20	2.2%			
A lot&cannot do this because of my sight	540	59.9%	0	0			
Problem in using toilets & washrooms							
Not at All	20	2.2%	680	75.5%			
A little	40	4.4%	220	24.4%			
Quite a bit	320	35.5%	0	0			
A lot&cannot do this because of my sight	520	57.7%	0	0			
Problems in daily life activities							
Not at All	0	0	660	73.3%			
A little	80	8.9%	240	26.6%			
Quite a bit	340	37.7%	0	0			
A lot&cannot do this because of my sight	480	53.3%	0	0			

*p<0.05 is considered as level of significance

Table-4.7. Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to Visual Symptoms

C.Visual symptoms scale	**Before QoVn&QoLResponses (N)**	**Before QoVn&QoLResponses (%)**	**After QoVn&QoLResponses (N)**	**After QoVn&QoLResponses(%)**	**Chi-Square analysis**		
	N=900	N%	N=900	N%	χ^2	**df**	**p-value**
Do you have reduced vision							
Not at All	0	0	500	55.5%			
A little	60	6.7%	400	44.4%			
Quite a bit	480	53.3%	0	0			

A lot&cannot do this because of my sight	360	40%	0	0			
Are you dazzled in bright light							
Not at All	0	0	240	26.6%			
A little	60	6.7%	620	68.8%	8.0	15	0.049
Quite a bit	540	59.9%	40	4.4%			
A lot&cannot do this because of my sight	300	33.3%	0	0			
Is your vision blurred in sunlight?							
Not at All	0	0	100	11.1%			
A little	0	0	740	82.1%			
Quite a bit	520	57.7%	60	6.7%			
A lot&cannot do this because of my sight	380	42.2%	0	0			
Does bright light hurt your eyes?							
Not at All	0	0	120	13.3%			
A little	20	2.2%	740	82.1%			
Quite a bit	640	71%	40	4.4%			
A lot&cannot do this because of my sight	240	26.6%	0	0			
Does everything seem dark when the light is dim?							
Not at All	0	0	100	11.1%			
A little	20	2.2%	740	82.1%			
Quite a bit	560	62.2%	60	6.7%			
A lot&cannot do this because of my sight	320	35.5%	0	0			
Does light seem like stars?							
Not at All	0	0	160	17.8%			
A little	80	8.9%	720	79.9%			
Quite a bit	620	68.8%	20	2.2%			
A lot&cannot do this because of my sight	200	22.2%	0	0			
Do you close your eyes because of the light from vehicles?							
Not at All	0	0	120	13.3%			
A little	60	6.7%	740	82.1%			
Quite a bit	620	68.8%	40	4.4%			
A lot&cannot do this because of my sight	220	24.4%	0	0			

*p<0.05 is considered as level of significance

Table-4.8. Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to the Psychosocial Impact.

D. Psycho-social impact scale	**Before QoVn&QoLResponses (N)**	**Before QoVn&QoLResponses (%)**	**After QoVn&QoLResponses (N)**	**After QoVn&QoLResponses(%)**	**Chi-Square analysis**		
	N=900	N%	N=900	N%	χ^2	**df**	**p-value**
Do you have difficulty seeing							
No difficulty	0	0	840	93.2%			
Some difficulty	220	24.4%	60	6.7%			
A lot of difficulty	560	62.2%	0	0			
Cannot do it at all	120	13.3%	0	0			
Do you have difficulty seeing someone's face clearly across a room?							
No difficulty	0	0	840	93.2%			
Some difficulty	220	24.4%	60	6.7%			
A lot of difficulty	560	62.2%	0	0			
Cannot do it at all	120	13.3%	0	0			
Do you have difficulty clearly seeing the picture on a coin?					27.94	25	0.031
No difficulty	20	2.2%	840	93.2%			
Some difficulty	200	22.2%	60	6.7%			
A lot of difficulty	600	66.6%	0	0			
Cannot do at all	80	8.9%	0	0			
Problem in feeling ashamed that you can't see							
Not at All	20	2.2%	320	35.5%			
A little	140	15.5%	580	64.4%			
Quite a bit	660	73.3%	0	0			
A lot&cannot do this because of my sight	80	8.9%	0	0			

Do you feel that you have become a burden on others?							
Not at All	0	0	320	35.5%			
A little	220	24.4%	580	64.4%			
Quite a bit	560	62.2%	0	0			
A lot&cannot do this because of my sight	100	11.1%	0	0			
I expect to be completely blind shortly.							
Valid	20	2.2%	20	2.2%			
Not at All	20	2.2%	320	35.5%			
A little	160	17.8%	560	62.2%			
Quite a bit	620	68.8%	0	0			
A lot&cannot do this because of my sight	80	8.9%	0	0			
Do you feel buying spectacles	is a financial burden?						
Not at All	60	6.7%	300	33.3%			
A little	220	24.4%	580	64.4%			
Quite a bit	580	64.4%	20	2.2%			
A lot&cannot do this because of my sight	40	4.4%	0	0			
Do you feel there is no use for the correction of one eye?							
Valid	0	0	20	2.2%			
Not at All	20	2.2%	280	31.1%			
A little	240	26.6%	600	66.6%			
Quite a bit	600	66.6%	0	0			
A lot&cannot do this because of my sight	40	4.4%	0	0			
Do you feel that refractive error is not a health problem?							
Not at All	20	2.2%	340	37.7%			
A little	340	37.7%	560	62.2%			
Quite a bit	480	53.3%	0	0			

A lot&cannot do this because of my sight	60	6.7%	0	0			
Is there any verbal abuse/negative feedback from the people							
Not at All	60	6.7%	240	26.6%			
A little	240	26.6%	660	73.3%			
Quite a bit	540	59.9%	0	0			
A lot&cannot do this because of my sight	60	6.7%	0	0			
Do you allow your child to wear spectacles?							
Not applicable	320	35.5%	300	33.3%			
Not at All	200	22.2%	480	53.3%			
A little	360	40%	0	0			
Quite a bit	20	2.2%	0	0			
A lot&cannot do this because of my sight							
Do you feel that a spectacle makes eyesight worse/the person will be dependent?							
Not at All	80	8.9%	300	33.3%			
A little	380	42.2%	600	66.6%			
Quite a bit	400	44.4%	0	0			
A lot&cannot do this because of my sight	40	4.4%	0	0			
Diet and traditional methods are alternative treatment options for RE							
Yes	120	13.3%	280	31.1%			
No	460	51.1%	320	35.5%			
Don’t know	320	35.5%	300	33.3%			
Are you aware of other ways of treating RE i.e. CL/Sx?							
Valid	40	4.4%	40	4.4%			

Yes	180	20%	300	33.3%			
No	280	31.1%	160	17.8%			
Don’t know	400	44.4%	400	44.4%			

*p<0.05 is considered as level of significance

Table-4.9. Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to Female-Specific Considerations.

E.Female specific	**Before QoVn&QoL Responses(N)**	**Before QoVn&QoL Responses (%)**	**After QoVn&QoL Responses(N)**	**After QoVn&QoL Responses(%)**	**Chi-Square analysis**		
	N=900	**N%**	**N=900**	**N%**	**χ^2**	**df**	**p-value**
Problem in identifying things in the kitchen							
Valid	440	48.8%	440	48.4%			
Not at All	20	2.2%	440	48.8%			
A little	20	2.2%	20	2.2%			
Quite a bit	80	8.9%	0	0			
A lot&cannot do this because of my sight	340	37.7%	0	0			
Problem in seeing objects have fallen into food							
Valid	440	48.8%	440	48.8%			
Not at All	20	2.2%	420	46.6%			
A little	0	0	40	4.4%	16.78	5	0.011
Quite a bit	120	13.3%	0	0			
A lot&cannot do this because of my sight	320	35.5%	0	0			
Problem in difficulty for cooking food							
Valid	440	48.8%	440	48.8%			
Not at All	20	2.2%	420	46.6%			

A little	0	0	40	4.4%			
Quite a bit	120	13.3%	0	0			
A lot&cannot do this because of my sight	320	35.5%	0	0			
Problem in difficulty for cutting vegetables							
Valid	440	48.8%	440	48.8%			
Not at All	20	2.2%	420	46.6%			
A little	20	2.2%	40	4.4%			
Quite a bit	120	13.3%	0	0			
A lot&cannot do this because of my sight	300	33.3%	0	0			
Problem difficulty facing personal hygienic/menstrual cycle							
Valid	440	48.8%	440	48.8%			
Not at All	40	4.4%	440	48.8%			
A little	40	4.4%	20	2.2%			
Quite a bit	100	11.1%	0	0			
A lot&cannot do this because of my sight	280	31.1%	0	0			
Problem difficulty doing i.e. Dressing/Hair/putting on makeup							
Valid	440	48.8%	440	48.8%			
Not at All	20	2.2%	460	51.1%			
A little	80	8.9%	0	0			
Quite a bit	60	6.7%	0	0			
A lot&cannot do this because of my sight	300	33.3%	0	0			

*$p<0.05$ is considered as level of significance

Table-4.10(a). Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to Children's Specific Outdoor Activities.

F(a). Children specific-Outdoor activities based	Before QoVn&QoLResponses (N)	Before QoVn&QoLResponses (%)	After QoVn&QoLResponses (N)	After QoVn&QoLResponses(%)	Chi-Square analysis		
	N=900	N%	N=900	N%	χ^2	df	p-value
How is your appearance with your spectacles							
Valid	600	66.6%	600	66.6%			
Average	140	15.5%	20	2.2%			
Good	20	2.2%	80	8.9%			
I look better without spectacles	20	2.2%	80	8.9%			
I Like my look with spectacles	40	4.4%	40	4.4%			
It doesn't matter to me	40	4.4%	40	4.4%			
Want to get rid of spectacles	40	4.4%	40	4.4%			
Do your friends tease you with different names because of spectacles?					8.76	5	0.011
Valid	600	66.6%	600	66.6%			
Yes	20	2.2%	280	31.1%			
No	280	31.1%	20	2.2%			
Problem in bicycle/bike ride							
Valid	600	66.6%	600	66.6%			
Not at All	0	0	200	22.2%			
A little	20	2.2%	40	4.4%			
Quite a bit	160	17.8%	0	0			

A lot&cannot do this because of my sight	60	6.7%	0	0			
I don't ride a bicycle/bike	60	6.7%	60	6.7%			
Difficulty in sports activities i.e. golf/bowling/jogging etc.							
Valid	600	66.6%	600	66.6%			
Not at All	0	0	280	31.1%			
A little	80	8.9%	20	2.2%			
Quite a bit	180	20%	0	0			
A lot&cannot do this because of my sight	40	4.4%	0	0			

*p<0.05 is considered as level of significance

Table-4.10(b). Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to Children's Specific Indoor Activities.

F (b). Children specific Indoor activities	**Before QoVn&QoL Responses(N)**	**Before QoVn &QoL Responses (%)**	**After QoVn& QoLResponses(N)**	**After QoVn &QoL Responses(%)**	**Chi-Square analysis**		
	N=900	**N%**	**N=900**	**N%**	**χ^2**	**df**	**p-value**
Problem in studying							
Valid	600	66.6%	600	66.6%			
Not at All	0	0	300	33.3%			
A little	140	15.5%	0	0			
Quite a bit	100	11.1%	0	0			
A lot&cannot do this because of my sight	60	6.7%	0	0			
Problem in painting/drawing							

Valid	600	66.6%	600	66.6%			
Not at All	0	0	300	33.3%	7.83	6	0.025
A little	120	13.3%	0	0			
Quite a bit	140	15.5%	0	0			
A lot&cannot do this because of my sight	40	4.4%	0	0			
Problem in writing examinations							
Valid	600	66.6%	600	66.6%			
Not at All	0	0	220	24.4%			
A little	120	13.3%	0	0			
Quite a bit	160	17.8%	0	0			
A lot&cannot do this because of my sight	20	2.2%	0	0			
Difficulty in playing cards/bingo/pubG							
Valid	600	66.6%	600	66.6%			
Not at All	0	0	180	20%			
A little	60	6.7%	40	4.4%			
Quite a bit	120	13.3%	0	0			
A lot&cannot do this because of my sight	40	4.4%	0	0			
I do not play these games	80	8.9%	80	8.9%			
Problem in the reorganization of colours							
Valid	600	66.6%	600	66.6%			
Not at All	80	8.9%	280	31.1%			
A little	120	13.3%	0	0			
Quite a bit	60	6.7%	0	0			
A lot&cannot do this because of my sight	40	4.4%	00	0			

*$p<0.05$ is considered as level of significance

Table-4.11. Analysis of Responses and Percentage Distribution Before and After KantiVelugu Intervention on Factors Related to the Aging Population.

G.Geriatric specific	**Before QoVn& QoL Responses(N)**	**Before QoVn & QoL Responses (%)**	**After QoVn&QoLResponses (N)**	**After QoVn&QoL Responses(%)**	**Chi-Square analysis**		
Difficulty in reading small print/telephone book/newspaper etc.	**N=900**	**N%**	**N=900**	**N%**	χ^2	**df**	**p-value**
Valid	560	62.2%	560	62.2%			
Not at All	0	0	280	31.1%			
A little	0	0	20	2.2%			
Quite a bit	0	0	0	0			
A lot&cannot do this because of my sight	280	31.1%	0	0			
Illiterate	60	6.7%	40	4.4%			
Because of my eyesight, I stay at home most of the time							
Valid	560	62.2%	560	62.2%			
Not at All	0	0	100	11.1%	7.86	6	0.024
A little	0	0	240	26.6%			
Quite a bit	220	24.4%	0	0			
A lot&cannot do this because of my sight	120	13.3%	0	0			
Problem in doing workup to your usual standards							
Valid	560	62.2%	560	62.2%			
Not at All	0	0	20	2.2%			
A little	0	0	300	33.3%			
Quite a bit	240	26.6%	20	2.2%			
A lot&cannot do this because of my sight	100	11.1%	0	0			

Do you expect your eyesight to get worse than it is now with your growing age?							
Valid	560	62.2%	560	62.2%			
Not at All	0	0	20	2.2%			
A little	0	0	300	33.3%			
Quite a bit	280	31.1%	20	2.2%			
A lot&cannot do this because of my sight	60	6.7%	0	0			

*p<0.05 is considered as level of significance

Table-4.12 Summary of Tables –4.5 to 4.11

	Particulars	**Results**	**Chi-square analysis**		
	Questions	**(%)**	**χ^2**	**df**	**p-value**
A	Visual function-outdoor activities	90%	14.96	14	0.038
B	Visual function-In door activities	80%	12.83	12	0.039
C	Visual symptoms scale	75%	8.0	15	0.049
D	Psycho-social impact scale	90%	27.94	25	0.031
E	Female gender	95%	16.78	5	0.011
F	Children specific out-door activities	92%	8.76	5	0.011
G	Children specific In-door activities	91%	7.83	6	0.025
H	Geriatric Male&Female gender (Aged population)	95%	7.86	6	0.024

*p<0.05 is considered as level of significance

Analysis of Percentage Distribution for All Respondents and Chi-Square Analysis Before and After KantiVelugu Program on Factors Related to the Entire Population.

4.6 Results:

The investigation used diverse questionnaires, including the Indian-Visual Functioning Questionnaire (IND-VFQ33) and the Washington Group on Vision Disabilities; Questionnaires tailored for children, females, and the geriatric population, were employed to evaluate visual outcomes before and after treatment among the beneficiaries of the KantiVelugu program. Initially, the sample consisted of 900/966 individuals, but 66 participants discontinued their participation, resulting in a final cohort of 900 individuals with complete questionnaire responses.

The results demonstrate a substantial improvement in the quality of life and daily functioning of participants following their receipt of glasses through the KantiVelugu program (KVP), with no such improvements noted before the intervention. Commendable efforts by the Government of Telangana in addressing preventable blindness among the state's residents are acknowledged by the researcher.

