

"A CROSS-SECTIONAL STUDY OF OCULAR
MORBIDITY PATTERN IN THE PEOPLE ABOVE THE
AGE OF 18 YEARS RESIDING IN CHELUVANATTI
VILLAGE, BELGAUM DISTRICT"

REG. NO. BD0108003

Dissertation

Submitted to the
KLE University, Belgaum, Karnataka

In Partial Fulfillment
of the requirements for the degree of

M. D.
in
COMMUNITY MEDICINE

**DEPARTMENT OF COMMUNITY MEDICINE,
JAWAHARLAL NEHRU MEDICAL COLLEGE,
BELGAUM, KARNATAKA**

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ENDORSEMENT

This is to certify that the dissertation entitled
**“A CROSS-SECTIONAL STUDY OF OCULAR
MORBIDITY PATTERN IN THE PEOPLE ABOVE
THE AGE OF 18 YEARS RESIDING IN
CHELUVANATTI VILLAGE, BELGAUM DISTRICT”**
is a bonafide research work done by **CANDIDATE REG.
NO. BD0108003** in the Department of Community
Medicine, Jawaharlal Nehru Medical College, Nehru Nagar,
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LIST OF ABBREVIATIONS USED

ARMD	-	Age related macular degeneration
LPG	-	Liquid petroleum gas
DS	-	Diopter sphere
WHO	-	World Health Organization
HTN	-	Hypertension

ABSTRACT

Background and Introduction

Human beings have been bestowed with several gifts by nature, the best among them is vision. The objectives of the present study were to estimate the prevalence of various ocular problems in the rural people above the age of 18 years, to know the ocular morbidities in various age groups above 18 years and to assess association between any major ocular morbidity and risk factors like alcohol, smoking etc.

Methodology

The present study was a one year community based cross-sectional study conducted on 872 individuals above the age of 18 years who were permanent residents of Cheluvanatti village, Handiganur Primary Health Centre, Belgaum between the period from January 2009 to December 2009. All the individuals above the age of 18 years and who were permanent residents of village were included in the study. Snellen's Charts were used to test visual acuity. Other ocular morbidities were diagnosed by clinical examination with naked eye examination and pen torch.

Results

In the present study majority were male participants (51.26%) in the age group of 18 to 30 years (38.42%) and had completed their high school education (33.49%). Nearly 12.30% of males were smokers and 14.10% were alcoholics. Overall ocular morbidity among study participants was 13.87%. Prevalence of various ocular morbidities among the study participants were, refractive errors

(6.42%), cataract (4.01%), blindness (2.98%), glaucoma (0.57%), stye (0.46%), pterygium (0.34%), corneal ulcer (0.34%), diabetic retinopathy (0.23%) and hypertensive retinopathy (0.11%).

Conclusion

In most of the patients ocular morbidities were either preventable or treatable. Blindness was significantly associated with increasing age, low educational status and associated medical conditions like diabetes mellitus and hypertension. Cataract was significantly associated with increasing age, low educational status, smoking and associated medical conditions like hypertension and diabetes mellitus. Refractive errors were significantly associated with increasing age, low educational status, smoking and alcohol consumption.

Keywords

Blindness; Cataract; Ocular morbidities; Refractive errors;

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INTRODUCTION

Human beings have been bestowed with several gifts by nature, the best among them is vision. Vision protects us from external injuries; it contributes to the largest store of information; it reveals the beauties of colour, shape and form; knowledge through the written word and the wonders of science through microscope and telescope. Thus people of all ages are frightened when they come to know that they are losing vision. Therefore “eyes are a possession to be cherished and trained in order to be of the greatest use of their owner”.

An estimated 135 million individuals are visually impaired and 45 million people are blind according to the World Health Organization (WHO). Impaired vision leads to many limitations. The best examples are the legal limitations of restricted driver licenses, limited job availability and limitations in daily work. Impaired vision will also lead to lack of confidence, self esteem and independence.¹

Visual impairment and blindness are major public health problems in India. Addressing avoidable blindness in India had mainly focused on age related cataracts and refractive errors as these are the two main causes of avoidable blindness in India.

Ocular morbidity has a direct effect on the economic health of the nation in terms of Gross Domestic Product (GDP). There is a huge unmet need for eye care throughout the world. It also hampers the performance of an individual's job, reduces productivity and in general impairs the quality of life. Studies have also

shown a economic deprivation experienced by visually impaired individuals (more in lower income countries) and their ability to obtain medical care.

Many times life style exposure also contribute to eye diseases. There is a 5.00% increased chance of posterior sub-capsular cataract and 9.00% increased chance of nuclear cataract in smokers. Alcohol consumption has also been associated with cataract.²

Ocular diseases, although majority are preventable, but due to ignorance or carelessness they may lead to gross visual impairment or even blindness. Almost 50% of legal blindness and 70% of visual impairment are caused by either preventable or treatable conditions. Visual function accounts for 13% of the estimated quality of life related to health.¹

In our country there are 12 million blind people and more than 90% of them live in rural areas. With increase in life expectancy and increase in the country population the number of blind people may increase to over 19 million by 2020. India is committed to reduce the burden of preventable blindness by 2020 by using the strategies advocated by vision 2020. The “Right to Sight” foundation in India was founded in May 2004, as an NGO consideration. Thus “Partnership endeavour, together making people see”.³

Studies on utilization of eye care services in south India have consistently reported under-utilization of services and have attributed much of the reasons for under-utilization to the accessibility, availability, and affordability of services.

The people in the rural areas of India suffer from a variety of eye problems. Some of the major eye problems from which the rural people suffer are cataract, glaucoma, refractive errors, ocular trauma, conjunctivitis, corneal opacities, childhood blindness, stye, chalazion, blepharitis, Vitamin A deficiency etc.

There is limited data available on the prevalence of various ocular morbidities in the adult Indian population and no population- based data from the rural population.

The field practice area of Cheluvanatti village caters to the population of 1181 people and health care is being provided to them through a sub-centre. There is no knowledge about the eye problems in this area and such type of studies have not been carried out. Hence this study is being taken up to know the various eye diseases that people suffer from.

OBJECTIVES

1. To estimate the prevalence of various ocular problems in the rural people above the age of 18 years.
2. To know the ocular morbidities in various age groups above 18 years.
3. To assess association between any major ocular morbidity and risk factors like alcohol, smoking etc.

REVIEW OF LITERATURE

Throughout recorded history, mankind has wondered at the world and sought to understand it. The study of vision and light has been central to understanding nature. Many scientists, philosophers and scholars of antiquity considered vision a supreme sense and understanding of nature of vision and lights as keys to unlocking the secrets of the universe. Their curiosity into the nature of light and visual processing in eyes gradually developed the field of vision sciences, a field in which men of understanding put their idea and prediction to test and surprised themselves as much as others of intricacy of optical phenomena. Their contributions to the field laid the foundations on which modern field of vision science stands today.

Mankind believes implicitly in its eyes, so much so that the phrase ‘seeing is believing’ has become a proverb. The proper use of eyes is very important for educative process as the objects are perceived by the brain through the eyes. The deprivation of eye sight is the hardest to bear.

It has been discovered that eyes share in the general nutrition of the body. Different parts of the eye contain and require special chemical substances which are supplied by the diet and certain vitamins are required for the maintenance of good sight. It has also been discovered that eye injuries which occur in agricultural and industrial field can be largely prevented by suitable precautions. Certain chemicals are injurious to the eye, so also is the excessive use of tobacco and alcohol.

Increased life expectancy has led to a sharp increase in the number of elderly persons. These people are prone to develop cataract and other age related ocular morbidity problems. Emerging eye issues like diabetic retinopathy, glaucoma and low vision need focused attention and multipronged solutions. In addition all age groups and specific categories of the workforce are vulnerable to ocular trauma.

The best way to reduce blindness is to prevent its occurrence by early intervention and more effective treatment, retard the progress or alleviate the symptoms of the condition which endanger vision at all ages.

Health personnel play a key role in the implementation of any health programme including National Programme for Control of Blindness (NPCB). Thus Doctors must be prepared to offer hope to their patients by providing early intervention, health education and treatment necessary to maximize the residual vision, so that these people can live a happier and better social life.

In a cross sectional study done on the prevalence of common ocular morbidities among the adults of rural and urban Aligarh it was found that, the prevalence of cataract was 21.70% and was significantly associated with age and fuel use. The prevalence of myopia and hypermetropia were 11.50% and 9.80% respectively. The prevalence rate of glaucoma was 0.9% and that of corneal opacity was 4.20%. The prevalence of blindness was 5.30%.⁴

Another study conducted in the elderly population of five randomly selected villages of Wardha district of Maharashtra revealed that, the prevalence of cataract was 40.40%, refractive errors was 40.80%, aphakia 11.10%,

pterygium 5.20%, glaucoma 3.10%, and corneal opacity 3.00%. The prevalence of blindness was reported to be 12.2%.⁵

A study done in nineteen randomly selected rural villages and urban slums of Chennai among all people above five years of age found the prevalence of visual impairment to be 12.38% and prevalence of blindness as 2.63%. Blindness was more frequent in females and aged over 50 years. The prevalence of cataract was 12.12% and was the major cause of blindness (89.39%).⁶

In a study conducted in three rural areas and one urban area of Andhra Pradesh, it was found that, the prevalence of visual impairment was 8.09%. The majority of this visual impairment was caused by refractive error (45.80%) and cataract (39.90%). The prevalence of blindness was 1.84%.⁷

A study done in a rural population of Nigeria showed that, the prevalence of ocular morbidity was 13.50%. The common eye problems encountered were cataract (16.40%), glaucoma (21.10%), allergic conjunctivitis (16.40%), refractive errors (12.40%), age related macular degeneration (0.70%) and corneal opacity (0.70%). The prevalence of blindness was 1.20%. Cataract was the leading cause of blindness (44.40%), followed by glaucoma (33.30%), macular degeneration (7.40%) and corneal opacity (7.40%).⁸

Another study done among elderly people of Nigeria reported that, the prevalence of visual impairment was 45.40%. Cataract alone caused 80.00% of the visual impairment. The prevalence of blindness was 5.60%. The leading causes of blindness were cataract (42.30%), glaucoma (32.40%) and uncorrected aphakia (9.90%).⁹

A study done in two villages of Aurangabad among people of all age groups observed that, the prevalence of ocular morbidity was 34.89%. The prevalence of cataract was 24.60% and that of refractive errors was 4.27%. The prevalence of blindness was 1.50%.¹⁰

A study conducted in Iran among all the people above the age of ten years in a rural area reported that the prevalence of visual impairment was 6.81% and that of bilateral blindness was 0.79%. The causes of visual impairment and blindness were cataract (37.70%), corneal opacity (15.00%), amblyopia (15.00%), glaucoma (5.70%) and hypermetropia (5.00%).¹¹

A study done in the rural and urban areas of Timor–Leste among people more than 40 years of age found the prevalence of low vision to be 17.70%. The prevalence of blindness was 4.10%. Cataract was the commonest cause of blindness (72.90%) and an important cause of low vision (17.80%). Uncorrected refractive errors caused 81.30% of low vision.¹²

In a study conducted among adults from different areas of Pakistan the prevalence of visual impairment was 26.70% and that of blindness was 2.70%. Blindness was more in females.¹³

It was observed in a study done among adults above thirty years of age in Bangladesh that, the prevalence of low vision was 13.80%. The main causes of low vision were cataract (74.20%), refractive errors (18.70%) and macular degeneration (1.9%). The prevalence of blindness was 1.53%. The predominant cause of bilateral blindness was cataract (79.60%) followed by uncorrected Apahkia (6.20%) and macular degeneration (3.10%).¹⁴

A study done in Malaysia reported that the prevalence of visual impairment in the rural areas (2.90%) was higher than that in urban areas (2.50%).¹⁵

Another study conducted in the rural population of Iran showed that, the prevalence rate of impaired vision was 32.00%. The most common etiology was refractive errors (28.30%) followed by cataract (6.00%), amblyopia (2.10%), strabismus (1.51%), glaucoma (0.67%) and nystagmus (0.50%). Impaired vision was more in females.¹

A population based cross sectional study done in Brazil found that, the prevalence of low vision as 5.20% and that of blindness as 2.20%. The main cause of low vision was refractive error (72.30%) and the main cause of blindness was cataract (50.00%).¹⁶

A survey done to find the global data on visual impairment in the year 2002 showed that, visual impairment was found in an excess of 161 million people. Nearly 37 million people were blind and 124 million had low vision. The leading cause of blindness worldwide was cataract (47.80%) followed by glaucoma (12.30%) and age related macular degeneration (8.70%).¹⁷

A study was conducted by the Centre for Disease Control (CDC) among persons aged above 50 years with and without diabetes to assess the prevalence of visual impairment. The prevalence of visual impairment in people with diabetes was 23.50% and prevalence in people without diabetes was 12.40%. Prevalence of diabetic retinopathy in people with diabetes was 10.20%. Prevalence of cataracts among those with and without diabetes was 31.80% and

21.20% respectively, for glaucoma 8.00% and 4.30% and for macular degeneration 2.80% and 2.90%.¹⁸

A study done in a rural population of Tamil Nadu among people above 40 years of age revealed that, the prevalence of decreased visual acuity was 19.20%. The prevalence of blindness was 3.36%. The main causes of blindness were cataract (78.63%), followed by glaucoma (4.29%), optic atrophy (3.42%) and corneal scars (2.56%).¹⁹

Another cross sectional study done in elderly people of Tirunalveli district, Tamil Nadu revealed that the prevalence of blindness was 11.00%. Cataract was the principal cause of blindness (70.60%). The prevalence of low vision was 24.30%.²⁰

A nation wide survey in 15 districts of India among people above 50 years of age showed the prevalence of blindness to be 8.50%. Cataract was responsible for 62.40% of bilateral blindness.²¹

The national survey on Blindness in India (2006-07) showed an estimated 1.00% prevalence of blindness in the general population. Cataract was the main cause of blindness (62.60%) followed by refractive errors (19.70%), glaucoma (5.80%), posterior segment pathology (4.70%), corneal opacity (0.90%) and others (4.19%).²²

A study conducted in 16 randomly selected districts among people aged 50 years and above showed that the prevalence of low vision was 16.80%. Nearly 4.40% had severely impaired vision and 3.60% were blind. Prevalence of

blindness and severe visual impairment were higher among rural people (8.20%) compared to urban people (7.10%). The major cause of blindness was cataract (81.90%) followed by uncorrected refractive errors (7.10%).²³

A population based cross sectional study done in Iran, revealed the visual impairment to be 2.52%. The prevalence of blindness was 0.39%. The major causes of visual impairment were uncorrected refractive errors 33.60%, cataract (25.40%), macular degeneration (12.70%) and ambyopia (8.20%).²⁴

A study done in a rural area of Tamil Nadu among people aged above 40 years reported that the prevalence of cataract was 47.50%. The prevalence of cataract was more in women.²⁵

Study conducted in three districts of Punjab showed the prevalence of cataract to be 15.30%.²⁶

A study conducted among South Indian adult population of Andhra Pradesh revealed that, the prevalence of myopia was 34.60% and that of hypermetropia 18.40%. There was no gender difference in any type of refractive errors.²⁷

A population based cross sectional study done on rural South Indian population of Tamil Nadu among people aged 39 years, and above found that the prevalence of myopia was 26.99% and hypermetropia was 18.70%.²⁸

In a study conducted by the eye disease prevalence group among people aged 40 years and older in the United States, Western European and Australia estimated that, the crude prevalence of myopia was 25.40%, 26.60%, and 16.40%

respectively. For hypermetropia the estimated crude prevalence was 9.90%, 11.60% and 5.80% respectively.²⁹

A community based survey conducted in Rajnandangoan district of Chattisgarh state of Central India among people aged 35 years and older found that the prevalence of glaucoma was 3.68%.³⁰

A study conducted in the rural community of Bisnah area of Jammu, India found the prevalence of cataract in 25.30% people. The high occurrence of cataract had significant co-relation with the exposure to indoor air pollution caused by smoke produced from the combustion of biomass fuel.³¹

Another study done in a village of Western India, cataract was found in 27.10% of wood users (either alone or in combination), 27.20% in only biomass (wood, cattle dung) users and 28.90% in only wood users. Overall prevalence of cataract in the study population was 26.00%. About 30.50% of the population complained of irritation to the eye during cooking. Nearly 4.80% of the study population had pterygium.³²

A study conducted in population from all parts of India except Kashmir and Sikkim found that, persons living in biomass fuel using household had a considerably higher prevalence of blindness (Partial or complete) than those living in households using cleaner fuels. The level of risk and extent of biomass fuel use in India indicate that 18.00% of partial and complete blindness among persons aged of 30 years and older may be attributed to biomass fuel use. The results strongly suggest that, smoke exposure from the use of biomass fuels for cooking substantially increases the risk of partial blindness.³³

A rural population based case control study on senile cataract in India done at two centres revealed that, utilization of rice gruel, duration of exposure to fire and dust per day, family history of cataract and use of cheap cooking fuels were significantly associated with cataract in both the centres.³⁴

Another cross sectional study done in rural and urban areas of Aligarh observed that, there was a significant association of cataract with fuel used. People using only solid fuels (firewood, coal, cow dung) had a significantly higher prevalence of cataract (24.90%) than those using only liquidified petroleum gas (LPG) (14.00%).⁴

A study done in the South Indian state of Andhra Pradesh found that, cigarette and cigar smokers had a significantly higher prevalence of any cataract. Nuclear cataract in smokers (18.70%) was higher than in non-smokers (10.10%), cortical cataract in smokers (8.90%) was higher than in non smokers (6.90%) and posterior sub capsular cataract was also higher in smokers (10.30%) than in non smokers (6.90%).³⁵

A study conducted in the United States found that, alcohol consumption was associated with cataract. There was an increased (34.00%) risk for nuclear sclerosis and (57.00%) for posterior sub-capsular cataract in past heavy drinkers compared to non drinkers.²

A study conducted in a rural area of China has shown that people who smoke 20 or more cigarettes per day had higher risk of developing nuclear opacity than non-smokers. Nuclear cataract was strongly associated with pipe

smoking than cigarette smoking. Cigarette smokers were more prone to glaucoma than non-smokers.³⁶

In the Beaver Dam eye study, while adjusting for age, gender and smoking history there was a statistically significant 40.00% increase in the odds of prevalent neovascular age related macular degeneration with beer drinking (per seven drinks per week).³⁷

A case-control study conducted in Nagpur, India, revealed a significant risk association between smoking and age related cataract. The overall estimates of attributable risk proportion and population attributable risk proportion were calculated to be 0.66 and 0.23 respectively. The study identified the role of smoking in the outcome of age related cataract.³⁸

In a population based cross sectional study in Australia, it was found that people who had ever smoked cigarettes had a higher prevalence of more severe nuclear and posterior sub capsular cataract than non-smokers. The association between pipe smoking and nuclear cataract was stronger than the association with cigarette smoking. Heavy alcohol consumption (4 drinks a day) was associated with nuclear cataract in current smokers but, not in never smokers.³⁹

METHODOLOGY

Study area

The present study was conducted in Cheluvanatti village which is under the Handiganur Primary Health Centre, a rural field practice area of Department of Community Medicine, Jawaharlal Nehru Medical College, Belgaum. Cheluvanatti village with a total population of 1181 is situated about 13 Kms. from Belgaum. Handiganur Primary Health Centre has four subcentres covering 16 villages from which Cheluvanatti village was randomly selected.

