Original Article

Practice of Ocular Hygiene and Risks for Ocular Disorders Among Undergraduate Students of The University of Benin

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Abstract

Ocular hygiene practices encompass a variety of behaviors and habits that individuals can incorporate into their daily routines. Proper ocular hygiene is not only preventive against ocular disorders but also supportive of ocular health, contributing to the overall well-being of an individual. The aim of this study is to assess the practice of ocular hygiene and the risk for ocular disorders among undergraduates of the University of Benin. This was a descriptive cross-sectional study design. There were 450 respondents, male and female, aged between 18-30 years with a mean age of 24.28 ± 2.27 years.

Results showed that participants had very good ocular hygiene practices (83.6%). A good percentage (82%) of them reported avoiding touching their eyes all the time, 70% of them wore sunglasses when going out, 76% consulted their eye doctor regularly and 82% only used eyedrops prescribed by the doctor. The risk for developing ocular diseases among participants was low. No family history of ocular diseases (61%), no past history of eye infection (70%), no history of diabetes mellitus (94%) or hypertension (94%) were reported. There was no significant correlation between ocular hygiene practices and risks for ocular disorders ($r < 0.1$; $p > 0.05$). Predominant ocular symptoms among participants were light sensitivity (60%), headache (54%) and eyestrain (46%). Although this study showed that most of the students had very good ocular hygiene practices, significant risk factors for ocular disorders were identified. This included excessive screen use and extended periods of near work activities. These factors could be associated with the development of ocular symptoms such as headaches and sensitivity to light, as reported in this study.

Key words: Ocular hygiene, ocular disorders, ocular health, eyelid hygiene.

Introduction

The eyes are constantly exposed to a myriad of environmental stressors, ranging from prolonged screen time to pollutants in the surroundings.[1] In the contemporary world today, where technological advancements and digitalization are integral aspects of daily life, the importance of ocular health cannot be overstated. The intricate anatomy and physiological complexity of the human eye renders it susceptible to various pathological conditions that can affect the ocular health. They are collectively known as ocular disorders. These disorders span a broad spectrum, ranging from benign refractive errors to severe conditions that may lead to irreversible vision impairment.[2,3] The World Health Organization (WHO) estimates that over 2.2 billion people worldwide suffer from vision impairment or blindness, with varying degrees of severity.[4] The prevalence of ocular disorders underscores their substantial impact on public health and quality of life.[5]

The term ocular disorders, encompasses a multitude of conditions affecting different structures of the eye. Refractive errors such as myopia, hyperopia, astigmatism, and presbyopia, represent common disorders that affect visual acuity. Additionally, more complex conditions include glaucoma, cataracts, age-related macular degeneration (AMD), diabetic retinopathy, and various inflammatory or infectious disorders.[6]

Ocular hygiene encompasses a range of practices aimed at maintaining the cleanliness and health of the eyes, this stands as a pivotal aspect of overall ocular

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https://dx.doi.org/10.4314/tjhc.v32i1.4

care. Consequently, the maintenance of ocular health through proper hygiene practices is essential for sustaining optimal visual function and preventing a spectrum of debilitating ocular disorders.[6,7]

The eyes are exposed to various environmental factors, including dust, allergens, pollutants, and microorganisms, all of which can potentially compromise ocular health. Furthermore, the increasing prevalence of digital screens in contemporary lifestyles introduces additional challenges, such as digital eye strain and potential long-term consequences associated with prolonged screen exposure.[8]

Ocular hygiene practices encompass a variety of behaviours and habits that individuals can incorporate into their daily routines. These may include but are not limited to, regular eye cleaning, appropriate contact lens hygiene, protection against environmental factors, and adherence to healthy visual habits. Proper ocular hygiene is not only preventive but also supportive of ocular health, contributing to the overall well-being of an individual.[6,9]