The study revealed significant enhancements in the quality of life among KantiVelugu program (KVP) beneficiaries who received eyeglasses. This improvement was strongly correlated with vision enhancement, ranging from 75% to 95%, based on data from 900 participants before and after the intervention. Furthermore, individuals experienced a significant improvement in their daily activities following the acquisition of glasses. The assessment of pre- and post-treatment visual outcomes in the KVP population was conducted using the Indian-Visual Functioning Questionnaire (IND-VFQ33) and the Washington Group on Vision Disabilities Questionnaire, including specialized versions for children, females, and the geriatric population.

In terms of Visual Function and Outdoor activities, there was an improvement of around 90% in responses, indicating positive changes in activities such as climbing stairs, walking, attending social gatherings, and more. For Visual Function indoor activities, there was an improvement of around 80%, indicating positive changes in activities such as finding ways, face recognition, and using toilets.

The Visual Symptoms scale showed a 75% improvement in responses, indicating positive changes in areas like reduced vision and sensitivity to bright light.

The Psychosocial Impact scale exhibited a 90% improvement, reflecting positive changes in aspects such as self-perception, financial burden, and social interactions. Additionally, responses to female-specific questions showed a 45% improvement, addressing challenges in kitchen activities, personal hygiene, and other female-specific tasks.

Children's specific outdoor activities improved by around 30%, focusing on appearance, teasing, and participation in sports. Children's specific indoor activities also improved by around 30%, addressing challenges in studying, painting, writing examinations, and playing games.

Finally, responses from the geriatric population showed a 33.3% improvement, addressing difficulties in reading small prints and engaging in usual activities. In summary, vision correction post-screening through the KantiVelugu program demonstrated substantial benefits across various age groups and specific activities, emphasizing the program's positive impact on the quality of life and daily functioning.

4.7 Discussion:

The KantiVelugu Program in Telangana has yielded notable positive outcomes in terms of both Quality of Vision (QoVn) and Quality of Life (QoL) for the participant cohort of 900 individuals. By employing a comprehensive approach involving screening, diagnosis, and treatment of refractive errors, the program has effectively enhanced both the quality of life and vision for a significant number of beneficiaries. The results of this study directly correlate with increased independence, improved social interactions, and an overall sense of well-being, all attributed to the provision of eyeglasses through the KantiVelugu Program (KVP).

Participants of the study experienced a remarkable increase of 75% to 90% in their scores on the IND-VFQ33 questionnaire. Notably, baseline visual acuity, initially measured at 6/36, 6/24, and 6/18, demonstrated improvement post-intervention to 6/12, 6/9, and 6/6 with the aid of spectacles provided through the KantiVelugu program for beneficiaries. This improvement underscores the program's efficacy in significantly enhancing both the perceived quality of vision and the overall quality of life for the individuals involved.

CHAPTER-5

COMPARISON OF KANTIVELUGU AND NETRA KUMBH: TWO LARGE-SCALE COMMUNITY EYE SCREENING PROGRAMS IN INDIA

5.1 Overview

This chapter undertakes a comparative analysis of two prominent large-scale community eye screening initiatives in India: The KantiVelugu and NetraKumbh programs. The aim is to discern and evaluate the distinct impacts these programs have on beneficiaries and the broader population. While KantiVelugu represents a temporary intervention, NetraKumbh stands as a continuous endeavour. This comparative study was recommended by the doctoral committee to gain deeper insights into the intricacies of mega-screening processes. By scrutinizing these programs, the researcher aims to elucidate their strengths, weaknesses, and the lasting effects they have on vision health within the communities they serve. This analysis not only informs the current research but also contributes to the broader discourse on the effectiveness and sustainability of large-scale vision screening initiatives in India.

Aim: This study aims to comprehend the operational procedures of mega vision screening programs and service delivery initiatives, gaining insights into how they are organized and implemented to effectively reach populations and address their eye care needs.

5.2 Objectives:

The specific objectives guiding the investigation are:

- To study the processes involved in these large initiatives.
- To study the organisation and implementation of vision screening programmes and service delivery initiatives.

5.3 Introduction:

India has launched Community Eye Care programs, with the National Program for Control of Blindness (NPCB) playing a central role since 1976 in expanding its outreach to the public. Recent noteworthy initiatives comprise NetraKumbh, conducted during the Kumbh Mela in Uttar Pradesh (January 12, 2019, to March 4, 2019), and KantiVelugu, a comprehensive state-wide effort in Telangana (August 15, 2018). These programs have received acclaim for their extensive reach, ensuring accessibility to eye care for underserved populations. The significance of vision spans all aspects of life, encompassing the entire visual system and associated functions (Ackman, J. B., 2012).

The World Health Organization (WHO) has reported a staggering 153 million individuals globally affected by uncorrected distance refractive error (Holden, B. A., 2007). Additionally, out of the 2.2 billion people worldwide with vision impairment or blindness, one billion cases could have been prevented (Marques, A.P., et al., 2021). Vision screenings play a crucial role in identifying potential vision problems and eye disorders (Ali, Q., et al., 2021). While screenings are not diagnostic tools, they prompt referrals to eye care specialists for comprehensive assessments and treatment. Uncorrected refractive errors stand as a significant cause of visual impairment, particularly in children, impacting their educational and psychosocial development (Pirindhavellie, G. P 2023). In India, studies have revealed varying prevalence rates of myopia and hyperopia in children, underscoring the necessity for corrective lenses. In rural India, approximately 86% of children do not have access to correction for refractive error (Sheeladevi, S., et al., 2018).

Addressing these issues is pivotal in reducing avoidable visual impairments. NetraKumbh, conducted during the Kumbh Mela in Uttar Pradesh, offered free eye check-ups and distributed 155,210 spectacles in 2019. KantiVelugu, aiming to eliminate avoidable

blindness, conducted eye screenings and provided free spectacles and cataract surgeries to the elderly population in 2018. This study provides a comparative analysis of both mega-screening programs, utilizing standardized questionnaires to collect participant feedback and evaluate the delivery process.

5.4 Earlier studies

Globally, more than 285 million individuals grapple with visual impairment, of which 39 million experience blindness and 246 million, have low vision (Ajuwon, P. M., 2014). Remarkably, India and China collectively contribute approximately half of the global burden of blindness and visual impairment attributed to uncorrected refractive errors (Steinmetz, J. D., 2021). This emphasizes the critical need for a comprehensive solution to address this pervasive issue.

Refractive errors, a prevalent eye disorder, manifest when the eye struggles to focus images from the external environment, often resulting in blurred vision and, in severe cases, visual impairment. Individuals with vision disabilities face various challenges, including inadequate support, discrimination, difficulties in accessing buildings and transportation, as well as feelings of depression and a lack of social and economic assistance. The classification of visual impairment into distance acuity highlights its significance in fundamental activities such as learning to navigate, expressing interest in objects, reaching for them, exploring, and developing hand-eye coordination.

Refractive errors impact individuals of all ages, posing substantial public health concerns. Recent research and World Health Organization (WHO) statistics indicate that 43% of vision impairments are attributed to refractive errors (Vitale, S., 2006). In 2010, it was reported that refractive errors led to vision impairment in 101.2 million individuals and blindness in 6.8

million. Moreover, these errors incur substantial economic costs, amounting to $269 billion globally each year (Wallace, D., 2016). The rise in myopia due to lifestyle changes is a notable concern, but discrepancies in measurement methodologies, definitions, and participant demographics complicate drawing definitive conclusions about the global distribution of refractive errors.

Patterns of refractive errors differ across countries, with higher rates of myopia observed in East Asian nations (Pan, C. W., 2013). The prevalence of hyperopia remains disputed, with some studies indicating significant frequencies in Europe and Western countries (Wolfram, C., 2014). However, interpreting these findings is complex as they predominantly focus on the elderly, in whom hyperopia is typical due to natural lens changes (Flitcroft, D. I., 2012). Given these disparities, our study aims to examine the impact of refractive error correction on vision quality and overall quality of life in Telangana state, considering the diverse outcomes, definitions, and measurement approaches.

The Telangana government has initiated the KantiVelugu program to combat "Avoidable Blindness" in the state. This six-month-long endeavour seeks to provide universal eye screening for the entire population, encompassing objectives such as conducting eye screening and vision tests for all citizens, offering cost-free spectacles, facilitating surgeries and necessary treatments at no cost, supplying medicines for common eye ailments, and educating people on preventing serious, disabling eye conditions.

Under this program, each Primary Health Centre (PHC) is equipped with a dedicated team, including a data entry operator for registration, demographic data entry, and initial unaided eye testing. The process involves objective and subjective refraction, confirmation of the prescription, dispensing at the counter for frame selection and lens fitting, and the provision

of a delivery date. Patients in need of ready-made glasses with specific power receive them immediately, and cases requiring ametropic or presbyopic correction are also attended to. All reports are subsequently forwarded to the Medical officer for final decision-making in screening camps.

5.5 Methods:

This research delves into the experiences of individuals who received complimentary spectacles through the NetraKumbh and KantiVelugu mega-vision screening programs conducted across diverse locations in Telangana and Uttar Pradesh. The study employs a retrospective and descriptive methodology to explore various aspects of the beneficiary journey, encompassing enhancements in vision quality, lifestyle, and the effectiveness of dispensed lenses and frames. Additionally, the study assesses logistic disparities between the two screening initiatives.

NetraKumbh, a stationary camp during the Kumbh Mela, screened a total of 202,020 participants over 51 days. During this period, 155,210 spectacles were dispensed, and additional referrals were made for participants requiring further treatment. On the other hand, KantiVelugu, operating on a state-wide scale, conducted population-based screening for six months. This extensive initiative involved 800 teams covering 12,751 villages, catering to a population of 3.70 crore, and distributing 40 lakh spectacles to citizens across the state.

Inclusive criteria- for participant selection targeted individuals with ametropia, encompassing beneficiaries from both eye camps within the age range of above 8 years to below 65 years. Exclusive criteria- excluded individuals with emmetropia, those with other ocular morbidities, head injuries, or traumas, as well as individuals below 8 years or above 65 years.

The study design adopted a retrospective approach to scrutinize the study population, employing rasch and descriptive statistics in conjunction with SPSS and Excel. Data for analysis were sourced from the NK-Saksham team and the KantiVelugu program, under the Commissioner of Health and Family Welfare (CHFW), National Program for Control of Blindness & Visual Impairment (NPCB&VI).

Variables examined included visual acuity, retinoscopy, questionnaire responses, screening duration, sample size screened, prevalence rates of diagnosed ocular disorders, geographical location, socioeconomic factors, and participant satisfaction levels. Both descriptive and inferential statistical methods were applied for comprehensive analysis.

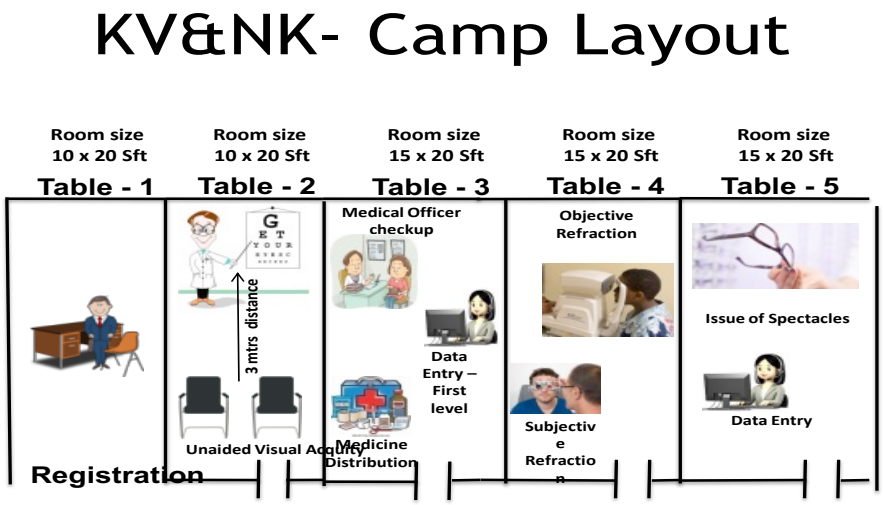


Figure 5.1: Demonstrating that the arrangement of both camps involves the utilization of tables 1 through 5 (Source: Govt of Telangana phase 1).

In the initial stage, Table One facilitates the manual registration of participants for the vision screening camps. Following this, Table Two conducts a fundamental vision screening test, measuring the participants' visual acuity at a fixed distance of either 3 meters or 10 feet. The

normal vision range is defined from 6/6 to 6/9, and a visual acuity of 6/12 or worse is considered abnormal for unaided distance vision. Near Vision Acuity (NVA) is also assessed, with N8 or above indicating abnormality and a preference for near vision correction for individuals aged 40 and above experiencing presbyopia.

Table Three, under the supervision of the Medical Officer (MO), plays a crucial role in the diagnosis and prescription process. If refractive errors are identified, the MO prescribes glasses tailored for myopia, hyperopia, astigmatism, and presbyopia. For other eye conditions, the MO may recommend medications, lubricating eye drops, or refer patients to secondary and tertiary eye hospitals.

In Table Four, objective refractive correction is executed in a darkroom utilizing an auto refractor (AR) and retinoscope to ascertain the necessary refractive correction. Subsequently, subjective refraction is performed in bright light to fine-tune both distance and near visual acuity. A duo-chrome test is administered to evaluate any under or overcorrection of refractive errors. Red indicates the addition of minus power (RAM), while green signifies the addition of plus power (GAP) for distance acuity correction. Additionally, near vision acuity correction is implemented, primarily for individuals aged 40 and above experiencing difficulty focusing on near objects due to age-related accommodation issues.

Table Five is tasked with data entry and the distribution of spectacles. During this process, patient photographs are taken for documentation and future reference, adding a layer of detail and precision to the overall screening and correction procedures.

Table 5.1 Illustrating the estimated daily output of vision screening programs.

