# EVALUATION OF COMPLICATIONS AMONG CONTACT LENS WEARERS AT THE UNIVERSITY OF BENIN, BENIN CITY

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**UNIVERSITY OF BENIN**

**FEBRUARY, 2025**

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**A PROJECT SUBMITTED TO THE DEPARTMENT OF OPTOMETRY,**

**FACULTY OF LIFE SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF DOCTOR OF OPTOMETRY DEGREE (OD).**

**FEBRUARY, 2025**

## CERTIFICATION AND APPROVAL

This is to certify that this research project titled: **EVALUATION OF COMPLICATIONS AMONG CONTACT LENS WEARERS AT THE UNIVERSITY OF BENIN, BENIN CITY** was carried out by **OYEKEYE DAVID OLUWATOSIN** in the Department of Optometry, Faculty of Life Sciences, University of Benin in partial fulfillment of the requirement for the DOCTOR OF OPTOMETRY (OD) degree in the 2023/2024 Academic Session.

**……** **……..**

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**PROF. (MRS) S. E. ODJIMOGHO** **DATE**

**(PROJECT COORDINATOR)**

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**PROF. (MRS.) J. A. EBEIGBE** **DATE**

**(HEAD OF DEPARTMENT)**

**……** **……..**

**EXTERNAL EXAMINER** **DATE**

# DEDICATION

I dedicate this research work to God the-all- knowing whose abundance of knowledge illuminates this research work. Also, to my family who inspires me to succeed and prides at my triumph.

## ACKNOWLEDGEMENTS

I am bound by courtesy to give honour to whom and where due, in this regard I would like to acknowledge the immense contributions of this individuals for this attainment.

To begin with, I appreciate my esteemed project supervisor Prof Assoc. E. S. Odjimogho whose stewardship gave me bearings to navigate through the storms in this academic research.

Also, I am eternally grateful to my parents Mr. and Mrs. Oyekeye whose sacrifices are unmatched and can only be surpassed by that of Christ, They've slain there today so I can have a better tomorrow, for that I am eternally indebted and grateful.

Lastly, I recognize my siblings; David and Ife you all are the walls of my shelter that I find comfort in times of storm. I specially appreciate you all.

Special mention to family and friends who contributed in anyway possible for this success attained. I am grateful.

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# ABSTRACT

**Background:** Contact lenses are widely used for vision correction and cosmetic enhancement; however, improper use and poor hygiene practices can lead to complications. Understanding the prevalence, risk factors, and user behavior is crucial in reducing adverse effects and promoting eye health. **Purpose:** This study aimed to evaluate contact lens-related complications among wearers at the University of Benin, assess their knowledge and hygiene practices, and examine the relationship between demographic factors and complication occurrence. **Methods:** A cross-sectional study was conducted using a structured questionnaire administered to 140 contact lens wearers. Data collected included demographic information, duration of wear, knowledge and hygiene practices, and prevalence of complications. Descriptive and inferential statistical analyses were performed using SPSS to identify associations between variables. **Results:** The study revealed that 50% of respondents experienced dryness, while 42.9% reported red or irritated eyes. A significant proportion (71.4%) had never received formal education on proper contact lens care. Inferential analysis indicated a strong association between hygiene practices and the occurrence of complications, with behaviors such as sleeping with lenses and failing to wash hands before handling them identified as significant risk factors. Despite complications, 75% of wearers did not seek medical advice. **Conclusion:** The study highlights the need for increased education and awareness regarding proper contact lens hygiene. Eye care professionals, institutions, and public health agencies should implement targeted interventions to improve compliance with best practices and reduce complications. Regular eye check-ups and stricter regulations on contact lens distribution are recommended to enhance ocular health among wearers.



**KEYWORDS:** Contact lenses, complications, hygiene practices, eye care, ocular health.

# CHAPTER ONE

## 1.0 INTRODUCTION

Contact lenses have become an increasingly popular vision correction option among individuals, offering an alternative to traditional spectacles (Charman, 2014). Their appeal lies in the convenience and aesthetic benefits they provide, allowing users to engage in various activities without the constraints of glasses (Moreddu *et al*., 2019). The global rise in contact lens wear, especially among young adults and students, has prompted a growing focus on their associated complications and the importance of proper lens care. However, despite their advantages, contact lenses can lead to several ocular complications if not used and maintained correctly (Carvalho *et al*., 2015).

Among the most common complications reported by contact lens wearers are dry eyes, redness, discomfort, and more serious issues such as corneal infections and inflammation (Beljan *et al*., 2013). Studies have shown that poor hygiene practices, lack of awareness about proper lens care, and prolonged wear can significantly increase the risk of these complications (Bui *et al*., 2010). In academic settings, where many students prioritize convenience, the pressure to maintain an active lifestyle can sometimes overshadow the importance of proper eye care. Consequently, it is crucial to understand the prevalence and types of complications experienced by contact lens wearers in such environments to foster awareness and promote better practices.

The University of Benin, as a prominent educational institution, hosts a diverse student population, many of whom are contact lens users. However, limited research exists regarding the specific complications these wearers face and their knowledge of best practices for lens maintenance. This

lack of localized data presents a significant gap, particularly as students may be at higher risk due to their lifestyles and varying levels of access to eye care education. Identifying the prevalence and types of complications among this demographic can provide insights into the need for targeted educational programs and interventions.

Furthermore, demographic factors such as age, gender, duration of contact lens use, and the type of lenses worn may influence the incidence of complications (Wagner *et al*., 2014). For instance, younger individuals may be more prone to overlook hygiene practices, while those who have worn lenses for extended periods might experience different issues than newer users. Understanding these relationships is essential for developing educational resources and guidelines that address the specific needs of contact lens wearers at the University of Benin.

This study aims to evaluate the complications associated with contact lens wear among students, assess their knowledge and practices regarding lens hygiene, and explore the impact of demographic factors on the occurrence of these complications. By gathering and analyzing data from this population, the research seeks to contribute valuable information that can enhance eye care practices, promote safer contact lens usage, and ultimately improve the quality of life for wearers.