However, the modern era has ushered in new challenges to ocular health, particularly among the younger demographic.[10] Students, in the pursuit of academic excellence, often find themselves immersed in a digital environment, spending extensive hours on computers, tablets, and smartphones. This prolonged exposure to digital screens, coupled with other environmental stressors, raises concerns about the well-being of their eyes. As a result, understanding their ocular hygiene habits becomes imperative for devising targeted preventive measures.[11,12] Ocular hygiene remains the key to maintaining eye health and improving ocular symptoms.[13] Studies on the awareness of eye hygiene habits among general populations worldwide, especially in Nigeria, are scant. Therefore, this study endeavours to delve into the practices of ocular hygiene among undergraduate students at the University of Benin and elucidate their potential connection with the risk of ocular disorders.

Materials and Methods

This was a descriptive cross-sectional study. This research was conducted at the University of Benin, Benin City, Edo State. Study population was the undergraduate male and female students of the University. Convenient sampling technique was used to recruit 450 participants for this study. Only undergraduate students of the University of Benin in different levels of their programmes were used for the study.

Ethical clearance was obtained from the Research and Ethics Committee of the Department of optometry University of Benin, Benin City. Study was done in accordance with the tenets of the declaration of Helsinki. Informed consent was obtained before administering the questionnaire to the participants.

A well-structured questionnaire adapted from the study by Arun *et al*[1] which was already validated, was used in this study. It was pretested with a small sample of the study population to ascertain that the responses matched the questions asked. The questionnaire was in three parts; the demography of the participants, ocular hygiene practices and risk assessment for ocular disorders. The demographic section contains information regarding age and gender. The ocular hygiene practice section consists of 14 items and was graded as very good (8-14), good (3-7) and fair (<3) for the purpose of this study. The risk assessment section for ocular disorders consists of 28 questions regarding risk factors and symptoms of ocular diseases. The respondents were asked to provide a "yes" or "no" response. "Yes" response was given a score of 1 and "No" as 0. The scores were graded as low-risk (<9), moderate risk (10-18) and high-risk (19-28) for the development of ocular disorder, for the purpose of this study.

For the purpose of this study, practice of ocular hygiene refers to the response given by the undergraduate students regarding the daily hygienic activities performed to minimize eye infections. Risk for ocular disorders refers to the identification of risk factors that have the potential to cause ocular disorders.[14]

Data Analysis

The Statistical Program for Social Sciences (SPSS), version 25.0 (IBM SPSS Inc., Chicago, IL, USA), was used to collect and analyze the data. Results were presented descriptively in tables and figures. Pearson's Chi-square test was used to test for associations between ocular hygiene practices and risks for ocular disorders. A value of $p < 0.05$ was considered statistically significant.

Results

Table 1 shows the demography of the participants. Majority of them were between the ages of 22 to 25 years (n = 266; 59.1%) with a mean age of 24.28 ± 2.27 years. There were more females (n = 295; 65.6%). Study population was fairly distributed across different levels in the various faculties. Table 2 highlights the ocular hygiene practice of the participants. A good percentage (82%) of them reported avoiding touching their eyes all the time, 70% of them wore sunglasses when they go out, 76% consulted their eye doctor regularly and 82% only used eyedrops prescribed by the doctor.

Table 3 shows risk assessment for developing ocular diseases among Participants. No family history of ocular diseases (61%), no past history of eye infection (70%), no history of diabetes mellitus (94%) or Hypertension (94%) were reported. There was also no report of previous eye injury (82%) or eye surgery

Table 1: Demography of Respondents

Characteristics	Frequency	%
Age		
18-21	170	37.8
22-25	266	59.1
26-30	14	3.1
Total	450	100
Gender		
Male	155	34.4
Female	295	65.6
Total	450	100
Year of Study		
100	68	15.1
200	80	17.8
300	124	27.6
400	69	15.3
500	41	9.1
600	68	15.1
Total	450	100