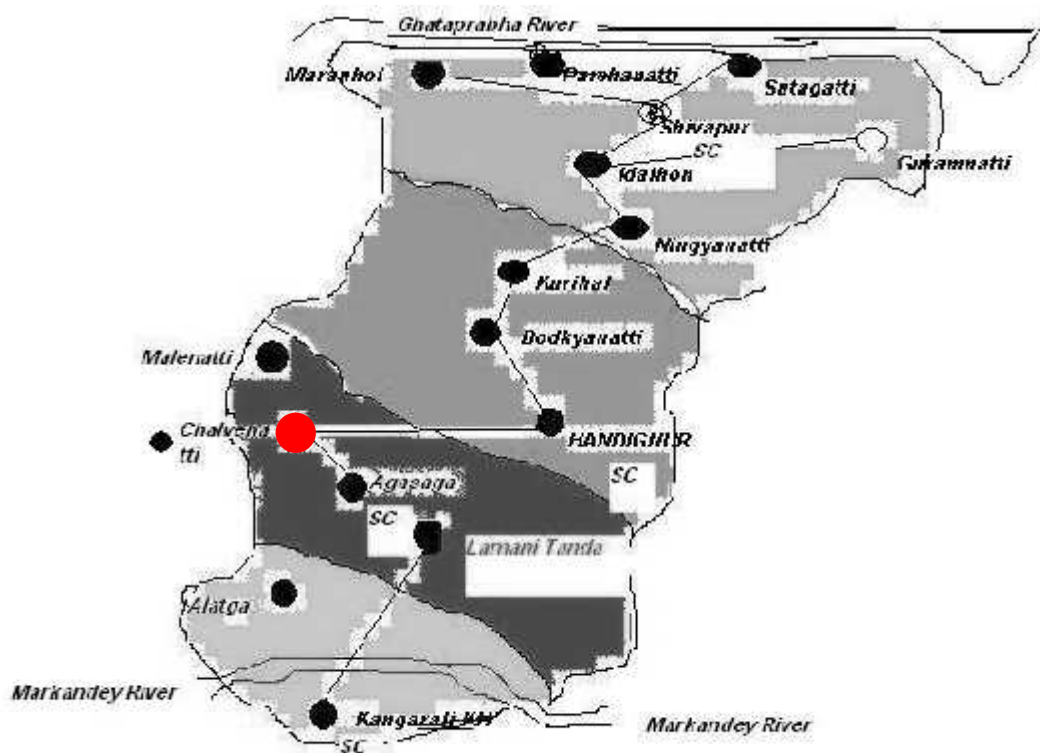


Figure 1. Map of Handiganur Primary Health Centre

Study design

It was a community based cross-sectional study.

Study period

The present study was conducted for a period of one year from January 2009 to December 2009.

Study participants

All the individuals above the age of 18 years who are permanent residents of Cheluvanatti village for the last one year.

Sample size

All the individuals above age of 18 years residing in Cheluvanatti village. The total population of the village is 1181. By excluding all individuals below 18 years residing in Cheluvanatti village from the total population the sample size was found to be 921. Out of the total sample of 921 individuals only 872 individuals could be examined. The remaining 49 individuals had migrated permanently to other places and thus could not be examined.

Selection criteria

Inclusion criteria

All the individuals above the age of 18 years, who are permanent residents of Cheluvanatti village for last one year, were included.

Exclusion criteria

1. All migrants were excluded
2. All individuals below 18 years were excluded.

Method of Data Collection

All the individuals who are permanent residents of Cheluvanatti village and above 18 years of age were examined. A house to house survey of the whole village was conducted.

Instruments used for data collection

1. Snellen's Charts were used to test visual acuity.
2. Other ocular morbidities were diagnosed by clinical examination with naked eye examination and pen torch.

Further ophthalmic examination and diagnosis of various ocular morbidities were done with the help of an ophthalmologist. Past history of ocular morbidity was taken from their hospital records.

Statistical Analysis

The data was tabulated and master chart was prepared (Annexure III) Analysis was done using percentages, rates and ratios. Chi square test with Yates correction was used to find the association between attributes.

Definition of variables

Age: Age was recorded to the nearest completed years.

Type of family

Nuclear family: Married couples, along with their dependent children living in the same house.

Joint family: Many married couples and their children who live in the same household. Males are blood relatives and females of the family are related by either marriage or blood relation.

Three generation family: Married couple with married children and their kids (three generations) related to each other by direct descent living together.

Broken family: One where, the couple have separated, or where death has occurred for one or both the spouse.

Educational status: The subjects were asked about their educational qualifications and were grouped into following categories.

Illiterate: A person who could not read and write with understanding in any language.

Primary school education: A person who had studied up to 7th standard.

High school education: A person who had studied from 8th to 10th standard.

College: A person who had studied up to pre-university / diploma/ TCH / below degree class / ITI.

Graduate: A person who had a bachelor's degree in any field.

Post-Graduate: A person who had a master's degree in any field.

Occupation:

Farmer: A farmer is a person, engaged in agriculture, who raises living organisms for food or raw materials, generally including livestock husbandry and growing crops such as produce and grain.

Student: All participants attending college.

Housewife: Women engaged in household duties but doing no other productive work to augment family income.

Food habit: Subjects were asked about their food habits i.e. consumption of non vegetarian and/or vegetarian food in their diet. Interpretation was made as "vegetarian diet" in those who were consuming vegetarian and "mixed diet" among those who were consuming non vegetarian food.

Socio economic status: Per-capita monthly income of the family was calculated by dividing total monthly income of the family with family size. Per capita income in Rupees per month was classified using the modified BG Prasad classification.⁴⁰

Modified B. G. Prasad's classification⁴¹

Socioeconomic class	Prasad's classification 1961 per capital income in Rs./ Month	Modified Prasad's classification in the study period 2009. Per capita per month income (Rs.)
I	100 & above	3600 & Above
II	50 – 99	1800 & 3599
III	30 –49	1080 & 1799
IV	15 – 29	540 & 1079
V	below 15	<540

Average consumer price index for the year 2009 = 727

Modification was done with the aid of Multiplication Factor (M.F), which was obtained as below:

$$\begin{aligned}
 \text{M. F.} &= \frac{\text{Average Consumer price index for study period}}{100} \times 4.93 \\
 &= 727/100 \times 4.93 = 35.8
 \end{aligned}$$

Smoking: For the assessment of history of smoking, period of recall was considered for the past one year.

Smokers: Subjects those who had smoked in the past or smoking at present were considered as “smokers”.

Present smoker: The person who smoked beedis or cigarettes for the last one year.

Past smoker: The person who smoked beedis or cigarettes earlier but left smoking for the last one year.

Non Smokers: Subjects who had never smoked in any form of tobacco (Cigarettes/Beedi) were considered as “non smokers”.

The total duration of smoking in years and number of cigarettes/beedies smoked per day was noted.

Alcohol Consumption: For the assessment of history of alcohol consumption period of recall was considered for the past one year.

Alcoholics: Subjects those who had consumed any alcoholic drinks either in the past or consuming at present were categorized as “alcoholics”.

Present alcoholic: The person who consumed alcohol for the last one year.

Past alcoholic: The person who consumed alcohol earlier but left consuming alcohol for the last one year.

Non Alcoholics: Subjects who had never consumed alcohol were considered and kept in the category of “non alcoholics”

The total duration of alcohol consumption in years and quantity of alcohol consumed per day was noted.

Ocular Morbidities

Cataract: It is the clouding of the lens of the eye which obstructs the passage of light.

Refractive error: When ray of light does not focus on the retina, but either in front or behind the retina.

1. *Myopia:* Was defined as a spherical equivalent less than -0.50 diopter sphere (DS)
2. *Hypermetropia:* was defined as a spherical equivalent greater than +0.5 DS.

Glaucoma: Is a condition in which there is an increase of pressure within the eyeball, which causes permanent damage to the optical nerve at the back of the eye. Schiottz tonometer was used to measure intraocular pressure to detect glaucoma.

Corneal opacity: It is a condition of lack of transparency of the cornea resulting from inflammation, ulceration or injury.

Diabetic retinopathy: It is composed of a characteristic group of lesions found in the retina, or fundus, of individuals having had diabetes mellitus for several years.

Hypertensive Retinopathy: Derangement of retina characterized by appearance of hemorrhages and exudates in the fundus oculi of individuals having had hypertension for several years.

Age Related macular degeneration: It is a bilateral condition affecting the chorio – capillaries, Bruch's membrane and retinal pigment epithelium causing considerable impairment of central vision in the elderly, usually above 65 years of age.

Blindness: The WHO has defined blindness as “visual acuity of less than 3/60 (Snellen’s) or its equivalent”. It has now added the “Inability to count fingers in daylight at a distance of three meters” to indicate less than 3/60 or its equivalent.

Pterygium: It is triangular encroachment of the bulbar conjunctive on to the cornea occurring in the palpebral aperture.

Stye: It is an acute inflammation at the edge of the lid from staphylococcus infection of a gland of zeis or moll generally ending in suppuration.

Conjunctivitis: It is the inflammation of the conjunctiva which is characterized by redness and discharge form the eye.

RESULTS

The present one year cross-sectional study was conducted between the period of January 2009 to December 2009 at Cheluvanatti Village of Belgaum District.

A total of 872 persons above the age of 18 years were studied. The data obtained was tabulated and analysed as below.

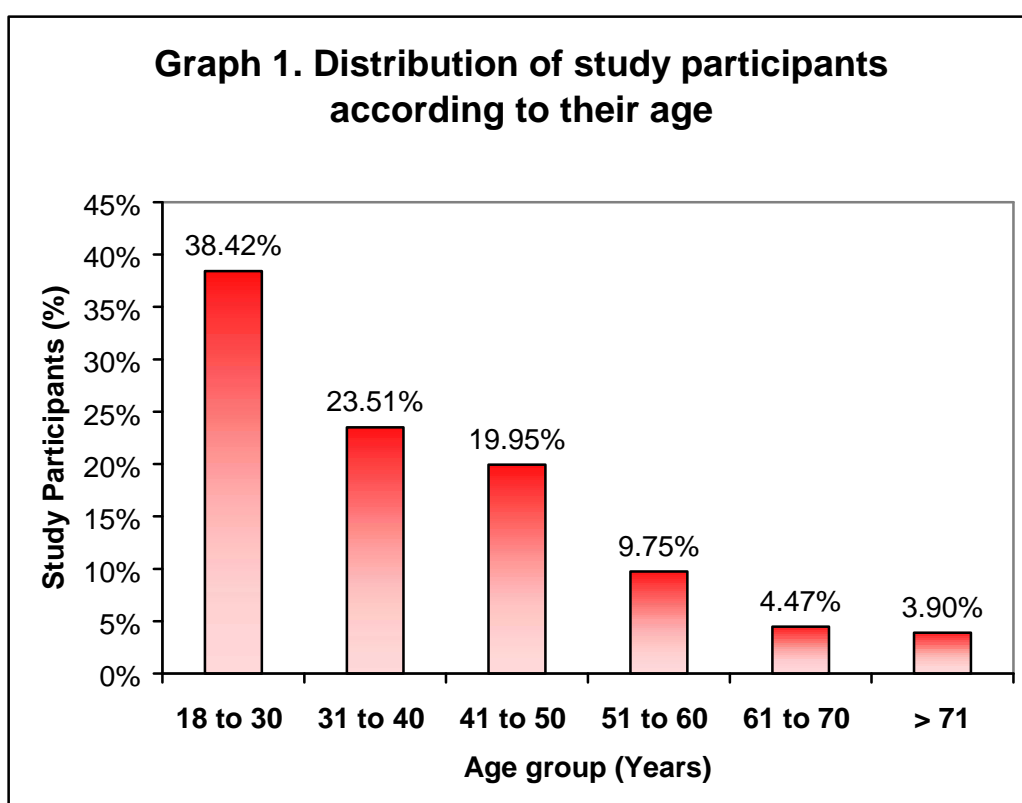
Table 1. Distribution of study participants according to gender

Gender	Study participants (n=872)	
	Number	Percentage
Male	447	51.26
Female	425	48.74
Total	872	100.00

In the present study slight male preponderance was seen. Out of 872 study participants, 51.26% were males and 48.74% were females.

Table 2. Distribution of study participants according to their age

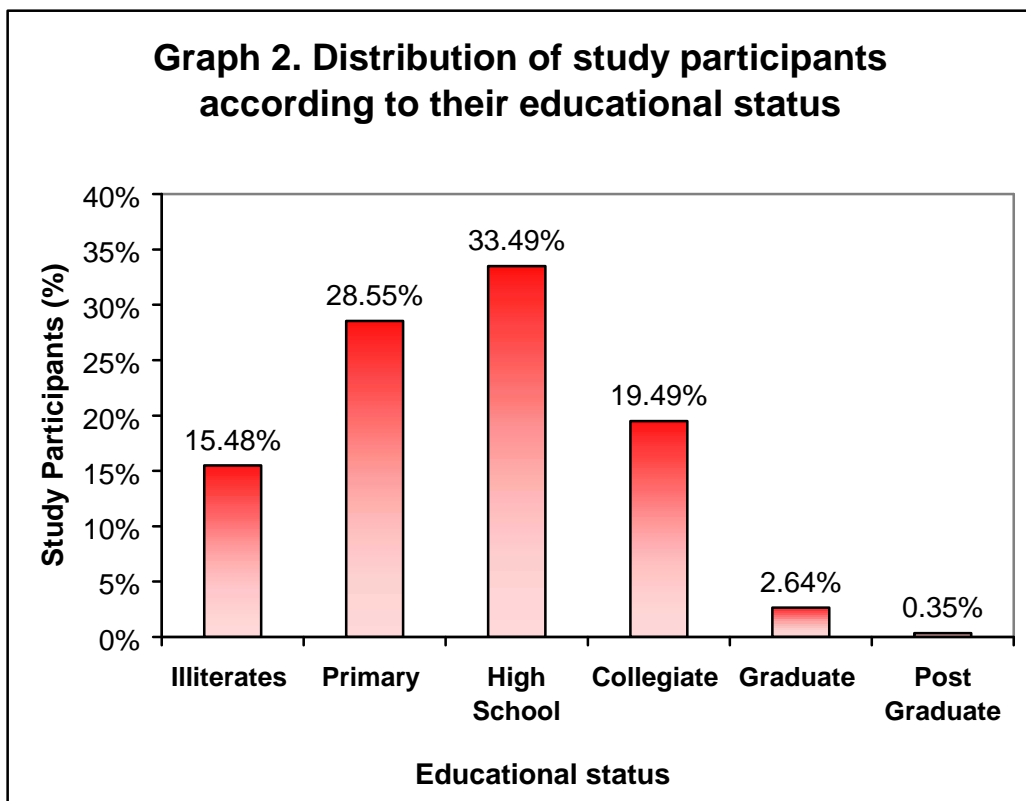
Age	Study participants (n=872)	
	Number	Percentage
18 – 30 Years	335	38.42
31 – 40 Years	205	23.51
41 – 50 Years	174	19.95
51 – 60 Years	85	9.75
61 – 70 Years	39	4.47
> 71 Years	34	3.90
Total	872	100.00



In the present study, out of 872 study participants, 335 (38.42%) were in the age group of 18 to 30 years, 205 (23.51%) were in the age group of 31 to 40 years, 174 (19.95%) were in the age group of 41 to 50 years, 85 (9.75%) were in the age group of 51 to 60 years, 39 (4.47%) were in the age group of 61 to 70 years and 34 (3.90%) were in the age group of above 71 years. The mean age of the study participants was 37.48 ± 15.13 years.

Table 3. Distribution of study participants according to their educational status

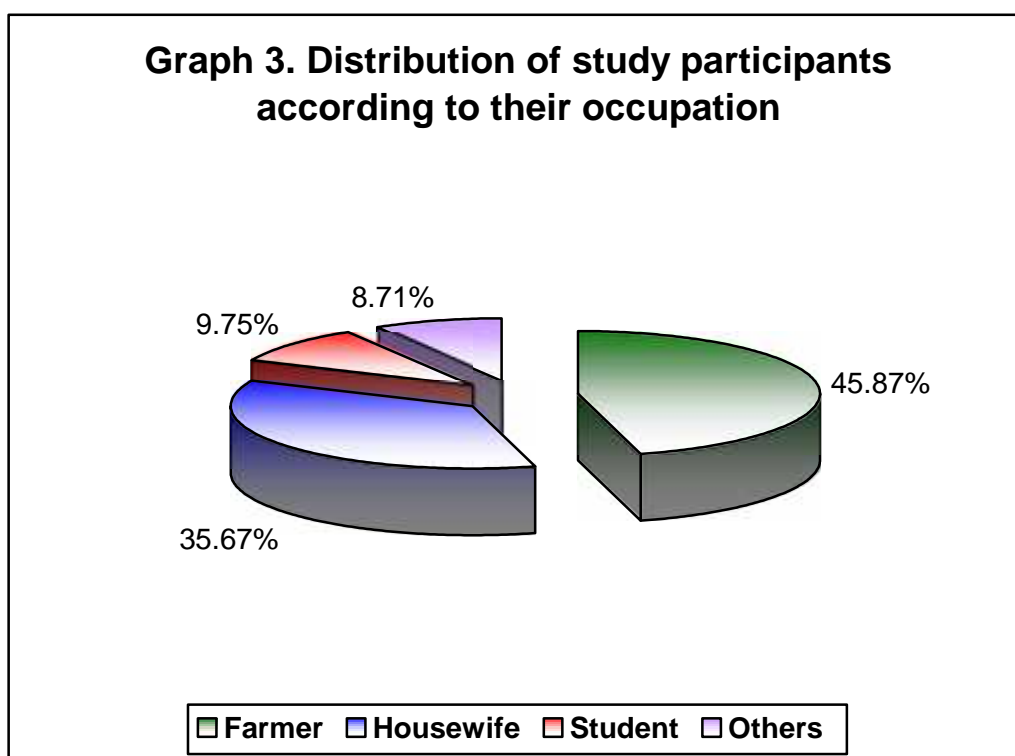
Educational status	Study participants (n=872)	
	Number	Percentage
Illiterates	135	15.48
Primary	249	28.55
High School	292	33.49
Collegiate	170	19.49
Graduate	23	2.64
Post Graduate	03	0.35
Total	872	100.00



In the present study, among the study participants, 135 (15.48%) were illiterates, 249 (28.56%) had studied upto primary school, 292 (33.49%) had studied up to high school, 170 (19.49%) had gone to college, 23 (2.64%) were graduates and 3 (0.35%) had done their post graduation.