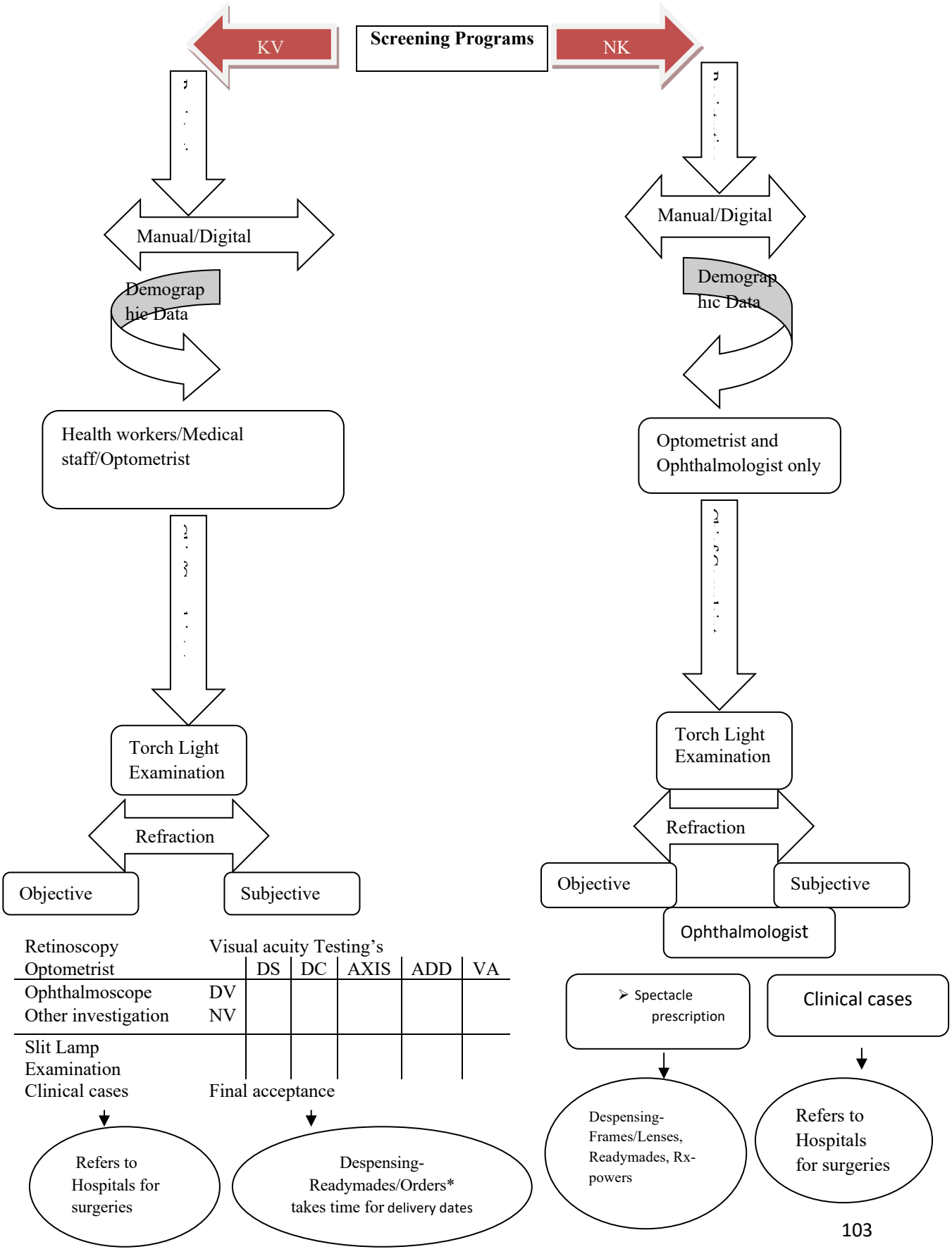
S.No.	Particulars of the Daily output	KV	NK
1	Number of teams	827	27
2	Average no. of people screened	1,50,000	4000
3	Average no. of near vision glasses distributed	28,000	1200
4	Average no. of prescription glasses	10,000	1800
5	Average no. of referrals	12,000	1000

Within the KantiVelugu program, a comprehensive deployment of 827 teams covered the entire state, whereas the NetraKumbh camp in Prayaagraj operated with 27 teams. Notably, KantiVelugu demonstrated a significantly higher daily screening capacity, averaging 150,000 individuals, while NetraKumbh, in contrast, screened a daily average of 4000. This trend continued in the distribution of near-vision glasses, where KantiVelugu exhibited an average of 28,000, in contrast to NetraKumbh's more modest figure of 1200. Similarly, KantiVelugu surpassed NetraKumbh in the distribution of prescription glasses, with averages of 10,000 and 1800, respectively. Additionally, KantiVelugu had a notable average of 12,000 referrals, whereas NetraKumbh had a considerably lower figure of 1000.

In summary, the KantiVelugu program consistently outperformed NetraKumbh across all aspects of daily output, demonstrating higher screening capacities, distribution rates of near vision and prescription glasses, as well as a greater number of referrals. These findings underscore the substantial disparities in the scale and efficiency of these two initiatives.

Procedure:

Flow-chart: -



5.5 Results:

Data collection period: 15th August 2018 to 12th March, 2019

Storage: Confidential

Results and key findings; -2018-2019

Table 5.2 Providing an overview of the results and key findings from both camps.

Parameters	**KantiVelugu**	**Netrakumbh**
Coverage	Telangana State	Uttar Pradesh
Screening	3.70Crore	2.2Lakhs
Spectacles	40 Lakhs	1.5Lakhs
Surgeries	4 Lakhs	6.6Thousand

The KantiVelugu program (KVP) exhibited a comprehensive reach, encompassing the entire state of Telangana, spanning 12,571 villages, while NetraKumbh (NK) specifically targeted the state of Uttar Pradesh, with a focus on Allahabad at sector 6 of the Ardha Kumbh Mela. KVP achieved an impressive feat by screening a population of 3.70 crores, surpassing NK's screening of 2.2 lakhs. In terms of spectacle distribution, KVP distributed an outstanding 40 lakhs, whereas NK's distribution reached 1.5 lakhs. Surgical interventions were conducted for those in need, with KVP performing 4 lakhs compared to NK's 6.6k. These figures distinctly highlight that, in comparison to NK, KVP attained higher numbers in terms of the screened population, spectacle distribution, surgeries, and related referrals. This underscores the notable contrast in the scale and impact of these two programs.

Their logistics:

NetraKumbh (NK) functioned as a stationary eye camp, with a single team stationed in Allahabad, specifically catering to Kumbh Mela events held in various locations across the state. In contrast, the KantiVelugu Program (KVP) operated dynamically in diverse locations across the state of Telangana, utilizing multiple teams for its implementation.

Table 5.3 Outlines the logistical details of both camps

NetraKumbh	**KantiVelugu**
Stationary camp	Conducted at different places
Duration 51-DAYS	6-MONTHS
Screened-202020 peoples from Kumbh Mela at various places in India.	Screened-12,751 villages 3.70 crore peoples in Telangana.
Spectacle dispensed-155210 &6.6k surgery. Other clinical cases they referred to Sadguru, MDI, etc.	Spectacle-dispensed-40Lakhs&4Lakhs people need Surgery-CAT, G, ARMD, DR, CD etc.
Only 1 team, 27 OPD's conducting mass vision screening eye camp	800 teams conducting eye camps across the state
BCVA-6/6	BCVA-6/12
more ametropic correction &less presbyopic correction	Less ametropic correction &more presbyopic correction

During its operation, NK successfully screened a total of 202,020 individuals at Kumbh Mela events, showcasing its reach in various locations. In contrast, KVP conducted screenings in an extensive 12,751 villages, reaching an impressive 3.70 crore individuals throughout the state of Telangana.

In terms of spectacle distribution, NK dispensed eyewear to a population of 155,210 and performed 6.6k cataract surgeries. Additionally, clinical cases were referred to esteemed institutions such as Sadguru Netra Chikitsalay and Manohar Das Eye Institute. Conversely,

KVP achieved a notable distribution of 40 lakh spectacles and conducted surgery for 4 lakh individuals. Similar to NK, clinical cases were referred to respected tertiary eye care institutions like L V Prasad Eye Institute, Sarojini Devi Eye Hospital, and PVRI, Neo-retina, CFS, Medivision, among others.

The Best Corrected Visual Acuity (BCVA) recorded in NK was 6/6, reflecting the stationary nature of the camp. In contrast, KVP's BCVA was 6/12. Notably, according to available information, KVP witnessed a significant provision of ready-made glasses and ready readers on the spot. In NK, while there were fewer ready-made available, prescription glasses were dispensed on the same day. This comparative analysis underscores the differing operational approaches and outcomes of these two eye care programs.**Achievements of both camps:**

Table 5.4 NetraKumbh Achievements

Particulars	NetraKumbh Achievements
Total patients screened	202020
Total spectacle distributed	155210

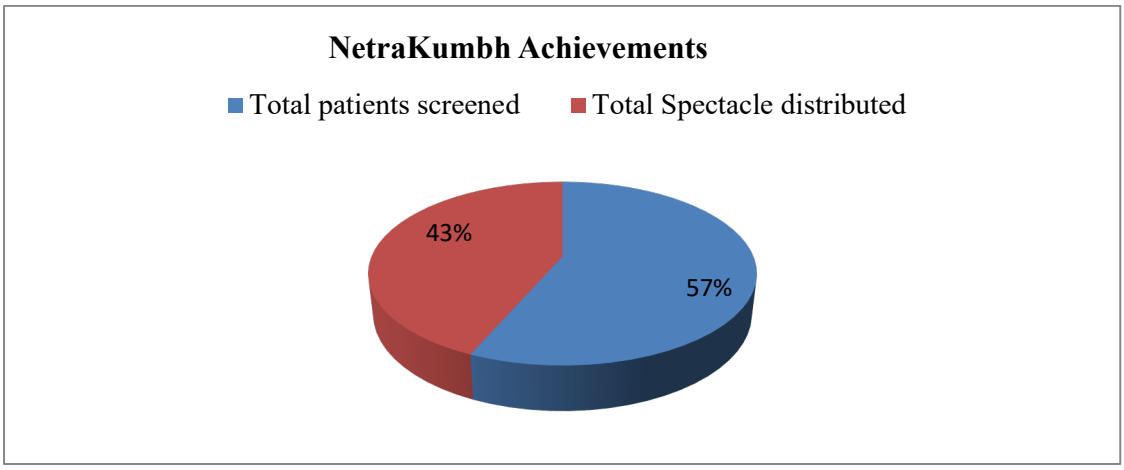


Figure-5.2 NetraKumbh Achievements

In the pie chart (Fig 5.2), the segment coloured in blue accounts for 57% of the overall patients screened, equating to a total of 202,020 individuals. Conversely, the red section represents 43% of the total, signifying those 155,210 individuals received distributed spectacles. This visualization provides a comprehensive breakdown of the distribution of patients screened and those who benefited from the provision of eyewear. This information is crucial for understanding the impact and outreach of the eye care program, offering insights into the proportion of individuals who not only participated in the screening but also availed the spectacles.

Table -5.5 KantiVelugu Achievements

Particulars	KantiVelugu Achievements
Total patients screened	370000000.00
Total spectacle distributed	4000000.00

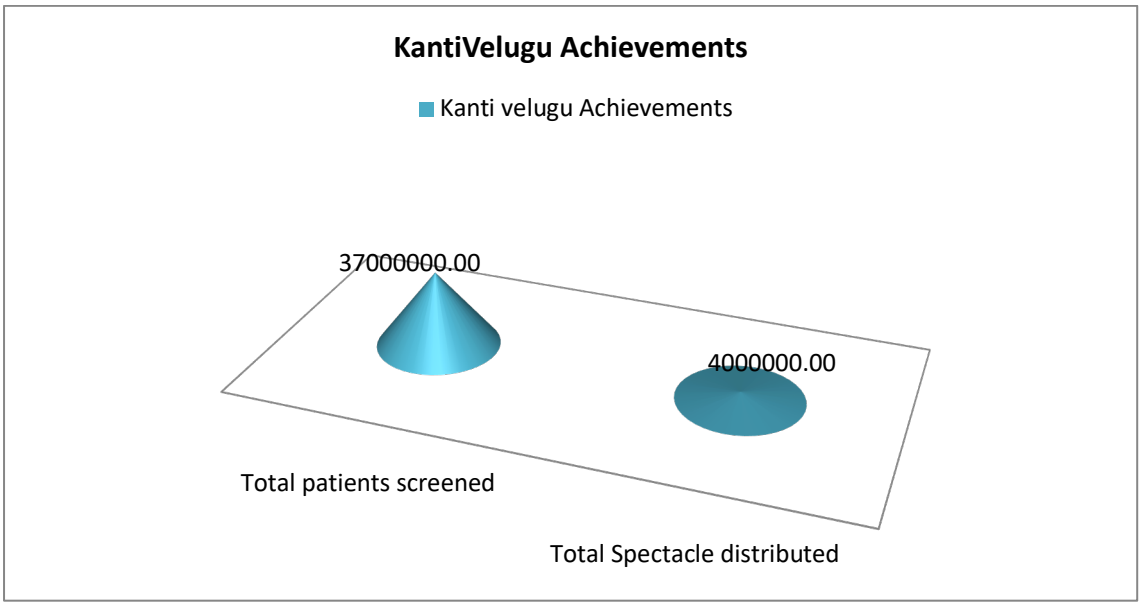


Figure-5.3 KantiVelugu Achievements

In line chart (Fig 5.3), a notable observation emerges, indicating that an impressive 3.7 crore patients underwent screening as part of the eye care program. Within this extensive cohort, a substantial subset, amounting to 40 lakhs, received spectacles. This depiction in the line chart underscores the scale of the program's outreach, showcasing the magnitude of individuals who participated in the screening process and, specifically, the substantial number who benefitted from the distribution of eyewear. Such data is pivotal for evaluating the program's efficacy and its tangible impact on providing vision care to a vast population. The line chart serves as a visual representation of these significant metrics, aiding in the comprehensive analysis of the eye care initiative.

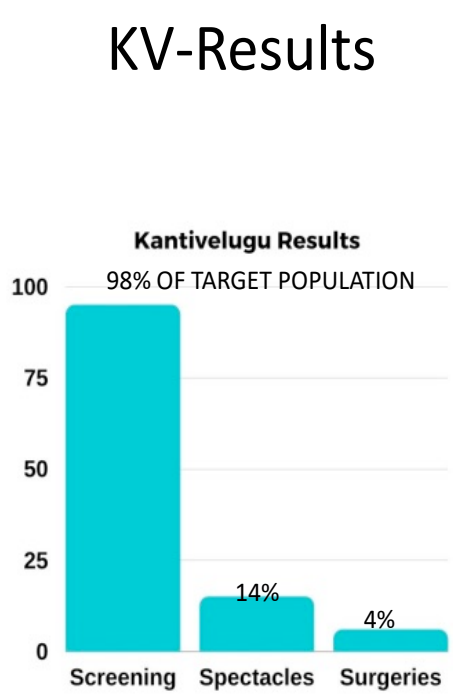


Figure 5.4 Results of KVP

In the context of the KantiVelugu (KV) program, the Bar diagram (Fig-5.4) results demonstrate an impressive screening coverage of 98% of the target population, totalling

3.70 crores of individuals across 12,571 villages in Telangana. Furthermore, a substantial 40 lakhs of spectacles were distributed, constituting 14% of the total participants. Surgeries were performed on 4.0 lakh individuals, representing 4% of the screened population. BCVA 6/12. Similar to NK, emmetropes with 6/6 vision comprised the remaining participants in KV who did not require corrective eyewear or contact lenses. Noteworthy is the observation that the majority of these individuals were from the aged or geriatric population, actively participating in this extensive vision screening program.

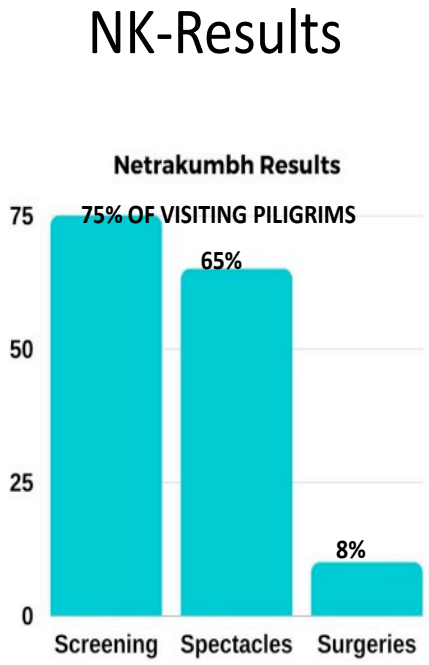


Figure 5.5 Results of NK

According to the Bar diagram (Fig-5.5) analysis of NetraKumbh (NK), it is evident that a significant total of 202,020 patients, constituting 75% of the visiting pilgrims, underwent screening. Among these, 155,210 spectacles were distributed, accounting for 65% of the total participants, and 6.6k surgeries were conducted, representing 8% of the screened

population. The remaining individuals, identified as emmetropes, exhibited a visual acuity of 6/6, signifying that they did not require corrective glasses or contact lenses. This subgroup predominantly consisted of young children, followed by older individuals who actively participated in the NetraKumb

This detailed analysis of the Bar diagram results provides a nuanced understanding of the scope and outcomes of both NetraKumbh and KantiVelugu programs, shedding light on the diverse demographics of participants and the impact of the eye care initiatives on different age groups.