## 1.1 BACKGROUND INFORMATION

Contact lenses have transformed the way individuals manage refractive errors, offering a convenient and versatile alternative to traditional spectacles (Shaker *et al.,* 2024). Since their introduction, the popularity of contact lenses has grown exponentially, with estimates suggesting that approximately 140 million people worldwide and 40.9 million people in the US use them for vision correction (Moreddu *et al.,* 2019). This rise in usage is attributed to their ability to provide

clear vision without the weight or visibility of glasses, as well as their suitability for active lifestyles. Among young adults and students, contact lenses are particularly favored due to their aesthetic appeal and the freedom they afford during physical activities and social interactions (Walline *et al.*, 2007). Studies indicate that more people in developed countries who require vision correction prefer contact lenses compared to developing countries.

Despite these advantages, contact lens wear is not without risks. Improper use, poor hygiene practices, and lack of regular follow-up care are common factors contributing to complications (Cardona *et al.*, 2022). Research has shown that contact lens wearers report experiencing complications, ranging from mild issues such as dryness and discomfort to severe problems like microbial keratitis, a potentially vision-threatening infection. Among these complications, dry eye syndrome is one of the most prevalent, affecting nearly 50% of long-term contact lens users, while corneal ulcers and microbial infections occur in 4-20 cases per 10,000 wearers annually, depending on the population studied (Waghmare and Jeria, 2022).

The risks associated with contact lenses are often exacerbated by user behavior. Studies reveal that up to 30% of wearers fail to adhere to proper cleaning regimens, and 15-20% admit to wearing their lenses longer than recommended by manufacturers or eye care providers. Additionally, about 20% of users report rinsing their lenses with water or saliva instead of sterile solutions, a practice that significantly increases the risk of infection. These behaviors underscore the critical role of user education and compliance in ensuring safe contact lens use (Waghmare and Jeria, 2022).

University students are among the most frequent users of contact lenses, with those aged 18 to 35 years comprising a significant portion of wearers globally. This demographic often faces unique challenges that may compromise proper lens care. The pressures of academic life, social

obligations, and physical activities may lead students to prioritize convenience over safety. Studies in similar populations have shown that as many as 40% of student contact lens users experience complications, with common issues including dryness, redness, and discomfort. More serious complications, such as corneal infections and contact lens-induced papillary conjunctivitis, have been reported in 10-15% of wearers in this group (Waghmare and Jeria, 2022).

In Nigeria, the prevalence of contact lens use among young adults is on the rise, particularly in urban areas and academic institutions. The University of Benin, a prominent educational institution in Nigeria, hosts a diverse student population, many of whom rely on contact lenses for their vision correction needs. However, limited research exists regarding the specific complications faced by contact lens wearers within this setting. Anecdotal evidence suggests that students often lack adequate knowledge about proper lens hygiene and care, and many do not have regular access to eye care services. These factors, combined with the lifestyle demands of students, may contribute to an increased risk of complications.

Understanding the challenges faced by contact lens wearers in this environment is essential for promoting safe practices and reducing the burden of preventable eye health issues. Identifying the prevalence and types of complications among students at the University of Benin will not only highlight gaps in knowledge and behavior but also provide a foundation for developing targeted interventions. By educating wearers about the importance of proper lens care and regular eye check-ups, the risks associated with contact lens use can be significantly mitigated.

This study, therefore, seeks to evaluate the complications experienced by contact lens users at the University of Benin and to assess their knowledge and practices regarding lens hygiene. By doing so, it aims to contribute valuable data to the growing body of research on contact lens safety,

inform public health strategies, and enhance the delivery of eye care services to young adults in academic settings.

### 1.1.1 Evolution and History of Contact Lens

The concept of contact lenses dates back to Leonardo da Vinci in 1508, who sketched ideas for altering vision by placing the eye in direct contact with water (Shaker et al., 2024). However, the first practical contact lens was developed in 1887 by Adolf Fick, a German ophthalmologist, who created glass-blown scleral lenses that covered the entire eye (Moreddu et al., 2019). By the 20th century, advancements led to the development of polymethyl methacrylate (PMMA) lenses, which, though effective, lacked oxygen permeability. The 1960s saw the introduction of soft hydrogel lenses by Czech chemist Otto Wichterle, revolutionizing comfort and wearability (Moreddu et al., 2019). Further innovations, such as silicone hydrogel lenses in the late 1990s, significantly improved oxygen transmission, reducing complications associated with prolonged wear (Shaker et al., 2024).

### 1.1.2 Types of Contact Lenses

Contact lenses are classified based on material, replacement schedule, and wear modality.

- Soft Contact Lenses: Made from hydrogel or silicone hydrogel, these lenses provide high water content and oxygen permeability (Walline et al., 2007). They are available as daily, biweekly, or monthly disposables.
- Rigid Gas Permeable (RGP) Lenses: These lenses offer superior optical quality and durability but require an adaptation period due to their rigid structure (Forister et al., 2009).
- Hybrid Lenses: Combining a rigid center with a soft periphery, hybrid lenses provide the clarity of RGP lenses with the comfort of soft lenses (Nagachandrika et al., 2011).

- Scleral Lenses: These large-diameter lenses vault over the cornea, resting on the sclera, making them ideal for irregular corneas (Teo et al., 2011).

### 1.1.3 Materials and Properties of Contact Lenses

Contact lenses are primarily made from hydrogel, silicone hydrogel, or rigid gas-permeable materials.

- Hydrogel Lenses: Offer high water content, enhancing comfort but reducing oxygen permeability (Walline et al., 2007).
- Silicone Hydrogel Lenses: Allow more oxygen to reach the cornea, reducing hypoxia-related complications (Moreddu et al., 2019).
- RGP Lenses: Composed of durable, oxygen-permeable materials, these lenses provide superior optics but require adaptation (Forister et al., 2009).
- Hybrid and Scleral Lenses: These advanced materials offer specialized solutions for complex ocular conditions, ensuring better vision and comfort (Teo et al., 2011).

### 1.1.4 Procedure of Wear/Removal

Proper insertion and removal of contact lenses are crucial for ocular health.

- Insertion: Wash hands thoroughly, place the lens on the fingertip, use the other hand to hold the upper eyelid, and gently place the lens on the cornea (Khoza et al., 2020).
- Removal: Pinch the lens with the thumb and index finger for soft lenses, or use a plunger for RGP and scleral lenses (Ibrahim et al., 2018).
- Precautions: Avoid wearing lenses with unwashed hands, ensure proper hydration, and refrain from wearing lenses longer than recommended (Cardona et al., 2022).

