ORIGINAL RESEARCH

# A Study On The Prevalence Of Ocular Morbidity Status Among Undergraduate Students Of Medical College

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**ABSTRACT**
**Objective:** To study the prevalence of ocular morbidity status among medical students.
**Methods:** A cross-sectional descriptive study was conducted over a time period of three months. The study population of 300 students was comprised of 180 male and 120 female students from different academic years. Each subject was examined by the optometrist using auto refractometer without the use of cycloplegia for objective assessment of refraction, cover test for examination of non strabismus binocular vision and Schirmer strip for assessment of dryness of eye. Obtained data was statistically analysed by Statistical Package for Social Sciences (SPSS) version 18.
**Results:** In our study population of 300 students, mean age was 20 years with a standard deviation 1.6. 180 (60%) students were male and remaining 120 (40%) were females. Myopia was found to be the commonest error of refraction (69%).Convergence defected was detected in 19.3% of students and moderate dry eye was found in 16.3% of students.
**Conclusion:** Myopia, convergence accomodation error and moderately dry eye were found to be the common morbidities in the young adults. A regular check-up is essential for timely correction of these morbidities and prevention of further deterioration of the vision.

**INTRODUCTION**
Eyes have been characterized as the 'windows of the spirit'. The International Agency for the Prevention of Blindness and World Health Organization have pronounced this by beginning the worldwide drive known as 'VISION 2020' for lessening of preventable visual impairment[1,2]. Mistakes of refraction especially near sightedness, has now become a new normal and is persistently on rise around the world. Visual impedance manifesting as uncorrected refractive errors is incredibly getting common among adolescents and young adults, becoming the second most cause for treatable visual deterrent[3]. Pascolini D, mentioned that visual shortcoming is a significant clinical issue and 80% of the explanations behind this illness are reasonably preventable[4]. Refractive mistakes currently are transforming into a tremendous issue in various nations all around the world. The rate pace of

near sightedness is starting to augment especially in Asian countries accomplishing disease levels[5]. Bourne RR et al., stated that uncorrected errors of refraction as the most well-known reasons for visual inability from one side of the planet to the other[6]. Refractive errors can be a load on country's economy especially the developing countries. Studies have shown a strong association between the degree of knowledge with long stretches of academic interest and the severity of near sightedness. A bigger populace is apparently uninformed about the issue, and this prompts an ever-evolving visual deficiency which genuinely influences their true capacity. This applies obviously to the youthful grown-ups who are in their schools, colleges, universities and endure because of normal mistakes of refraction. Furthermore in recent times the use of electronic gadgets like mobile phones and computers with a prolonged time spent with them have only added to the pathophysiology.

Recently dry eye is becoming a common reason of visit to ophthalmologists. Prolonged use of computer devices with decreased frequency of blinking is one of its potential cause in the educated population. Studies from different parts of the globe have indicated about this repeatedly in their recent works[7,8]. Similarly, many young adults suffer from an undiagnosed binocular vision disorders. Non-strabismic binocular vision dysfunction are common among pre-presbyopic population.[9,10.]This often creates a lesser productivity in academic performance as well as other near vision related works[11,12,13]. Very few studies have done in the past considering all these factors in a vulnerable population like medical students who used to spend a high amount of time in reading and using electronic gadgets. Keeping a view of all these problems, the current study was planned to determine the prevalence of refractive error as well as the condition of dry eye and non-strabismus binocular vision defect among the undergraduate students at the College of medical sciences, Bharatpur, Chitwan, Nepal. The information gathered from this review will help to expand the familiarity with ocular morbidities in a vulnerable group. This can also aid for a timely prevention and management of the morbidities which can make a substantial improvement in the academic performance, quality of life and prevention of future complications related to them.

**MATERIALS AND METHODS**

Our present cross sectional study was conducted on 300 MBBS & BDS students from the College of Medical sciences, Bharatpur Chitwan Nepal. The included study population was by arbitrary choice from various undergraduate years. A detailed history was taken with regards to co-morbidities and history of past medical procedures if any for exclusion. Students having any systemic disease, previous ocular surgery or having any ongoing ocular disease were excluded from the study. The chosen study population was explained about the targets of the study and a composed assent structure that expressed the reason, techniques, dangers, benefits, and the affirmation of the privacy of the information was acquired from every understudy. In the wake of getting assent from the members, every member was analysed by Snellen's chart, plane mirror retinoscope and an auto refractometer (Auto Refractometer ARK-510A, NIDEK, Aichi, Japan) as portrayed beforehand for a subjective and objective assessment of refractive errors. Momentarily, three estimations were taken of every member's refractive status for both eye. The readings were recorded on an information sheet for each person, and the Statistical analysis was performed with the help of Statistical Package for Social Sciences (SPSS)-18. Non-strabismus binocular vision was measured with the help of cover test(covering the yes with occulader). Accommodation and convergence were measured with RAF ruler. Accommodative facility was measured with ±2D flippers. Vergence facility measured with 3 prism base in and 12 prism base out prism. Negative and positive fusional vergence values were measured with prism bars. Negative and positive relative accommodation was measured with ± lenses of trial frame.Eso and exo deviation measured with prisms too.

**OBSERVATION**

**Table-1: Demographic profile of students**

| Variables | Frequency(n) | Percentage(%) |
|---|---|---|
| **Age(years)** | | |
| 15-20 | 232 | 77.3 |
| 20-25 | 66 | 22.0 |
| 25-30 | 2 | .7 |
| Mean±SD | 19.77±1.6 years | |
| **Gender** | | |
| Male | 180 | 60.0 |
| Female | 120 | 40.0 |

**Table-2: Frequency of error of refraction among students**

| Ref. Error | Frequency(n) | Percentage(%) |
|---|---|---|
| Normal | 162 | 54.0 |
| Myopia | 69 | 23.0 |
| Hypermetropia | 6 | 2.0 |
| Astigmatism | 63 | 21.0 |
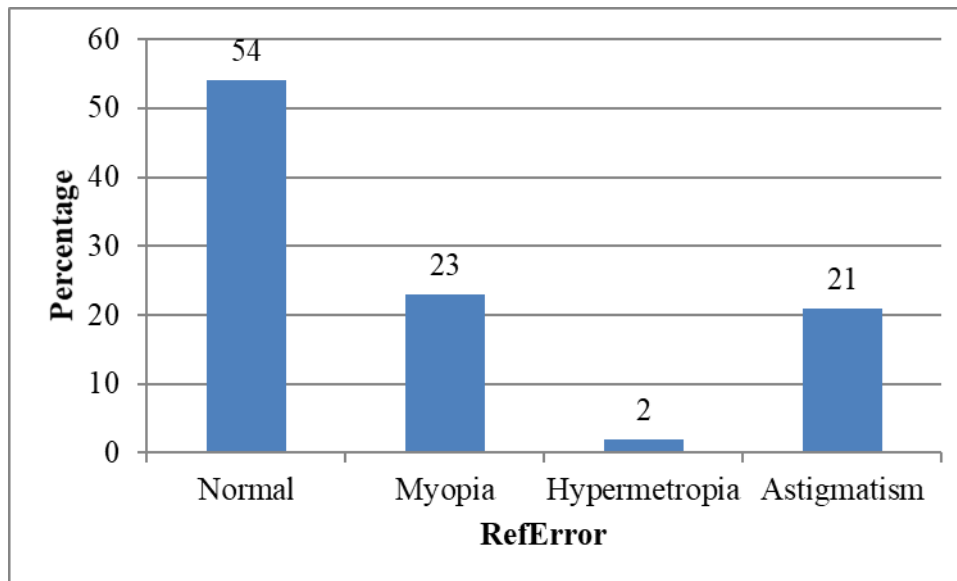