Table 4. Distribution of study participants according to their occupation

Occupation	Study participants (n=872)	
	Number	Percentage
Farmer	400	45.87
Housewife	311	35.67
Student	85	9.75
Others	76	8.71
Total	872	100.00

Graph 3. Distribution of study participants according to their occupation

In the present study, out of 872 study participants, 400 (45.87%) were farmers, 311 (35.67%) were housewives, 85 (9.75%) were students and 76

(8.71%) belonged to other categories like daily labourers, drivers, factory workers, business men and army personnel.

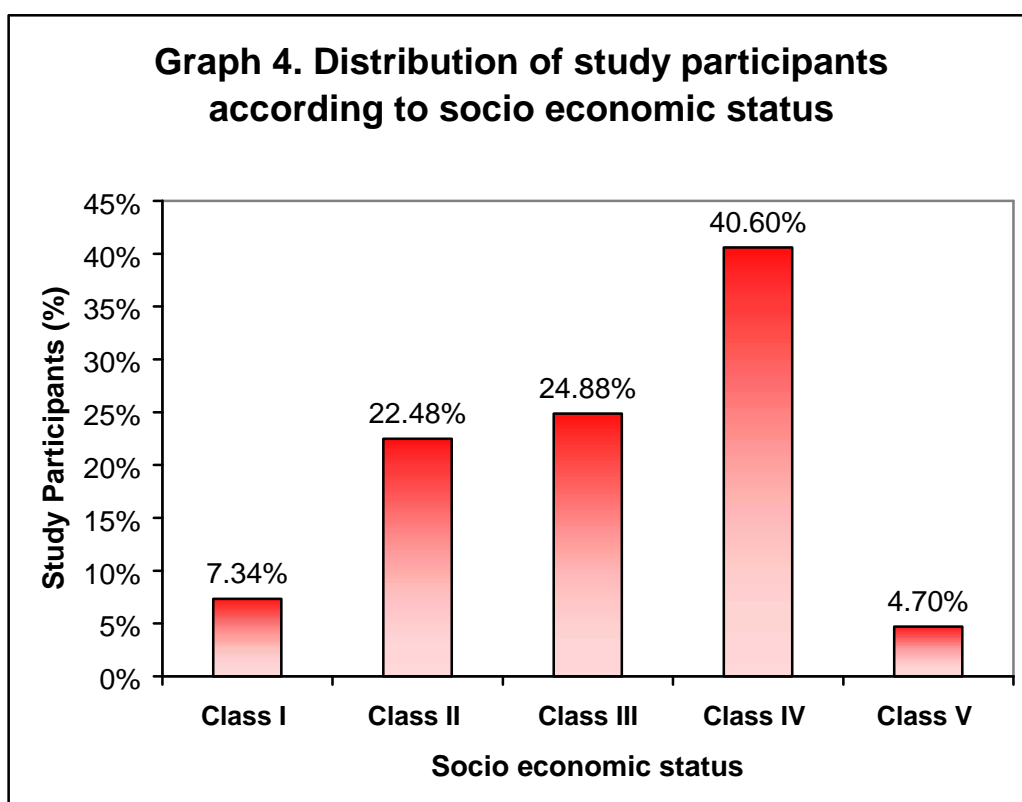
Table 5. Distribution of study participants according to type of family

Type of family	Study participants (n=872)	
	Number	Percentage
Nuclear	518	59.40
Joint	303	34.75
Others	51	5.85
Total	872	100.00

In this study, 518 (59.40%) of the study participants belonged to nuclear families, 303 (34.75%) belonged to joint families and 51 (5.85%) belonged to other types of families including three generational families and broken families.

Table 6. Distribution of study participants according to socio economic status

Socio economic status (Modified B. G. Prasad Classification)	Study participants (n=872)	
	Number	Percentage
Class I (Rs. 3600)	64	7.34
Class II (Rs. 1800 – 3599)	196	22.48
Class III (Rs. 1080 – 1799)	217	24.88
Class IV (Rs. 540 – 1079)	354	40.60
Class V (Rs. 540)	41	4.70
Total	872	100.00



In the present study, 64 (7.34%) of the study participants belonged to Class I of modified B. G. Prasads classification, 196 (22.48%) belonged to Class II, 217 (24.88%) belonged to Class III, 354 (40.60%) belonged to class IV and 41 (4.70%) belonged to Class V.

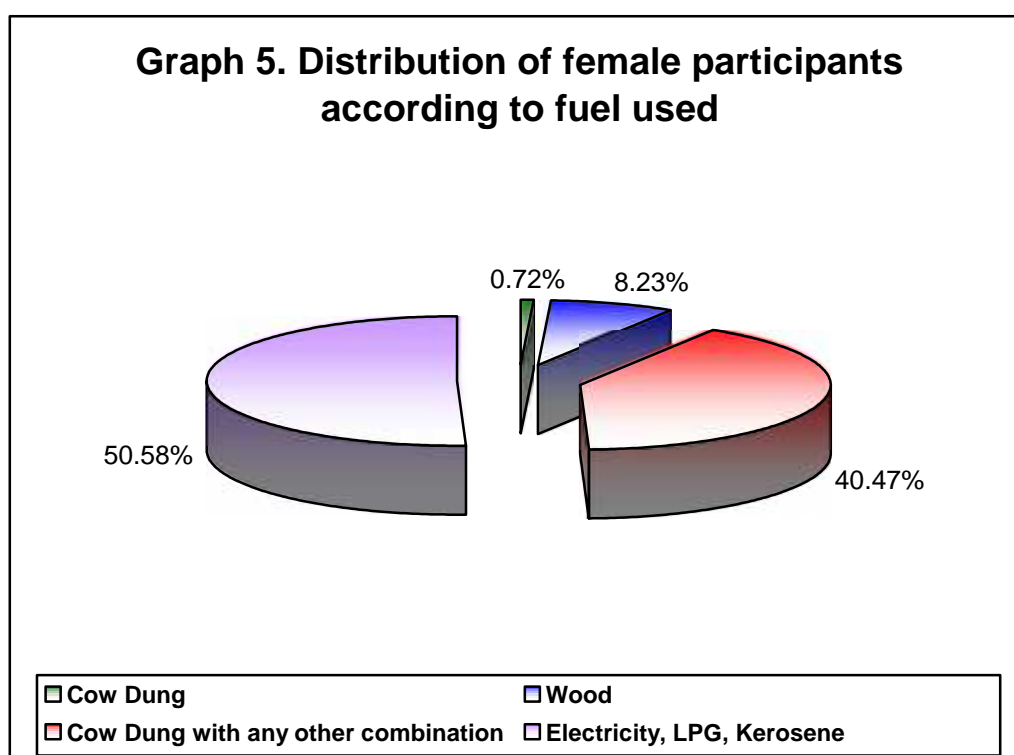
Table 7. Distribution of study participants according to risk of overcrowding

Overcrowding	Study participants (n=872)	
	Number	Percentage
Present	324	37.16
Absent	548	62.84
Total	872	100.00

In the present study, 324 (37.16%) study participants were living in overcrowded conditions and 548 (62.84%) were not living in overcrowded conditions.

Table 8. Distribution of female participants according to fuel used

Fuel used for cooking	Study participants (n=425)	
	Number	Percentage
Cow dung	03	0.72
Wood	35	8.23
Cow dung + wood with any other combination	172	40.47
Electricity, LPG, Kerosene	215	50.58
Total	425	100.00



In the present study, 03 (0.72%) of the female study participants were using only cowdung as the fuel for cooking, 35 (8.23%) were using only wood,

172 (40.47%) were using a combination of cow dung or wood with any other fuel and 215 (50.58%) were using kerosene, LPG or electricity.

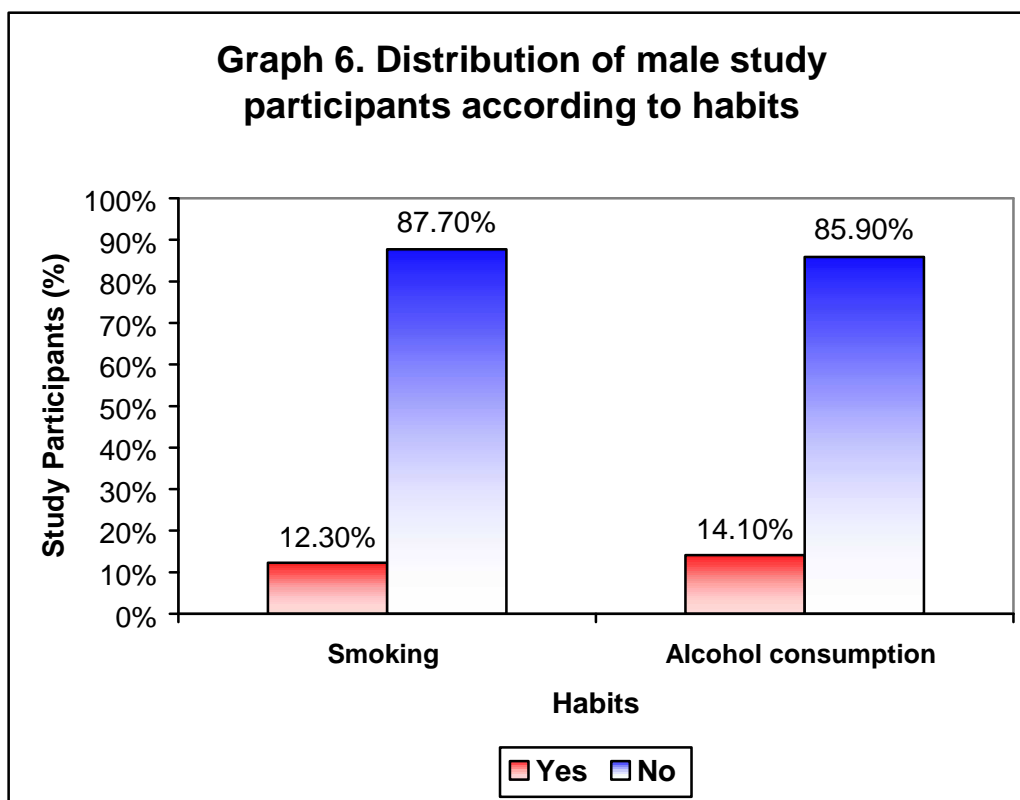
Table 9. Distribution of study participants according to diet

Diet	Study participants (n=872)	
	Number	Percentage
Vegetarian	92	10.56
Mixed	780	89.44
Total	872	100.00

In the present study, out of 872 study participants, 92 (10.56%) were vegetarian whereas 780 (89.44%) were consuming mixed type of diet.

Table 10. Distribution of male study participants according to habits

Habits	Study Participants (n=447)					
	Yes		No		Total	
	No	%	No	%	No	%
Smoking	55	12.30	392	87.70	447	100.00
Alcohol	63	14.10	384	85.90	447	100.00



In the present study, 55 (12.30%) male participants were smokers and 63 (14.10%) were alcoholics. Smoking and alcohol consumption was absent in females.

Table 11. Distribution of male study participants according to history of smoking

History of smoking	Study participants (n=447)	
	Number	Percentage
Non smokers	392	87.70
Present smokers	50	11.18
Past smokers	5	1.12
Total	447	100.00

In our present study, out of 447 male participants, 55 (12.30%) were smokers whereas 392 (87.70%) were non-smokers. Among the smokers, the present smokers were 50 (11.18%) and the past smokers were 5 (1.12%). Smoking was absent in females.

Table 12. Distribution of male present smokers

Smoking details		Study participants (n=50)	
		Number	Percentage
Type	Cigarettes	28	56.00
	Beedis	22	44.00
	Total	50	100.00
Number per day	< 10	21	42.00
	> 10	29	58.00
	Total	50	100.00
Duration (Years)	< 10	8	16.00
	> 10	42	84.00
	Total	50	100.00

In the present study, among the present smokers, 28 (56.00%) smoked cigarettes while 22 (44.00%) smoked beedis. Among the present smokers, 21 (42.00%) smoked less than 10 cigarettes (or) beedis per day while 29 (58.00%) smoked more than 10 cigarettes (or) beedis per day. Among the present smokers

8 (16.00%) have been smoking for less than 10 years whereas 42 (84.00%) have been smoking for more than 10 years.

Table 13. Distribution of male past smokers

Past smoking details		Study participants (n=5)	
		Number	Percentage
Type	Cigarettes	0	0
	Beedis	5	100.00
	Total	5	100.00
Number per day	< 10	0	0
	> 10	5	100.00
	Total	5	100.00
Duration leaving (Years)	< 10	5	100.00
	> 10	0	0
	Total	5	100.00

In this study among the past smokers, 5 (100%) smoked beedis and there were no past cigarette smokers. All the past smokers had smoked more than 10 beedis per day and all the past smokers have left smoking within the last 10 years.

Table 14. Distribution of male study participants according to history of alcohol consumption

History of alcohol consumption	Study participants (n=447)	
	Number	Percentage
Non alcoholics	384	85.90
Present alcoholics	59	13.20
Past alcoholics	4	0.90
Total	447	100.00

In the present study, among the male study participants, 63 (14.10%) were alcoholics whereas 384 (85.90%) were non alcoholics. Among the alcoholics, 59 (13.20%) were present alcoholics while 4 (0.90%) were past alcoholics.

Table 15. Distribution of male present alcoholics

Details of alcohol consumption		Study participants (n=59)	
		Number	Percentage
Quantity per day (ml)	< 180	56	94.91
	> 180	3	5.09
	Total	59	100.00
Duration (Years)	< 10	13	22.03
	> 10	46	77.97
	Total	59	100.00

In the present study, among the present alcoholics, 56 (94.91%) consumed less than 180 ml of alcohol per day whereas 3 (5.09%) consumed more than 180 ml per day. Among the present alcoholics, 13 (22.03%) have been consuming alcohol for less than 10 years whereas 46 (77.97%) have been consuming alcohol for more than 10 years.

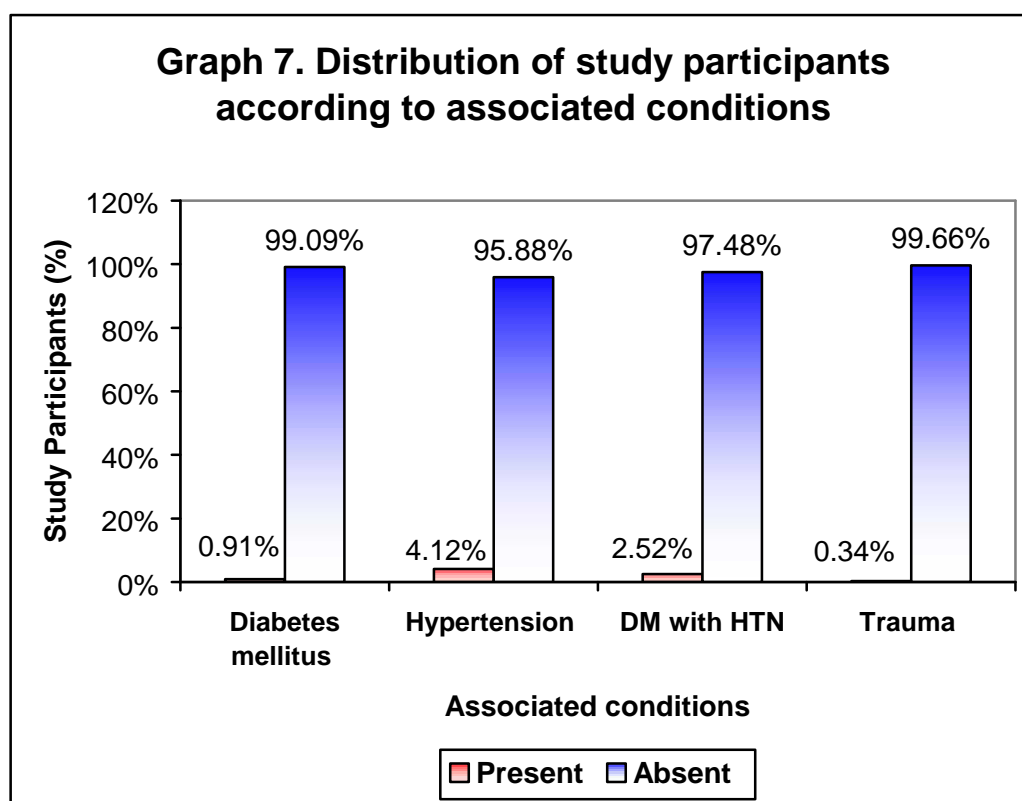
Table 16. Distribution of male past alcoholics

Details of past alcohol consumption		Study participants (n=4)	
		Number	Percentage
Quantity per day (ml)	< 180	4	100.00
	> 180	0	0
	Total	4	100.00
Duration of leaving (Years)	< 10	2	50.00
	> 10	2	50.00
	Total	4	100.00

In the present study, among the past alcoholics, 4 (100.00%) consumed less than 180 ml of alcohol per day. Among the past alcoholics, 2 (50.00%) have left alcohol consumption within the last 10 years whereas 2 (50.00%) have left alcohol consumption for more than 10 years.