Table 2: Ocular Hygiene Practice among Participants

Ocular Hygiene Practice	No		Yes	
	Frequency	%	Frequency	%
I avoid touching my eyes all the time	89	19.8	361	80.2
I wear sunglasses while in the sun	133	29.6	317	70.4
I wash my face before sleeping	155	34.4	295	65.6
I rub my eyes when my eyes are itching	395	87.8	55	12.2
I use eye drops only with doctor's prescription	77	17.1	373	82.9
I use personal towel to wipe my eyes	208	46.2	242	53.8
Use eye cosmetics	165	36.7	285	63.3
I spend more time watching TV, Computer, mobile	218	48.4	232	51.6
I consult doctor for regular eye checkup	108	24.0	342	76.0
I eat a lot of junk food	177	39.3	273	60.7
I incorporate fruits, green leafy vegetables into diet	218	48.4	232	51.6
I sleep for at least 7 hours a day	247	54.9	203	45.1
I wear contact lenses while sleeping	441	98.0	9	2.0
I drink 1.5- 2 L of water everyday	232	51.6	218	48.4

(95%). There was no association between ocular hygiene practices and risks for ocular disorders (p=0.382). Table 4 displays the ocular symptoms present among the participants. The commonest symptom was light sensitivity (60%), headache (54%), eyestrain (46%) and blur vision (35%). Table 5 gives the graded scores for ocular hygiene practices among the participants. A good percentage of them (88%) fell between the 8-14 range and this was rated as very good. Table 6 shows that the participants had a low risk (<9)

Presence of Risk Factors	Yes		No	
	Frequency	%	Frequency	%
Family history of eye disorders	174	38.7	276	61.3
Past history of eye infections	132	29.3	318	70.7
Alcohol consumption	100	22.2	350	77.8
History of Smoking	30	6.7	420	93.3
Presence of Diabetes mellitus	26	5.8	424	94.2
Presence of Hypertension	27	6.0	423	94.0
Foreign body sensation	91	20.2	359	79.8
Previous eye injury	78	17.3	372	82.7
Previous eye surgery	22	4.9	428	95.1
>10 min exposure to sunlight	320	71.1	130	28.9
Use of eye cosmetics	285	63.3	165	36.7
Use of contact lenses	153	34.0	297	66.0
Dryness in the eyes	122	27.1	328	72.9
Screen time more than 6 hours in a day	225	50.0	225	50.0
Spending prolonged periods focusing on close objects such as reading	285	63.3	165	36.7
Sensitivity to chemicals found in make up or other products	250	55.6	200	44.4
Pre-existing skin conditions- skin infections, dandruff	131	29.1	319	70.9
Intense burning in the eyes	300	66.7	150	33.3

Table 4: Ocular symptoms present among Participants

Symptoms	Yes		No	
	Frequency	%	Frequency	%
Blur vision	159	35.3	291	64.7
Headache	244	54.2	206	45.8
Nausea and vomiting	31	6.9	419	93.1
Redness of the eyes	123	27.3	327	72.7
Seeing halos around lights	110	24.4	340	75.6
Eye pain	147	32.7	303	67.3
Light sensitivity	274	60.9	176	39.1
Eye strain	210	46.7	240	53.3
Excessive tearing	106	23.6	344	76.4
Discharge from eyes	90	20.0	360	80.0

Table 5: Graded Scores for Ocular Hygiene Practices among Participants

Variable	Frequency	Percentage
Very Good	376	83.6
Good	52	11.6
Fair	22	4.9
Total	450	100.0

Table 6: Graded Scores for Risk Assessment of Ocular Diseases among Participants

Variable	Frequency	Percentage
Low Risk	396	88.0
Moderate Risk	54	12.0
High Risk	0	0.0
Total	450	100.0

for developing ocular disorders.