**Table-3: Frequency of Non-strabismus Binocular Vision Dysfunction among students**

| NSBVD | Frequency(n) | Percentage(%) |
|---|---|---|
| Normal | 187 | 62.3 |
| Accommodation | 40 | 13.3 |
| Convergence | 58 | 19.3 |
| Divergence | 15 | 5.0 |
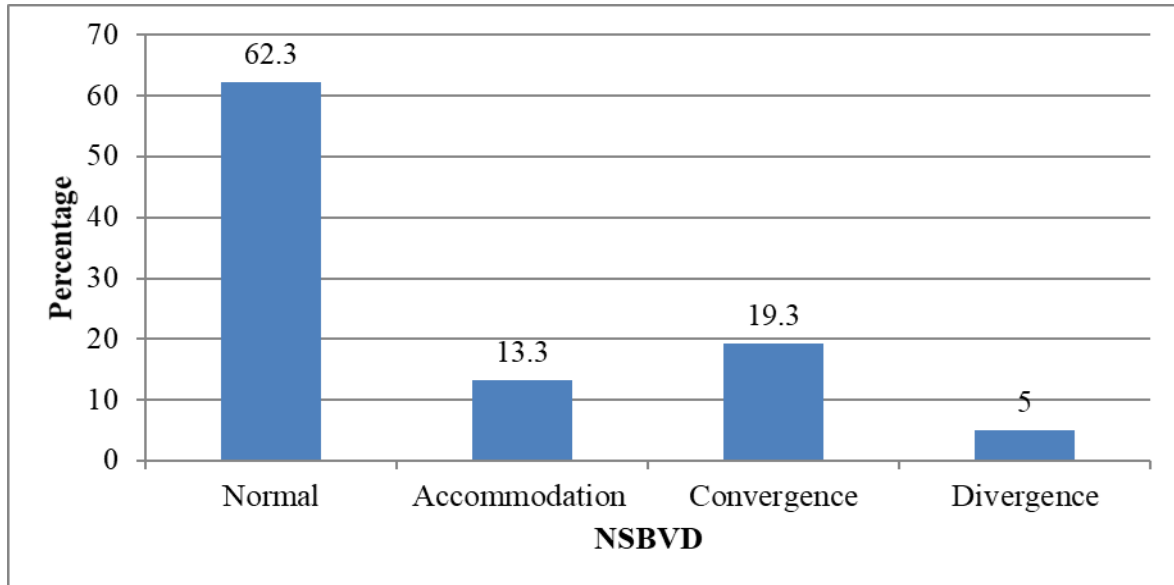
**Table-4: Frequency of dryness of eye among students**

| Dry eye | Frequency(n) | Percentage(%) |
|---|---|---|
| Normal | 184 | 61.3 |
| Severe dry | 35 | 11.7 |
| Mild dry | 32 | 10.7 |
| Moderate dry | 49 | 16.3 |
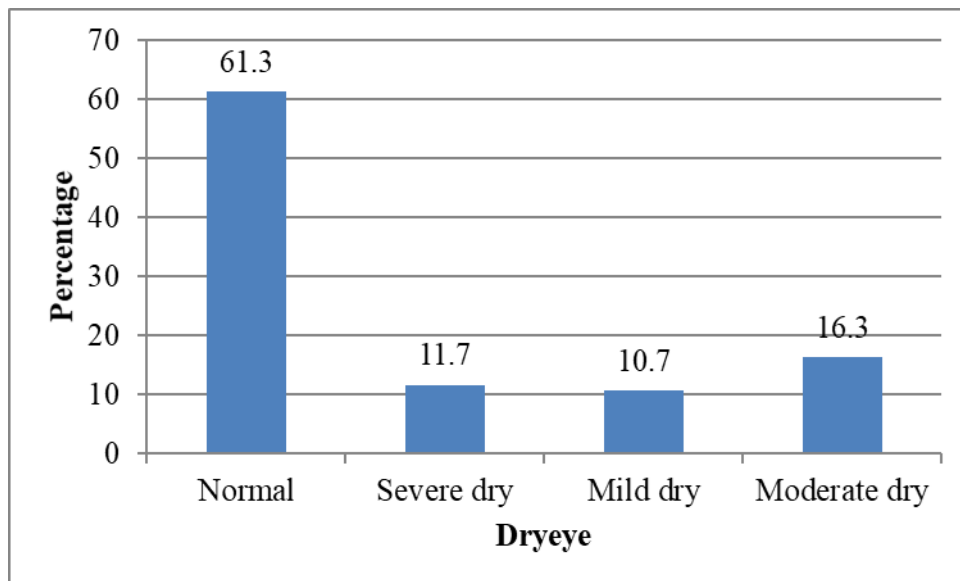


**Table-5; Association of refractive errors with variables**

| Variables | Ref Error | | | | Chi-square | p-value |
|---|---|---|---|---|---|---|
| Age(years) | Normal | Myopia | Hypermetropia | Astigmatism | | |
| 15-20 | 123(53) | 54(23.3) | 6(2.6) | 49(21.1) | 5.57 | 0.47 |
| 20-25 | 37(56.1) | 15(22.7) | 0(0) | 14(21.2) | | |
| 25-30 | 2(100) | (0) | 0(0) | 0(0) | | |
| Gender | | | | | | |
| Male | 95(52.8) | 41(22.8) | 4(2.2) | 40(22.2) | 0.57 | 0.9 |

| Female | 67(55.8) | 28(23.3) | 2(1.7) | 23(19.2) | | |

**Table-6: Association of different types of NSBVD with variables**

| Variables | NSBVD | | | | Chi-square | p-value |
|---|---|---|---|---|---|---|
| Age(years) | Normal | Accommodation | Convergence | Divergence | | |
| 15-20 | 144(62.1) | 32(13.8) | 45(19.4) | 11(4.7) | | |
| 20-25 | 43(65.2) | 8(12.1) | 11(16.7) | 4(6.1) | 7.1 | 0.3 |
| 25-30 | | | 2(100) | | | |
| Gender | | | | | | |
| Male | 112(62.2) | 28(15.6) | 33(18.3) | 7(3.9) | 3.04 | 0.38 |
| Female | 75(62.5) | 12(10) | 25(20.8) | 8(6.7) | | |

**Table-7: Association of Dryness of eye with variables**

| Variables | Dryness of Eye | | | | Chi-square | p-value |
|---|---|---|---|---|---|---|
| Age(years) | Normal | Severe dry | Mild dry | Moderate dry | | |
| 15-20 | 142(61.2) | 28(12.1) | 24(10.3) | 38(16.4) | | |
| 20-25 | 40(60.6) | 7(10.6) | 8(12.1) | 11(16.7) | 2.21 | 0.89 |
| 25-30 | 2(100) | | | | | |
| Gender | | | | | | |
| Male | 112(62.2) | 24(13.3) | 18(10) | 26(14.4) | 2.31 | 0.51 |
| Female | 72(60) | 11(9.2) | 14(11.7) | 23(19.2) | | |

In our present study, 300 students of different academic sessions of College of Medical Sciences participated. Among them, 180(60%) students were males and 120(40%) were females. Maximum number of students were of less than or equal to 20years. The demographic details are given in table-1. Different errors of refraction observed among the students are myopia/near sightedness- 69(23%), Astigmatism- 63(21%) and hypermetropia/ long-sightedness-in 6(2%). When we examine the non-strabismus binocular vision dysfunction in our student, we found 58(19.3%) students are having convergence defect, 40(13.3%) and 15(5.0%) students are having accommodation and divergence defect respectively. We also examined the sufficiency of tear formation by assessing the dryness of the eye. In our study we found 49(16.3%) students having moderately severe dry eye and 35(11.7%) students are having severe dry eye whereas 32(10.7%) students were having mild dryness of eye. There was no statistically significant association between our variables like age and gender with the different refractive errors as well as NSBVD and dry eye.

**DISCUSSION**

Refractive errors are usually detected through regular appraisal of patients who present to ophthalmologic centers or through vision screening. Vision screening programs are a pivotal need for many organizations from one side of the planet to the next. Vision screening is usually done on schoolchildren, which is a critical strategy for seeing potentially treatable visual assortments from the standard, thinking about the refractive deficiency and related amblyopia. Ghaderi et al. in their study have also noticed this in their findings with regards to the increasing pace of errors of refraction among younger adolescents[14]. It is as of now overall around declared that astigmatism is the most broadly perceived problem of refraction worldwide and it is advancing for an upward climb, and by and by getting transformed into a huge social and money related load for the affected individuals. The regularity of myopia in the United States appears, apparently, to be through and through extended in 1999-2004 as differentiated and 30 years earlier. The degree of frequencies of myopia in the specific metropolitan areas is a concern. Reports from the metropolitan regions like Singapore, Hong

Kong Taiwan, etc displayed partial blindness is more typical and on the rise[15]. Lately, Pan et al. have done a meta-examination on age-express inescapability of myopia among Asian people and found that it is extending with age[16]. Our study was coordinated on 300 MBBS and BDS undergraduates of College of Medical Sciences, Bharatpur Chitwan Nepal and the data showed an extended event of the issue of refraction among them. Majority are affected with myopia followed by astigmatism. Our outcomes are totally maintained by the past focus on drove in Singapore and Saudi Arabia clinical students, which showed the frequency of the myopic condition to be more than 82% and 53% when stood out from the repeat of various errors of refraction[17,18]. Have these, but our study is furthermore maintained by another survey coordinated on clinical students of Malaysia, where astigmatism was moreover seen to be higher as differentiated with various errors of refraction[5]. Moreover, our revelations in clinical students are maintained by another study performed among clinical students of Norway, where astigmatism was again found to be higher[19]. Inquisitively, it is moreover crucial for the point, that medical students are affected by refractive errors, but the reports showed that students at school levels were in like manner affected by myopia. These disclosures further refreshes our outcomes. An assessment of Sydney schoolchildren exhibited ethnic contrasts with offspring of East Asian identity had a higher speed of myopia than European Caucasian kids[20]. Extending levels of astigmatism increases the problem of vision defect. Unequivocally, high near sightedness is associated with the risk of ensured and wearisome visual weakness in view of related visual issues. Our findings that myopia is the most common defect of refraction, can have a pernicious ramifications for visual perception further. The higher percentage of this refractive error in medical students may be correlated with their long exhaustive study hour schedule and the demand of a prolonged near work for continuous 5-6 years. Even if particular pathophysiology explanation of the myopisation of ocular refractive mechanism is not fully established  but a recent theory focuses on the blurring of retinal images that occur with a prolonged near work stimulating the biochemical and structural changes in sclera and choroid leading to an axial elongation[21]. These problems are correctable visual issues but can cause a serious visual impedance and there is a significant stress over the rising ocurrence of these issues from one side of the planet to the next.

In our study we observed the prevalence of NSBVD to be lower compared to 55% reported by Dahal and Khatri in their study among optometric students of Bangalore, but at par with other studies done by Porcar and Martinez-Palomera, Richman and Laudon, Darko-Takyi et al[22,9,23,24]. We could not find any significant association of NSBVD with of age and gender in our students. Many workers have indicated that a high percentage of NSBVD is found with jobs related to high level of deskwork demand and among students. These statements can be correlated in our study. With our findings, a frequently neglected condition of NSBVD which can be successfully managed with proper lens correction and /or vision therapy have been identified with a high prevalence among medical students of this part of the world.

Dry eye disease is a multifactorial disease of tear pathophysiology and ocular surface resulting in ocular discomfort, visual disturbance and having the potential to damage the ocular surface. Recent unprecedented upsurge in the prevalence of moderate to severe dry eye in urban population has been reported by studies done by Tityal JS[25]. Prolonged time spent in-front of the monitors of electronic gadgets with infrequent blinking and tear formation has been cited as a potential cause. The prevalence of dry eye reported by our study (38.7%) is similar to the hospital based study done on north Indians by Tityal Js and Alshamrani et al in Saudi Arabia(32.1%)[25,26]. But our prevalence is lower than the assessment done by other workers in Saudi Arabia and Jordan[27,28].This difference may be due to the different techniques used to assess the dry eyes. Studies done in China and Spain have a significantly lower dry eyes prevalence with 17% and 11% respectively[29,30]. This could be explained by

the difference in the climate and lifestyle. Other associated risk factors like time spent with mobiles or computer monitors or family history could not be studied because of non-inclusion of any related questionnaire. A high prevalence of dry eyes in theses selected population requires an early diagnosis and treatment before the appearance of any serious complication out of it.

We hope our findings will create an awareness among the population and the policy makers about the magnitude and burden of these highly prevalent ocular morbidities among a very highly vulnerable population to take timely appropriate measures and prevent a very productive population from being physically compromised and becoming an economical burden for the society.

## LIMITATIONS

Our study was having few limitations, as our study population could have been larger for a better reflection of the ocular morbidities identification in this vulnerable group. We have not included any questionnaire related to the associated factors like family background and time spent in front of the monitor of electronic gadgets, which could have given a more in depth analysis of the pathophysiology for different preventive measures.

## CONFLICT OF INTEREST
None

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