Table 17. Distribution of study participants according to associated conditions

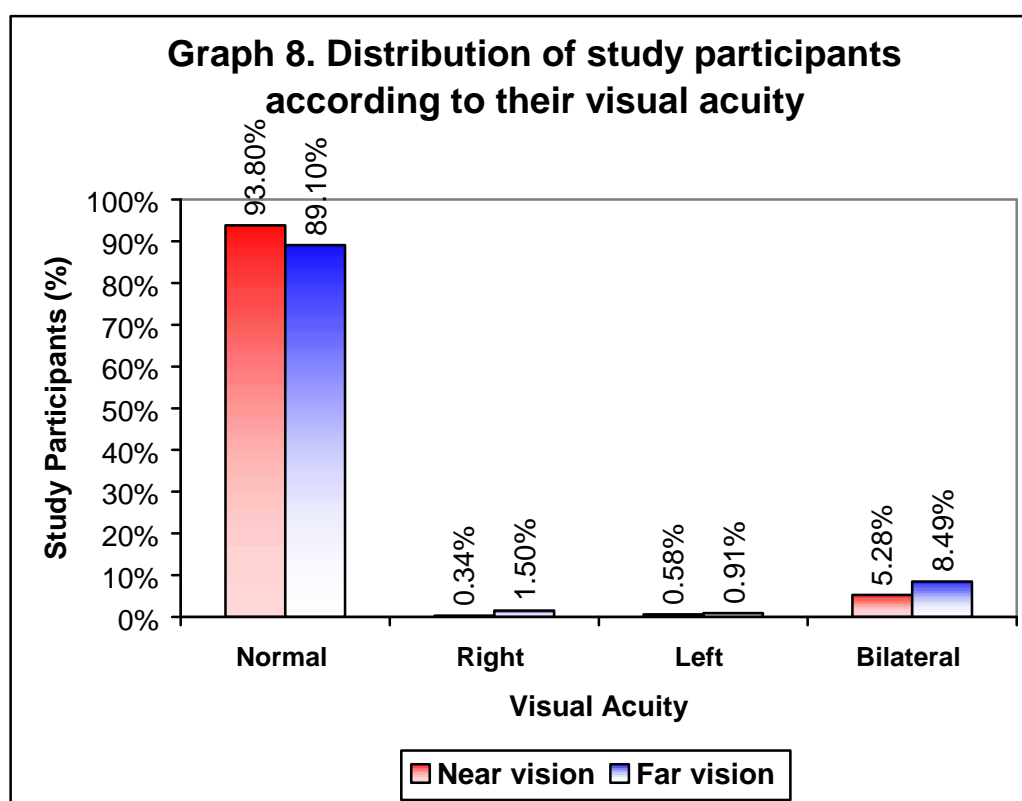
Associated condition	Study participants (n=872)					
	Yes		No		Total	
	No	%	No	%	No	%
Diabetes mellitus	8	0.91	864	99.09	872	100.00
Hypertension	36	4.12	836	95.88	872	100.00
Diabetes with Hypertension	22	2.52	850	97.48	872	100.00
Trauma	3	0.34	869	99.66	872	100.00



In the present study, among the study participants, 8 (0.91%) were diabetic only, 36 (4.12%) were hypertensive only and 22 (2.52%) were both diabetic and hypertensive. Trauma was recorded in 3 (0.34%) participants.

Table 18. Distribution of study participants according to their visual acuity

Visual acuity	Near vision (n=872)		Far vision (n=872)	
	Number	Percentage	Number	Percentage
Normal	818	93.80	777	89.10
Right	3	0.34	13	1.50
Left	5	0.58	8	0.91
Bilateral	46	5.28	74	8.49
Total	872	100.00	872	100.00

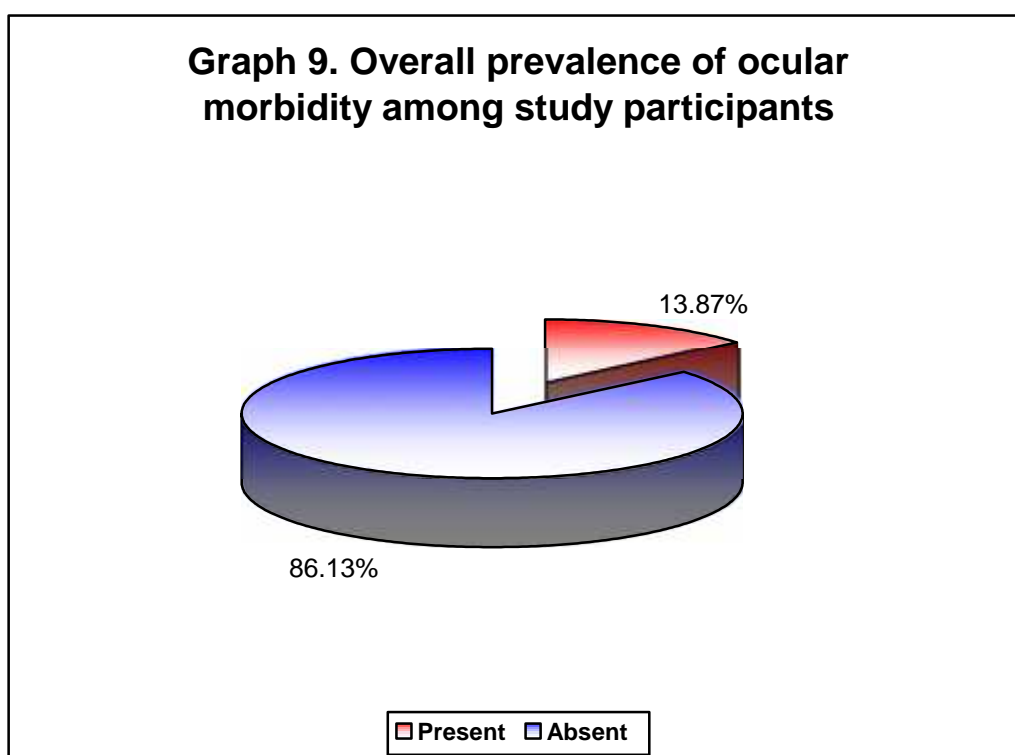


In the present study, among the study participants, 818 (93.80%) had normal near vision while 3 (0.34%) had impaired near vision in the right eye, 5 (0.58%) had impaired near vision in the left eye and 46 (5.28%) had impaired near vision bilaterally. Among the study participants, 777 (89.10%) had normal

far vision while 13 (1.50%) had impaired far vision in the right eye, 8 (0.91%) had impaired far vision in the left eye and 74 (8.49%) had impaired far vision bilaterally.

Table 19. Overall prevalence of ocular morbidity among study participants

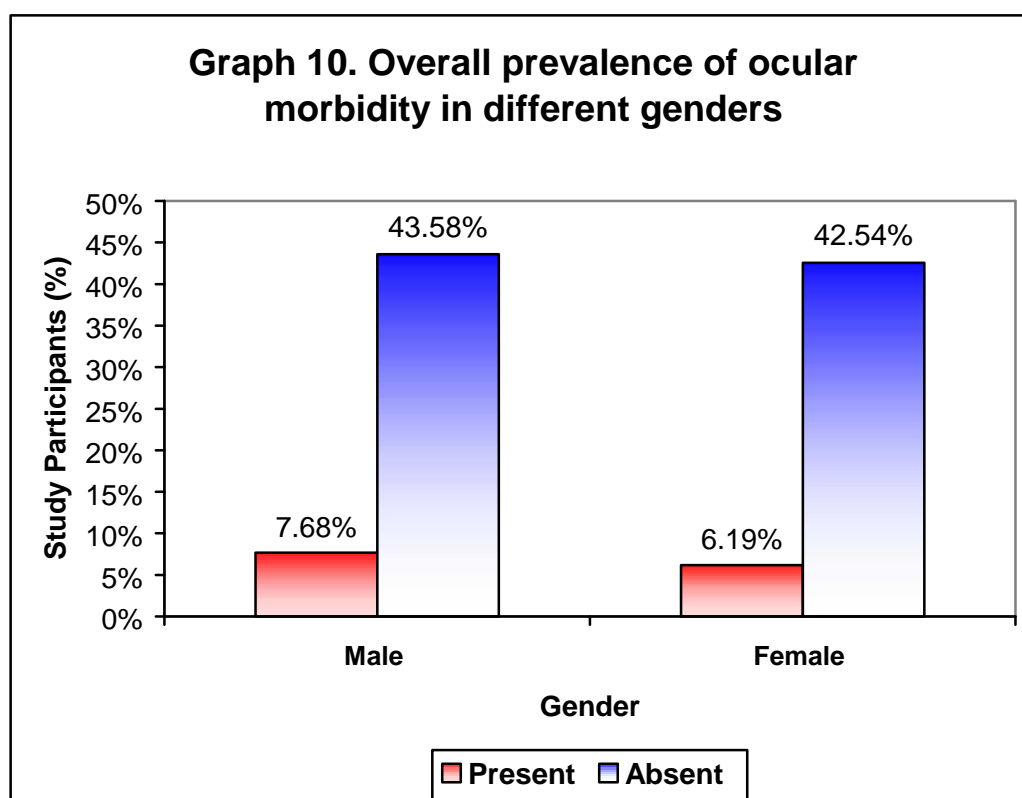
Ocular morbidities	Study participants (n=872)	
	Number	Percentage
Present	121	13.87
Absent	751	86.13
Total	872	100.00



In the present study, 121 (13.87%) suffered from one or more ocular morbidities, while 751 (86.13%) were normal.

Table 20. Overall prevalence of ocular morbidity in different genders

Ocular Morbidities	Study participants (n=872)					
	Male		Female		Total	
	No	%	No	%	No	%
Present	67	7.68	54	6.19	121	13.87
Absent	380	43.58	371	42.54	751	86.13
Total	447	51.26	425	48.74	872	100.00



In the present study 67 (7.68%) males and 54 (6.19%) females suffered from one or more ocular morbidities.

Table 21. Prevalence of different ocular morbidities among study participants

Ocular morbidities	Study participants (n=872)					
	Present		Absent		Total	
	N	%	N	%	N	%
Refractive errors	56	6.42	816	93.58	872	100.00
Myopia	38	4.35	834	95.65	872	100.00
Hypermetropia	18	2.06	854	97.94	872	100.00
Cataract	35	4.01	837	95.99	872	100.00
Blindness	26	2.98	846	97.02	872	100.00
Pseudophakia	15	1.72	857	98.28	872	100.00
Conjunctivitis	7	0.80	865	99.20	872	100.00
Glaucoma	5	0.57	867	99.43	872	100.00
Stye	4	0.46	868	99.54	872	100.00
Ocular trauma	3	0.34	869	99.66	872	100.00
Pterygium	3	0.34	869	99.66	872	100.00
Corneal ulcer	3	0.34	869	99.66	872	100.00
Diabetic retinopathy	2	0.23	870	99.77	872	100.00
Age related macular deg	2	0.23	870	99.77	872	100.00
Scleritis	1	0.11	871	99.89	872	100.00
Hypertensive retinopathy	1	0.11	871	99.89	872	100.00
Others	9	1.03	863	98.97	872	100.00

In the present study among the study participants, refractive errors (6.42%) was the leading morbidity followed by cataract (4.01%), blindness (2.98%), pseudophakia (1.72%), conjunctivitis (0.80%), glaucoma (0.57%), stye (0.46%), ocular trauma (0.34%), pterygium (0.34%), corneal ulcer (0.34%), diabetic retinopathy (0.23%), age related macular degeneration (0.23%), scleritis (0.11%), hypertensive retinopathy (0.11%) and others (1.03%). Others included squamous blepharitis, staphyloma, aphakia, squint, microcornea, fungal infection, pingecula and ptosis.

Table 22. Prevalence of different ocular morbidities in different age groups

Ocular morbidities	Age groups (Years)													
	18-30 (n=335)		31-40 (n=205)		41-50 (n=174)		51-60 (n=85)		61-70 (n=39)		>71 (n=34)		Total (n=872)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Refractive errors	9	2.70	10	4.90	16	9.20	17	20.00	3	7.70	1	2.90	56	6.42
Cataract	0	0.00	0	0.00	1	0.60	4	4.70	14	35.90	16	47.10	35	4.01
Blindness	2	0.60	2	0.90	2	1.10	2	2.30	6	15.40	12	35.30	26	2.98
Pseudophakia	0	0.00	0	0.00	0	0.00	0	0.00	3	7.69	12	35.29	15	1.72
Conjunctivitis	1	0.30	4	1.95	1	0.57	1	1.18	0	0.00	0	0.00	7	0.80
Glaucoma	0	0.00	0	0.00	0	0.00	0	0.00	3	7.69	2	5.88	5	0.57
Stye	4	1.19	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	4	0.46
Ocular trauma	2	0.60	1	0.49	0	0.00	0	0.00	0	0.00	0	0.00	3	0.34
Pterygium	0	0.00	0	0.00	2	1.15	0	0.00	1	2.56	0	0.00	3	0.34
Corneal ulcer	0	0.00	0	0.00	0	0.00	0	0.00	2	5.13	1	2.94	3	0.34
DM retinopathy	0	0.00	0	0.00	0	0.00	0	0.00	1	2.56	1	2.94	2	0.23
ARMD	0	0.00	0	0.00	0	0.00	0	0.00	1	2.56	1	2.94	2	0.23
HTN retinopathy	0	0.00	0	0.00	0	0.00	1	1.18	0	0.00	0	0.00	1	0.11
Scleritis	0	0.00	0	0.00	1	0.57	0	0.00	0	0.00	0	0.00	1	0.11
Others	4	1.19	2	0.98	1	0.57	1	1.18	0	0.00	1	2.94	9	1.03

In the present study, prevalence of refractive errors was highest (20.00%) in the age group of 51 to 60 years followed by age group of 41 to 50 years (9.20%). The highest prevalence of cataract (47.10%) and blindness (35.30%) were seen in the age group above 71 years. The highest prevalence of glaucoma in the age group of 61 to 70 years was 7.69%.

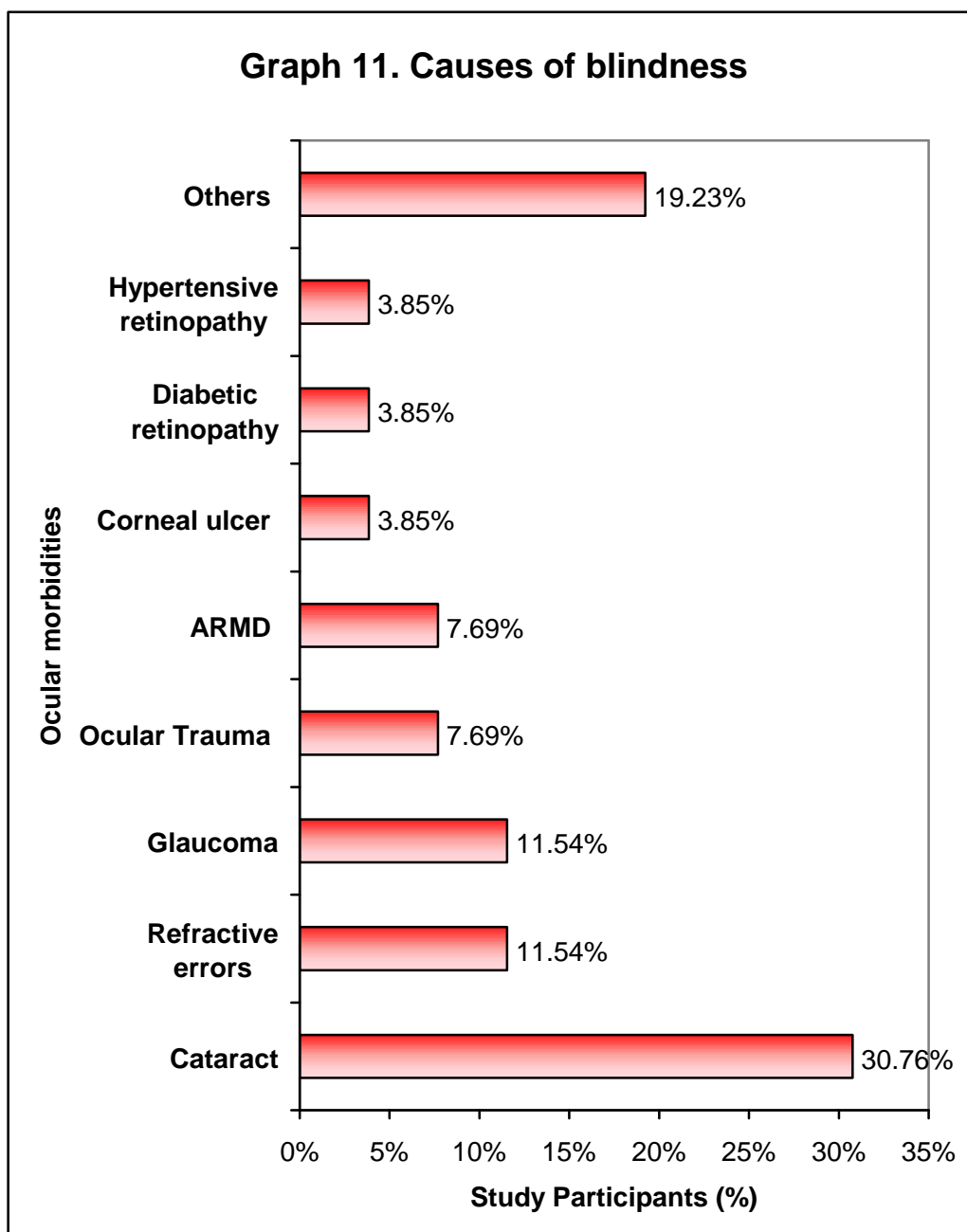
Table 23. Prevalence of ocular morbidities in different genders

	Male (n=447)		Female (n=425)		Total (n=872)	
	No	%	No	%	No	%
Refractive errors	34	7.60	22	5.20	56	6.42
Cataract	16	3.60	19	4.50	35	4.01
Blindness	14	3.10	12	2.80	26	2.98
Pseudophakia	6	1.34	9	2.12	15	1.72
Conjunctivitis	4	0.89	3	0.71	7	0.80
Glaucoma	3	0.67	2	0.47	5	0.57
Stye	3	0.67	1	0.24	4	0.46
Ocular trauma	3	0.67	0	0.00	3	0.34
Pterygium	1	0.22	2	0.47	3	0.34
Corneal ulcer	0	0.00	3	0.71	3	0.34
Diabetic retinopathy	0	0.00	2	0.47	2	0.23
Age related macular deg	1	0.22	1	0.24	2	0.23
Hypertensive retinopathy	1	0.22	0	0.00	1	0.11
Scleritis	1	0.22	0	0.00	1	0.11
Others	4	0.89	5	1.18	9	1.03

In the present study the prevalence of refractive errors, cataract and blindness in males was 7.60%, 3.60% and 3.10% respectively. Similarly in females the prevalence of refractive errors, cataract and blindness were 5.20%, 4.50% and 2.80% respectively.

Table 24. Causes of blindness

Causes of blindness	No. with blindness (n=26)	
	Number	Percentage
Cataract	8	30.76
Refractive errors (Myopia)	3	11.54
Glaucoma	3	11.54
Ocular trauma	2	7.69
Age related macular deg	2	7.69
Corneal ulcer	1	3.85
Diabetic retinopathy	1	3.85
Hypertensive retinopathy	1	3.85
Others	5	19.23
Total	26	100%



In the present study the prevalence of blindness in both sexes was found to be 2.98%. The main causes of blindness were cataract (30.76%), refractive errors (11.54%), glaucoma (11.54%) followed by ocular trauma (7.69%), age related macular degeneration (7.69%), corneal ulcer (3.85%), diabetic retinopathy (3.85%), hypertensive retinopathy (3.85%) and others (19.23%). Other causes included staphyloma, micro cornea, aphakia and fungal infection.

Table 25. Association of cataract with socio demographic characteristics (n=872)

Characters		Total number	Study participants with cataract	
			Number	Percentage
Gender	Male	447	16	3.60
	Females	425	19	4.50
	Total	872	35	4.01
		$\chi^2=0.449$	DF=1	p=0.503
Age	18 – 30 Years	335	00	-
	31 – 40 Years	205	00	-
	41 – 50 Years	174	01	0.60
	51 – 60 Years	85	04	4.70
	61 – 70 Years	39	14	35.90
	> 71 Years	34	16	47.10
	Total	872	35	4.01
		$\chi^2=294.339$	DF=3	p=0.000*
Occupation	Farmers	400	22	5.50
	House wife	311	13	4.20
	Student	85	00	-
	Others	76	00	-
	Total	872	35	4.01
		$\chi^2=9.084$	DF=2	p=0.011*
Socioeconomic Class (Modified B. G. Prasad Classification)	Class I	64	01	1.60
	Class II	196	05	2.60
	Class III	217	11	5.10
	Class IV	354	16	4.50
	Class V	41	02	4.90
	Total	872	35	4.01
		$\chi^2=3.029$	DF=4	p=0.553
Educational Status	Illiterates	135	31	22.90
	Primary	249	04	1.60
	Secondary	292	00	-
	Collegiate	170	00	-
	Graduate	23	00	-
	Post Graduate	03	00	-
	Total	872	35	4.01
		$\chi^2=143.106$	DF=1	p=0.000*

* p < 0.05 Statistically significant

Gender

In the present study, among the study participants cataract was seen in 3.60% of males and 4.50% of females. However, there was no significant association between cataract and sex.

Age groups

In the present study, among the study population cataract was present in 0.60% of people in the age group of 41 to 50 years, 4.70% in the age group of 51 to 60 years, 35.90% in the age group of 61 to 70 years and 47.10% in the age group above 71 years. There was a significant association of cataract with increasing age.

Occupation

In the present study among the study participants cataract was seen in 5.50% of farmers and 4.20% of housewives. Cataract was significantly associated with certain occupations.

Socio-economic groups

In the present study among the study participants belonging to various socio economic classes, cataract was seen in 1.60% of study participants belonging to Class I, 2.60% belonging to Class II, 5.10% belonging to Class III, 4.50% belonging to class IV and 4.90% belonging to Class V. There was no significant association between cataract and socio economic status.

Educational status

In the present study among the study participants cataract was seen in 22.90% of the illiterates and 1.60% of the study participants who had studied up to primary school. The results showed significant association of cataract with low educational status.

Table 26. Association of cataract with socio cultural characteristics

Characters		Total number	Study participants with cataract	
			Number	Percentage
Type of family	Nuclear	518	15	2.90
	Joint	303	18	5.80
	Others	51	02	3.90
	Total	872	35	4.01
		$x^2=4.602$	DF=2	p=0.100
Overcrowding	Present	324	17	5.20
	Absent	548	18	3.30
	Total	872	35	4.01
		$x^2=2.035$	DF=1	p=0.154
Diet	Vegetarian	92	03	3.30
	Mixed	780	32	4.10
	Total	872	35	4.01
		$x^2=0.011$	DF=1	p=0.913
Fuel used for cooking in female participants	Cow dung	03	00	-
	Wood	35	03	8.60
	Cow dung and wood with any other combination	172	09	5.20
	Electricity, LPG, Kerosene	215	07	3.20
	Total	425	19	4.50
		$x^2=2.020$	DF=2	p=0.364

Type of families

In the present study, among the study participants cataract was seen in 2.90% of study participants living in nuclear families, 5.80% living in joint families and 3.90% living in other types of families. However, there was no significant association between cataract and type of family.

Overcrowding status

In the present study among the study participants cataract was present in 5.20% of people living in overcrowded conditions and 3.30% of people not living in overcrowded conditions. There was no significant association of cataract with overcrowding status.

Diet

In our study it was seen that cataract was present in 3.30% of study participants who were vegetarians and 4.10% of study participants who had a mixed diet. Cataract was not significantly associated with diet.

Fuels used for cooking in female study participants

In the present study among the female study participants cataract was present in 8.60% of women who used only wood as fuel for cooking, 5.20% of women who used a combination of cow dung or wood with any other fuel and 3.20% of women who used electricity, LPG or kerosene. Fuel used for cooking was not significantly associated with cataract.

Table 27. Association of cataract with personal habits in male participants**(n=447)**

Characters		Total number	Study participants with cataract	
			Number	Percentage
Smoking	Yes	55	6	10.90
	No	392	10	2.60
	Total	447	16	3.60
		$\chi^2=7.491$	DF=1	p=0.006*
Alcohol	Yes	63	5	7.90
	No	809	11	2.90
	Total	447	16	3.60
		$\chi^2=2.698$	DF=1	p=0.100

* p < 0.05 Statistically significant

Personal habits in male study participants

It was seen in our study that cataract was present in 10.90% of smokers and 7.90% of alcoholics. There was a significant association between cataract and smoking. However, there was no significant association between cataract and alcohol consumption.

Table 28. Association of cataract with associated medical conditions (n=872)

Characters		Total number	Study participants with cataract	
			Number	Percentage
Associated condition	Diabetes mellitus	8	06	75.00
	Hypertension	36	03	8.30
	Diabetes with hypertension	22	14	63.60
	No associated conditions	806	12	1.50
	Total	872	35	4.01
		$\chi^2=169.776$	DF=1	p=0.000*

* p < 0.05 Statistically significant

Associated conditions

In the present study cataract was seen in 75.00% of the participants who were only diabetic, 8.30% of participants who were only hypertensive and 63.60% of participants who were both diabetic and hypertensive. Cataract was seen only in 1.50% of participants who were non diabetic or hypertensive. The results showed a significant association of cataract with associated medical conditions.

Table 29. Association of refractive error with socio demographic characteristics (n=872)

Characters		Total number	Study participants with refractive error	
			Number	Percentage
Gender	Male	447	34	7.60
	Females	425	22	5.20
	Total	872	56	6.42
		$x^2=2.140$	DF=1	p=0.143
Age	18 – 30 Years	335	9	2.70
	31 – 40 Years	205	10	4.90
	41 – 50 Years	174	16	9.20
	51 – 60 Years	85	17	20.00
	61 – 70 Years	39	03	7.70
	> 71 Years	34	01	2.90
	Total	872	56	6.42
		$x^2=37.685$	DF=5	p=0.000*
Occupation	Farmers	400	31	7.80
	House wife	311	15	4.80
	Student	85	03	3.50
	Others	76	07	9.20
	Total	872	56	6.42
		$x^2=4.664$	DF=3	p=0.198
Socioeconomic Class (Modified B. G. Prasad Classification)	Class I	64	04	6.20
	Class II	196	11	5.60
	Class III	217	20	9.20
	Class IV	354	19	5.40
	Class V	41	02	4.90
	Total	872	56	6.42
		$x^2=3.855$	DF=4	p=0.426
Educational Status	Illiterates	135	38	28.10
	Primary	249	09	3.60
	Secondary	292	05	1.70
	Collegiate	170	04	2.40
	Graduate	23	00	-
	Post Graduate	03	00	-
	Total	872	56	6.42
		$x^2=126.40$	DF=3	p=0.000*

* p < 0.05 Statistically significant

Gender

In the present study among the study participants 7.60% of males had refractive errors and 5.20% of females had refractive errors. Gender was not significantly associated with refractive errors.

Age group

In the present study it was observed that refractive errors were present in 2.70% of participants in the age group of 18 to 30 years, 4.90% in the age group 31 to 40 years, 9.20% in the age group 41 to 50 years, 20.00% in the age group 51 to 60 years, 7.70% in the age group 61 to 70 years and 2.90% in the age group above 71 years. The results showed a significant association of refractive errors with increasing age.

Occupation

In the present study it was found that refractive errors were present in 7.80% of the farmers, 4.80% of the housewives, 3.50% of the students and 9.20% of the participants belonging to other occupations. The results did not show any significant association between refractive errors and occupation.

Socio economic status

In the present study, among the study participants belonging to various socio economic classes, refractive errors were seen in 6.20% of study participants belonging to Class I, 5.60% belonging to Class II, 9.20% belonging to Class III,

5.40% belonging to Class IV and 4.90% belonging to Class V. However, refractive errors were not significantly associated with socio economic status.

Educational status

In the present study refractive errors were present in 28.10% of illiterates, 3.60% of the participants who had studied up to primary school, 1.70% of participants who had studied up to secondary school and 2.40% of participants who had attended college. There was a significant association of refractive errors with low educational status.

Table 30. Association of refractive errors with socio cultural characteristics

Characters		Total number	Study participants with refractive errors	
			Number	Percentage
Type of family	Nuclear	518	31	6.00
	Joint	303	25	8.30
	Others	51	00	-
	Total	872	56	6.42
		$x^2=5.351$	DF=2	p=0.069
Overcrowding	Present	324	17	5.20
	Absent	548	39	7.10
	Total	872	56	6.42
		$x^2=1.185$	DF=1	p=0.276
Diet	Vegetarian	92	06	6.50
	Mixed	780	50	6.40
	Total	872	56	6.42
		$x^2=0.002$	DF=1	p=0.967
Fuel used for cooking in female participants	Cow dung	03	00	-
	Wood	35	05	14.20
	Cow dung and wood with any other combination	172	05	2.85
	Electricity, LPG, Kerosene	215	12	5.58
	Total	425	22	5.20
		$x^2=0.145$	DF=1	p=0.703

Type of families

It was observed in the present study that refractive errors were found in 6.00% of participants living in nuclear families and 8.30% of participants living in joint families. There was no significant association between type of family and refractive errors.

Overcrowding status

It was observed in our study that refractive errors were present in 5.20% of people who lived in overcrowded conditions and 7.10% of people who were not living in overcrowded conditions. However, there was no significant association between refractive errors and overcrowding status.

Diet

In the present study it was seen that refractive errors were present in 6.50% of participants who were vegetarians and 6.40% of participants who had a mixed diet. Diet was not significantly associated with refractive errors.

Fuels used for cooking

In the present study among the female study participants refractive errors were seen in 14.20% of participants who used only wood as fuel for cooking, 2.85% of participants who used combinations of cow dung and wood with any other fuel and 5.58% of participants who used electricity, LPG or kerosene. However, there was no significant association between fuel used for cooking and refractive errors.

Table 31. Association of refractive errors with personal habits in male participants (n=447)

Characters		Total number	Study participants with refractive errors	
			Number	Percentage
Smoking	Yes	55	11	20.00
	No	392	23	5.90
	Total	447	34	7.60
		$\chi^2=11.771$	DF=1	p=0.0006*
Alcohol	Yes	63	10	15.90
	No	809	24	6.30
	Total	447	34	7.60
		$\chi^2=5.827$	DF=1	p=0.016*

* $p < 0.05$ Statistically significant

In the present study, among the male study participants refractive errors were seen in 20.00% of the smokers and 15.90% of alcoholics. The results showed a significant association between refractive errors and personal habits like smoking and alcohol consumption.

Table 32. Association of refractive errors with associated medical conditions**(n=872)**

Characters		Total number	Study participants with refractive errors	
			Number	Percentage
Associated condition	Diabetes mellitus	8	01	12.50
	Hypertension	36	05	13.88
	Diabetes with hypertension	22	00	-
	No associated conditions	806	50	6.20
	Total	872	56	6.42
		$\chi^2=0.434$	DF=1	p=0.511

The present study revealed that refractive errors were present in 12.50% of diabetics, 13.88% of hypertensives and 6.20% in participants who were not diabetic or hypertensive. However, there was no significant association between refractive errors and associated medical conditions.

Table 33. Association of blindness with socio demographic characteristics (n=872)

Characters		Total number	Study participants with blindness	
			Number	Percentage
Gender	Male	447	14	3.10
	Females	425	12	2.80
	Total	872	26	2.98
		$x^2=0.072$	DF=1	p=0.789
Age	18 – 30 Years	335	02	0.60
	31 – 40 Years	205	02	0.90
	41 – 50 Years	174	02	1.10
	51 – 60 Years	85	02	2.30
	61 – 70 Years	39	06	15.40
	> 71 Years	34	12	35.30
	Total	872	26	2.98
		$x^2=154.291$	DF=2	p=0.000*
Occupation	Farmers	400	13	3.20
	House wife	311	12	3.80
	Student	85	00	-
	Others	76	01	1.30
	Total	872	26	2.98
		$x^2=4.268$	DF=3	p=0.234
Socioeconomic Class (Modified B. G. Prasad Classification)	Class I	64	03	4.70
	Class II	196	07	3.50
	Class III	217	08	3.70
	Class IV	354	07	1.90
	Class V	41	01	2.40
	Total	872	26	2.98
		$x^2=2.528$	DF=4	p=0.640
Educational Status	Illiterates	135	19	14.10
	Primary	249	05	2.00
	Secondary	292	01	0.30
	Collegiate	170	01	0.60
	Graduate	23	00	-
	Post Graduate	03	00	-
	Total	872	26	2.98
		$x^2=60.547$	DF=1	p=0.000*

* p < 0.05 Statistically significant

Genders

In the present study among the study participants blindness was seen in 3.10% of males and 2.80% of females. There was no significant association of genders with blindness.

Age group

In the present study, blindness was seen in 0.60% of participants aged 18 to 30 years, 0.90% of participants aged 31 to 40 years, 1.10% of participants aged 41 to 50 years, 2.30% of participants aged 51 to 60 years, 15.40% of participants aged 61 to 70 years and 35.30% of participants aged above 71 years. Blindness was significantly associated with increasing age.

Occupation

It was observed in our study that blindness was present in 3.20% of farmers, 3.80% of housewives and 1.30% of participants in other occupations. Blindness was not significantly associated with occupation.

Socio-economic status

In the present study, among the study participants who belonged to various socio-economic groups blindness was seen in 4.70% of participants who belonged to Class I, 3.50% who belonged to class II, 3.70% who belonged to Class III, 1.90% who belonged to class IV and 2.40% who belonged to Class V. No significant association was found between blindness and socio economic status.

Educational status

In the present study blindness was seen in 14.10% of illiterates and 2.00% of participants who had studied up to primary school. The results showed a significant association of blindness with low educational status.

Table 34. Association of blindness with socio cultural characteristics

Characters		Total number	Study participants with blindness	
			Number	Percentage
Type of family	Nuclear	518	15	2.90
	Joint	303	11	3.60
	Others	51	00	-
	Total	872	26	2.98
		$x^2=2.021$	DF=2	p=0.364
Overcrowding	Present	324	11	3.40
	Absent	548	15	2.70
	Total	872	26	2.98
		$x^2=0.305$	DF=1	p=0.581
Diet	Vegetarian	92	4	4.30
	Mixed	780	22	2.80
	Total	872	26	2.98
		$x^2=0.240$	DF=1	p=0.623
Fuel used for cooking in female participants	Cow dung	03	00	-
	Wood	35	02	5.71
	Cow dung and wood with any other combination	172	03	1.74
	Electricity, LPG, Kerosene	215	07	3.25
	Total	425	12	2.80
		$x^2=0.296$	DF=1	p=0.586

Type of families

In the present study blindness was seen in 2.90% of participants who lived in nuclear families and 3.60% of participants who lived in joint families. The results were not significant. Type of family was not significantly associated with blindness.

Overcrowding

It was observed in the present study that blindness was present in 3.40% of participants living in overcrowded conditions and 2.70% of participants not living in overcrowded conditions. The results did not show any significant association between blindness and overcrowding status.

Diet

In the present study, it was found that blindness was present in 4.30% of participants who had vegetarian food and 2.80% of participants who had a mixed diet. However, blindness was not significantly associated with diet.

Fuels used for cooking

In the present study it was observed that blindness was present in 5.71% of females who used wood, 1.74% of females who used a combination of cow dung or wood with any other fuel and 3.25% of females who used electricity, LPG or kerosene as fuel. The fuel used for cooking was not significantly associated with blindness.

Table 35. Association of blindness with personal habits in male participants**(n=447)**

Characters		Total number	Study participants with blindness	
			Number	Percentage
Smoking	Yes	55	4	7.30
	No	392	10	2.60
	Total	447	14	3.10
		$x^2=2.158$	DF=1	p=0.141
Alcohol	Yes	63	2	3.20
	No	809	12	3.10
	Total	447	14	3.10
		$x^2=0.136$	DF=1	p=0.312

In the present study among the male participants blindness was present in 7.30% of smokers and 2.60% of non smokers. Blindness was seen in 3.20% of alcoholics and 3.10% of non alcoholics. However, blindness was not associated significantly with smoking and alcoholism.

Table 36. Association of blindness with associated medical conditions (n=872)

Characters		Total number	Study participants with blindness	
			Number	Percentage
Associated condition	Diabetes mellitus	8	02	25.00
	Hypertension	36	07	19.44
	Diabetes with hypertension	22	10	45.45
	No associated conditions	806	07	0.86
	Total	872	26	2.98
		$\chi^2=133.055$	DF=1	p=0.000*

* p < 0.05 Statistically significant

In the present study among the study participants blindness was seen in 25.00% of the participants who were diabetics, 19.44% of participants who were hypertensives and 45.45% of participants who were both diabetic and hypertensive. Nearly 0.86% blindness was seen in participants who were not diabetic or hypertensive. The results showed a significant association of blindness with associated medical conditions.

DISCUSSION

Due to the vital function of the eyes and vision, studying the epidemiology of eye diseases in different populations helps with the preservation of healthy eyes and normal vision in individuals and ultimately in the whole population. There was lack of knowledge about the eye problems in the study area and hence this community based cross-sectional study was taken up to know the various eye diseases that people suffer from in Cheluvanatti village under the Handiganur Primary Health Centre, a rural field practice area of Department of Community Medicine, Jawaharlal Nehru Medical College, Belgaum.

SOCIO DEMOGRAPHIC PROFILE

Gender and age

In the present study there were 51.26% of males and 48.74% of females. There were more number of males than females. The mean age of the study participants was 37.48 ± 15.13 . Majority of the study participants belonged to the age group of 18 – 30 years (38.42%), followed by age group of 31 – 40 years (23.51%), age group of 41 – 50 years (19.95), age group of 51 – 60 years (9.75), age group of 61 – 70 years (4.47) and age group above 71 years (3.90%). The least number of study participants belonged to the age group above 71 years (Table 1 and 2).

Educational status

In our study, Majority 33.49% had studied upto high school followed by participants who had studied up to primary school 28.55%, participants who had gone to college 19.49%, illiterates 15.48%, graduates 2.64% and post graduates 0.35% (Table 3).

In a similar study conducted in rural areas of Aligarh it was seen that majority 54.90% of study participants were illiterates, 20.10% had studied upto primary school, 15.80% had studied up to secondary school, 5.9% had gone to college, 5.6% were graduates, 1.9% were postgraduates and 1.9% were professionals.⁴

Occupation and type of family

The present study revealed that, majority (45.87%) of the study participants were farmers, followed by housewives (35.67%), students (9.75%) and others (8.71%) which included Army personnel, Drivers, business people, daily labourers and factory workers. Majority (59.40%) of the study participants lived in nuclear families, 34.75% lived in joint families and 5.85% lived in other families which included three generational families and Broken families (Table 4 and 5)

Socio economic status

The present study showed that majority 40.60% of the study participants belonged to Class IV Socio economic status according to modified B. G. Prasad Classification, 24.88%, 22.48% and 7.34% of study participants belonged to

Class III, II and I respectively and only 4.70% study participants were from Class V (Table 6).