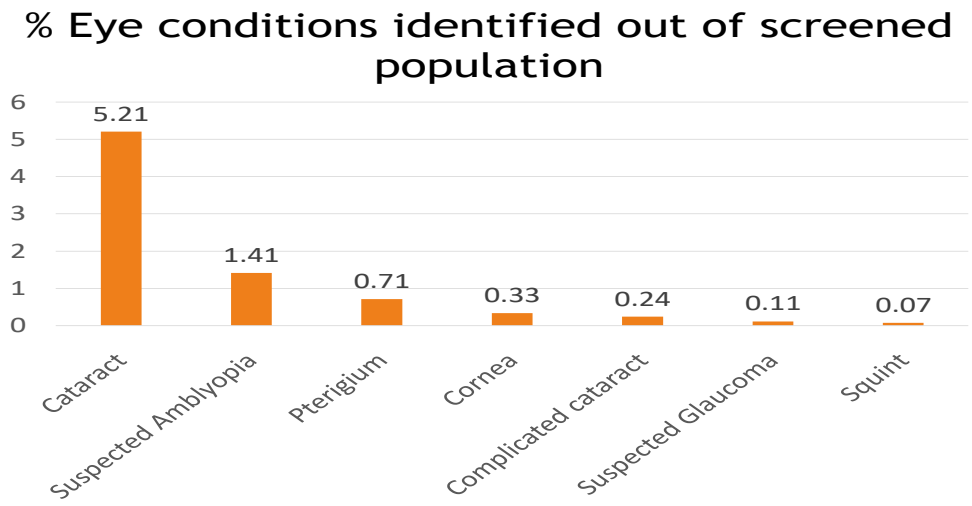


Fig: 5.6 Percentages of an Eye conditions identified out of screened population

The bar diagram provides a comprehensive overview of the prevalence of identified eye diseases as a percentage of the screened population, ranging from 0 to 6%. Among the observed conditions, cataract emerges as the most prevalent, accounting for 5.21% of the screened cases. Suspected amblyopia follows with a prevalence of 1.41%. Pterygium is identified in 0.71% of cases, while corneal disorders are seen in 0.33%. More complex cases

of cataracts termed complicated cataracts, are found in 0.24% of instances, suspected glaucoma in 0.11%, and squint in 0.07%.

The data underscores that Cataract stands out as the most commonly identified condition in comparison to others. In contrast, squint, a rare misalignment of the pupils or strabismus, is exceptionally infrequent and predominantly observed in the paediatric population. Paediatric cases of cataracts are uncommon, with the condition primarily affecting the geriatric or age-related population, leading to the development of cloudy lenses.

This nuanced analysis of identified eye diseases sheds light on the varying prevalence and nature of ocular conditions within the screened population, providing valuable insights for targeted intervention and care strategies.

5.7 Discussion: -

The research conducted a comprehensive comparative analysis of two prominent community eye screening initiatives in India, namely KantiVelugu (KV) and NetraKumbh (NK). NetraKumbh, operating for 51 days with 27 Outpatient Departments (OPDs), screened 202,020 Kumbh Mela attendees nationwide, providing 155,210 glasses. It achieved a Best Corrected Visual Acuity (BCVA) of 6/6 and hosted 27 OPDs. In contrast, KantiVelugu's phase-1 spanned six months, deploying 800 teams comprising ophthalmologists, optometrists, and community health workers. These teams assessed 12,751 communities with a population of 3.70 crores. The program distributed 40 lakh spectacles, conducted four million eye surgeries, and referred nine million patients for further care.

Geographically, KantiVelugu covered the entire state of Telangana, encompassing 12,571 villages. On the other hand, NetraKumbh focused on the state of Uttar Pradesh, specifically in Allahabad and Prayagraj at Kumbh Mela sector number 6^{th}. KantiVelugu's screening

population significantly exceeded that of NetraKumbh, with 3.70 crores compared to NK's 2.2 lakhs. Additionally, KantiVelugu distributed 40 lakhs spectacles, whereas NetraKumbh provided 1.5 lakhs. In terms of surgical interventions, KantiVelugu conducted 4 lakh surgery procedures, while that of NetraKumbh was 6.6k.

These findings underscore the extensive reach and impactful contributions of both programs in addressing vision-related issues within their respective regions. The detailed comparison provides valuable insights into the scale, scope, and outcomes of these large-scale community eye care initiatives, contributing to the broader understanding of effective strategies in vision health at a community level.

CHAPTER–6

PILOT TESTING OF ADVOCACY MATERIAL DEVELOPED FOR POPULATION-BASED VISION SCREENING INITIATIVES

6.1 Overview

This chapter provided a comprehensive overview of the community-centered strategies employed in the extensive vision screening program of KantiVelugu within Telangana state. It encompassed an in-depth analysis of phase 1 and phases 2 data, drawing comparisons to discern key trends and results. Phase 2 data from KantiVelugu was particularly highlighted, as it served as the foundation for developing tailored advocacy and educational materials based on insights gleaned from Phase 1. The chapter further explored the critical process of pilot testing these materials to ensure their efficacy and relevance in the context of population-based vision screening initiatives. This iterative approach not only strengthened the practical implementation of the KantiVelugu program but also contributed to the broader discourse on refining advocacy strategies for community eye health programs.

Aims: The study aims to conduct pilot testing of advocacy material developed for population-based vision screening

6.2 Objectives:

The specific objectives guiding the investigation are:

- Developed Advocacy and Educational Materials: This objective involved creating customized advocacy and educational materials based on insights and data derived from both phases of the KantiVelugu program. The focus was on effectively communicating the importance and benefits of population-based vision screening initiatives.

- ❖ Conducted Rigorous Pilot Testing: This objective entailed rigorously evaluating the efficacy, relevance, and impact of the developed advocacy and educational materials through comprehensive pilot testing. The goal was to ensure their suitability for implementation in population-based vision screening programs and their potential to effectively engage and inform target audiences.
- ❖ These objectives aimed to systematically guide the development and assessment of advocacy materials, ultimately enhancing their effectiveness in promoting population-based vision screening initiatives.

6.3 Introduction:

Phase 2 of the KantiVelugu Program represented a progressive step forward in the endeavor to promote comprehensive population-based vision screening, leveraging the groundwork established by Phase 1. This proposal delineated the methodologies involved in the development of advocacy and education materials, the execution of the pilot study, the meticulous process of data collection, and the subsequent analysis, interpretation, and discussions.

6.4 Review of literature:

Approximately 45 million individuals worldwide were experiencing blindness, with a substantial number concentrated in economically disadvantaged regions. A significant portion of these cases could have been prevented or treated. This challenge was notably widespread in less developed countries, where economic difficulties were exacerbated by the burden of vision impairment. Without effective intervention, it was anticipated that the number of individuals experiencing blindness could have increased to 76 million by 2020, primarily due to the aging populations worldwide. Given that eye diseases were predominantly observed in older demographics, the projected doubling of the global population aged 50 and above to 2

billion by 2020 significantly contributed to the rise in cases of blindness and low vision. (Bourne, R., et al., 2021).

6.5 Methods:

Materials Methods: During this stage, healthcare professionals, educators, and design experts collaborated in crafting informative and engaging resources. A diverse range of materials, including brochures, videos, infographics, and web-based content, was crafted to cater to varying learning styles and preferences. Stringent measures were taken to ensure the accuracy and cultural sensitivity of the materials, tailoring them to resonate with the target demographic.

Design of Pilot Study: The pilot study delineated the specific demographic groups and regions that constituted the target population for material distribution. Locations such as schools, community centers, and clinics were strategically selected for the dissemination of the educational resources. A well-structured timeline was devised to ensure the smooth execution of the pilot study, optimizing the reach and impact of the materials. Metrics for assessing impact, including participation rates and knowledge enhancement, were defined to quantify the effectiveness of the materials.

Data Collection: The distribution and reach of the educational materials were meticulously tracked to ascertain their penetration into the intended audience. Surveys were administered to participants to gauge their comprehension of ocular health and their engagement with screening services for Phase 2.

In the second phase of the KantiVelugu Program (KVP), a meticulous and systematic process was employed during vision screening camps. The initiation involved manual registration overseen by dedicated ASHA workers stationed at the registration desk. Subsequently,

ANM/GNM nurses utilized the BEST protocol, employing a 3-meter or 10-foot chart to assess distance visual acuity (6/12) and a 40 cm chart for near vision correction (N8). Patients with satisfactory vision were expedited to save time in the screening process.

Table 6.1 District-level number of teams, wards and Health centres for KVP-Phase 2

	District	No of PHCs/UPHCs	No of Teams	Rural	Urban
				No of Villages	No of Wards
1	Adilabad	27	33	468	49
2	Bhadradri Kothagudem	34	48	480	105
3	Hanumakonda	24	45	208	62
4	Hyderabad	91	115	0	97
5	Jagtial	22	46	383	134
6	Jangaon	16	26	281	30
7	Jayashankar Bhupalpally	14	25	241	30
8	Jogulamba Gadwal	13	25	255	77
9	Kamareddy	21	44	526	80
10	Karimnagar	24	48	313	146
11	Khammam	30	55	589	125
12	Komaram Bheem Asifabad	22	26	335	30
13	Mahabubabad	21	38	461	82
14	Mahabubnagar	22	45	441	86
15	Mancherial	21	40	310	152
16	Medak	20	40	469	75
17	Medchal-Malkajgiri	33	79	61	218
18	Mulugu	15	20	174	0
19	Nagarkurnool	28	50	461	86
20	Nalgonda	39	74	844	182
21	Narayanpet	11	24	280	56
22	Nirmal	20	32	396	3
23	Nizamabad	37	70	530	145
24	Peddapalli	24	34	263	114
25	Rajanna Sircilla	15	26	255	67
26	Ranga Reddy	37	80	558	246
27	Sangareddy	34	69	647	202
28	Siddipet	36	45	499	115
29	Suryapet	28	50	475	141
30	Vikarabad	24	42	566	97
31	Wanaparthy	15	28	255	80
32	Warangal	21	44	323	70
33	Yadadri Bhuvanagiri	21	34	421	104
	Total	860	1500	12768	3286

Procedure: -

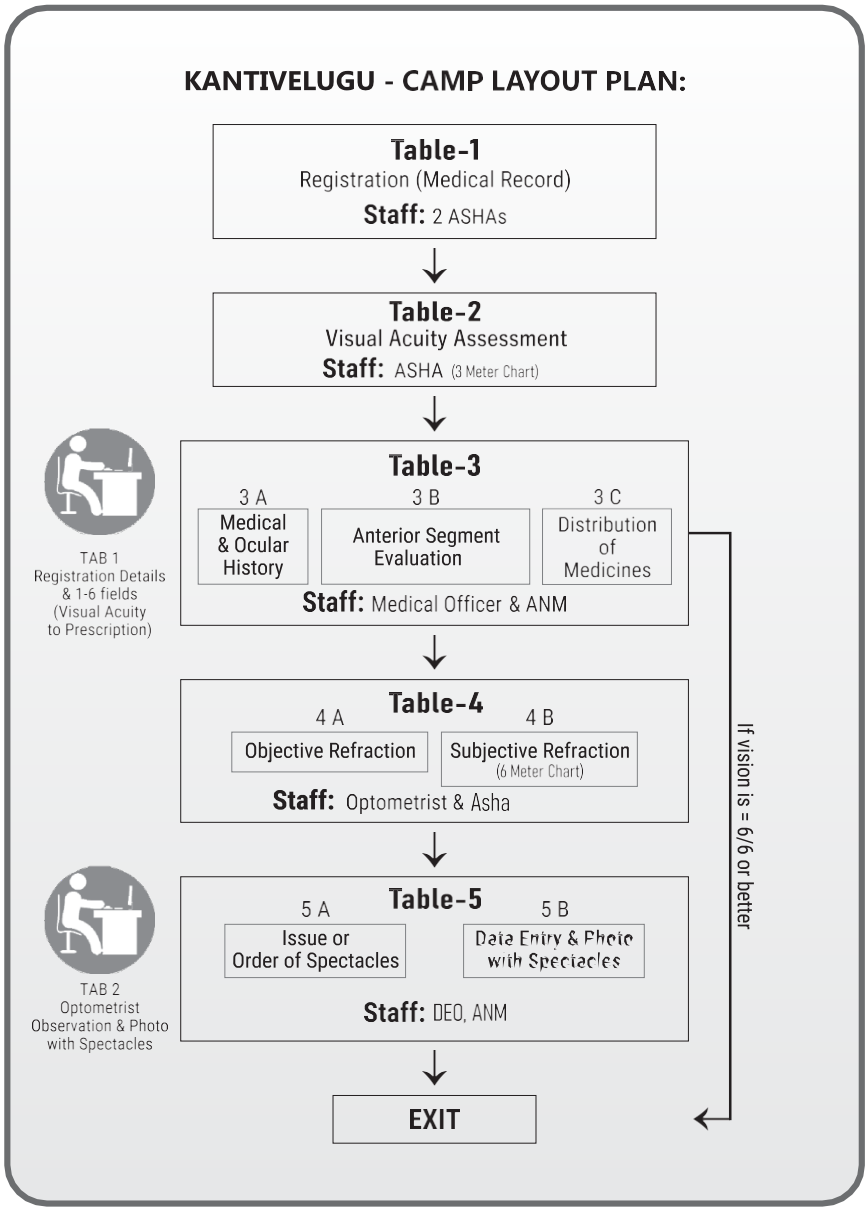


Figure 6.1 KantiVelugu Phase 2 Camp Layout Plan (Source: MoHFW, Govt. of Telangana)

The medical officer conducted a comprehensive examination using torchlight and provided necessary general medical attention. GNM personnel recorded auto-refractor readings for both eyes during this phase, while ANM staff meticulously documented all relevant data digitally in TAB-1. An optometrist then employed a Snellen Visual Acuity chart positioned at

6 meters or 20 feet for subjective refraction, aiding in determining the necessary subjective refraction for both distance and near visual acuity. Subsequently, the optometrist provided recommendations based on the findings, which may have included prescribing spectacles for single vision and bifocals, reading glasses, or suggesting further assessments and referrals.

The distribution of spectacles was managed by the Data Entry Operator (DEO) and the camp supervisor. Reading glasses were immediately provided, accompanied by the documentation of beneficiaries' photos for record-keeping. However, prescription glasses may have required a lead time of approximately 2 to 3 weeks. PHC/UPHC staff members played a crucial role in notifying beneficiaries about the status of their prescription glasses and ensuring timely delivery. This entire process was meticulously documented in TAB-2, emphasizing the importance of regular data synchronization to prevent any delays in order fulfillment.

To facilitate the screening process, essential refractive equipment, including torchlight, stethoscope, auto-refractor, visual acuity charts, and a mirror, were utilized. Notably, these mobile camps were a hallmark of adaptability, with 800 teams in KV Phase-1 and an expanded force of 1500 teams in KVP-2. Each screening team, comprised of 10 members, collaboratively worked to ensure the efficiency and effectiveness of the screening operations.

This highly organized and technology-driven approach to vision screening underscored the KantiVelugu Program's commitment to providing accessible and comprehensive eye care services to a diverse population. Through careful coordination and the integration of modern technology, the program aimed to have had a meaningful impact on the visual health and overall well-being of the communities it served.

Data Analysis: Participation rates before and after material distributions were rigorously examined to measure discernible changes in engagement levels. Responses from the surveys

were analyzed to assess shifts in knowledge and attitudes towards vision screening, employing statistical methods to ascertain the significance of the study.

6.6 Results:

The preliminary findings from the pilot study presented compelling evidence of the positive impact of advocacy and educational materials on population-based vision screening. The significant 98% increase in participation rates following the distribution of materials indicated heightened awareness and increased engagement. Survey responses further revealed a noteworthy improvement in participants' understanding of the importance of regular vision screening and the early detection of ocular conditions. These outcomes underscored the effectiveness of well-designed educational resources in advancing public health initiatives. In the context of the KantiVelugu program, the beneficiaries and objectives were guided by professionals in healthcare, public health, and research to ensure the accuracy and efficacy of the advocacy materials developed for population-based vision screening initiatives. This collaborative and expert-driven approach underscored the program's commitment to delivering impactful and informed educational content to enhance community participation and awareness in vision care.