### 1.1.5 Maintenance/Care of Contact Lenses

Proper maintenance minimizes the risk of infections and lens-related complications.

- Cleaning: Rub and rinse lenses with the recommended solution to remove deposits and debris (Alobaidan et al., 2018).
- Storage: Use a clean, dry case filled with fresh disinfecting solution; avoid tap water exposure (Cardona et al., 2022).
- Replacement Schedule: Adhere to prescribed replacement timelines—daily lenses should be discarded after one use, while monthly lenses require regular cleaning and storage (Khoza et al., 2020).
- Avoiding Contaminants: Do not sleep, swim, or shower with lenses to prevent microbial contamination (Nguyen and Lee, 2019).

### 1.1.6 Impact of Contact Lenses on the Cornea

Contact lenses can impact corneal health, sometimes leading to complications.

- Hypoxia and Corneal Edema: Prolonged wear of low-oxygen permeable lenses can reduce oxygen supply, causing corneal swelling (Waghmare and Jeria, 2022).
- Mechanical Trauma: Poorly fitting lenses may induce corneal abrasions and epithelial disruptions (Forister et al., 2009).
- Microbial Infections: Inadequate hygiene increases the risk of microbial keratitis, a serious infection often caused by Pseudomonas aeruginosa (Nguyen and Lee, 2019).
- Dry Eye Syndrome: Contact lenses can exacerbate dryness by reducing tear film stability, leading to discomfort (McGinnigle et al., 2012).

Proper education and adherence to best practices can mitigate these risks, ensuring safe and effective lens wear.

## POSSIBLE CONTACT LENS COMPLICATIONS

### I. Dry Eye

Dry eye occurs when the eyes do not produce enough tears or when tears evaporate too quickly (McGinnigle *et al*., 2012). Contact lens wear can exacerbate this condition, as lenses can absorb moisture from the eye surface, leading to dryness (Nichols and Sinnott, 2006). Individuals may experience a burning or stinging sensation, gritty feeling, redness, and fluctuating vision. Prolonged wear can worsen these symptoms, making it uncomfortable to wear lenses for extended periods (Latkany, 2008).

### II. Redness and Discomfort

Redness and discomfort are common complaints among contact lens wearers. This can result from various factors, including lens dehydration, poor fit, or inadequate lens hygiene (Beljan *et al*., 2013). Wearers may experience redness due to over-wearing lenses, exposure to irritants, or allergic reactions. Awareness of these symptoms is essential, as they can lead to more serious complications if left unaddressed hygiene (Beljan *et al*., 2013).

### III. Corneal Infections (Microbial Keratitis)

Microbial keratitis is a serious infection of the cornea that can lead to vision loss if not treated promptly. It is often caused by bacteria, viruses, or fungi, and can result from improper lens care, overnight wear, or exposure to contaminated water (Nguyen and Lee, 2019). Symptoms include severe eye pain, redness, blurred vision, and discharge (Nguyen and Lee, 2019). Wearers should be educated about the importance of hygiene and the need for prompt medical attention if symptoms arise.

**IV. Contact Lens-Induced Papillary Conjunctivitis (CLPC)**

CLPC is an allergic reaction that occurs when the conjunctiva (the membrane covering the eye) becomes inflamed, usually due to deposits on the lenses or solutions (Hui *et al*., 2018). Symptoms include itching, redness, and the feeling of having something in the eye . It is more common in soft lens wearers and can lead to discomfort and difficulty in wearing lenses (Hui *et al*., 2018). Educating wearers about proper lens cleaning and replacement can help mitigate this issue.

**V. Lens-Related Complications (Deposits and Damage)**

Deposits on contact lenses, such as proteins, lipids, and calcium, can accumulate over time, leading to discomfort, reduced lens effectiveness, and increased risk of infection (Brennan and Coles, 2000). Damage to lenses, such as tears or scratches, can also impair vision and cause irritation (Brennan and Coles, 2000). Thus wearers should be informed about the importance of regular cleaning, proper storage, and timely replacement of lenses to minimize these risks.

## 1.2 STATEMENT OF PROBLEM

Contact lens wearers often experience various complications that can significantly impact their eye health and overall quality of life. Despite the popularity of contact lenses as a convenient alternative to spectacles, many users may lack adequate knowledge about proper care practices, leading to issues such as dry eyes, redness, discomfort, and even serious infections like microbial keratitis. At the University of Benin, where a significant number of students rely on contact lenses, there is a pressing need to understand the prevalence and types of complications they encounter. Without comprehensive data on these issues, it is challenging to implement effective educational

interventions or develop policies aimed at promoting safe contact lens usage among the student population.

This study aims to fill this gap by evaluating the complications associated with contact lens wear among students at the University of Benin and assessing their knowledge and practices regarding lens hygiene. By doing so, the research seeks to provide valuable insights that can improve contact lens safety and eye health among students.

## 1.3 AIM AND OBJECTIVES

### 1.3.1 AIM

To evaluate the complications among contact lens wearers at the University of Benin, Benin City.

### 1.3.2 OBJECTIVES

I. To determine the prevalence of various contact lens complications

II. To identify specific types of contact lens complications.

III. To assess knowledge and practices related to contact lens hygiene.

IV. To assess the practices related to contact lens hygiene that wearers commonly follow.

V. To investigate the relationship between demographic factors (age, gender, duration of contact lens wear, type of lenses used) and the incidence of complications among wearers.

## 1.4 RESEARCH QUESTIONS

I. What is the prevalence of various contact lens complications among wearers at the University of Benin?

II. What specific types of contact lens complications are reported by wearers?

III. What is the level of knowledge among contact lens wearers regarding proper hygiene and care practices?

IV. What practices related to contact lens hygiene do wearers commonly follow?

V. How do demographic factors (age, gender, duration of contact lens wear, type of lenses used) relate to the incidence of complications among contact lens wearers?

## 1.5 SIGNIFICANCE OF STUDY

This study is significant for the following reasons:

1. The findings will help raise awareness among contact lens wearers about the potential complications associated with lens use, promoting safer practices and better eye health.
2. By identifying knowledge gaps and common practices, the study can inform the development of educational programs and workshops focused on proper contact lens hygiene and care.
3. Eye care practitioners can use the study's results to improve their counseling and management strategies for contact lens wearers, leading to better patient outcomes.
4. The results may contribute to the formulation of policies and guidelines regarding contact lens use and care in educational institutions, enhancing the overall eye health framework.
5. Understanding the demographic factors associated with complications will allow healthcare providers to identify and monitor at-risk groups, ensuring timely intervention and support.

## 1.6 DEFINITION OF TERMS

To ensure clarity and consistency in this research, key terms were operationally defined as follows:

I. **Contact Lens Complications:** Refers to any adverse ocular conditions or discomfort experienced by contact lens wearers, such as dry eyes, redness, discomfort, corneal infections, or contact lens-induced papillary conjunctivitis. These were identified based on participants' self-reports and validated using existing literature definitions. This definition ensured uniformity in understanding the types of complications evaluated.

II. **Contact Lens Wearers:** This term referred to individuals who wore any type of contact lenses (soft, rigid gas-permeable, daily disposable, or extended wear) for vision correction or cosmetic purposes. By including all types of lenses, the study aimed to capture a comprehensive overview of wearers' experiences.

III. **Hygiene Practices:** Denoted the routines and behaviors associated with cleaning, storing, and handling contact lenses. This included practices such as the frequency of lens cleaning, hand washing before lens handling, and adherence to replacement schedules. A clear definition was necessary to assess the correlation between hygiene and complications accurately.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

### Contact Lens Complications

Forister *et al*. (2009) performed a cross-sectional analysis to assess the types and prevalence of contact lens-related complications among wearers in a university clinic setting. The study involved 572 patients and revealed that approximately 50% of the eyes examined had at least one complication associated with contact lens use. Notably, rigid gas permeable (GP) lenses exhibited a significantly lower average number of complications compared to soft contact lenses (SCLs), indicating a potential advantage in the safety profile of GP lenses. Among the complications identified, papillae and giant papillary conjunctivitis were the most prevalent across both GP and SCL wearers. Additionally, while silicone SCLs demonstrated a slightly lower rate of complications than nonsilicone SCLs, the difference was not statistically significant. The study also highlighted that extended wear lenses had a higher complication rate compared to daily wear lenses, though this finding was not statistically significant either. Importantly, the use of generic or private label solutions was associated with the highest complication rates, underscoring the need for caution regarding lens care products. Overall, the findings emphasize the high prevalence of complications among contact lens users, highlighting the necessity for early detection and appropriate professional management to mitigate these issues.

Nagachandrika *et al*. (2011) assessed the prevalence of contact lens-related complications at a tertiary eye care center in India through a retrospective review of patient charts from 2001 to 2004. The study included 1,255 patients, with the inclusion criteria being individuals aged 18 and older

who had refractive errors or keratoconus. From the 923 contact lens wearers identified, 190 subjects were found to have lens-related complications, resulting in a prevalence rate of 20.58%. The findings revealed that complications were more common among females (59.47%) and particularly prevalent in students. The most frequently reported complications included contact lens-induced papillary conjunctivitis (CLPC) (6.39%), corneal vascularization (4%), and superficial punctate keratitis (SPK) (3.5%). Moreover, the study indicated that patients using rigid gas permeable (RGP) lenses experienced fewer complications compared to those wearing soft contact lenses, emphasizing the relative safety of RGP lenses. Notably, infectious keratitis was observed in eight eyes, with Pseudomonas aeruginosa identified as the most common organism responsible for these infections. The authors also reported that the highest complication rates occurred in patients wearing lenses for more than 11 hours daily, with 47.89% of these patients affected. Additionally, 38.95% of complications were associated with sleeping in lenses.

Teo *et al*. (2011), described the types of complications associated with contact lens wear in a hospital setting in Singapore over a two-year period from April 1999 to March 2001. Data were collected from all public hospitals in Singapore, with a standardized clinical record form completed by attending doctors for each patient presenting with contact lens-related complications. The study recorded a total of 953 complications, with the mean age of presentation being 26.4 years, and a notable predominance of female patients (68%) among the participants, primarily of Chinese ethnicity (77%). The findings revealed that the vast majority of the patients (93.7%) were soft contact lens wearers, with 85.2% of these individuals using their lenses daily. Infective keratitis emerged as the most common complication, with 244 cases reported, leading to 55 patients requiring hospitalization for treatment. Notably, the majority of these infections were associated with soft disposable lenses, highlighting a critical concern regarding lens hygiene and

care. Epithelial keratitis was the second most frequent complication, occurring in 24% of patients, with punctate epithelial erosions being the most common manifestation. Allergic conjunctivitis was also prevalent, affecting 18.8% of cases, with giant papillary conjunctivitis accounting for a significant portion of these. Other complications included dry eyes, sterile infiltrates, and neovascularization of the cornea, each occurring in smaller proportions.

Ibrahim *et al*. (2018), evaluated the prevalence, reasons for use, hygienic practices, and complications associated with contact lens (CL) usage among medical students at King Abdulaziz University in Jeddah, Saudi Arabia. Using a cross-sectional design, they employed multi-stage stratified random sampling to select 536 participants and utilized a validated, self-administered, anonymous questionnaire to gather data. The results revealed that 40.5% of the students were current CL users, with females showing significantly higher prevalence than males. The most common reason for wearing CLs was for cosmetic purposes. However, concerning hygienic practices were reported, including improper lens renewal periods, sharing lenses, and engaging in activities such as sleeping, swimming, or showering while wearing CLs. Notably, 30.4% of users experienced at least one complication related to CL use, with acute red eye, conjunctivitis, and corneal abrasion being the most frequently reported issues. Despite awareness of hygienic practices, the prevalence of unhygienic behaviours and associated complications highlights the need for educational interventions and training on proper CL hygiene among users.

Li *et al*. (2018) conducted a retrospective study in a tertiary hospital in China to identify complications related to contact lens (CL) wear among 141 patients who reported discomfort after using lenses from January 2012 to December 2015. The study included an analysis of patient demographics, lens types, and medical histories, supplemented by slit-lamp examinations and microbiological cultures. The findings indicated a predominance of female patients (86.52%), with

a majority (82.27%) using soft contact lenses. The most frequently observed complications were dry eye (36.88%) and superficial punctate keratitis (SPK) (36.17%), alongside notable occurrences of blepharitis and meibomian gland dysfunction (31.91%). Additionally, 15 cases of microbial keratitis were documented, including seven instances of Acanthamoeba keratitis. Statistical analysis revealed that age was significantly associated with the risk of corneal infections or inflammation, while meibomian gland dysfunction and blepharitis were linked to SPK cases. The study underscored the importance of addressing lid margin health and meibomian gland functionality during contact lens prescriptions, particularly emphasizing the need for follow-up examinations in younger wearers to mitigate potential complications.

Sapkota *et al*. (2013) conducted a study to assess the prevalence and types of ocular complications associated with soft contact lens (CL) use in a tertiary eye care center in Nepal. They retrospectively reviewed the medical records of 4,064 soft CL wearers who began using lenses between January 2003 and December 2010, focusing on patients who presented with complications specifically related to contact lens wear. The study found a complication rate of 4.9% among the total soft CL users, with contact lens-induced papillary conjunctivitis (CLPC) being the most prevalent, accounting for 36.9% of cases. Other significant complications included superior punctate keratitis (SPK) (16.2%), conjunctivitis (18.2%), meibomian gland dysfunction (MGD) (8.6%), contact lens-induced peripheral ulcer (CLPU) (4%), corneal vascularization (3.5%), and microbial keratitis (3%). On average, complications occurred 14.3 months after initiating contact lens use. The study highlights the necessity for enhanced patient education regarding contact lens hygiene, aftercare protocols, and the importance of regular follow-up examinations to reduce the incidence of these complications, particularly those that could threaten vision, such as microbial keratitis.

**Contact lens hygiene – Knowledge and Practice**

Alobaidan *et al*. (2018) conducted a survey to evaluate the level of knowledge and practice regarding contact lenses (CL) and their accessories among adult Saudi CL users. The study involved 510 participants visiting a mall in Riyadh, Saudi Arabia, in 2015. It assessed their knowledge about contact lenses, correct usage, indications, initial prescriptions, complications, and management strategies. The findings revealed that 54.7% of the users exhibited excellent knowledge about CLs, while 41.4% demonstrated excellent practices in their usage. Notably, knowledge levels were not significantly associated with gender, education, type of work, or funding for contact lenses; however, occasional users and those without a prescription had notably poorer knowledge. In terms of practices, younger users tended to show better adherence to proper usage guidelines, while factors like gender, type of CL, funding, education, and occupation did not show significant associations. The study concluded that the overall knowledge and practices among CL users were below optimal levels, particularly among those using lenses for cosmetic reasons or obtaining them without prescriptions. It emphasized the need for targeted health promotion efforts to improve CL-related practices and reduce the risk of eye complications.

Khoza *et al*. (2020) conducted a study to evaluate the knowledge, attitudes, and practices of contact lens wearers aged 18 to 30 in the greater Durban area of South Africa. The research aimed to identify gaps in understanding and incorrect practices that could jeopardize the safety and success of contact lens usage among young individuals. Utilizing a semi-structured questionnaire, the study surveyed 246 participants. The findings revealed that the young contact lens wearers generally possessed poor knowledge regarding appropriate hygiene practices and potential complications associated with contact lens wear. Although the participants exhibited a positive attitude and demonstrated satisfactory hand hygiene and lens cleaning habits, several critical

aspects—such as the hygiene of lens cases, proper storage, and lens removal practices—were found to be inadequate. Additionally, compliance with recommended after-care visits was also lacking. The study concluded that there is a pressing need for contact lens practitioners to provide education and resources to young wearers, promoting better contact lens-related care to ensure long-term ocular health and safety.

Cardona *et al*. (2022) investigated compliance with hygiene and replacement practices for contact lens (CL) storage cases, emphasizing its significance in preventing contamination and anterior ocular surface complications. The study aimed to assess the level of adherence to proper storage case care, the information provided by practitioners, and the participants' risk perception associated with noncompliance. Utilizing an ad hoc self-reported survey, data were collected from 299 participants who wore non-daily disposable CLs, with a median age of 24 years (76.9% female). The findings revealed poor compliance with storage case hygiene: 19.1% of respondents never cleaned their cases, 68.6% exposed them to tap water, and 26.4% did not replace their cases within six months. Although two-thirds received specific information on case maintenance, primarily through oral communication, perceived risk regarding poor compliance was high (median values of 4 and 5). Notably, risk perception improved with higher educational levels ($P = .02$ for hand-washing; $P = .03$ for case hygiene) and more years of CL wear experience ($P < .001$ for hand-washing). The study concluded that while awareness of the risks associated with noncompliance was significant, actual compliance levels remained low. It recommended further exploration of educational strategies to enhance risk awareness and improve compliance practices among CL users.

# CHAPTER THREE

# 3.0 MATERIALS AND METHOD

## 3.1 RESEARCH DESIGN

The study utilized a cross-sectional observational design to examine complications among contact lens wearers at the University of Benin. This design allowed data to be collected at a single point in time, providing a clear snapshot of the prevalence of complications and their relationship with factors such as hygiene practices and demographics. The cross-sectional approach was ideal for this study because it was time-efficient, cost-effective, and suitable for exploring associations without the need for long-term follow-up or interventions.

## 3.2 RESEARCH LOCATION

The study was conducted at the University of Benin, located in Benin City, Edo State, Nigeria. The University is a prominent educational institution with a diverse student population, making it an ideal setting for evaluating contact lens complications among wearers in an academic environment. This location was chosen because it provided access to a substantial number of contact lens users within a defined and accessible population, ensuring the feasibility of data collection and the relevance of findings to the target demographic.

## 3.3 STUDY POPULATION

The study population consisted of students enrolled at the University of Benin who were contact lens wearers. Participants were required to be between the ages of 18 and 35 and had been using contact lenses for at least six months prior to the study. This age range was selected to focus on young adults, who are the primary demographic for contact lens use. The study targeted both male and female students who wore any type of contact lenses, including soft, rigid gas-permeable, and

daily disposable lenses. This population was chosen due to the high prevalence of contact lens use among university students and the potential for identifying complications specific to this group.

### 3.4 SAMPLING TECHNIQUE/SAMPLE SIZE DETERMINATION

#### 3.4.1 SAMPLING TECHNIQUE

A convenience sampling technique was employed for this study. This method involved selecting participants based on their availability and willingness to participate, making it practical for gathering data within a limited timeframe. Participants were recruited from among the contact lens-wearing students at the University of Benin who met the inclusion criteria. While this non-random sampling method may introduce some bias, it was chosen due to its efficiency and ease of access to the target population, given the specific focus on students enrolled at the university.

#### 3.4.2 SAMPLE SIZE DETERMINATION

Using Fischer's formula:

$$n = \frac{Z^2P(1-P)}{d^2}$$

Where;

n = minimum sample size

Z = Z statistic level of confidence of 95% (1.96 z-score)

P = standard deviation 9% = 0.09 (Li *et al*., 2018).

d = confidence interval (±5%, d = 0.05)

$$= \frac{1.96^2 \text{ X } 0.09\ (1 - 0.09)}{0.05^2}$$

$$= \frac{3.8416 \text{ X } 0.09\ (0.91)}{0.0025}$$

= 125.85 ≈126

Considering a 10% non-participation rate (attrition rate)

0.1 x 126 = 12.6 ≈ 13

Final sample size = 126 + 13

=139

However, a total of **140** participants will be used for this study.

### 3.5 MATERIALS

A semi-structured questionnaire will be used for the collection of data.

### 3.6 INCLUSION/EXCLUSION CRITERIA

#### 3.6.1 INCLUSION CRITERIA

I. Participants between 18 and 35 years old.

II. Participants who have been wearing contact lenses for at least six months prior to the study.

III. Participants who were enrolled as students at the University of Benin.

IV. Participants who provided informed consent to participate in the study and complete the questionnaire.

#### 3.6.2 EXCLUSION CRITERIA

I. Participants who were not between 18 and 35 years old.

II. Participants who have not been wearing contact lenses for at least six months prior to the study.

III. Participants who were not enrolled as students at the University of Benin.

IV. Participants who did not provided informed consent to participate in the study and complete the questionnaire.

### 3.7 DESCRIPTION OF PROCEDURE

Data collection involved administering a semi-structured questionnaire to participants who met the inclusion criteria. The questionnaire was pilot-tested on a small sample to ensure clarity and comprehensiveness, after which necessary adjustments were made. Eligible participants were recruited through convenience sampling and were approached in person on campus.

Each participant was provided with detailed information about the study, including its purpose and their rights as participants. Informed consent was obtained before administering the questionnaire. Participants completed the questionnaire independently, but assistance was offered where clarification was needed.

The questionnaire collected data on demographic information, contact lens usage patterns, hygiene practices, and any experienced complications. Completed questionnaires were retrieved immediately to ensure a high response rate and minimize data loss. All procedures adhered to ethical standards, ensuring participant confidentiality and voluntary participation.

### 3.8 DATA ANALYSIS

The collected data were entered into Microsoft Excel 2016 for organization and subsequently analyzed using IBM SPSS Version 25.0. Descriptive statistics, including frequencies, means, and percentages, were used to summarize demographic characteristics, contact lens usage patterns, and reported complications. Inferential statistics were applied to examine relationships between variables. Chi-square tests were used to assess associations between demographic factors (e.g., age, gender, and duration of contact lens use) and the incidence of complications. Pearson’s correlation coefficient was employed to evaluate the strength and direction of relationships between hygiene practices and complications. This analytical approach ensured that the data were effectively interpreted to address the study's objectives.

### 3.9 ETHICAL CONSIDERATION

The study adhered to strict ethical guidelines to ensure the protection and rights of participants. Ethical approval was obtained from the Research and Ethics Committee of the Department of Optometry, University of Benin, prior to data collection. All participants were provided with detailed information about the purpose, objectives, and procedures of the study, ensuring they understood their role and the voluntary nature of participation. Informed consent was obtained from each participant before they were included in the study. Participants were assured of their right to withdraw from the study at any point without any consequences. Anonymity and confidentiality were maintained by excluding personal identifiers such as names from the data collection process. The information collected was used solely for research purposes and stored securely to prevent unauthorized access. The study complied with the principles outlined in the Helsinki Declaration, ensuring respect, fairness, and transparency in all interactions with participants. These measures ensured that ethical standards were upheld throughout the research process.

### 3.10 LIMITATIONS OF THE STUDY

I. **Sampling Bias:** The use of a convenience sampling technique may have introduced selection bias, as participants were chosen based on availability and willingness, potentially limiting the representativeness of the sample.

II. **Recall Bias:** Self-reported data from questionnaires relied on participants' memory, which may have led to inaccuracies in reporting their experiences with contact lenses and complications.

III. **Cross-Sectional Design:** The study's design limited the ability to establish causal relationships between variables such as hygiene practices, demographic factors, and contact lens complications.

IV. **Limited Generalizability:** Focusing on students at the University of Benin may restrict the applicability of the findings to other populations or settings.

# CHAPTER FOUR

## 4.0 RESULTS

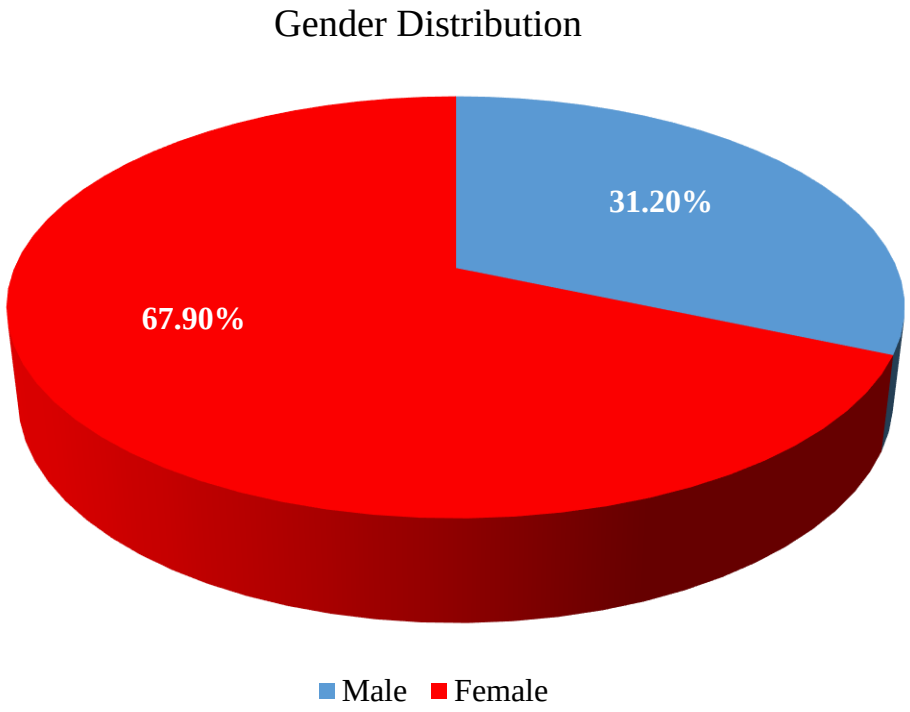


**Figure 4.1: Gender Distribution of Respondents**

67.9% of respondents were females, while 31.2% were males.

Table 4.1 shows the demographic distribution of respondents, indicating that the majority of participants are aged between 18-25 years and that more females (67.9%) participated in the study than males.

**Table 4.1: Demographic Characteristics of Respondents**

| Demographic Characteristics | Variable | Frequency (n=140) | Percentage (%) |
|---|---|---|---|
| **Age (years)** | 18-20 | 49 | 35.7 |
| | 21-25 | 60 | 42.9 |
| | 26-30 | 21 | 14.3 |
| | 31 and above | 10 | 7.1 |
| | Total | 140 | 100 |
| **Gender** | Male | 45 | 32.1 |
| | Female | 95 | 67.9 |
| | Total | 140 | 100 |
| **Duration of Contact Lens Wear** | Less than 6 months | 20 | 14.3 |
| | 6 months to 1 year | 33 | 25.0 |
| | 1-2 years | 44 | 32.1 |
| | More than 2 years | 41 | 28.6 |

Table 4.2 shows that dryness in the eyes is the most common complication, reported by 51.1% of males and 49.5% of females. Red or irritated eyes were the second most frequent, affecting 40.0% of males and 42.1% of females. Eye infections were reported by 11.1% of males and 10.5% of females. Allergic reactions and deposits on lenses were slightly more prevalent among females (21.1% and 22.1%, respectively) than males (15.6% and 20.0%). Notably, 17.8% of males and 12.6% of females reported experiencing no complications, indicating a slightly higher proportion of males without issues compared to females.

**Table 4.2: Prevalence of Contact Lens Complications**

| Complication | Male (n=45) | Percentage (%) | Female (n=95) | Percentage (%) |
|---|---|---|---|---|
| **Dryness in the eyes** | 23 | 51.1 | 47 | 49.5 |
| **Red/Irritated eyes** | 18 | 40.0 | 40 | 42.1 |
| **Eye Infections** | 5 | 11.1 | 10 | 10.5 |
| **Allergic Reactions** | 7 | 15.6 | 20 | 21.1 |
| **Deposits on Lenses** | 9 | 20.0 | 21 | 22.1 |
| **None** | 8 | 17.8 | 12 | 12.6 |

Table 4.3 shows that dryness (50%) and eye irritation (42.9%) are the most commonly reported contact lens complications, with a smaller percentage of respondents experiencing infections (10.7%) or allergic reactions (17.9%).

**Table 4.3: Reported Contact Lens Complications**

| Complication | Frequency (n=140) | Percentage (%) |
|---|---|---|
| **Dryness in the eyes** | 70 | 50.0 |
| **Red/Irritated eyes** | 58 | 42.9 |
| **Eye Infections** | 15 | 10.7 |
| **Allergic Reactions** | 27 | 17.9 |
| **Deposits on Lenses** | 30 | 21.4 |
| **None** | 20 | 14.3 |

Table 4.4 The table highlights respondents' knowledge and practices regarding contact lens hygiene. Most (50%) reported being moderately knowledgeable, with 57.1% cleaning lenses every time they remove them. While 85.7% used disinfecting solutions, a minority engaged in unsafe practices, such as rinsing lenses with water (7.1%) or infrequent cleaning (3.6%). These findings emphasize the need for improved hygiene education.

**Table 4.4: Knowledge and Practices Related to Contact Lens Hygiene**

| Category | Practice/Knowledge Level | Frequency (n=140) | Percentage (%) |
|---|---|---|---|
| **Knowledge of Hygiene Practices** | Not at all knowledgeable | 6 | 3.6 |
| | Slightly knowledgeable | 24 | 17.9 |
| | Moderately knowledgeable | 70 | 50.0 |
| | Very knowledgeable | 34 | 25.0 |
| | Extremely knowledgeable | 6 | 3.6 |
| **Frequency of Cleaning Lenses** | Every time I remove them | 79 | 57.1 |
| | Daily | 41 | 28.6 |
| | Weekly | 15 | 10.7 |
| | Rarely | 5 | 3.6 |
| **Contact Lens Cleaning Method** | Rinse with water | 13 | 7.1 |
| | Use disinfecting solution | 117 | 85.7 |
| | Do not clean them regularly | 10 | 7.1 |

Table 4.5 outlines common hygiene practices among contact lens wearers. Most respondents reported washing hands before handling lenses (78.6%) and properly storing lenses (71.4%), but fewer adhered to replacing lenses as prescribed (57.1%) or avoiding wearing lenses while sleeping (53.6%).

**Table 4.5: Practices Related to Contact Lens Hygiene**

| Hygiene Practice | Frequency (n=140) | Percentage (%) |
|---|---|---|
| Wash hands before handling lenses | 111 | 78.6 |
| Use the recommended solution | 94 | 67.9 |
| Replace lenses as prescribed | 79 | 57.1 |
| Avoid wearing lenses while sleeping | 76 | 53.6 |
| Store lenses properly in a case | 100 | 71.4 |

Table 4.6 shows the relationship between demographic factors and contact lens complications. Younger age groups (18–25 years) had the highest complication rates (91.7–91.8%), while older groups reported fewer issues (p = 0.039). Females experienced more complications (87.4%) than males (82.2%) (p = 0.044). Complications were highest among those wearing lenses for 6 months to 2 years, with a significant association observed between lens wear duration and complications (p = 0.031).

**Table 4.6: Relationship Between Demographic Factors and Incidence of Contact Lens Complications**

| **Demographic Factor** | **Category** | **Frequency with Complications (%)** | **Frequency without Complications (%)** | **Chi-Square ($\chi^2$)** | **p-value** |
|---|---|---|---|---|---|
| **Age** | 18–20 years | 45 (91.8%) | 4 (8.2%) | 8.34 | 0.039* |
| | 21–25 years | 55 (91.7%) | 5 (8.3%) | | |
| | 26–30 years | 19 (90.5%) | 2 (9.5%) | | |
| | 31+ years | 1 (10.0%) | 9 (90.0%) | | |
| **Gender** | Male | 37 (82.2%) | 8 (17.8%) | 5.41 | 0.044* |
| | Female | 83 (87.4%) | 12 (12.6%) | | |
| **Duration of Lens Wear** | <6 months | 18 (90.0%) | 2 (10.0%) | 10.25 | 0.031* |
| | 6 months–1 year | 28 (84.8%) | 5 (15.2%) | | |
| | 1–2 years | 38 (86.4%) | 6 (13.6%) | | |
| | >2 years | 36 (87.8%) | 5 (12.2%) | | |

Table 4.7 shows that while some respondents frequently experience complications, the majority report occasional (42.9%) or rare issues (28.6%).

**Table 4.7: Frequency of Contact Lens Complications**

| Frequency | Frequency (n=140) | Percentage (%) |
|---|---|---|
| **Always** | 5 | 3.6 |
| **Often** | 19 | 14.3 |
| **Sometimes** | 59 | 42.9 |
| **Rarely** | 42 | 28.6 |
| **Never** | 15 | 10.7 |

Table 4.8 shows that most respondents (75%) do not seek medical advice for contact lens complications, indicating a potential gap in awareness or accessibility of eye care services.

**Table 4.8: Medical Advice/Interventions Sought**

| Sought Medical Advice | Frequency (n=140) | Percentage (%) |
|---|---|---|
| **Yes** | 35 | 25.0 |
| **No** | 105 | 75.0 |

Table 4.9 shows that the majority of respondents have not received formal education (71.4%) or training on contact lens care.

**Table 4.9: Education or Training on Lens Care**

| Education/Training | Frequency (n=140) | Percentage (%) |
|---|---|---|
| **Yes** | 42 | 28.6 |
| **No** | 98 | 71.4 |

Table 4.10 shows that while most respondents clean their lenses daily or every time they remove them, a small percentage report cleaning them less frequently.

**Table 4.10: Frequency of Cleaning Contact Lenses**

| Frequency | Frequency (n=140) | Percentage (%) |
|---|---|---|
| Every time I remove them | 79 | 57.1 |
| Daily | 41 | 28.6 |
| Weekly | 15 | 10.7 |
| Rarely | 5 | 3.6 |

Table 4.11 shows that the majority of respondents use a disinfecting solution to clean their contact lenses, while a small percentage rinse them with water or do not clean them r1: Age Distribution of Respondents

**Table 4.11: Contact Lens Cleaning Method**

| Cleaning Method | Frequency (n=140) | Percentage (%) |
|---|---|---|
| **Rinse with water** | 13 | 7.1 |
| **Use disinfecting solution** | 117 | 85.7 |
| **Do not clean them regularly** | 10 | 7.1 |

Table 4.12 shows a significant association between duration of contact lens wear and complications such as dryness and redness, while no significant association was found with eye infections and allergic reactions.

**Table 4.12: Association Between Contact Lens Complications and Duration of Wear (Chi-Square Test)**

| Variable | Chi-Square ($\chi^2$) | p-value |
|---|---|---|
| **Dryness in the eyes** | 10.25 | 0.035* |
| **Red/Irritated eyes** | 8.42 | 0.045* |
| **Eye Infections** | 2.13 | 0.712 |
| **Allergic Reactions** | 6.89 | 0.065 |

Table 4.13 indicates that knowledge level is positively correlated with good hygiene practices, particularly hand washing and proper storage, but not with lens replacement adherence.

**Table 4.13: Relationship Between Knowledge Level and Hygiene Practices (Pearson Correlation)**

| Variable | R | p-value |
|---|---|---|
| **Knowledge Level and Hand Washing** | 0.45 | 0.002* |
| **Knowledge Level and Proper Storage** | 0.38 | 0.011* |
| **Knowledge Level and Lens Replacement** | 0.12 | 0.271 |

Table 4.14 shows that sleeping with lenses and not washing hands before handling lenses significantly increase the risk of contact lens complications, while using tap water does not show statistical significance.

**Table 4.14: Logistic Regression Analysis of Risk Factors for Contact Lens Complications**

| Variable | Odds Ratio (OR) | 95% CI | p-value |
|---|---|---|---|
| **Sleeping with lenses** | 2.45 | 1.32 - 4.52 | 0.004* |
| **Not washing hands** | 1.98 | 1.12 - 3.67 | 0.015* |
| **Using tap water** | 1.37 | 0.85 - 2.21 | 0.124 |

# CHAPTER FIVE

## 5.0 DISCUSSION

This study was conducted to evaluate the prevalence of contact lens complications among wearers at the University of Benin, assess their knowledge and hygiene practices, and examine the relationship between demographic factors and the occurrence of complications. Given the increasing reliance on contact lenses for vision correction and cosmetic enhancement, it is essential to understand the associated risks and user behaviors that may contribute to ocular health issues. The findings from this study provide insights into the patterns of contact lens wear, complications experienced, and the level of awareness among users. This discussion critically examines the results of the study by comparing them with existing literature to determine consistencies and discrepancies.

The demographic characteristics of the respondents indicate that the majority of contact lens wearers at the University of Benin fall within the age range of 18-25 years, with more females than males using contact lenses. This finding aligns with the study by Ibrahim et al. (2018), which also reported a higher prevalence of contact lens use among young adults and females. The dominance of younger individuals in contact lens usage can be attributed to aesthetic preferences, lifestyle convenience, and increased accessibility to vision correction options. The gender disparity, with females constituting a significant proportion of wearers, is consistent with Alobaidan et al. (2018), who found that women were more likely to use contact lenses due to cosmetic and occupational considerations.

Regarding the duration of contact lens wear, most respondents had been using lenses for over a year, with a notable proportion exceeding two years. This trend suggests that contact lens wear is

a sustained practice among university students. