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Ocular morbidities among asymptomatic adults in the Goan population seeking fitness for jobs

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Abstract
Background: *The working population is an immensely important subset of any population as it is a driving force of the nation's economy. This population subset constitutes approximately 48 % of the Indian population.*
Materials and Methods: *We conducted a retrospective cohort study attempting to analyze the ocular health of candidates seeking fitness for jobs and attending outpatient department in Ophthalmology in a large tertiary care hospital in Goa. The period of study was from January 2015 to December 2017. A total of 1126 patient records were included in the study.*
Results: *Out of the 1126 patient records analyzed, 393 individuals had some form of ocular morbidity. The most important ocular morbidity observed in this population was uncorrected refractive error which was observed in 31.79% individuals. Around1.42% of the patients were detected to have varying degrees of color blindness. About 0.36 % of patients were found to have visually significant fundus changes. About 0.27% patients had corneal opacities with significant reduction in visual acuity.*
Keywords: *Asymptomatic adults, Goan population, Ocular morbidities, Refractive errors, Working population.*

Introduction

Visual impairment is a major health problem with significant socioeconomic impact. Working population is the term used for people aged 15 to 64 years old. This proportion of population assumes immense importance as it supports the remaining population. Also, this population is the driving force of any economy. Thus, for a developing nation like India, it becomes even more important. As per the 2011 census, the people in the age group of 15 to 65 years constitutes 65.2 % of the total population of India[1]. The population of Goa, as per the 2011 census is 14,58,545 which accounts to around 0.12% of the Indian population[1]. Also, according to 2011 census, total workforce of Goa is around 5,77,248 which constitutes 39.58% of the total population of the State[2]. Studies conducted in Manipur[3] and Karnataka[4] found that the majority of patients with visual disability belonged to the age-group of 15-40 years. It is noteworthy that despite the immense importance attached to this population group, there has been no study conducted in Goa to estimate the

ocular morbidities of people in this working age group. In this study, we attempted to estimate the undiagnosed ocular morbidities of this immensely important population group for the state of Goa.

Materials and Methods

Study design: We conducted a retrospective cohort study. The study cohort was the people seeking fitness for jobs from the outpatient department of a large tertiary care hospital in Goa. The aim of our study was to estimate the visual morbidities in the working age group in the Goan population.

Inclusion & Exclusion Criteria: We included data of all the individuals who attended the outpatient department of a large tertiary care hospital in Goa to seek fitness for jobs from January 2015 to December 2017. These individuals were largely asymptomatic. Incompletely filled records were excluded.

Study Methodology: Medical records of all the patients seeking medical fitness were accessed with permissions from the medical records department. These records were examined for completeness before being included in the study. The included records were analyzed, and any abnormalities detected in the examination were noted.

The definitions[5] used for the study are listed in Table 1 below.

Table 1 Definitions used in our study

Term	Definition used
Cataract	Lens opacity associated with visual loss.
Corneal opacity	Loss of normal corneal transparency.
Refractive error	Inability to see 6/12 unaided but can see 6/12 with pinhole.
Myopia	Spherical equivalent <-0.50 diopter sphere (DS).
Hypermetropia	Spherical equivalent $> + 0.50$ DS.
Presbyopia	Inability to read N8 or smaller fonts on Jaeger's near vision charts.

A total of 1126 patient records were included in the study. The period of study was from January 2015 to December 2017. Data was collected using the epidata data entry manager software and was analyzed using the SPSS software version 17.

Observations and Results

A total of 1126 case records were examined. The number of males included was 677 against 449 females, the male: female ratio being 1.5:1. Mean age of the patients under study was 27.6 ± 6.9 years. The higher incidence of males could be attributed to the higher number of working males in the goan population[2]. The mean logMAR visual acuity was 0.16 in the right eye and 0.17 in the left eye which corresponds to a visual acuity of 6/36 on Snellen's visual acuity chart. The mean logMAR best corrected visual acuity was 0.003 in the right eye and 0.002 in the left eye corresponding to a visual acuity of around 6/6 on Snellen's visual acuity chart. It is noteworthy that out of these 1126 patients, 393 individuals had some form of ocular morbidity. The most important ocular morbidity observed in this population was uncorrected refractive error which was observed in 358 individuals constituting 31.79% of the population studied. This was comparable to the results obtained by Rizyal et al and Singh et al. in a similar community based study[6],[7]. According to previous studies, frequency of eye diseases has been shown to start to increase with increasing age[7],[8]. According to the Global estimates of visual impairment, refractive error accounts for 43% of treatable visual impairment[9]. Uncorrected refractive error thus formed 91.09 % of all the ocular morbidity in this population. These patients were asymptomatic prior to this examination. There was considerable overlap between different types of refractive errors. The refractive error most commonly observed was myopia which was noted in 279 patients. It accounted for 70.99 % of all the ocular morbidity in this population. This corresponds to the findings of a study conducted in an elderly population in North India[10]. Of these 279 patients, 78 patients (18.06% morbidity) had myopia of more than 3 diopters which also includes 7 patients (1.78% morbidity) with myopia more than 6diopters. Hypermetropia was noted in 21 patients (5.34% morbidity). Astigmatism was responsible for decreased visual acuity in 88 patients (22.39% morbidity). Of these, 29 patients (7.37% morbidity) had astigmatism of >1.5 diopters.

About 13.48 % of the total morbidity was attributable to presbyopia of which 8.65% of patients were purely presbyopic. A study conducted in Zanzibar concluded that wearing presbyopic spectacles increased patient's quality of life.

Amblyopia accounted for 0.44 % of this population and accounted for 1.27 % of all the ocular morbidity in this population. This was comparable to the results of a study conducted in the South Indian state of Andhra Pradesh[11].

Surprisingly, as many as 1.42 % of these patients were detected to have varying degrees of color blindness. The results were comparable to a study conducted by Gupta[12] et al in North India. This is a significant concern as these patients may be termed unfit for occupations heavily depending on color appreciation. These patients required counselling to take up alternative jobs which suited them better.

About 0.62 % of patients were found to have fundus changes. Of these, 0.36 % were visually significant, causing decreased visual acuity in these patients.

About 0.27 % patients had corneal opacities with significant reduction in visual acuity. Though, this constitutes a very small proportion, the potential benefits of undergoing newer corneal procedures which may give better visual outcome, must be borne in mind.

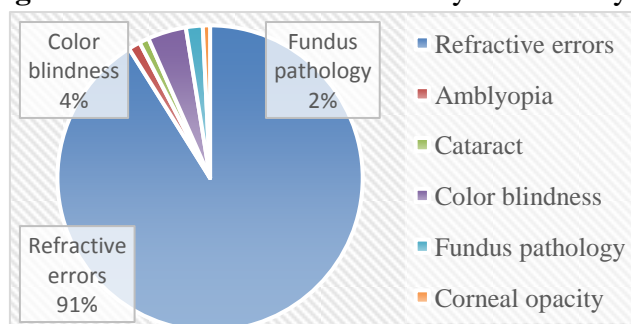**Figure 1:** Causes of ocular morbidity in our study.

Table 2 Contribution of various causes of ocular morbidity noted in our study population.

Cause of ocular morbidity	No. of patients	Percentage of study population (n=1126)
Refractive errors	358	31.79 %
Color blindness	16	1.42 %
Fundus pathology	7	0.62%
Amblyopia	5	0.44%
Cataract	4	0.36%
Corneal opacity	3	0.27%

Figure 2. Contribution of different refractive errors to the Ocular morbidity in this study.
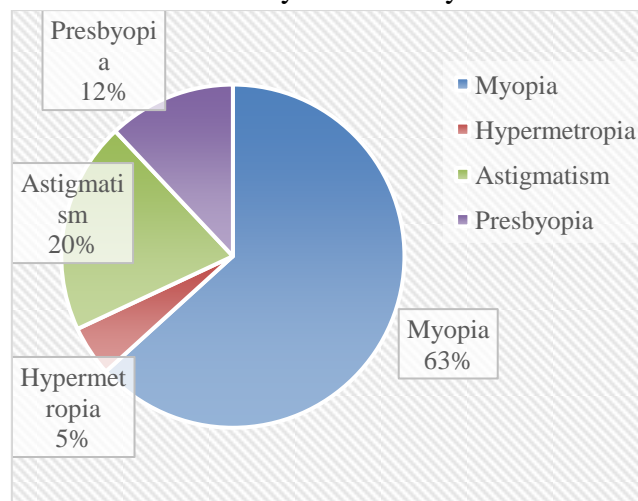

Table 3. Contribution of different refractive errors to the Ocular morbidity in this study.

Refractive error	No. of patients showing the refractive error	Percentage of ocular morbidity (n=393)
Myopia	279	70.99
< 3 diopters	201	51.14
3-6 diopters	71	18.06
> 6 diopters	7	1.78
Hypermetropia	21	5.34
Astigmatism	88	22.39
<1.5 diopters	59	15.01
> 1.5 diopters	29	7.37
Presbyopia	53	13.48

Conclusions

Uncorrected Refractive errors form a major cause of ocular morbidity in the working age group. Being one of the easiest to correct, these should not be missed as they may be a source of decreased work efficiency in these patients. Visual screening camps should be conducted periodically or at least annually at the workplace. This is expected to detect these refractive errors early and to treat them with the necessary refractive correction. Such camps will also help to identify individuals with corneal blindness which could be potentially corrected by surgical procedures. Besides, they will motivate this population group to seek medical care. They will serve to create awareness among these patients about ocular disorders.

Limitations

We conducted a hospital-based study with retrospective evaluation of medical records due to constraints of time and man-power. Further work in this direction could be done by performing a prospective study with a community-based set-up. This would help in better generalization of the results obtained to the population.

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