In the second phase of the KantiVelugu Program, a thorough investigation targeted the adult population aged 18 and above across all 33 districts in Telangana. This expansive initiative mobilized a substantial workforce comprising approximately 1500 screening teams. Over 100 working days, an impressive 1.61 crore individuals underwent screening. The finding that only 25.1% of this population required the provision of spectacles was noteworthy. A significant majority, accounting for 72%, displayed no major eye conditions, while a small fraction of 2.1% necessitated referrals to tertiary eye hospitals, underscoring the critical role of accurate record-keeping for successful outcomes as documented in the Guinness Book.

This all-encompassing effort served as a testament to the KantiVelugu Program's unwavering dedication to ensuring widespread eye health across the state of Telangana.

Table 6.2: - Results of KantiVelugu program (KVP)-Phase 2

KV Phase II

Parameters		**Kantivelugu**
Coverage		Telangana State
Districts covered		33 districts
Total Screening		1.61 Crores
Spectacles		40.59 Lakhs (25.1%)
	Reading glasses	22.51 Lakhs
	Prescription glasses	18.08 lakhs
Normal Condition (No Eye problems)		85.5 lakhs (72%)

The available evidence strongly indicates that the distribution of glasses through the KantiVelugu Program (KVP) has significantly enhanced the quality of vision and overall life satisfaction for participants. Moreover, their capacity to engage in daily activities has improved substantially compared to the pre-intervention periods. These positive outcomes underscore the potential advocacy issues that can be addressed in subsequent phases, emphasizing the transformative impact of vision correction on individuals' well-being and daily functionality. This observation serves as a compelling basis for advocating the continued and expanded implementation of vision-related interventions in future program phases.

Table 6.3: Comparison results of KantiVelugu program (KVP)-Phase 1 and 2 parameters

Comparison between KV-I & KV-II

Parameters	KV Phase I	KV Phase II
Total Teams	800	1500
Duration of Camp	6 months	100 working days
Ready Readers	RMBF,R2C	Reading only
Age group	8 and above	18 and above
QC Team	30	33
Manufacturer	2.5 NVG (An **Essilor** group of initiative)	**Akriti** Ophthalmic Private limited,
Results	40 Lakhs spectacles distributed	40.59 Lakhs spectacle distributed

6.7 Discussion:

The findings of this pilot study emphasized the pivotal role played by advocacy and education materials in advocating for population-based vision screening. The increased rates of participation and heightened levels of knowledge suggested that accessible and informative materials could serve as crucial catalysts for positive shifts in behavior. However, a more extensive research initiative was deemed necessary to explore the sustained impact of this intervention over the long term and to refine the materials based on valuable participant feedback. This study laid the foundation for the broader integration of the KantiVelugu Program, highlighting the collaborative synergy among healthcare providers, educators, and communities in advancing collective public health goals. The implications of the thesis highlighted the potential for targeted advocacy and educational strategies to instigate enduring positive transformations in population health.

6.8 Limitations

Time Constraints: Due to time constraints, the study encountered limitations in conducting a comprehensive comparison of KantiVelugu program data across all districts.

Population Setting Comparison:The original plan to compare KantiVelugu program beneficiaries in diverse settings, including tribal, urban, and rural populations, was impeded by the COVID-19 pandemic. Owing to the aforementioned constraints, the study couldn't thoroughly explore and compare data and achievements between the two phases of the KantiVelugu program (KVP).

Financial Constraints: A significant challenge was the absence of funding for this research endeavour, impacting its scope and depth.

Limited Data Sources:The restricted funding also affected the ability to gather data from other hospitals, limiting data collection to 900 samples from Sarojini Devi Eye Hospital (SDEH) in Mehdipatnam, Hyderabad.

Foundation for Future Enhancements:The outlined study objectives serve as a foundation for potential future enhancements and implementations, contingent upon resource availability and extended research efforts.

6.9 Highlights

Innovative Epidemiological Strategy: This study presents a pioneering epidemiological strategy and technique designed for the implementation of large-scale vision screening programs with spectacle distribution in developing nations.

Guinness Book of World Records Recognition: The research program achieved recognition in the Guinness Book of World Records for executing the fastest mass vision screening in India, showcasing its efficiency and impact.

Contributions to Vision Science and Ophthalmology: The study is poised to make significant contributions to the knowledge base for the vision science and ophthalmology community by providing novel findings and insights derived from the unique approach of the KantiVelugu program.

Mega and Mass Vision Screening Focus: The research program specifically focuses on mega and mass vision screening initiatives, addressing the challenges and requirements unique to developing countries.

Application in Developing Countries: The newly introduced strategy and technique offer practical solutions tailored to the context of developing nations, providing a valuable resource for public health interventions in similar settings.

Recognition for Efficient Execution: The Guinness World Records acknowledgement underscores the program's exceptional speed and efficiency in conducting mass vision screenings, setting a notable precedent for similar endeavours globally.

Potential for Future Research: The study paves the way for potential future research avenues, laying the groundwork for continued advancements in the field of vision science and the optimization of large-scale vision screening programs.

6.10 Future Scope

District-Level Data Analysis: The current study faced limitations in obtaining district-level data, primarily due to time constraints and the impact of the COVID-19 pandemic. Future

research endeavours should prioritize accessing and analysing district-level data, offering a more granular understanding of the KantiVelugu program's impact on specific regions within Telangana.

Insights for Program Enhancement: Analysing data at the district level can yield crucial insights into the regions that have witnessed the most significant positive outcomes from the KantiVelugu program. This information can be instrumental in tailoring strategies to enhance the program's effectiveness in those areas, optimizing resource allocation and intervention approaches.

Expansion to Neighbouring States:The vision screening methodologies successfully implemented in this initiative present an opportunity for potential expansion into neighbouring states. By extending the program's reach, there is potential for significant contributions to the broader reduction of avoidable blindness in a more extensive geographical context.

Integration of New Technologies: Future research could explore the integration of new technologies and methodologies to further streamline the vision screening process. Leveraging advancements in telemedicine or mobile health applications could enhance accessibility and efficiency, especially in remote or underserved areas.

Long-Term Impact Assessment: Subsequent studies should focus on conducting a long-term impact assessment of the KantiVelugu program. This includes evaluating the sustained effectiveness of the interventions and their lasting impact on vision health within the targeted population.

Collaboration with Public Health Agencies: Collaboration with public health agencies and local governments can be explored for more extensive implementation and integration of the

program into existing healthcare frameworks. This collaboration can ensure sustainability and scalability.

Community Engagement Strategies: Future research could delve into developing and testing community engagement strategies to enhance participation rates and community awareness. This can contribute to the program's overall success and its ability to reach a broader segment of the population.

Evaluation of Economic Impacts: Assessing the economic impacts of the program, including cost-effectiveness and the potential socio-economic benefits for the screened population, would provide a comprehensive understanding of the program's overall value and sustainability.

Training and Capacity Building: Investing in training and capacity building for healthcare professionals involved in the program can contribute to its long-term success. Continuous education and skill development can enhance the quality of vision care provided during screenings and follow-up interventions.

CHAPTER–7

SUMMARY AND CONCLUSION

Summary: -

This study comprehensively explored the "KantiVelugu" program, a significant initiative delivering eye care services in Telangana, a substantial state in South Central India. Employing a descriptive epidemiological approach, secondary data was systematically gathered from diverse sources, including the Telangana government's Department of Health and Family Welfare and consultations with stakeholders and officials intimately involved in the KantiVelugu program.

Encompassing Telangana's rural and urban areas, the program spanned 250 rural wards and 300 urban ward areas, benefiting an expansive population of approximately 3.5 crore. Notably, the data reveals that 40% of those screened required treatment, underscoring the program's profound impact. The initial phase of KantiVelugu commenced with screening 8, 92,256 individuals in 90 wards in Hyderabad. This initiative rapidly expanded to cover the entire state of Telangana and the neighbouring state of Andhra Pradesh, evolving into the "YSR KantiVelugu programme." The year 2023 marked the implementation of the second phase, further extending the program's reach and influence.

A parallel initiative, "NetraKumbh," conducted extensive eye screenings during the revered Kumbh Mela from January 12 to March 4, 2019. Operating on a grand scale, this program provided free eye tests and screenings to over 2,02,020 individuals, with 1,56,020 receiving free spectacles, significantly enhancing their visual capabilities. Both KantiVelugu and NetraKumbh accumulated extensive data on vision screenings, providing distinct insights into the ocular health of people in Telangana and Uttar Pradesh, respectively.

Untreated refractive errors persist as the leading cause of blindness in India, making initiatives like KantiVelugu and NetraKumbh pivotal in mitigating avoidable blindness, particularly among economically disadvantaged communities. Remarkably, this study was the first endeavour to compare eye camp data on such a grand scale across individual states throughout India, contributing valuable insights to the broader landscape of public health initiatives.

Conclusion: -

The information derived from the control program was meticulously analyzed using epidemiological approaches to gauge its tangible impact on the beneficiary population. Notably, the districts of Hyderabad and Rangareddy in Telangana state revealed 42.42% of "KantiVelugu" beneficiaries, prompting the necessity to delve into and assess the experiences of these beneficiaries based on the study findings.

The imminent second phase of the state's flagship KantiVelugu project was poised to include mass eye screening camps across all villages, Gram Panchayats, and municipal wards. This strategic expansion involves micro-level discussions led by public representatives to prepare for the upcoming eye camps in January 2023, employing 1500 health teams working for 100 days. Building on the success of the first phase with 827 health teams working for eight months, this initiative underscored the commitment to extend the reach and impact of vision correction interventions.

Taken together, the individual objectives of the study indicated a favourable outcome resulting from vision correction interventions in Telangana. The KantiVelugu Program effectively improved both the quality of vision and the overall quality of life for its beneficiaries. The comprehensive documentation of large-scale vision screening initiatives,

particularly focusing on KantiVelugu and NetraKumbh, offers a deep understanding of the extensive efforts undertaken in the state. The research accentuates the substantial positive impact of the KantiVelugu program on visual acuity and the overall well-being of its recipients, highlighting its efficacy in addressing vision-related challenges and enhancing overall well-being within the target population.

Significantly, uncorrected refractive errors, a leading cause of blindness in India, were addressed through mega vision screening programs, potentially preventing avoidable blindness, particularly among economically disadvantaged communities. Uniquely positioned, this study was the first to compare extensive eye camp data at the state level across India. Furthermore, the pilot testing of advocacy and educational materials underscored the pivotal role of well-designed informational resources in promoting early intervention for vision-related issues. This research informs future vision correction programs andemphasizes the critical role of accessible and comprehensive eye care services in improving visual health and overall well-being for individuals in Telangana.

In conclusion, this research strives to comprehensively understand the "KantiVelugu" program and the accessibility of eye care services in Telangana. The program's inclusive and systematic approach profoundly impacted both rural and urban areas, benefitting a significant portion of the state's population. By providing accessible and cost-effective eye care, this state-wide initiative represented a crucial step towards achieving universal eye health. The finding of this study holds significance not only for Telangana but also offers valuable insights for similar initiatives on a national scale.

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APPENDIX I

IEC APPROVAL

UNIVERSITY OF HYDERABAD
INSTITUTIONAL ETHICS COMMITTEE DECISION LETTER

IEC No. **Application No:**	UH/IEC/2019/216	**Date of review**	16-03-2022
Project Title:	The Quality of Vision & Quality of life after vision correction due to refractive errors in Telangana State.		
Principal Investigator/ Co-PI:	PI: Lavudi Suresh CI: Prof. B.R. Shamanna		
Participating Institutes if any	----	Approval from Participating Institute	----
Documents received and reviewed	Protocol & ICF		
In case of renewal submission of update	----		
Decision of the IEC:	Approved Duration: One year from date of approval		
Any other Comments Requirements for conditional Approval	----		
Members Present	Dr. A.S. Sreedhar, Sri. A. Madhava Rao, Dr. Stalin Chowdary Bala, Dr. M. Srinivas, Dr. M.K. Aruansree, Prof. Pingali Sailaja, Prof. B.R. Shamanna, Dr. M. Varalakshmi and Dr. Deepa Srinivas		

Please note:

a. Any amendments in the protocol must be informed to the Ethics committee and fresh approval taken.
b. Any serious adverse event must be reported to the Ethics Committee within 48 hours in writing (mentioning the protocol No. or the study ID)
c. Any advertisement placed in the newspapers, magazines must be submitted for approval.
d. If the conduct of the study is to be continued beyond the approved period, an application for the same must be forwarded to the Ethics Committee.
e. It is hereby confirmed that neither you nor any of the members of the study team participated in the decision making/voting procedures and declared conflict of interest.

A S Sreedhar 16/03/22

Chairman — **(Dr. A S Sreedhar)**

Member Secretary 16/3/22 — **(Prof. B.R. Shamanna)**

16/03/2022

Convenor — **(Dr. M. Varalakshmi)**

Address: School of Medical Sciences, University of Hyderabad, C. R. Rao Road, Gachibowli, Hyderabad-5000046
Tel (O): +91-040-23135470/23135471 Email: iec_uoh@uohyd.ernet.in, deanmd@uohyd.ernet.in

APPENDIX II

PERMISSION LETTERES

The Joint Director (NPCB&VI),
Commissioner, Health and Family Welfare,
Koti Sultana Bazar Hyderabad, Telangana State, India
Kind attention: Dr. L. Kalavathi Bai

Dear Madam,

Sub: - Reg: Permission for my scholar to secure and use "Kanti Velugu " data for his academic research.

On behalf of my scholar, Mr.Lavudi Suresh (17MOPH03) pursuing Ph.D in Health Sciences (Optometry and Vision science), School of Medical sciences, University of Hyderabad I am approaching you with this request for facilitation.

Mr. Suresh is doing his doctoral research on studying the "Kanti Velugu" program. He will require data for understanding the process and magnitude of this phenomenal event and comparing the process with the Netra Kumbh program. He will also administer the quality of life changes questionnaire before and after intervention through Kanti Velugu to understand the impact of this unique program.

For his academic research he wants to collect data from Kanti Velugu from selected districts in confidence and will use it as per the guidelines of the University Ethics Committee that he has already secured. I copy of the IEC approval is enclosed for your perusal.

Thank you in advance for your kind help and we will acknowledge your contribution in our project and final thesis as you deem it fit.

Thank you.