SOCIO CULTURAL PROFILE

Risk of overcrowding

In this study, majority 62.84% of participants were not living in overcrowded conditions while 37.16% of the participants were living in overcrowded conditions (Table 7).

Fuel used for cooking

In the present study, 03 (0.72%) of the female study participants were using only cowdung as the fuel for cooking, 35 (8.23%) were using only wood, 172 (40.47%) were using a combination of cow dung or wood with any other fuel and 215 (50.58%) were using kerosene, LPG or electricity. (Table 8).

In a similar study conducted in a rural area of Aligarh majority 69.10% of the study participants were found to be using a combination of wood, coal and cowdung as fuel for cooking followed by combination of LPG, Wood, Coal, cowdung 22.20% and only LPG was used by 8.60% of the participants.⁴

Diet

In this study 10.56% of the study participants were vegetarians and 89.44% were consuming a mixed diet. Majority of the study participants were on a mixed diet (Table 9).

PERSONAL HABITS IN MALES

The present study revealed that 12.30% of the male participants were smokers and 14.10% were Alcoholics. Only the male study participants were involved in smoking and Alcohol consumption. No female participant was a smoker or an alcoholic (Table 10).

History of smoking

In the present study among the male study participants 87.70% were non smokers, 11.18% were smokers and 1.12% were ex – smokers (Table 11).

In a study done in Nagpur 62.50% were non smokers, 33.40% were smokers and 4.00% were ex-smokers.³⁸

In the blue mountain eye study 51.00% of the study population had history of smoking, 37.00% were past smokers and 14.00% were current smokers.³⁹

Present smokers

In the present study among the present smokers 56.00% smoked cigarettes while 44.00% smoked beedis. Majority 58.00% of the present smokers, smoked more than 10 cigarettes/beedis a day whereas 42.00% smoked less than 10 cigarettes/beedis a day. Majority 84.00% of the present smokers have been smoking for more than 10 years while only 16.00% have been smoking for less than 10 years (Table 12).

Past smokers

In the present study all the past smokers (100.00%) were those who smoked beedis. None of the past smokers used cigarettes. All the past smokers (100.00%) used to smoke more than 10 beedis a day. All the past smokers (100.00%) have left smoking within the last 10 years (Table 13).

History of alcohol consumption

In the present study among the male participants 13.20% were current alcoholics, 0.90% were ex-alcoholics and 85.90% were non alcoholics (Table 14).

In the blue mountain eye study 66.87% were alcoholics while only 33.13% were non alcoholics. There were no ex-alcoholics.³⁹

Present alcoholics

In the present study among the current alcoholics 94.91% consumed less than 180 ml of alcohol a day and 5.09% consumed more than 180 ml a day. Majority 77.97% of the present alcoholics have been consuming alcohol for more than 10 years while 22.03% have been consuming alcohol for less than 10 years (Table 15).

Past alcoholics

In our study all the past alcoholics (100.00%) consumed less than 180 ml alcohol a day. Nearly 50.00% of past alcoholics have left consuming alcohol for

more than 10 years whereas 50.00% have left consuming alcohol within the last 10 years (Table 16).

ASSOCIATED MEDICAL CONDITIONS

In the present study it was seen that 4.12% of the participants were only hypertensive, nearly 0.91% were only diabetic and 2.52% were both diabetic and hypertensive. Majority 92.11% of the study participants did not have any associated medical condition (Table 17).

VISUAL ACUITY

In the present study among the study participants 93.80% had normal near vision while 6.20% had impaired near vision. Among the study participants 89.10% had normal far vision while 10.90% had impaired far vision (Table 18).

In a similar study conducted in rural and urban areas of Aligarh 13.00% of the participants had impaired visual acuity and 87.00% had normal visual acuity. Compared to our study, the population in this study had a higher percentage of impaired visual acuity.⁴

OCULAR MORBIDITIES

Overall prevalence of ocular morbidity

In the present study among the study participants 13.87% of study participants suffered from one or more ocular morbidities, while 86.13% participants had no ocular problems (Table 19).

In a similar study conducted in Nigeria among rural people it was seen that 13.50% of participants had ocular disease.⁸ The prevalence of ocular morbidity is almost same as in our present study.

In another similar study conducted in three randomly selected villages in Uttar Pradesh it was observed that 76.10% residents had various ocular problems.⁴²

Ocular morbidity in genders

In the present study the prevalence of ocular morbidity was 13.87% out of which 7.68% were males and 6.19% were females. The majority of the participants with ocular problems were males (Table 20).

In a similar study conducted among rural people in Nigeria the prevalence of ocular morbidity was 13.53%. Nearly 6.95% of males and 6.58% of females had one or more ocular morbidities.⁸ Similar to our study in this study also the ocular problems were more in males when compared to females.

Prevalence of ocular morbidities

In the present study, majority 6.42% of ocular morbidity was due to refractive errors, followed by cataract 4.01%, blindness 2.98% and pseudophakia 1.72% (Table 21).

In a similar study conducted in rural and urban areas of Aligarh it was seen that the major causes for ocular morbidity were cataract 21.70%, followed by myopia 11.5%, hypermetropia 9.8%, blindness 5.30% and glaucoma 0.9%.⁴ In

this study the major ocular morbidity was refractive error whereas in this study cataract was the major ocular morbidity. The prevalence of blindness was also higher in this population compared to our study.

In another similar study done in Nigeria among rural people the common eye problems encountered were cataract (48.00%), glaucoma (21.10%), allergic conjunctivitis (16.40%) and refractive errors (12.40%). The prevalence of blindness was 1.20%.⁸

Prevalence of ocular morbidities in age groups

In the present study prevalence of refractive errors was highest (20.00%) in the age group of 51 to 60 years followed by age group of 41 to 50 years (9.20%). The highest prevalence of cataract (47.10%) and blindness (35.30%) were seen in the age group above 71 years. The highest prevalence of glaucoma in the age group of 61 to 70 years was 7.69% (Table 22).

Prevalence of ocular morbidities in genders

In the present study the prevalence of refractive errors, cataract and blindness in males was 7.60%, 3.60% and 3.10% respectively. Similarly in females the prevalence of refractive errors, cataract and blindness were 5.20%, 4.50% and 2.80% respectively (Table 23).

Causes of blindness

In our study the major causes of blindness were cataract (30.76%), refractive error (11.54%), glaucoma 11.54% followed by ocular trauma (7.69%)

and age related macular degeneration (7.69%). The overall prevalence of blindness was 2.98% (Table 24).

A study conducted in 19 randomly selected villages and urban slums in Chennai showed that the prevalence of blindness was 0.72%. The major cause of blindness was cataract (94.44%).⁶

In the national survey done on blindness in India (2006-07) the prevalence of blindness was found to be 1.00%. The major causes of blindness were cataract (62.60%), refractive error (19.70%), glaucoma (5.80%), posterior segment pathology (4.70%), corneal opacity (0.90%) and others (4.19%).²² Compared to the national level, the prevalence of blindness was more in the study area of Cheluvanatti village.

ASSOCIATION OF CATARACT WITH SOCIO-DEMOGRAPHIC CHARACTERISTICS

Gender

In our study it was observed that cataract was present more in females 4.50% when compared to males 3.60%. The results showed that there was no significant association of cataract with gender (Table 25).

In a similar study conducted in rural Tamil Nadu the prevalence of cataract was 47.50%. Prevalence of cataract was 21.50% in males and 26.00% in females. The results showed a significant association of cataract with female gender.²⁵

Age group

In the present study it was seen that majority 47.10% of cataract was present in the age group above 71 years, 35.90% in the age group 61 to 70 years and 4.70% in the age group 51 to 60 years. The results in our study showed a significant association of cataract with increasing age (Table 25).

In a similar study conducted in rural and urban areas of Aligarh the prevalence of cataract was 21.70%. The prevalence of cataract increased from 0.50% in the age group of 20 – 29 years to 82.10% in those aged 70 years and above. Cataract was significantly associated with age.⁴

In another study conducted in rural Tamil Nadu the prevalence of cataract was 47.50%. The prevalence of cataract increased significantly with age, from 15.70% among those aged 40 to 49 years to 79.40% among those aged 70 years or more.²⁵

Educational status

In our study it was observed that majority 22.90% of illiterates had cataract and 1.60% of people who had studied up to primary school had cataract. The results showed a significant association of cataract with low educational status (Table 25).

In a similar study conducted in rural and urban areas of Aligarh the prevalence of cataract was 21.70%. The prevalence of cataract was highest in illiterates (32.80%) and decreased with increasing levels of education. There was a significant association of cataract with low education status.⁴

In another study conducted in Punjab the prevalence of cataract was 15.30%. The prevalence of cataract was highest in illiterates (16.20%) and decreased with increasing levels of education. Cataract was significantly associated with low educational status.²⁶

Occupation

In the present study it was seen that majority 5.50% of farmers had cataract and 4.20% of housewives had cataract. The results showed significant association of cataract with certain occupations (Table 25).

In a study conducted in Punjab the prevalence of cataract was 15.30%. The prevalence of cataract in indoor occupations was higher (17.10%) than in outdoor occupations (12.50%). The results did not show any significant association of cataract with occupation.²⁶

Socio economic group

In the present study majority 5.10% in Class III socio economic status group presented with cataract, 4.90% in Class V, 4.50% in Class IV, 2.60% in Class II and 1.60% in Class I. The results did not show any association between cataract and socio-economic status (Table 25).

A similar study conducted in rural and urban areas of Aligarh found that the prevalence of cataract was 21.70%. Prevalence of cataract was 23.80% in higher socio economic classes (I, II and III) and 21.60% in lower socio-economic classes (IV and V). The results did not show any significant association between cataract and socio economic status.⁴

In another study conducted in three rural and one urban areas of Andhra Pradesh, the prevalence of cataract was 14.40%. The prevalence of cataract in the extreme lower socio-economic class was 22.00% and 13.10% in the upper class. Cataract was significantly higher in the extreme lower socio-economic status group.³⁵

ASSOCIATION OF CATARACT WITH SOCIO-CULTURAL CHARACTERISTICS

Different fuels used for cooking in female participants

In the present study, majority 8.60% of female participants using only wood as fuel for cooking had cataract, 5.20% of people using a combination of cow dung or wood with any other fuel for cooking had cataract and 3.20% of participants using electricity, LPG or kerosene as fuel had cataract. The results in our study did not show any significant association between cataract and fuel use (Table 26).

A study conducted in rural area of Jammu and Kashmir revealed that prevalence of cataract was 25.30%. Nearly 70.40% were housewives exposed to smoke produced from Biomass fuel combustion. There was a significant correlation of cataract with the exposure to indoor air pollution, caused by smoke due to Biomass fuel combustion.³¹

In another similar study conducted in a village of Western India, the prevalence of cataract was 26.00%. The prevalence of cataract in people who

used only wood as fuel was 36.90% and in people who used only LPG was 6.00%. The usage of wood as fuel was significantly associated with cataract.³²

Type of family

In our study majority 5.80% of participants living in joint families had cataract, 3.90% living in other type of families and 2.90% of people living in nuclear families had cataract. The results were not significant (Table 26).

In a similar study conducted in Punjab the prevalence of cataract was 15.30%. The prevalence of cataract was found to be high in the widowed (Broken family) 22.20%. Cataract was significantly associated with those who were widowed.²⁶

Overcrowding status

In the present study it was observed that 5.20% of people living in overcrowded conditions had cataract whereas 3.30% of people not living in overcrowded conditions had cataract. The results were not significant (Table 26).

Diet

In the present study it was seen that 4.10% of people who were on a mixed diet had cataract whereas 3.30% of vegetarians had cataract. The results were not significant (Table 26).

In a study conducted in Punjab the prevalence of cataract was 15.30%. The prevalence of cataract was high (18.90%) in people who used rock salt for

cooking. Cataract was significantly associated with usage of rock salt for cooking.²⁶

ASSOCIATION OF CATARACT WITH PERSONAL HABITS IN MALES

In our study 10.90% of smokers had cataract and 2.60% of non-smokers had cataract. Nearly 7.90% of Alcoholics had cataract whereas 2.90% of non alcoholics had cataract. The results in our study showed a significant association of cataract with smoking. There was no association between cataract and alcohol consumption (Table 27).

In a study done in three rural and one urban area of Andhra Pradesh the prevalence of cataract was 14.40%. The prevalence of cataract was high among smokers 27.00% when compared to non-smokers 17.20%. Cataract was significantly associated with smoking.³⁵

In the Blue mountains eye study it was seen that Heavy alcohol consumption was associated with an increased prevalence (2.10%) of nuclear cataract, and a decreased prevalence of (0.80%) cortical cataract.³⁹

ASSOCIATION OF CATARACT WITH ASSOCIATED MEDICAL CONDITIONS

In the present study, among the study participants 63.30% of participants who had both diabetes mellitus and hypertension had cataract, 8.30% having only hypertension had cataract, 75.00% having only diabetes mellitus had cataract and only 1.50% of participants who did not have any associated medical condition

had cataract. The results showed a significant association of cataract with associated medical conditions (Table 28).

In a study conducted by CDC United States in 2002 it was observed that the prevalence of cataract was higher among persons with diabetes than among those without diabetes. The age adjusted prevalence of cataracts among those with and without diabetes mellitus was 31.80% and 21.20% respectively.¹⁸

ASSOCIATION OF REFRACTIVE ERRORS WITH SOCIO-DEMOGRAPHIC CHARACTERISTICS

Gender

In the present study refractive errors were seen in majority 7.60% of males and 5.20% of females. The total prevalence of refractive errors among the study population was 6.42%. It was the major ocular morbidity in our study. The results were not significant (Table 29).

In a similar study conducted in rural and urban areas of Aligarh, the prevalence of refractive errors was 24.96%. The prevalence of refractive errors was more in males (26.23%) when compared to females (24.08%). The results did not show any significant association between refractive errors and gender.⁴

In another study conducted in a rural South Indian population it was found that the prevalence of refractive errors was 45.69%. The prevalence of refractive errors in females (25.79%) was more than that in males (19.89%). The results showed a significant association between refractive errors and female sex.²⁸

Age group

In the present study refractive errors were seen majority 20.00% in the age group of 51 to 60 years. In our study it was seen that refractive errors increased with increasing age but again decreased from the age group 61 to 70 years onwards. The results showed a significant association of refractive errors with increasing age (Table 29).

In a similar study done in a South Indian rural population the prevalence of refractive errors was 45.61%. Refractive errors were significantly associated with increasing age and the highest prevalence was seen in the age group of above 70 years (92.18%).²⁸

In another study done in rural and urban areas of Aligarh it was observed that the prevalence of refractive errors was 24.96%. The highest prevalence of refractive errors (50.54%) was seen in the age group of 50 to 59 years. The prevalence started to decrease again from the age group of 60 to 69 years (32.39%). The results showed a significant associated of refractive errors with increasing age.⁴

Educational status

In the present study refractive errors were seen in 28.10% of illiterates, 3.60% of people who had studied up to primary school and 2.40% in participants who had attended college. The results in our study showed a significant association between refractive errors and low educational status (Table 29).

In a study conducted in Andhra Pradesh the prevalence of refractive errors was found to be 39.37%. The prevalence was highest among the illiterates (36.60%), however the results were not significant.²⁷

Occupation

In the present study refractive errors were seen in 7.80% of farmers, 4.80% of housewives, 3.50% of students and 9.20% of people from other occupations. The majority of refractive errors were seen in people doing other occupations. The results did not show any significant association (Table 29).

Socio economic status

In our present study refractive errors were seen in 9.20% of participants in Class III, 6.20% in Class I, 5.60% in Class II, 5.40% in Class IV and 4.90% in Class V. Refractive errors were seen more in Class III socio economic group. The results were not significant (Table 29).

ASSOCIATION OF REFRACTIVE ERRORS WITH SOCIO CULTURAL CHARACTERISTICS

Type of family

In the present study among the study participants 8.30% of people living in joint families had refractive errors and 6.00% of people living in nuclear families had refractive errors. The results were not significant (Table 30).

Overcrowding

In our study it was observed that refractive errors were present in 7.10% of people who did not live in overcrowded conditions and 5.20% in people who lived in overcrowded conditions. The results did not show any significant association (Table 30).

Diet

In our study it was seen that 6.50% of participants who were vegetarians had refractive errors whereas 6.40% of participants who had a mixed diet had refractive errors. The results were not significant (Table 30).

Fuel used for cooking in female participant

In our study 14.20% females using only wood as fuel had refractive errors followed by 5.58% participants who used electricity, LPG or kerosene as fuel and 2.85% in participants who used a combination of cowdung or wood with any other fuel. Refractive errors were seen more in women who used only wood as fuel. The results were not significant (Table 30).

ASSOCIATION OF REFRACTIVE ERRORS WITH PERSONAL HABITS IN MALE STUDY PARTICIPANTS

Among the male participants in our study refractive errors were seen in 20.00% of the smokers and only 5.9% of non-smokers. Refractive errors were seen in 15.90% of alcoholics and only 6.30% of non-alcoholics. Surprisingly in

our study the results showed a significant association between refractive errors and personal habits like smoking and alcohol consumption (Table 31).

ASSOCIATION OF REFRACTIVE ERRORS WITH ASSOCIATED MEDICAL CONDITIONS

In our present study among the study participants refractive errors were seen in 13.88% of participants who were only hypertensive, 12.50% in participants who were only diabetic and 6.20% in participants who did not have any associated medical conditions. There were no participants with refractive errors who were both hypertensive and diabetic. The results did not show any significant association (Table 32).

In a similar study done in rural and urban areas of Tamil Nadu it was observed that the prevalence of refractive errors was 61.21% and diabetes was significantly associated with refractive errors.⁴³

In another similar study conducted in Andhra Pradesh the prevalence of refractive errors was 39.37%. Nearly 62.63% of the hypertensives had refractive errors. The results showed significant association of refractive errors with hypertension.²⁷

ASSOCIATION OF BLINDNESS WITH SOCIO-DEMOGRAPHIC CHARACTERISTICS

Gender

The present study observed that 3.10% of the male participants were blind while 2.80% of the female participants were blind. Blindness was more in males than in females. The results did not show any significant association between blindness and gender (Table 33).

In a similar study conducted in Tirunalveli district of Tamil Nadu prevalence of blindness was 11.00%. Prevalence of blindness was higher in females 13.40% when compared to males 8.00%. Blindness was significantly associated with female sex.²⁰

In a study conducted to estimate blindness in India the prevalence of blindness was found to be 8.50%. The prevalence of blindness in females (9.87%) was higher than that in males (6.98%). Blindness was significantly associated with female sex.²¹

In another study conducted in Nigeria it was observed that the prevalence of blindness was 5.60%. Nearly 76.00% of blindness was seen in males. The association between blindness and male gender was significant.⁹

Age groups

In the present study, among the study participants, 35.30% of the participants in the age group above 71 years were blind, 15.40% in the age group

61 to 70 years were blind and 2.30% in the age group 51 to 60 years were blind. The results showed that there was a significant association of blindness with increasing age (Table 33).

In a similar study conducted in Tirunelveli district of Tamil Nadu the prevalence of blindness was 11.00%. The prevalence of blindness in the age group of 50 to 59 years was 5.80% and increased to 21.80% in the age group 70 years and above. Blindness was significantly associated with increasing age.²⁰

In another similar study done in rural Tamil Nadu the prevalence of blindness was 3.36%. The prevalence of blindness in the age group 40 to 49 was 10.60% and increased to 32.57% in the age group 70 to 79. Blindness was significantly associated with increasing age.¹⁹

Educational status

In our study it was observed that majority 14.10% of the illiterates were blind, 2.00% of people who had studied up to primary school were blind and 0.60% of people who had gone to college were blind. The results showed a significant association of blindness with illiteracy (Table 33).

In a study done in Tirunelveli district of Tamil Nadu the prevalence of blindness was 11.00%. The prevalence of blindness was 14.50% in illiterates and 5.40% in literates. Blindness was significantly associated with illiteracy.²⁰

In a nation wide survey done in India it was observed that prevalence of blindness was 8.50%. Prevalence of blindness among the illiterates was 10.44%

and prevalence in people educated beyond grade 10 was 1.87%. Blindness was significantly associated with illiteracy.²¹

Occupation

In the present study 3.80% of the housewives were blind and 3.20% of the farmers were blind. Blindness was seen more in housewives than in other occupations. The results were not significant (Table 33).

A study conducted in Timore-Leste showed that the prevalence of blindness was 4.10%. Blindness was significantly associated with subsistence farming.¹²

Socio economic group

In the present study it was seen that majority 4.70% of participants belonging to Class I socio economic status group were blind, 3.70% in class III, 3.50% in class II, 2.40% in Class V and 1.90% in Class IV. The results did not show any significant association (Table 33).

The Andhra Pradesh Eye Disease Study reported the prevalence of blindness as 1.84%. The prevalence of blindness in the extreme lower socio economic status group was 4.51% whereas the prevalence in the upper socio economic status group was 0.55%. Blindness was significantly associated with decreasing socio economic status.⁴⁴

ASSOCIATION OF BLINDNESS WITH SOCIO-CULTURAL CHARACTERISTICS

Type of families

In the present study among the study participants 3.60% of people living in Joint families were blind and 2.90% of people living in nuclear families were blind. The results were not significant (Table 34).

Overcrowding status

In the present study, 3.40% of people living in overcrowded conditions were blind and 2.70% of people not living in overcrowded conditions were blind. The results were not significant (Table 34).

Diet

In the present study blindness was seen in, majority 4.30% of vegetarians and 2.80% of people who had a mixed diet. The results were not significant (Table 34).

Fuel used for cooking in female participants

In the present study it was seen that 5.71% of participants using only wood were blind, 3.25% of participants using electricity, LPG or kerosene were blind and 1.74% of people using a combination of cowdung or wood with any other fuel were blind. The results were not significant (Table 34).

In a study conducted in different parts of India it was observed that the prevalence of partial blindness was more (7.20%) in people using biomass fuels

when compared to people using cleaner fuels (5.48%). Partial blindness was significantly associated with use of biomass fuels. Complete blindness was also higher (0.66%) in people who used biomass fuels when compared to people who used cleaner fuels (0.60%). The association of complete blindness with fuel use was not significant.³³

ASSOCIATION OF BLINDNESS WITH PERSONAL HABITS IN MALE PARTICIPANTS

In the present study blindness was seen in 7.30% of smokers and 3.20% of alcoholics. The results did not show any significant association between blindness and personal habits like smoking and alcohol (Table 35).

ASSOCIATION OF BLINDNESS WITH ASSOCIATED MEDICAL CONDITIONS

In the present study among the study participants, blindness was present in 45.45% of participants who were both diabetic and hypertensive, 25.00% of participants who were only diabetic and 19.44% of participants who were only hypertensive. Only 0.86% of participants who had no associated medical conditions were blind. The results showed a significant association of blindness with associated medical conditions (Table 36).

CONCLUSION

The results of the present study revealed that ocular morbidity was high among the study participants. The major causes of ocular morbidity were refractive errors and cataract.

Blindness was high in the study population when compared to the overall prevalence. The major cause of blindness was cataract. In most of the patients blindness was avoidable either preventable or treatable. Blindness was associated with increasing age, low educational status and associated medical conditions like diabetes mellitus and hypertension. Cataract was associated with increasing age, low educational status, and associated medical conditions like hypertension and diabetes mellitus. Refractive errors were associated with increasing age and low educational status.

The personal habits like, smoking was significantly associated with cataract and refractive errors whereas consumption of alcohol was significantly associated with refractive errors.

LIMITATIONS

The limitations of the study are;

- The study was done in only adult population hence the findings of the study cannot be applied to whole population.
- For some ocular morbidities special investigations (automated refractive meter, fundus fluorescein angiography etc) could not be done.

RECOMMENDATIONS

On the basis of this study, the following recommendations have been made for the improvement of ocular morbidities of rural community.

- People should be educated about the causes, preventive measures, and appropriate treatment to overcome the ocular problems.
- Health education programs should target older age groups specifically and the population in general.
- Health education programs should also encourage and educate people about modifiable risk factors for hypertension and diabetes mellitus.
- Create awareness about the adverse effects of habits like smoking and alcohol.
- Improve the quality of available human resources by increasing the number of training facilities and by more balanced distribution of eye care providers especially in the rural areas.

SUMMARY

This one year community based cross-sectional study among the rural population with age more than 18 years was taken-up in Cheluvanatti village under the Handiganur Primary Health Centre, Belgaum during the period of Jan 2009 to Dec 2009.

In the present study there were more male participants (51.26%) than female participants. Majority of the study participants were in the age group of 18 to 30 years (38.42%) and had completed their high school education (33.49%). Majority (45.87%) of the study participants were farmers and lived in nuclear families (59.40%). Majority (40.60%) of the study participants belonged to Class IV socio-economic status group and had a mixed diet (89.44%). Majority (50.58%) of the female participants used electricity, LPG or kerosene as fuel for cooking. Nearly 12.30% of males were smokers and 14.10% were alcoholics.

The overall prevalence of ocular morbidity among the study participants was 13.87% and more males (7.68%) suffered from one or more ocular morbidities. The prevalence of various ocular morbidities among the study participants were, refractive errors (6.42%), cataract (4.01%), blindness (2.98%), glaucoma (0.57%), stye (0.46%), pterygium (0.34%), corneal ulcer (0.34%), diabetic retinopathy (0.23%) and hypertensive retinopathy (0.11%).

In the present study, prevalence of refractive errors was highest (20.00%) in the age group of 51 to 60 years followed by age group of 41 to 50 years (9.20%). The highest prevalence of cataract (47.10%) and blindness (35.30%)

were seen in the age group of above 71 years followed by age group of 61 to 70 years where prevalence of cataract and blindness were 35.90% and 15.40% respectively. The highest prevalence of glaucoma (7.69%) was in the age group 61 to 70 years. Styne was present in 1.19% of participants in the age group 18 to 30 years. Prevalence of corneal ulcer was highest (5.13%) in the age group of 61 to 70 years. Pterygium was seen in 2.56% of participants in the age group of 61 to 70 years followed by 1.15% in the age group of 41 to 50 years.

Cataract was significantly associated with increasing age, low educational status, occupation, smoking and associated medical conditions like hypertension and diabetes mellitus.

Cataract was not significantly associated with gender, socio-economic status, type of family, overcrowding, diet, fuel used for cooking and alcohol consumption.

Refractive errors were associated significantly with increasing age, low educational status, smoking and alcohol consumption.

Refractive errors were not significantly associated with gender, occupation, socio-economic status, type of family, overcrowding, diet, fuel used for cooking and associated medical conditions like hypertension and diabetes mellitus.

Blindness was significantly associated with increasing age, low educational status and associated medical conditions like hypertension and diabetes mellitus.

Blindness was not significantly associated with gender, occupation, socio-economic status, type of family, overcrowding, diet, fuel used for cooking, smoking and alcohol consumption.

BIBLIOGRAPHY

1. Shirzadesh E, Bolourian AA, Mohamadi Nikpoor M, Bemani Naeini M. A survey of impaired vision and common etiology in the rural population of Sabzevar, Iran. *JSMR* 2007; 2: 19-23.
2. Klein B, Klein R. Lifestyle exposures and eye diseases in adults. *Am J Ophthalmol.* 2007; 144(6): 961–969.
3. Deshpande M. Vision 2020: Right to sight-India. *MAFI* 2008; 64: 302-3.
4. Haq I, Khan Z, Khalique N, Amir A, Jilani FA, Zaidi M. Prevalence of common ocular morbidities in adult population of aligarh. *Indian J Community Med.* 2009; 34(3): 195–201.
5. Singh MM, Murthy GV, Venkatraman R, Rao SP, Nayar S. A study of ocular morbidity among elderly population in a rural area of central India. *Indian J Ophthalmol* 1997; 45 (1): 61-5.
6. Su Z, Wang BQ, Buys YM. Prevalence of visual impairment and blindness and survey of barriers to eye care in a South Indian Population. Toronto: University of Toronto Research Protocol; 2009.
7. Dandona R, Dandona L, Srinivas M, Giridhar P, Prasad MN, Vilas K, et al. Moderate visual impairment in India: the Andhra Pradesh Eye Disease Study. *Br J Ophthalmol* 2002; 86: 373-7.

8. Adegbehingbe BO, Majengbasan TO. Ocular health status of rural dwellers in South-Western Nigeria. *Aust J Rural Health*. 2007; 15(4): 269-72.
9. Adegbehingbe BO, Fajemilehin BR, Ojofeitimi EO, Bisiriyu LA. Blindness and visual impairment among the elderly in Ife-Ijesha zone of Osun State, Nigeria. *Ind J Ophthalmol* 2006; 54: 59-62.
10. Dalvi SD, Sathe PV. A survey of ocular morbidity with special reference to senile cataract in rural population. *Indian J Prev Soc Med* 1985; 16 (4): 103-10.
11. Shahriari HA, Izadi S, Rouhani MR. Prevalence and causes of visual impairment and blindness in Sistan-va-Baluchestan Province, Iran: Zahedan Eye Study. *Br J Ophthalmol*. 2007; 91(5): 579-84.
12. Ramke J, Palagyi A, Naduvilath T. Prevalence and causes of blindness and low vision in Timor-Leste. *Br J Ophthalmol* 2007; 91: 1117-21.
13. Jadoon MZ, Dineen B, Bourne RRA, Shab SP, Khan MA, Johnson GJ, et al. Prevalence of blindness and visual impairment in Pakistan: The Pakistan National Blindness and Visual Impairment Survey. *IOVS* 2006; 47(11): 4749-55.
14. Dineen BP, Bourne RRA, Ali SM, Noorul Huq DM, Johnson GJ. Prevalence and causes of blindness and visual impairment in bangladeshi adults: results of the National Blindness and Low Vision Survey of Bangladesh. *Br. J Ophthalmol* 2003; 87: 820-8.

15. Reddy SC, Tajunisah I, Low KP, Karmila AB. Prevalence of eye diseases and visual impairment in urban population – A study from University of Malaya Medical Centre. *Malaysian Family Physician* 2008; 3(1): 25-8.
16. Schellini SA, Durkin SR, Hoyama E, Hirai F, Cordeiro R, Casson RJ, et al. Prevalence and causes of visual impairment in a Brazilian population; The Botucatu Eye Study. *BMC Ophthalmology* 2009, 9: 8.
17. Resnikoff S, Pascolini D, Etya'ale D, Kocur I, Pararajasegarm R, Pokharel GP. Global data on visual impairment in the year 2002. *Bull World Health Organ* 2004; 82 (11): 844-51.
18. Centers for Disease Control and Prevention (CDC). Prevalence of visual impairment and selected eye diseases among persons aged ≥ 50 years with and without diabetes--United States, 2002. *MMWR Morb Mortal Wkly Rep.* 2004 Nov 19;53(45):1069-71.
19. Vijaya L, George R, Arvind H, Baskaran M, Raju P, Ramesh SV, et al. Prevalence and causes of blindness in the rural population of the Chennai Glaucoma Study. *Br J Ophthalmol* 2006; 90: 407-10.
20. Nirmalan PK, Thulasirako RD, Maneksha V, Rahmathullah R, Ramakrishnan R, Padmavathi A, et al. A population based eye survey of older adults in Tirunelveli district of South India: blindness, Cataract surgery, and visual outcomes. *Br J Ophthalmol* 2002; 86: 505-12.
21. Murthy GV, Gupta SK, Bachani D, Jose R, John N. Current estimates of blindness in India. *Br J Ophthalmol* 2005; 89: 257-60.

22. Park K. Park's Textbook of Preventive and Social Medicine. 20th Ed., Jabalpur, India: Banarasidas Bhanot; 2009.
23. Neena J, Rachel J, Praveen V, Murthy GVS for the RAAB India Study Group. Rapid Assessment of Avoidable Blindness in India. PLoS One. 2008; 3(8): e2867.
24. Fotouhi A, Hashemi H, Mohammad K, Jalali KH. The prevalence and causes of visual impairment in Tehran: The Tehran Eye Study. Br J Ophthalmol 2004; 88: 740-5.
25. Nirmalan PK, Krisbnadas R, Ramakrishnan R, Thulasiraj RD, Katz J, Tielsch JM, et al. Lens Opacities in a rural population of Southern India: The Aravind comprehensive eye study. IOVS 2003; 44(11): 4639-43.
26. Chatterjee A, Milton RC, Thyle S. Prevalence and aetiology of cataract in Punjab. Br J Ophthalmol 1982; 66: 35-42.
27. Krishnaiah S, Srinivas M, Khanna RC, Rao GN. Prevalence and risk factors for refractive errors in the South Indian adult population: The Andhra Pradesh Eye disease study. Clin Ophthalmol 2009; 3: 17-27.
28. Raju P, Ramesh SV, Arvind H, George R, Baskaran R, Paul PG, et al. Prevalence of refractive errors in a rural South Indian population. IOVS, 2004; 45(12): 4268-72.

29. The Eye Diseases Prevalence Research Group. The prevalence of refractive errors among adults in the United States, Western Europe and Australia. *Arch Ophthalmol* 2004; 122: 495-505.
30. Palimkar A, Klandekar R, Venkataraman V. Prevalence and distribution of glaucoma in central India (Glaucoma Survey – 2001). *Indian J Ophthalmol* 2008; 56: 57-62.
31. Hassan G, Waseem Q, Kadri SM, Manzoor A, Sajad KA, Omer MS. Domestic smoke pollution from biomass fuel combustion and increased prevalence of cataracts in Jammu and Kashmir, India. *Ann Trop Med Public Health* 2009; 2(1): 31.
32. Saha A, Kulkarni PK, Shah A, Patel M, Saiyed HN. Ocular morbidity and fuel use: an experience from India. *Occup Environ Med* 2005; 62: 66-9.
33. Mishra VK, Retherford RD, Smith KR. Biomass cooking fuels and prevalence of blindness in India. *J Environ Med* 1999; 1: 189-99.
34. Sreenivas V, Prabhakar AK, Badrinath SS, Fernandez T, Roy IS, Sharma T, et al. A rural population based case control study of senile cataract in India. *J Epidemiol* 1999; 9(5): 327-36.
35. Krishnaiah S, Vilas K, Shamanna BR, Rao SGN, Thomas R, Balasubramanian D. Smoking and its association with cataract: Results of the Andhra Pradesh eye disease study from India. *IOVS* 2005; 46(1): 58-65.

36. Cheng ACK, Pang CP, Leung ATS, Chua JKH, Fan DSP, Lam DSC. The association between cigarette smoking and ocular diseases. *HKMJ* 2000; 6: 195-202.
37. Ritter LL, Klein R, Klein BE, Mares-Perlman JA, Jensen SC. Alcohol use and age related maculopathy in the Beaver Dam Eye Study. *Am J Ophthalmol* 1995; 120: 190-6.
38. Zodpey SP, Ugade SN. Tobacco smoking and risk of age related cataract in Men. *Regional health forum WHO South East Asia Region (Volume 3)* 2006; 3: 336-46.
39. Cumming RG, Mitchell P. Alcohol, smoking and cataracts. *Arch Ophthalmol* 1997; 115: 1296-1303.
40. Kulkarni AP, Baride JP. *Textbook of community medicine 1st Ed.* Mumbai; Vora Medical publications: 1998.
41. Insurance Worker. 2010; *LIII* (6): 28.
42. Mehrotra SK, Maheshwari BB. Prevalence of ocular lesions in a rural community. *Indian J Ophthalmol* 1975; 23: 17-20.
43. Prema R, Rinnie G, Ve SR, Hemamalini A, Baskaran M, Kumaramanickavel G, et al. Comparison of refractive errors and factors associated with spectacle use in a rural and urban South Indian Population. *Indian J Ophthalmol* 2008; 56: 139-44.
44. Dandora L, Dandora R, Srinivas M. Et al. Blindness in the Indian State of Andhra Pradesh. *Invest Ophthalmol Vis Sci* 2001; 42: 908-16.

ANNEXURE I

INFORMED CONSENT

A CROSS-SECTIONAL STUDY OF OCULAR MORBIDITY PATTERN IN THE PEOPLE ABOVE THE AGE OF 18 YEARS RESIDING IN CHELUVANATTI VILLAGE, BELGAUM DISTRICT

Introduction

You are being invited to participate in this study to find out the ocular morbidity pattern in Cheluvanatti village under Handignur Primary Health Centre, Belgaum District.

Explanation of procedure

In this study we will be examining your eye by asking you to read the Snellen's chart and by clinical examination. Clinical examination will be done by naked eye examination and pen torch and not by slit lamp, indirect ophthalmoscopy, estimation of lacrimal pressure etc. If you agree to participate, you will be examined, the moment you don't want to continue you can leave.

Possible benefits

The investigator does not promise or guarantee that you will get direct benefit being in this study. It will benefit for the whole community because by this study we will know the various eye problems, in Cheluvanatti village. This study will surely help in the future for development of the community.

Confidentiality

Your identity will not be revealed. All information will be collected and coded so that no one will know your identity.

Withdrawal

Participation in this study is voluntary. If you don't wish to participate in this study, you will not lose benefits to which you are entitled.

Cost of participation

The cost of the study will be borne by the researcher. There will be no additional cost to you for taking part in this study.

Payment of participation

There will be no incentive to you for participating in this study.

Risks involved in the study to the participants

This survey does not contain any intervention or major procedures hence has no adverse effects on the participants. However, if you have any questions about this study, you can contact Dr. ***** *****, Post Graduate Student, Department of Community Medicine, J. N. Medical College, Belgaum – 590 010 at ***** ***** or Dr. **** ***** Department of Community Medicine, J. N. Medical College, Belgaum – 590 010 at ***** ***** if you have any questions about your rights as a study participant you may contact Chairman, Jawaharlal Nehru Medical College Institutional Ethics Committee on human subjects research.

Legal rights

By signing this consent form, you are not waiving any of your legal rights.

Publication rights

The results of the survey will be used for teaching and medical publications. However the participants identity will be kept confidential.

Consent statement

I volunteer and consent to participate in this study. I have read the consent or it has been read to me. The study has been fully explained to me and I may ask questions at any time.

Signature or thumb impression _____ Date _____
(Volunteer Subject)

Name : _____ Place _____

Signature of person obtaining consent _____ Date _____

Name : _____ Place _____

ANNEXURE II – PROFOMA

**STUDY: A CROSS-SECTIONAL STUDY OF OCULAR MORBIDITY
PATTERN IN THE PEOPLE ABOVE THE AGE OF 18 YEARS
RESIDING IN CHELUVANATTI VILLAGE, BELGAUM DISTRICT.**

Sr. No. :

1. Name :

2. Age :

3. Sex :

4. Educational status:

5. Occupation :

6. Religion :

7. Address :

8. **Family**

a) Total number of family members :

b) Type of family :

c) Total income of family :

d) Per capita Income :

9. **House**

a) No of rooms in the house :

b) Overcrowding :

c) House sanitation :

d) Surroundings :

e) Fuel used for cooking :

Cow Dung	<input type="checkbox"/>	Wood	<input type="checkbox"/>
Kerosene	<input type="checkbox"/>	Gas	<input type="checkbox"/>
Electricity	<input type="checkbox"/>		

10. Personal History

a) Diet Vegetarian Mixed

b) Smoking Yes No

If Yes, Beedi Cigarette

I. Number of cigarettes per day

II. Duration of smoking

III. If left smoking since when

c) Alcohol Yes No

If Yes,

I. Quantity

II. Duration

III. If left, since when

11. Past History Diabetes mellitus Hypertension

Trauma

12. Family history Any similar complaints in the family

Yes No

13. Ophthalmic examination

Examination of eyes

	Rt. Eye	Lt. Eye
1. Adnexia		
Eye lids	:	:
Eye Brows	:	:
2. Conjunctiva	:	:
3. Cornea	:	:
4. Sclera	:	:
5. Iris	:	:
6. Pupil	:	:
7. Lens	:	:

Visual acuity

	Rt. Eye	Lt. Eye
Near Vision	:	:
Far vision	:	:

Systemic examination

CVS	:
RS	:
Per abdomen	:
CNS	:

14. Diagnosis

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
7	2	50	2	1	3	IV	1	0	1	1	0	0		0	.	.	.	.	.	0	.	.
10	1	60	1	1	2	III	0	0	0	1	0	0	1	0	.	.	.	.	.	0	.	.
13	2	56	2	1	2	V	0	1	0	1	0	0	1	0	.	.	.	.	.	0	.	.
29	1	51	1	1	2	III	0	0	0	1	0	0	1	0	.	.	.	.	.	0	.	.
31	1	56	1	1	1	III	0	1	0	1	0	0	1	0	.	.	.	.	.	0	.	.
51	1	52	1	1	1	IV	0	1	1	0	0	0	1	0	.	.	.	.	.	0	.	.
58	1	29	1	1	3	III	0	0	0	0	1	0	1	0	.	.	.	.	.	0	.	.
63	2	49	2	1	1	II	0	0	0	0	1	0	0	0	.	.	.	.	.	0	.	.
260	1	32	1	1	3	IV	1	0	0	1	0	0	1	0	.	.	.	.	.	0	.	.
4	2	60	1	1	1	IV	1	0	1	1	0	0	1	1	1	25	40	1	.	0	.	.
17	2	49	2	1	1	III	1	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
22	1	29	4	1	1	III	0	1	1	0	0	0	1	0	.	.	.	.	.	0	.	.
39	1	52	1	1	1	IV	1	0	1	0	0	0	1	1	1	20	28	1	.	1	180	30
47	2	19	3	1	1	V	0	1	1	0	0	0	1	0	.	.	.	.	.	0	.	.
54	2	26	2	1	1	IV	0	1	1	0	0	0	1	0	.	.	.	.	.	0	.	.
56	1	56	1	1	1	III	0	0	0	0	1	0	1	0	.	.	.	.	.	0	.	.
57	2	49	2	1	1	III	0	0	0	0	1	0	1	0	.	.	.	.	.	0	.	.
71	2	42	1	1	2	IV	0	1	0	1	0	0	1	0	.	.	.	.	.	0	.	.
75	2	71	1	1	2	IV	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
115	2	98	2	1	3	IV	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
117	2	44	1	1	1	IV	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
120	1	67	1	1	2	III	1	0	1	0	0	0	1	1	1	10	40	1	.	0	.	.
130	1	70	1	1	2	IV	0	0	1	1	0	0	1	1	1	20	45	1	.	1	180	35
133	1	85	1	1	3	IV	0	0	1	1	0	0	1	1	3	20	55	0	10	1	180	62
140	1	58	1	1	2	IV	0	1	0	0	0	0	1	1	3	20	35	1	.	1	100	35
157	1	75	1	1	2	III	0	0	0	0	1	0	1	0	.	.	.	.	.	0	.	.
165	2	42	1	1	3	IV	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
168	2	51	2	1	2	III	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
187	1	67	1	1	1	III	0	0	0	1	1	0	1	1	1	10	45	1	.	1	180	47
190	2	34	1	1	1	III	0	0	0	1	1	0	1	0	.	.	.	.	.	0	.	.
200	2	72	2	1	2	IV	1	0	1	1	0	0	1	0	.	.	.	.	.	0	.	.
205	1	28	4	1	2	III	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
208	2	54	2	1	2	III	0	0	0	1	0	0	1	0	.	.	.	.	.	0	.	.
215	1	22	3	1	2	IV	1	0	1	1	0	0	1	0	.	.	.	.	.	0	.	.
217	2	82	2	1	2	IV	1	1	1	1	0	0	1	0	.	.	.	.	.	0	.	.
223	2	94	2	1	1	II	1	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
236	1	100	1	1	1	III	0	0	1	1	0	0	1	0	.	.	.	.	.	0	.	.
253	1	40	1	1	2	IV	0	0	1	0	0	0	1	1	2	10	22	.	.	1	90	23
264	1	18	3	1	2	III	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
284	1	37	1	1	3	III	0	0	1	1	1	0	1	1	2	10	20	.	.	0	.	.
296	1	30	1	1	2	III	0	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
322	1	32	1	1	1	II	0	0	0	1	1	0	1	0	.	.	.	.	.	1	180	14
326	2	74	1	1	2	II	0	0	0	1	1	0	1	0	.	.	.	.	.	0	.	.
332	1	78	1	1	1	II	0	0	1	0	1	0	1	0	.	.	.	.	.	0	.	.
336	1	46	1	1	1	II	0	1	0	0	0	0	0	1	1	25	28	1	.	0	.	.
345	2	67	1	1	1	III	1	0	1	1	0	0	1		.	.	.	.	.	0	.	.
347	2	36	1	1	1	III	1	0	1	0	0	0	1	0	.	.	.	.	.	0	.	.
351	1	82	1	1	1	II	1	0	1	0	1	0	1	0	.	.	.	.	.	0	.	.
359	1	82	1	1	2	III	1	0	1	1	0	0	1	1	1	20	45	1	.	1	100	45
360	2	77	1	1	2	III	1	0	1	1	0	0	1	0	.	.	.	.	.	0	.	.
372	2	30	1	1	2	IV	1	0	1	1	0	0	1	0	.	.	.	.	.	0	.	.
382	1	52	4	1	2	III	1	0	1	1	0	0	1	1	2	12	27	1	.	1	90	33

388	2	40	2	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
397	1	42	1	1	2	III	0	0	1	1	0	0	1	0	-	-	-	-	-	0	-	-
401	1	20	3	1	2	I	0	0	0	1	1	0	1	0	-	-	-	-	-	1	90	2
415	1	72	1	1	2	II	0	0	1	0	1	0	1	0	-	-	-	-	-	0	-	-
417	1	34	4	1	2	II	0	0	1	0	1	0	1	0	-	-	-	-	-	0	-	-
420	2	34	2	1	2	III	0	0	1	0	0	0	1	0	-	-	-	-	-	-	-	-
426	1	50	1	1	1	III	0	0	1	1	0	0	1	1	1	20	27	1	-	0	-	-
427	2	48	2	1	1	III	0	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
431	2	22	2	1	1	III	0	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
443	2	50	2	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
444	1	34	4	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
448	2	82	2	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
455	1	62	1	1	1	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
475	2	65	1	1	2	V	0	1	0	1	0	0	0	0	-	-	-	-	-	0	-	-
476	1	46	1	1	2	IV	0	0	0	1	0	0	1	1	1	20	25	1	-	0	-	-
482	1	60	1	1	1	III	1	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
500	1	47	4	1	1	III	1	0	0	1	1	0	1	1	1	20	28	1	-	0	-	-
504	1	27	4	1	1	III	1	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
509	2	60	2	1	1	I	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
517	2	65	2	1	3	III	0	1	0	1	0	0	0	0	-	-	-	-	-	0	-	-
522	2	72	2	1	2	IV	0	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
530	2	67	2	1	2	III	0	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
533	1	37	4	1	2	IV	0	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
535	1	67	1	1	2	III	0	0	0	0	0	1	1	0	-	-	-	-	-	0	-	-
543	1	53	1	1	2	I	0	0	0	0	0	1	1	1	2	10	30	1	-	1	180	33
544	2	48	2	1	2	I	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
547	1	21	2	1	2	I	0	0	0	0	1	0	1	-	-	-	-	-	-	0	-	-
548	1	67	1	1	2	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
552	2	82	2	1	1	III	1	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
559	1	52	1	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
563	1	54	1	1	2	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
574	2	47	2	1	1	IV	1	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
578	1	54	1	1	1	I	1	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
590	1	52	1	1	1	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
591	2	49	2	1	1	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
596	2	82	2	1	2	IV	1	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
599	2	42	1	1	2	III	0	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
602	2	62	2	1	1	III	1	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
608	1	52	1	1	1	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
609	2	47	2	1	1	II	0	0	0	0	1	0	0	0	-	-	-	-	-	0	-	-
618	1	77	1	1	1	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
619	2	72	2	1	1	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
620	1	37	1	1	1	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
624	2	67	1	1	1	IV	1	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
636	1	72	1	1	1	I	0	0	0	0	1	0	1	0	-	-	-	-	-	1	180	45
637	2	62	2	1	1	I	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
646	2	57	2	1	2	V	1	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
655	2	52	2	1	2	II	0	0	0	0	1	0	1	1	-	-	-	-	-	0	-	-
664	1	52	1	1	1	IV	0	0	0	1	0	0	1	0	-	-	-	-	-	1	180	32
668	1	37	4	1	2	III	0	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
676	1	29	1	1	2	IV	0	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
690	2	72	2	1	2	IV	0	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
692	2	32	2	1	2	IV	0	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
700	1	26	1	1	1	I	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
702	1	61	1	1	2	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	1	180	40
709	1	82	2	1	2	IV	1	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-

717	1	19	3	1	2	II	0	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
723	1	67	1	1	1	IV	1	1	0	1	0	0	0	0	-	-	-	-	-	1	180	40
727	1	23	1	1	1	IV	1	1	0	1	0	0	1	0	-	-	-	-	-	0	-	-
738	2	82	2	1	2	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
749	1	67	1	1	2	IV	0	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
757	1	52	1	1	2	IV	1	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
765	2	63	2	1	2	V	0	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
790	1	60	1	1	1	III	1	1	1	1	0	0	1	0	-	-	-	-	-	0	-	-
791	2	50	2	1	1	III	1	1	1	1	0	0	1	0	-	-	-	-	-	0	-	-
796	2	62	2	1	2	V	0	1	1	0	0	0	1	0	-	-	-	-	-	0	-	-
797	1	65	1	1	2	II	0	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
809	1	25	1	1	1	IV	1	1	1	0	0	0	1	0	-	-	-	-	-	1	90	8
813	1	57	1	1	2	III	0	1	1	0	0	0	1	0	-	-	-	-	-	0	-	-
824	2	37	2	1	2	IV	0	0	0	1	0	0	0	0	-	-	-	-	-	0	-	-
837	1	37	4	1	2	IV	1	0	0	1	0	0	1	1	1	20	19	1	-	0	-	-
839	2	72	2	1	1	II	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
848	1	52	1	1	2	II	0	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
849	2	47	1	1	2	II	0	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
854	1	62	1	1	1	IV	1	0	0	1	0	0	1	0	-	-	-	-	-	0	-	-
858	1	35	1	1	2	IV	0	0	1	1	0	0	1	0	-	-	-	-	-	1	90	16
863	1	18	1	1	2	III	0	0	1	1	0	0	1	0	-	-	-	-	-	0	-	-
864	1	50	1	1	2	IV	1	0	0	1	0	0	1	1	1	20	27	1	-	1	90	25

117	2	44	1	1	1	IV	0	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
157	1	75	1	1	2	III	0	0	0	0	1	0	1	0	-	-	-	-	-	0	-	-
205	1	28	4	1	2	III	0	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
215	1	22	3	1	2	IV	1	0	1	1	0	0	1	0	-	-	-	-	-	0	-	-

223	2	94	2	1	1
326	2	74	1	1	2
417	1	34	4	1	2

||

1	0	1	0	0	0	1	0	-	-	-	-	-	0	-	-
0	0	0	1	1	0	1	0	-	-	-	-	-	0	-	-
0	0	1	0	1	0	1	0	-	-	-	-	-	0	-	-

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24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	0	0	0	0	0	0	0	0	0	3	3	3	0	3	0	0	.	.	0
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	3	0
1	.	1	1	1	0	0	0	1	0	0	0	0	1	0	1	0	1	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	3	0	
.	.	1	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	1	2	.	0	
.	.	1	1	1	0	0	0	0	0	0	0	0	0	3	1	0	0	0	1	2	.	0	
.	.	1	1	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	0	1	1	0	0	0	0	0	0	0	0	3	0	3	0	3	0	0	.	.	0	
.	.	1	0	1	1	0	0	3	0	0	0	0	3	3	3	1	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	.	0	
.	.	0	0	1	0	0	0	0	0	0	0	0	3	3	3	1	3	0	0	.	.	0	
0	10	1	0	1	1	0	0	0	0	0	0	0	3	3	3	1	2	0	0	.	.	0	
1	.	1	0	1	0	0	0	0	0	0	0	0	3	0	3	1	0	0	0	.	.	0	
1	.	0	0	1	0	0	0	0	0	0	0	0	3	3	3	0	3	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	3	0	3	1	3	0	0	.	.	0	
.	.	1	1	1	0	0	0	2	0	0	0	0	2	0	2	1	2	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	3	0	1	0	0	1	2	1	0	
1	.	1	1	1	1	0	0	0	0	0	0	0	2	0	2	1	2	0	1	1	.	0	
.	.	1	1	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	1	1	1	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	3	0	3	1	3	0	0	.	.	0	
.	.	1	1	1	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	3	0	1	0	0	1	2	1	0	
.	.	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	.	.	0	
.	.	0	0	1	1	0	0	0	0	0	0	0	3	3	3	1	1	0	0	.	.	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	3	3	3	1	2	0	0	.	.	0	
.	.	0	0	1	1	0	0	0	0	0	0	0	3	3	3	1	1	0	0	.	.	0	
1	.	1	1	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	1	1	1	0	
.	.	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	1	0	
.	.	1	1	1	1	0	0	3	0	0	0	0	0	0	0	1	0	0	0	.	.	3	
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.	.	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	.	.	0	
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-	-	1	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0
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-	-	1	1	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	-	-	0	
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-	-	0	1	1	1	0	0	0	0	0	0	0	3	2	3	1	2	0	0	-	-	0
-	-	1	1	1	1	0	0	0	0	0	0	0	2	2	2	0	2	0	0	-	-	0
-	-	0	1	1	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	1	1	0
-	-	1	0	1	0	0	0	3	0	0	0	0	0	0	3	0	0	3	0	-	-	0
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0	0	0	0	0	0	0	0	0	2	0
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0	0	0	0	0	0	0	0	0	0	0
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0	0	0	0	0	0	0	0	0	0	0

0
0
0

0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	0	3	0
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0	1	0	0	0	0	0	0	0	0	2
1	0	0	0	0	0	0	0	0	0	1
0	0	2	0	0	0	0	0	0	0	2

ANNEXURE III - KEY TO MASTER CHART

Sex

- 1 - Male
- 2 - Female

Education

- 1 - Illiterate
- 2 - Primary school
- 3 - High school
- 4 - College
- 5 - Graduate
- 6 - Post graduate

Occupation

- 1 - Farmer
- 2 - House wife
- 3 - Student
- 4 - Others

Religion

- 1 - Hindu
- 2 - Muslim
- 3 - Christian

Type of Family

- 1 - Joint
- 2 - Nuclear

3 - Others

Socio-economic status

1 - Class I

2 - Class II

3 - Class III

4 - Class IV

5 - Class V

Overcrowding

0 - Absent

1 - Present

Fuel Used for Cooking

0 - Absent

1 - Present

Diet

0 - Vegetarian

1 - Mixed

Smoking

0 - No

1 - Yes

Type

1 - Beedi

2 - Cigarette

Stopped Smoking

0 - Yes

1 - No

Alcohol Status

0 - No

1 - Yes

Stopped Alcohol

0 - Yes

1 - No

Past History

Diabetes Mellitus

0 - Present

1 - Absent

Hypertension

0 - Present

1 - Absent

Trauma

0 - Present

1 - Absent

Family History

0 - Present

1 - Absent

Ophthalmic Examination

- 0 - No morbidity in both the eyes
- 1 - Morbidity in the right Eye
- 2 - Morbidity in the left Eye
- 3 - Morbidity bilaterally

Diagnosis

- 0 - Absent
- 1 - Right Eye
- 2 - Left Eye
- 3 - Bilateral

Far Vision

- 0 - Normal in both the eyes
- 1 - Impaired in the right Eye
- 2 - Impaired in the left Eye
- 3 - Bilaterally impaired

Near Vision

- 0 - Normal in both the eyes
- 1 - Impaired in the right Eye
- 2 - Impaired in the left Eye
- 3 - Bilaterally impaired

Blindness

- 0 - Absent
- 1 - Blindness in the right eye
- 2 - Blindness in the left eye
- 3 - Bilaterally blind