Discussion

Findings from this study shows that students had very good ocular hygiene practices. Some of these practices were not touching their eyes with their hands all the time, regularly seeing their eye doctor and only using prescribed eyedrops when they needed them. The average individual touches the eyes multiple times a day. This was one of the main issues, during the covid pandemic in 2020, when people were always reminded and encouraged not to touch their eyes with their hands. This is largely because infection can be caused when one touches the eyes with unwashed hands. It is one of the ways bacteria can be spread. Regular consultation with your eye doctor is a good practice because any issues arising can be nipped in the bud. Prognosis for any condition is always better when there is early intervention. Also, using only prescribed medication is a good health practice any day. A lot of problems are associated with drug abuse or misuse. The findings of this study are similar to the research conducted by Arun *et al*[1], which showed that majority of their study participants had good practice of ocular hygiene in their daily life. Although 34% of participants wore contact lenses, only 2% of them reported wearing contact lenses when sleeping. Wearing of contact lenses when sleeping is strongly advised against. This is because it encourages the onset and spread of infection in the eyes. This agrees with the study by Albasheer *et al*[14] where they conducted a cross-sectional study among Jazan University students, exploring knowledge, attitudes and practices related to contact lens use. They found impressive rate of eye hygiene practices among the study population which include avoidance of sharing contact lens. Their study also revealed an average knowledge about hygienic practices for the ocular health. However, this study contradicts the personal hygiene risk factors that contributed to contact lens-related microbial keratitis reported by Stellwagen *et al,*[15] in their study, sleeping with contact lenses asides other factors like showering while wearing contact lenses and age group were the significant risk factors. Similarly, Alghamdi *et al*[16] found that patients with dry eye symptoms who adhered to routine lid hygiene experienced symptomatic improvement. Other studies[17-19] identified factors such as improper hand washing and the use of water alone for cleaning contact lens storage cases as contributors to microbial contamination of contact lenses. Similarly, Stellwagen *et al*[14] highlighted the significant risk posed by showering while wearing contact lenses, with a notable increase in the risk of microbial keratitis among individuals who engaged in this practice.

Many students affirmed they used eye cosmetics but they also had a good practice of washing their face with soap and water before sleeping. This is good because it would prevent the occurrence of infection and allow the pores of the skin to breath.

A good number of participants reported eating a lot of junk food. This is usually overprocessed food with little or no nutritional value. This can affect overall health in the long run as students would tend to fall sick more frequently when they are not well nourished. Only about half of the study population incorporated fruits and vegetables into their diets. Balanced nutrition is crucial for healthy eyes and vision. Many nutritional deficiencies can result in vision impairment. Ocular manifestations of vitamin deficiencies could give rise to different ophthalmic symptoms and signs, including dry eye disease, corneal xerosis, decreased night vision, subconjunctival hemorrhage and retinal changes similar to retinitis pigmentosa.[21]

Half of the study population have personal face towels reserved for the use of the face only. Eyelid hygiene is key to maintaining ocular surface health and improving ocular symptoms. Studies[10,14,15] have reported that contact lens wear, use of retinoids for acne treatment, use of cosmetic eye products and overuse of smartphones are associated with meibomian gland disease and dry eye. Incidences of ocular conditions, including meibomian gland dysfunction (MGD), blepharitis and dry eye have been increasing globally.

Other practices like use of sun glasses when walking under the sun, not constantly touching the eyes are very commendable in avoiding pollution and irritants in the air. Air pollution is inevitably the result of human civilization, industrialization and globalization. It is composed of a mixture of gases and particles at harmful levels. Particulate matter (PM), nitrogen oxides (NOx), and carbon dioxides (CO_2) are mainly generated from vehicle emissions and fuel consumption and are the main materials causing outdoor air pollution. Exposure to polluted outdoor air has been proven to be harmful to human eyes.[21] On the other hand, indoor air pollution from environmental tobacco smoking, heating, cooking, or poor indoor ventilation is also related to several eye diseases, including conjunctivitis, glaucoma, cataracts and age-related macular degeneration (AMD).[22]

Some of the unhygienic practices that were identified among the students were spending more time watching television, on computer or mobile; rubbing eyes when itching, using eye drops without doctor's recommendation and not consulting doctor for eye check-up. Other unhygienic practices are not wearing sun glasses while in the sun. These findings are in support with the study by Azuamah *et al*[6] who reported that most patients that presented with eye infections at the optometry clinic did not observe simple hand washing hygiene practices with soap and water and sharing of hand towels and other personal items were common. Similarly, other studies[14,15] reported that poor contact lens care and not washing hands were

predominantly major hygiene practices that caused eye problem in their study population.

The study found that most of the participants exposed their eyes to digital screens for more than 6 hours in a day and spend prolonged periods doing near work such as reading. These factors were concluded to have been recognized as having significant influence on development of ocular diseases among students in the previous studies.[11-13] The present study supports the study by Scott *et al*[23] on public attitudes about eye and vision health, which found that more than seventy-five percent of the participants in their study identified exposure to sunlight as a major risk factor responsible for vision loss.

The predominant symptoms of ocular disorder among participants in this study were headache and sensitivity to lights. This contradicts the findings by Nwosu *et al*[24] where they found poor distance vision, tearing and grittiness among others as predominant symptoms among university students in Anambra State.

This study also ascertained common risk factors that could influence the development of ocular disorders among students. The results revealed that majority of the participants had low risk of ocular disorders. There was no previous history of eye infections, injuries or presence of diabetes or hypertension among them. This finding is similar to a study reported by Arun *et al*[1] that reported a low risk of ocular disease among undergraduate students in India. The fact that majority of participants in this study did not report any family history of eye disorders agrees with the study by Scott *et al*[24] where they recognized family history as a major risk factor to vision loss.

Lastly, this study determined the correlation between ocular hygiene practices and the risk of ocular disorders among undergraduate students. There was no significant correlation observed between ocular hygiene practices and risks for ocular disorders. This contrasts with a previous study[1] which reported a negative correlation between ocular hygiene practices and the risk of ocular disorders among undergraduate students in Mangaluru, Karnataka, India.

The lack of correlation between ocular hygiene practices and ocular risks in this study suggests that other factors beyond hygiene may play a more significant role in determining ocular health outcomes among undergraduate students. Possible factors could include genetic predispositions, environmental influences or lifestyle habits.[25] The implications of these findings are significant, as they underscore the complexity of factors influencing ocular health and the need for a comprehensive approach to ocular care. While promoting good ocular hygiene remains essential for preventing eye infections and diseases, our study suggests that additional factors should be considered in assessing and managing ocular health risks, particularly among young adults in university settings.

This study had several limitations that should be acknowledged. Firstly, the use of a convenient sampling technique may have introduced selection bias, as participants were chosen based on their accessibility rather than through random selection. This could have potentially led to an overrepresentation or underrepresentation of certain groups within the undergraduate student population of the University of Benin, thereby impacting the generalizability of the findings to the broader student body. Also, the reliance on self-reported data through a questionnaire introduces the possibility of response bias, where participants may provide answers that are influenced by social desirability or recall bias. This could affect the accuracy and reliability of the information collected, particularly regarding practices of ocular hygiene and risk factors for ocular disorders.

The cross-sectional study design employed in this research limits the ability to establish causality or temporality between ocular hygiene practices and the risk of ocular disorders among undergraduate students. However, it provides a snapshot of the relationship between these variables at a specific point in time. Longitudinal studies would be needed to better understand the temporal sequence and potential causal pathways between ocular hygiene practices and ocular disorders among this population. While this study provides valuable insights into the practice of ocular hygiene and the risk for ocular disorders among undergraduate students of the University of Benin, it is important to consider the aforementioned limitations when interpreting and generalizing the findings. Future research should aim to address these limitations to enhance the validity and reliability of the results.

Acknowledgement: The authors wish to thank the undergraduate students of the University of Benin who participated in this study.
Conflict of Interest: None

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