Yours Sincerely,

20/12/2021

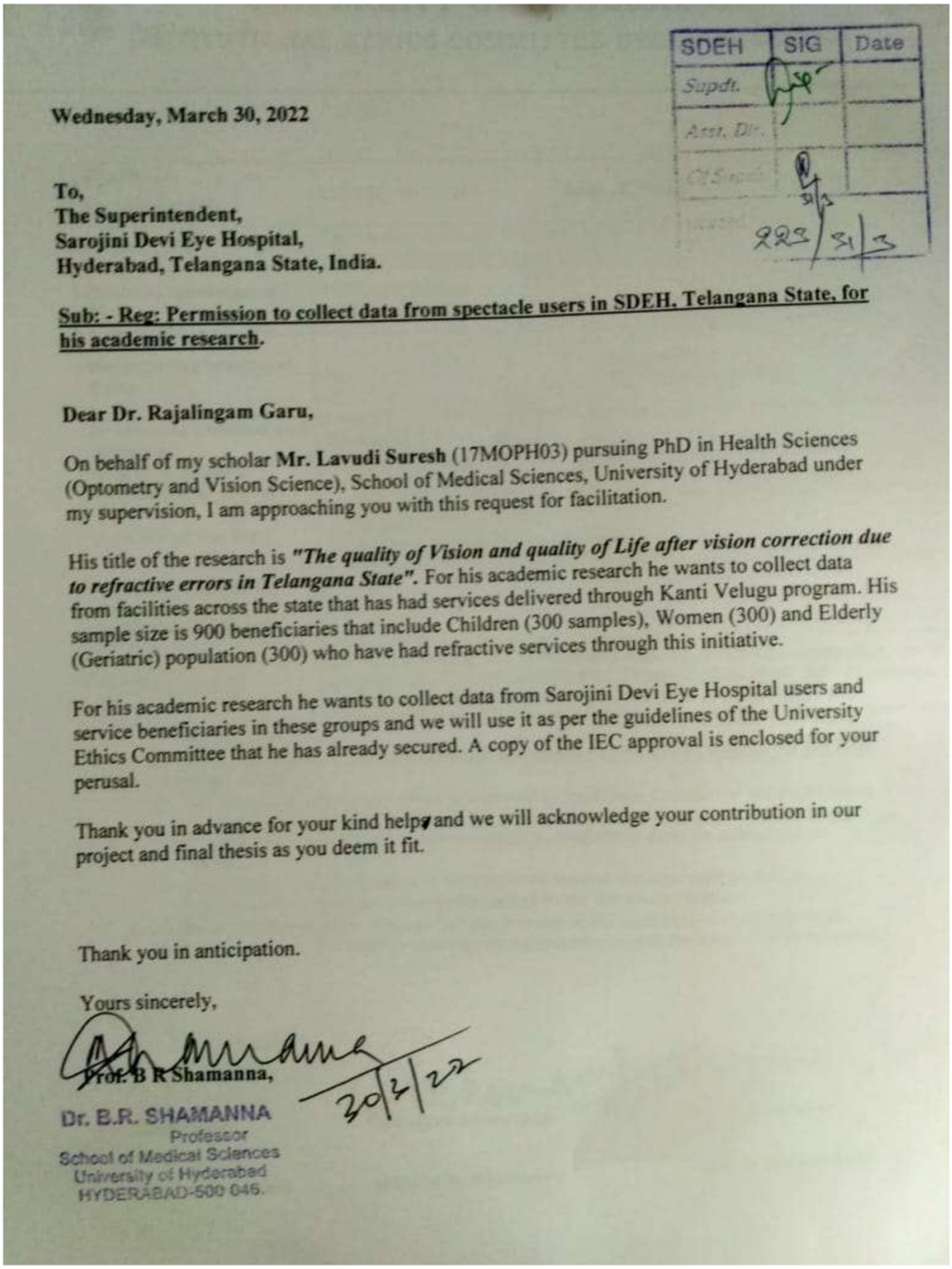
Date: 20/12/2021,
Place: Hyderabad.

B.K. SHAMANNA
Professor
School of Medical Sciences
University of Hyderabad
HYDERABAD - 500 046. T.S. India.

Approved and Provided data,

10/1/21

Joint Director (NPCB) &
State Programme Officer,
Directorate of Public Health &
Family Welfare
Koti, Sultan Bazar, Hyderabad.



SDEH	SIG	Date
Supdt.		
Asst. Dir.		
CA Supdt.		

223/31/3

Wednesday, March 30, 2022

To,
The Superintendent,
Sarojini Devi Eye Hospital,
Hyderabad, Telangana State, India.

Sub: - Reg: Permission to collect data from spectacle users in SDEH, Telangana State, for his academic research.

Dear Dr. Rajalingam Garu,

On behalf of my scholar **Mr. Lavudi Suresh** (17MOPH03) pursuing PhD in Health Sciences (Optometry and Vision Science), School of Medical Sciences, University of Hyderabad under my supervision, I am approaching you with this request for facilitation.

His title of the research is ***"The quality of Vision and quality of Life after vision correction due to refractive errors in Telangana State".*** For his academic research he wants to collect data from facilities across the state that has had services delivered through Kanti Velugu program. His sample size is 900 beneficiaries that include Children (300 samples), Women (300) and Elderly (Geriatric) population (300) who have had refractive services through this initiative.

For his academic research he wants to collect data from Sarojini Devi Eye Hospital users and service beneficiaries in these groups and we will use it as per the guidelines of the University Ethics Committee that he has already secured. A copy of the IEC approval is enclosed for your perusal.

Thank you in advance for your kind help and we will acknowledge your contribution in our project and final thesis as you deem it fit.

Thank you in anticipation.

Yours sincerely,

Prof. B R Shamanna,

30/3/22

Dr. B.R. SHAMANNA
Professor
School of Medical Sciences
University of Hyderabad
HYDERABAD-500 046.

The Joint General Secretary,
SAKSHAM, Hyderabad,
Telangana State, India.

Sub: - Reg: Permission for my scholar to secure and use "Netra Kumbh" data for his academic research.

Dear Dr. Santoshji,

On behalf of my scholar, **Mr.Lavudi Suresh** (17MOPH03) pursuing Ph.D in Health Sciences (Optometry and Vision science), School of Medical sciences, University of Hyderabad I am approaching you with this request for facilitation.

Mr. Suresh is doing his doctoral research on studying the "Netra Kumbh" program. He will require data for understanding the process and magnitude of this phenomenal event and comparing the process with the state's Kanti Velugu program.

For his academic research he wants to collect data from Netra Kumbh in confidence and will use it as per the guidelines of the University Ethics Committee that he has already secured. I copy of the IEC approval is enclosed for your perusal.

Than you in advance for your kind help and we will acknowledge your contribution in our project and final thesis as you deem it fit.

Thank you.

Yours Sincerely,

20/12/21

Date: 20/12/2021,
Place: Hyderabad.

B.R. SHAMANNA
Professor
School of Medical Sciences
University of Hyderabad
HYDERABAD - 500 046. T.S. India.

Approved
13/1/2022.
Dr. Santhosh to take lead.

Dr. Santhosh Kumar Kralati
National Program Director - CAMBA
(A Project of SAKSHAM)

APPENDIX III:

QUESTIONNAIRE TOOLS

"THE QUALITY OF VISION AND QUALITY OF LIFE AFTER VISION CORRECTION DUE TO REFRACTIVE ERRORS IN TELANGANA STATE."

Demographic details:-

Name:

Gender:

Age:

Educational qualifications:

Question number to be attempted: All population-1-42, Female specific-43-48, Children specific 49-57, Geriatric age group 58-61 (Adapted from IND VFQ33&Washington Group on Vision)

I am a beneficiary of KantiVelugu Program of TS state? Yes/No

Location of Services from the KV program: _____

1	In KantiVelugu camp You were given spectacles for?	• Distance vision only • Near vision only • Both distance and near vision • I am not aware	
2	Are you still using the pair of spectacles regularly provided at KantiVelugu?	• Yes • No	
	If no: what is the reason for you to stop using the spectacles?	• Vision was not clear with spectacles • The spectacles were hurting behind the ears • The spectacles were hurting around the nose • People said I do not look good with those spectacles • Others specify_____	
	If yes: How much (adaption) time did it take for you to get used to your new glasses	• 1 week • 2 weeks • 3 weeks • More than 3 weeks • I did not notice	
A.VISUAL FUNCTION-OUTDOOR ACTIVITIES			
	QUESTIONS General functioning scale	Before getting spectacles from KantiVelugu	After getting spectacles from KantiVelugu
3	Because of your vision how much problem do you have in climbing stairs?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)

4	Because of your vision how much problem do you have in making out the bumps and pot holes in the road when walking?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
5	Because of your vision how much problem do you have in seeing if there are animals or vehicles when walking?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
6	Because of your vision how much problem do you have in finding your way in new places?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
7	Because of your vision how much problem do you have in going to social functions such as weddings or places of worship like temples, mosque, church and Gurudwara?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
8	Because of your vision how much problem do you have in going out at night?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
9	Because of your vision how much problem do you have in seeing the steps of the bus when climbing out?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
10	How much problem do you have in seeing outside in bright sunlight?	• Not all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
11	Because of your vision how much problem do you have in making out differences In coins or notes?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
12	Because of your eye problem do you feel frightened to bump into things?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)

13	Because of your eye problem do you feel frightened to go out at night?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
14	How much problem do you have in recognizing people from a distance like bus numbers, wall posts and TV scrolls etc..?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
B.VISUALFUNCTIONS-INDOOR ACTIVITIES.			
15	Because of your vision how much problem do you have in finding your way indoors/inside the house/work place?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
16	How much problem do you have in recognizing the face of a person standing near you?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
17	Because of your vision how much problem do you have in locking or unlocking the door?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
18	Because of your vision how much problem do you have in searching for things at home?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
19	How much problem do you have in seeing when coming into the house after being in the sunlight?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
20	Because of your vision how much problem do you have in going to toilet?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
21	Because of your vision how much problem do you have in doing your activities of daily life or daily routine in the house?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)

VISUAL SYMPTOMS SCALE			
22	Do you have reduced vision?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
23	Are you dazzled in bright light?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
24	Is your vision blurred in sunlight?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
25	Does bright light hurt your eyes?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
26	Does everything seem dark when the light is dim?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
27	Does light seem like stars?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
28	Do you close your eyes because of light from vehicles?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
	PSYCHO SOCIAL IMPACT SCALE		
29	[Do/Does] [you/he/she] have difficulty seeing, [If VIS_1 = 1: even when wearing [your/his/her] glasses]? Would you say...?	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all
30	Do/does] [you/he/she] have difficulty clearly seeing someone's face across a room [IfVIS_1 = 1: even when wearing [your/his/her] glasses]? Would you say...? [Read response categories]?	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all
31	[Do/does] [you/he/she] have difficulty clearly seeing the picture on a coin [If VIS_1 = 1: even when wearing [your/his/her] glasses]? Would you say...? [Read response categories]?	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all	• No difficulty • Some difficulty • A lot of difficulty • Cannot do at all
32	Because of your eye problem do you feel ashamed that you can't see?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
33	Because of your eye problem do you feel you have become a burden on	• Not at all (1) • A little (2) • Quite abit (3)	• Not at all (1) • A little (2) • Quite abit (3)

	others?	• Alot (4)	• Alot (4)
34	I expect to be completely blind at some time in the future?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
35	Do you feel financial burden for buying spectacles?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
36	Do you feel that there is no use of spectacles if correction of power is given for one eye only (Unilateral refractive correction)?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
37	Do you consider that refractive error is not a real health problem/sickness like other medical sickness?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
38	Is there any verbal abuse or negative feedback from people around which is making you use spectacles less efficiently?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
39	Do you allow your child to wear prescribed spectacles?	• Yes • No • Not applicable	• Yes • No • Not applicable
40	Do you feel that a spectacle makes eyesight worse or person will be dependent on it? Eyes will shrink or deep socketed after spectacles use?	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot (4)
41	Diet and traditional methods are alternative treatment option for refractive error?	• Yes • No • Don't know	• Yes • No • Don't know
42	Are you aware of other ways of treating refractive errors? (Contact Lens and Surgery etc...)	• Yes • No • Don't know	• Yes • No • Don't know
Female specific questions: Answer only if gender is female			
43	Because of your vision how much problem do you have in identifying things in the kitchen when using. Seeing?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
44	Because of your vision how much problem do you have in seeing objects that may have fallen in the food?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)

45	Because of your vision how much difficulty you have in cooking food?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
46	Because of your vision how much difficulty you have in cutting vegetables?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
47	Because of you vision how much difficulty you face in personal hygiene and hygiene during menstrual cycle?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
48	Because of your eyesight, how much difficulty do you have doing things like dressing, styling Your hairs or putting on make-up?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
CHILDREN SPECIFIC-OUTDOOR ACTIVITIES BASED			
49	How is your appearance with your spectacles?	• Good(1) • I like my spectacles look(2) • Average • I look like book worm • I feel like I look more better without spectacles • Want to get rid of spectacles • It does not matter to me	• Good • I like my spectacles look • Average • I look like book worm • I feel like I look more better without spectacles • Want to get rid of spectacles • It does not matter to me
50	Do your friends tease you with different names because of spectacles?	• Yes • No	• Yes • No
51	Because of your vision how easy is it for you to ride your bicycle/bike?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • I don't ride bicycle/bike (5)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • I don't ride bicycle/bike(5)
52	Because of your eyesight, how much difficulty do you have taking part in active sports or other outdoor activities that you enjoy (Like Golf, Bowling, Jogging or Walking)?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
CHILDREN SPECIFIC-INDOOR ACTIVITIES BASED			

53	Because of your vision how much difficulty do you face in studying?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
54	Because of you vision do you face difficulty in painting or drawing? Other hobby limitations?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
55	Because of your vision do you think that examination time is not sufficient as you are slow because of your vision?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
56	Because of your eyesight, how much difficulty do you have playing cards or games like bingo or Pub G?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • I do not play these games(5)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • I do not play these games(5)
57	Becauseofyourvisionshowmuch problemdoyouhaveinseeingdifferencesincolours?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
GERIATRIC SPECIFIC QUESTIONS – answer only if your age is above 60 years			
58	Wearing glasses, how much difficulty do you have reading the small print in a telephone book, on a medicine bottle, or on legal forms? newspaper	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • Illiterate	• Not all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4) • Illiterate
59	I stay home most of the time because of my eyesight?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
60	Because of your vision how much problem do you have in doing your workup to your usual standard?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)
61	Do you expect your eyesight to get worse than it is now with your growing age?	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)	• Not at all (1) • A little (2) • Quite abit (3) • Alot&Cannot do this because of my sight (4)

"తెలంగాణరాష్ట్రంలోవక్రీభవనలోపాలకారణంగాదృష్టిదిద్దుబాటుతర్వాతదృష్టినాణ్యతమరియుజీవితంయొక్కనాణ్యత"

జనాభావివరాలు:-

పేరు :

లింగం :

వయస్సు :

విద్యార్హతలు :

ప్రయత్నించవలసినప్రశ్న సంఖ్య: మొత్తంజనాభా-1-42, స్త్రీనిర్దిష్ట-43-48, పిల్లలునిర్దిష్ట 49-57, వృద్ధులవయస్సు 58-61
(IND VFQ33& వాషింగ్టన్గ్రూప్ఆన్వికున్నుండిస్వీకరించబడింది)

నేనుతెలంగాణరాష్ట్రకంటివెలుగుప్రోగ్రామ్యొక్కలబ్ధిదారునినా? అవును/కాదు
KV ప్రోగ్రామ్నుండిసేవలస్థానం : _____

1	కంటివెలుగుక్యాంపులోమీకుకళ్ల ద్దాలుఇచ్చారా?	• దూరదృష్టిమాత్రమే • సమీపదృష్టిమాత్రమే • దూరంమరియుసమీపదృష్టిరెండూ • నాకుతెలియదు	
2	కంటివెలుగులోక్రమంతప్పకుండా అందించేకళ్లజోడునుమీరుఇప్ప టికీఉపయోగిస్తున్నారా?	•అవును •కాదు	
	లేకపోతే : మీరుకళ్లద్దాలువాడటంమానేయ డానికికారణంఏమిటి?	• కళ్లద్దాలతోదృష్టిస్పష్టంగాలేదు • కళ్లద్దాలుచెవులవెనుకనొప్పిగాఉన్నాయి • కళ్లద్దాలుముక్కుచుట్టూగాయపడ్డాయి • ఆకళ్లద్దాలతోనేనుబాగాకనిపించడంలేదనిప్రజలుచెప్పారు • ఇతరులు _____నిపేర్కొంటారు	
	అవునుఅయితే: మీరుమీకొత్తఅద్దాలకుఅలవాటు పడేందుకుఎంత (అనుకూలత) సమయంపట్టింది	•1 వారం •2 వారాల • 3 వారాలు • 3 వారాలకంటేఎక్కువ •నేనుగమనించలేదు	
విజువల్ఎంక్షన్-అవుట్డోర్కార్యకలాపాలు			

	ప్రశ్నలు సాధారణపనితీరుస్థాయి	కంటివెలుగునుంచికళ్లద్దాలుతెచ్చుకునేముందు	కంటివెలుగునుంచికళ్లద్దాలుతీసుకున్నతర్వాత
3	మీదృష్టికారణంగామెట్లుఎక్కడానికిమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
4	మీదృష్టికారణంగా, నడిచేటప్పుడురోడ్డులోగడ్డలుమరియుగుంతలుఏర్పడటంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
5	మీదృష్టికారణంగానడిచేటప్పుడుజంతువులులేదావాహనాలుఉన్నాయాఅనిచూడటంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
6	మీదృష్టికారణంగాకొత్తప్రదేశాలలోమీమార్గాన్నికనుగొనడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
7	మీదృష్టికారణంగావివాహాలులేదాదేవాలయాలు, మసీదు, చర్చిమరియుగురుద్వారావంటిప్రార్థనాస్థలాలువంటిసామాజికకార్యక్రమాలకువెళ్లడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
8	మీదృష్టికారణంగారాత్రిపూటబయటికివెళ్లడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
9	మీదృష్టికారణంగాబస్సుఎక్కేటప్పుడుస్టెప్పు	• అస్సలుకాదు (1)	• అస్సలుకాదు (1)

	లుచూడడంలోమీకుఎంతసమస్యఉంది?	• కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
10	ప్రకాశవంతమైనసూర్యకాంతిలోబయటచూడటంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
11	మీదృష్టికారణంగాతేడాలుచేయడంలోమీకుఎంతసమస్యఉంది నాణేలులేదానోట్లలో?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
12	మీకంటిసమస్యకారణంగామీరువిషయాల్లోదూసుకుపోవడానికిభయపడుతున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
13	మీకంటిసమస్యకారణంగామీరురాత్రిపూటబయటకువెళ్లడానికిభయపడుతున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
14	బస్సునంబర్లు, వాల్పోస్టులుమరియుటీవీస్క్రోల్స్వంటిదూరంనుండివ్యక్తులనుగుర్తించడంలోమీకుఎంతసమస్యఉంది..?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
విజువల్ఫంక్షన్స్-ఇండోర్కార్యకలాపాలు			
15	మీదృష్టికారణంగాఇంటిలోపల/ఇంట్లో/పనిస్థలంలోమీమార్గాన్నికనుగొనడంలోమీకుఎంతసమస్య	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3)

	ఉంది?	•నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	•నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
16	మీదగ్గరనిలబడిఉన్నవ్యక్తిముఖాన్నిగుర్తించడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
17	మీదృష్టికారణంగాతలుపులాక్చేయడంలేదాఅన్‌లాక్చేయడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
18	మీదృష్టికారణంగాఇంటివస్తువులనువెతకడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
19	సూర్యకాంతిలోఉన్నతర్వాతఇంట్లోకివచ్చినప్పుడుచూడటంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
20	మీదృష్టికారణంగామీరుమరుగుదొడ్డికివెళ్లడంలోఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
21	మీదృష్టికారణంగామీరోజువారీజీవితంలోలేదాఇంట్లోరోజువారీకార్యకలాపాలుచేయడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)

విజువల్సింప్టమ్స్స్కేల్			
22	మీకుచూపుతగ్గిందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
23	మీరుప్రకాశవంతమైనకాంతిలోఅబ్బురపడుతున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
24	సూర్యకాంతిలోమీదృష్టిఅస్పష్టంగాఉందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
25	ప్రకాశవంతమైనకాంతిమీకళ్ళకుహానికలిగిస్తుందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
26	వెలుతురుమసకగాఉంటేఅంతాచీకటిగాఅనిపిస్తుందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
27	కాంతినక్షత్రాలలాఅనిపిస్తుందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
28	వాహనాలవెలుతురువల్లకళ్లుమూసుకుంటున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)

సైకోసోషల్ఇంపాక్ట్స్			
29	[చేయండి/చేయండి] [మీరు/అతను/ఆమె] చూడటంకష్టం, [VIS_1 = 1 అయితే: ధరించినప్పుడుకూడా [మీ/అతని/ఆమె] అద్దాలు]? చెబుతారా . . .?	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము
30	[మీరు/అతడు/ఆమె] గదిఅంతటాఒకరిముఖాన్నిస్పష్టంగాచూడటంలోఇబ్బందిపడుతున్నారా? [VIS_1 = 1 అయితే: [మీ/అతని/ఆమె] అద్దాలుధరించినప్పుడుకూడాచెబుతారా. ..? [ప్రతిస్పందనవర్గాలనుచదవండి]?	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము
31	[చేస్తాను/చేస్తాడు] [మీరు/అతడు/ఆమె] నాణెంపైచిత్రాన్నిస్పష్టంగాచూడటం [VIS_1 = 1 అయితే: [మీ/అతని/ఆమె] అద్దాలుధరించినప్పుడుకూడా]? చెబుతారా...? [ప్రతిస్పందనవర్గాలనుచదవండి]?	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము	• ఇబ్బందిలేదు • కొంతకష్టం • చాలాకష్టం • అస్సలుచేయలేము
32	మీకంటిసమస్యవల్లమీరుచూడలేకసిగ్గుపడుతున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
33	మీకంటిసమస్యకారణంగామీరుఇతరులకుభారంగామారారనిభావిస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
34	నేనుభవిష్యత్తులోఏదోఒకసమయంలోపూర్తిగాఅంధుడినిఅవుతాననిఅనుకుంటున్నానా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)

35	కళ్లద్దాలుకొనడంవల్లమీకుఆర్థికభారంఅనిపిస్తుందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
36	ఒక్కకంటికిమాత్రమేపవర్ఆప్టిద్దుబాటు (ఏకపక్షవక్రీభవనకరెక్షన్) ఇస్తేకళ్లద్దాలవల్లఉపయోగంలేదనిభావిస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
37	వక్రీభవనదోషంఇతరవైద్యపరమైనఅనారోగ్యాలవలెనిజమైనఆరోగ్యసమస్య/అనారోగ్యంకాదనిమీరుభావిస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
38	మీచుట్టూఉన్నవ్యక్తులనుండిఏదైనాశబ్దదుర్వినియోగంలేదాప్రతికూలఅభిప్రాయంఉందా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
39	సూచించినకళ్లద్దాలుధరించడానికిమీరు మీబిడ్డనుఅనుమతిస్తారా?	•అవును •కాదు •వర్తించదు	•అవును •కాదు •వర్తించదు
40	కళ్లజోడుకంటిచూపునుమరింతదిగజార్చుతుందనిలేదావ్యక్తిదానిపైఆధారపడతారనిమీరుభావిస్తున్నారా? కళ్లద్దాలువాడినతర్వాతకళ్లుముడుచుకుపోతాయాలేదాలోతుగాకుంగిపోతాయా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) • చాలా (4)
41	ఆహారంమరియుసాంప్రదాయపద్ధతులు వక్రీభవనలోపానికిప్రత్యామ్నాయచికిత్సా ఎంపిక?	•అవును •కాదు • తెలియదు	•అవును •కాదు • తెలియదు
42	వక్రీభవనలోపాలచికిత్సకుఇతరమార్గాలగురించిమీకుతెలుసా? (కాంటాక్ట్లెన్స్మరియుసర్జరీమొదలైనవి...)	•అవును •కాదు • తెలియదు	•అవును •కాదు • తెలియదు
స్త్రీనిర్దిష్టప్రశ్నలు: లింగంస్త్రీఅయితేమాత్రమేసమాధానంఇవ్వండి			

43	మీదృష్టికారణంగావంటగదిలోని వస్తువులనుఉపయోగించినప్పుడుగుర్తించడంలోమీకుఎంతసమస్యఉంది. చూస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
44	మీదృష్టికారణంగాఆహారంలోపడిపోయినవస్తువులనుచూడటంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
45	మీదృష్టికారణంగామీరుఆహారంవండడంలోఎంతకష్టపడుతున్నారు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
46	మీదృష్టికారణంగామీరుకూరగాయలుకోయడానికిఎంతకష్టపడుతున్నారు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
47	మీదృష్టికారణంగాఋతుచక్రంసమయంలోవ్యక్తిగతపరిశుభ్రతమరియుపరిశుభ్రతలోమీరుఎంతఇబ్బందులుఎదుర్కొంటున్నారు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
48	మీకంటిచూపుకారణంగా, మీరుడ్రైస్సింగ్, స్టైలింగ్వంటిపనులుచేయడానికిఎంతకష్టపడుతున్నారు మీవెంట్రుకలులేదామేకప్వేసుకుంటున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
పిల్లలనిర్దిష్ట-అవుట్‌డోర్యాక్టివిటీస్ఆధారంగా			

49	మీకళ్లద్దాలతోమీప్రదర్శనఎలాఉంది?	•మంచిది •నాకళ్లద్దాలరూపాన్నినేనుఇష్టపడుతున్నాను • సగటు •నేనుపుస్తకాలపురుగులాకనిపిస్తున్నాను •నేనుకళ్లద్దాలులేకుండామరింతమెరుగ్గాకనిపిస్తున్నాను •కళ్లద్దాలువదిలించుకోవాలనుకుంటున్నారా •నాకుసంబంధంలేదు	•మంచిది •నాకళ్లద్దాలరూపాన్నినేనుఇష్టపడుతున్నాను • సగటు •నేనుపుస్తకాలపురుగులాకనిపిస్తున్నాను •నేనుకళ్లద్దాలులేకుండామరింతమెరుగ్గాకనిపిస్తున్నాను •కళ్లద్దాలువదిలించుకోవాలనుకుంటున్నారా •నాకుసంబంధంలేదు
50	కళ్లద్దాలకారణంగామీస్నేహితులుమిమ్మల్నిరకరకాలపేర్లతోఆటపట్టిస్తారా?	•అవును •కాదు	•అవును •కాదు
51	మీదృష్టికారణంగామీసైకిల్/బైక్తొక్కడంఎంతసులభం?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నేనుసైకిల్/బైక్నడపను(5)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నేనుసైకిల్/బైక్నడపను(5)
52	మీకంటిచూపుకారణంగా, మీరుయాక్టివ్స్పోర్ట్స్లేదాఇతరఅవుట్డోర్యాక్టివిటీస్లోపాల్గొనడంవల్ల మీరుఎంతకష్టపడుతున్నారు (గోల్ఫ్, బౌలింగ్, జాగింగ్లేదావాకింగ్వంటివి)?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
పిల్లలనిర్దిష్ట-ఇండోర్కార్యకలాపాలుఆధారంగా			
53	మీదృష్టికారణంగామీరుచదువులోఎంతఇబ్బందిపడుతున్నారు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)

54	మీదృష్టికారణంగామీరుపెయింటింగ్లేదాడ్రాయింగ్లోఇబ్బందులుఎదుర్కొంటున్నారా? ఇతరఅభిరుచిపరిమితులు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
55	మీదృష్టికారణంగామీరునెమ్మదిగాఉన్నందునపరీక్షసమయంసరిపోదనిమీరుఅనుకుంటున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
56	మీకంటిచూపుకారణంగా, మీరుకార్డ్లులేదాబింగోలేదాపబ్ G వంటిగేమ్లుఆడటంలోఎంతఇబ్బందిపడుతున్నారు?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నేనుఈఆటలుఆడను(5)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నేనుఈఆటలుఆడను(5)
57	మీదృష్టికారణంగామీరురంగులలోతేడాలనుచూస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
వృద్ధులకుసంబంధించిననిర్దిష్టప్రశ్నలు - మీవయస్సు 60 ఏళ్లుపైబడిఉంటేమాత్రమేసమాధానంఇవ్వండి			
58	అద్దాలుధరించి, టెలిఫోన్బుక్లో, మందుబాటిల్లోలేదాచట్టపరమైనఫారమ్లలోనిచిన్నముద్రణనుచదవడంమీకుఎంతకష్టంగాఉంది? వార్తాపత్రిక	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నిరక్షరాస్యుడు	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4) •నిరక్షరాస్యుడు

59	నాకంటిచూపుకారణంగానేనుఎక్కువసమయంఇంట్లోనేఉంటాను?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము(4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
60	మీదృష్టికారణంగామీసాధారణప్రమాణానికిఅనుగుణంగామీపనినిచేయడంలోమీకుఎంతసమస్యఉంది?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)
61	మీపెరుగుతున్నవయస్సుతోమీకంటిచూపుఇప్పుడుఉన్నదానికంటేఅధ్వాన్నంగాఉంటుందనిమీరుభావిస్తున్నారా?	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)	• అస్సలుకాదు (1) • కొద్దిగా (2) • కొంచెం (3) •నాదృష్టికారణంగాచాలా&దీన్నిచేయలేము (4)

APPENDIX IV

CONSENT FORM

PARTICIPANT INFORMATION WITH INFORMED CONSENT FORM

Dear Participant,

The present research study entitled "**THE QUALITY OF VISION AND QUALITY OF LIFE AFTER VISON CORRECTION DUE TO REFRACTIVE ERRORS IN TELENGANA STATE."**Conducted by **Mr. Lavudi Suresh** is carried out as his part of PhD research under the Supervision of Prof. BR Shamanna Faculty, School of Medical Sciences, and University of Hyderabad. For this study I am collecting data from you through the questionnaires on Information related as stated above. The confidentiality and anonymity of the data will be maintained and the data further may by used the investigators for the academic / research and may be shared in the programs planned for the welfare of the target population.

Participation in this study is entirely voluntary. You may withdraw from the study or refuse to participate at any point of the study. You will be given opportunity to clarify your doubts or questions at any point of time throughout the study period.

INFORMED CONSENT FORM

Here with I am willing to participate in the study voluntarily and my participation indicates my complete understanding of the information. I am providing my consent to participate in the study and agree for any audio/video recording of the interview if necessary as part of the study.

Participant's Signature: Name:

Address: Mobile No:

Date:

Name & Signature of the Investigator: Mr. Lavudi Suresh

Contact No: +91-7674976712, Email id:17moph03@uohyd.ac.in / suresh.lavudi@gmail.com

Details of the Supervisor:

Dr BR Shamanna
Professor,
School of Medical Sciences,
University Of Hyderabad,
Gachibowli, 500046.

పాల్గొనేవారి సమాచార సమ్మతి పత్రం

ప్రియమైన పాల్గొనేవారు,

ప్రస్తుత పరిశోధన అధ్యయనం "తెలంగాణ రాష్ట్రంలో కంటిచూపు దిద్దుబాటు తర్వాత జీవితం మరియు జీవితం యొక్క నాణ్యత." అనేఅంశంపైపరిశోధకుడులావుడిసురేష్ చేతనిర్వహించబడినది,డాక్టర్ రిషి భరద్వాజ్మరియుడాక్టర్బిఆర్షమన్నా

పర్యవేక్షణలో పిహెచ్‌డి పరిశోధనలో భాగంగా, మెడికల్ సైన్సెస్, హైదరాబాద్ విశ్వవిద్యాలయంలో ఈ పరిశోధన జరుగుతుంది. ఈ అధ్యయనం కోసం నేను పైన పేర్కొన్న విధంగా సమాచారానికి సంబంధించిన ప్రశ్నపత్రాల ద్వారా మీ నుండి సమాచారాన్ని సేకరిస్తున్నాను. సమాచారం యొక్క గోప్యత మరియు అనామకత నిర్వహించబడుతుంది మరియు సమాచారం విద్య / పరిశోధనల కోసం మాత్రమే ఉపయోగించబడుతుంది. ఈ సమాచారం నిర్దేశించబడిన జనాభా యొక్క సంక్షేమం పథకాల కోసం కూడా ఉపయోగించబడును. ఈ అధ్యయనంలో పాల్గొనడం పూర్తిగా స్వచ్ఛందంగా ఉంటుంది. మీరు అధ్యయనం నుండి వైదొలగవచ్చు లేదా
సమయంలోనైనా పాల్గొనడానికి నిరాకరించవచ్చు. అధ్యయన జరిగే ఏ సమయంలోనైనా మీ సందేహాలను లేదా ప్రశ్నలను స్పష్టం చేయడానికి మీకు అవకాశం ఇవ్వబడుతుంది.

సమాచార సమ్మతి పత్రం

ఇక్కడ నేను స్వచ్ఛందంగా అధ్యయనంలో పాల్గొనడానికి సిద్ధంగా ఉన్నాను. ఈ అధ్యయనంలో ఇస్తున్న సమాచారం నా సంపూర్ణ అవగాహనతో, ఇష్టపూర్వతను తెలియజేస్తుంది. నేను అధ్యయనంలో పాల్గొనడానికి నా సమ్మతిని అందిస్తున్నాను మరియు అధ్యయనంలో భాగంగా అవసరమైతే ఇంటర్వ్యూ యొక్క ఏదైనా ఆడియో / వీడియో రికార్డింగ్ కోసం అంగీకరిస్తున్నాను.

పాల్గొనేవారి సంతకం: **పేరు:**

చిరునామా: **మొబైల్ నెంబర్:**

తేదీ:

పరిశోధకుడి పేరు & సంతకం: లావుడి సురేష్

సంప్రదింపు నెంబర్: + 91-7674976712, ఇమెయిల్ ఐడి: 17moph03@uohyd.ac.in

పర్యవేక్షకుల వివరాలు:

డాక్టర్ రిషి భరద్వాజ్
అసిస్టెంట్ ప్రొఫెసర్,
స్కూల్ ఆఫ్ మెడికల్ సైన్సెస్,
హైదరాబాద్ విశ్వవిద్యాలయం,
గచ్చిబౌలి, 500046.

డాక్టర్ బి ఆర్ షమన్న
ప్రొఫెసర్,
స్కూల్ ఆఫ్ మెడికల్ సైన్సెస్,
హైదరాబాద్ విశ్వవిద్యాలయం.
గచ్చిబౌలి, 500046.

APPENDIX V

CERTIFIACTE OF ASSENT

School of Medical Sciences,

University of Hyderabad

Certificate of Assent:

I have read the information, or it has been read to me. I have the opportunity to ask questions about it and any questions that I have asked came till satisfaction. I acknowledge that my participation in this research project is voluntary and my decision whether or not to participate will not prejudice my further relations with The University of Hyderabad. Research title "**THE QUALITY OF VISION AND QUALITY OF LIFE AFTER VISON CORRECTION DUE TO REFRACTIVE ERRORS IN TELENGANA STATE."** will be conducted in the way that address and signature or thumb impression of the informer will be taken for each person. The aim of the study is to know about the welfare of the service and people so the maximum area of interest would be study to be unbiased for anyone.

I may withdraw at any time without prejudice or penalty. Complaints

Concerning this research project may be directed to the research scholar Mr. Lavudi Suresh, Ph.D Scholar from School of Medical Sciences, University of Hyderabad, India

(Phone+91-7674976712, and email:-17moph03@uohyd.ac.in)

Print Name of the Participant: ----------

Signature of the Participant: ----------

Date: ----------

Day/month/year

Signature of informer:

అంగీకారపత్రం

నేను సమాచారాన్ని చదివాను, లేదా అది నాకు చదవి వినిపించబడింది. పరిశోధన గురించి ఎలాంటి ప్రశ్నలు అడగడానికైనా నాకు అవకాశం ఉంది. ఆ ప్రశ్నలపై నాకు పూర్తి అవగాహన కలిగింది. ఈ పరిశోధనలో నా భాగస్వామ్యం స్వచ్ఛందమైనదిగా నేను అంగీకరిస్తున్నాను. ఈ పరిశోధనలో పాల్గొనాలా వద్దా అనే నా నిర్ణయం హైదరాబాద్ విశ్వవిద్యాలయంతో సంబంధాలపై ఎటువంటి ప్రభావం చూపదు. ఈ పరిశోధనలో ప్రతి భాగస్వామి యొక్క చిరునామా మరియు సంతకం లేదా వేలి ముద్ర తీసుకోబడుతుంది.

అధ్యయనం యొక్క ముఖ్య ఉద్దేశ్యం "తెలంగాణ రాష్ట్రంలో కంటిచూపు దిద్దుబాటు తర్వాత జీవితం మరియు జీవితం యొక్క నాణ్యత." తెల్సుకోవడం. దీనికి కోసం అధిక మొత్తంలో భాగస్వాములను స్వీకరించబడుతుంది. ఈ అధ్యయనం నిస్పక్షపాతంగా నిర్వహించబడుతుంది.

నేను ఈ పరిశోధనను నుంచి ఎలాంటి పక్షపాతం లేదా జరిమానా లేకుండా ఎప్పుడైనా ఉపసంహరించుకోవచ్చు. ఈ పరిశోధనకు సంబంధించిన ఫిర్యాదులను పరిశోధకుడు లావుడి సురేష్, స్కూల్ ఆఫ్ మెడికల్ సైన్సెస్, హైదరాబాద్ విశ్వవిద్యాలయం, గచ్చిబౌలి -500046, తెలంగాణ రాష్ట్రం, భారతదేశం నకు సంప్రదించవచ్చు.

(మొబైల్ నంబర్ + 91-7674976712, మరియు ఇమెయిల్: -17moph03@uohyd.ac.in)

పాల్గొనేవారి ముద్రణ పేరు: ----------

పాల్గొనేవారి సంతకం: ----------

తేదీ: ----------

రోజు / నెల / సంవత్సరం

సమాచారం ఇచ్చినవారి సంతకం

APPENDIX-VI:

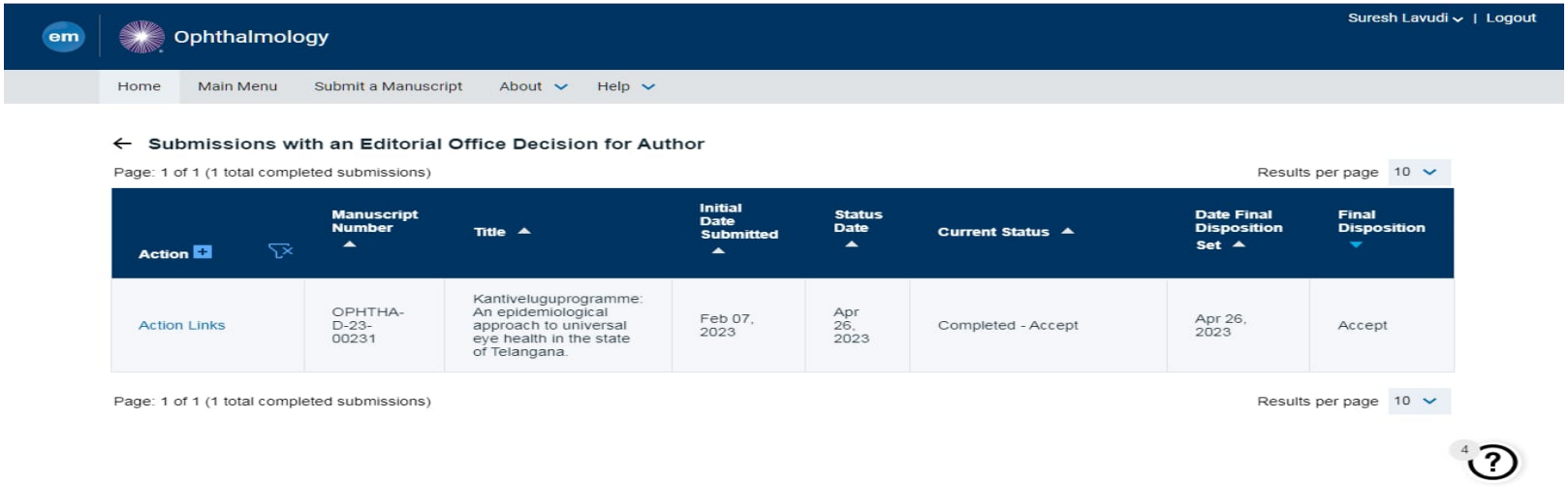
LIST OF PUBLICATIONS AND PIPELINES

1) Suresh, L, Shamanna, BR. (2023) KantiVelugu programme: An epidemiological approach to universal eye health in the state of Telangana. (Manuscript sent to journal 07/02/2023: Accepted on 26/04/2023: Ophthalmology journal.

2) Suresh, L, Shamanna, BR. (2023) The quality of Vision and quality of Life before and after vision Correction due to refractive errors in Telangana state. June-2023: Submitted: Indian Journal of Ophthalmology.

3) Suresh, L, Shamanna, BR. (2023) The significance of vision screening initiatives in preventing avoidable blindness in developing countries: A narrative review. October-2023: sent to Community Practitioners journal

4) Suresh, L, Shamanna, BR. (2023) Comparison between NetraKumbh and KantiVelugu – Learning from two Mega Vision Screening Programs in India. Under preparation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OPHTHA-D-23-00231
Kantiveluguprogramme: An epidemiological approach to universal eye health in the state of Telangana.
Feb 07, 2023
Apr 26, 2023
Completed - Accept
Apr 26, 2023
Accept
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From: **Ophthalmology** <em@editorialmanager.com>
Date: Wed, Apr 26, 2023 at 2:18 PM
Subject: Decision on Manuscript
To: Suresh Lavudi

26-Apr-2023

Dear Mr Lavudi:

Many thanks for your submission to our journal. We have reached a decision regarding your submission to the Ophthalmology. "Kantiveluguprogramme: An epidemiological approach to universal eye health in the state of Telangana". After your paper has been subject to a Fast Track Review Process, it has been accepted to be published in our journal subject to minor revisions. After you make the revisions, send us the revised paper as soon as possible.

We wish you the very best of luck with your future work and thank you for considering our journal.

Article received: Tue, 07 Feb 2023
Accepted on: Wed, 26 Apr 2023
Date of publication: Vol: 130,Issue 10 to get release in Oct 2023

Thank you for submitting your work to this journal.

Kind regards,
Ophthalmology

APPENDIX VII:

LIST OF CONFERENCE/PRESENTATIONS

Presented about “National Programme for Control of Blindness” (NPCB) and Anatomy, Physiology of Eye ball and about Geriatric Eye Health, Refractive errors and Presbyopia to ASHA’S, ANM & GNM Nursing professionals and other community health workers at TUPHRAN, Medak district-CHC, (Before the KV-Phase1 Program) 2018 Organized by TATA Trust and MoHFW

“Comparison between Netra Kumbh and KantiVelugu – Learning from two Mega Vision Screening Programmes in India “Oral paper presented at First International conference on Health and Pharma (ICHP-2021)

“Reaching the unreached – Vision care through a state-wide mega Initiative – KantiVelugu experience” Abstract presented virtual at International conference on Science for Society (ICSS-2022) organized by Kalinga University New Raipur

“The quality of Vision and quality of Life before and after vision Correction due to refractive errors in Telangana state” Title Presented at International Conference on “Innovations in Health Interventions: Traditional, Complementary and Alternative Methods (TCAM) In Holistic Health Care", Organised by University of Hyderabad-Under the project of UOH-IOE GRANT-2022.

International Conference on

Innovations in Health Interventions: Traditional, Complementary and Alternative Methods (TCAM) in Holistic Healthcare

Under IOE Project 'Health care needs and practices in Indian men and women with Reproductive System cancer'

(UoH/IoE/RC1-20-030)

University of Hyderabad

10th & 11th, November 2022

प्रतिष्ठित संस्थान
INSTITUTION OF EMINENCE

Certificate

This is to certify that Dr./Mr./Ms. Kavudi Suresh presented a paper titled The quality of vision and quality of life before and after vision correction due to refractive Errors in Telangana state in **International conference on Innovations in Health Interventions:** Traditional, Complementary and Alternative Methods (TCAM) in holistic healthcare, conducted by UoH/IoE/RC1-20-030, Centre for Health Psychology, School of Medical Sciences and School of Management Studies, University of Hyderabad.

Dean	Dean	Principal Investigator
School of Medical Sciences	**School of Management Studies**	**IoE Project** **Centre for Health Psychology**

Ministry of Micro, Small and Medium Enterprises, Government of India

MSME
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सूक्ष्म, लघु एवं मध्यम उद्यम

FIRST INTERNATIONAL CONFERENCE ON HEALTH & PHARAMACUTICAL - 2021

MULTIPURPOSE AWARENESS SOCIETY
https://masindia.org/

CERTIFICATE OF PARTICIPATION

This is to certify that Mr./~~Ms.~~/~~Mrs.~~/~~Dr.~~ Suresh Lavudi

from University of Hyderabad

has attended in **1st INTERNATIONAL CONFERENCE ON HEALTH & PHARMACEUTICAL - 2021** held on **11th & 12th December, 2021 at Hyderabad** organised by **Multipurpose Awareness Society** Hyderabad supported by Ministry of Micro, Small and Medium Enterprises, Govt. of India.

Dr. Alam

Dr. EMAN A. ALAM
Faculty of Science
Al-Azhar University,
Cairo, Egypt

Dr. MEENA JHA
Faculty of Science
Lincoln University College
Malaysia

Mr. BODA NAGESWARA RAO
Conference Convener &
President, Multipurpose Awareness Society, India

Ministry of Micro, Small and Medium Enterprises, Government of India

MSME

MICRO, SMALL & MEDIUM ENTERPRISES

FIRST INTERNATIONAL CONFERENCE ON HEALTH & PHARAMACUTICAL - 2021

mas

MULTIPURPOSE AWARENESS SOCIETY

https://masindia.org/

CERTIFICATE OF PARTICIPATION

This is to certify that Mr./Ms./Mrs./**Dr.Suresh Lavudi** from **University of Hyderabad** has attended and presented the paper entitled **"Comparison between Netra kumbh and Kantivelugu"– Learning from two Mega Vision Screening Programmes in India.** on the occasion of 1st INTERNATIONAL CONFERENCE ON HEALTH & PHARMACEUTICAL-2021 held on 11th &12th December, 2021 at Hyderabad organised by Multipurpose Awareness Society Hyderabad supported by Ministry of Micro, Small and Medium Enterprises, Govt of India.

Dr.RANGA REDDY BURRI
PRESIDENT
INFECTION CONTROL ACADEMY OF INDIA

Date: 11th & 12th December 2021

Mr.BODA NAGESWARA RAO
CONFERENCE CONVENER & PRESIDENT
MULTIPURPOSE AWARENESS SOCIETY


KALINGA UNIVERSITY
Kotni, Near Mantralaya, Naya Raipur
आज़ादी का अमृत महोत्सव
swissnex
International Interdisciplinary Conference on Science for Society (IICSS2022)
Certificate
This is to certify that
Dr./Mr./Mrs./Ms. Lavudi Suresh
Research scholar from School of Medical sciences, University of Hyderabad. has Attended/Presented (Research Paper) entitled "Reaching the unreached – Vision care through a state-wide mega initiative – Kantivelugu Programm-experience" on "International Interdisciplinary Conference on Science for Society (IICSS2022)" Organized by Faculty of Science, Kalinga University, Naya Raipur (C.G.) 492101 India on 11th & 12th January 2022.
DR. SANDEEP GANDHI
REGISTRAR
DR. V.P. KOLLA
CONVENER
www.kalingauniversity.ac.in

THE QUALITY OF VISION (QoVn) AND QUALITY OF LIFE (QoL) AFTER VISION CORRECTION DUE TO REFRACTIVE ERRORS IN TELANGANA STATE

by Lavudi Suresh

Submission date: 07-Dec-2023 03:00PM (UTC+0530)
Submission ID: 2251171441
File name: LAVUDI_SURESH.pdf (2.89M)
Word count: 27890
Character count: 156322

THE QUALITY OF VISION (QoVn) AND QUALITY OF LIFE (QoL) AFTER VISION CORRECTION DUE TO REFRACTIVE ERRORS IN TELANGANA STATE

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PRIMARY SOURCES

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3	Hassan Hashemi, Akbar Fotouhi, Abbasali Yekta, Reza Pakzad, Hadi Ostadimoghaddam, Mehdi Khabazkhoob. "Global and regional estimates of prevalence of refractive errors: Systematic review and meta-analysis", Journal of Current Ophthalmology, 2018 Publication	<1%
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12	Rupert Bourne, Brendan Dineen, Zahid Jadoon, Pak S. Lee, Aman Khan, Gordon J. Johnson, Allen Foster, Daud Khan, Daud Khan. "The Pakistan National Blindness and Visual Impairment Survey—Research Design, Eye Examination Methodology and Results of the Pilot Study", Ophthalmic Epidemiology, 2009 Publication	<1%
13	Submitted to University of Hyderabad, Hyderabad Student Paper	<1%

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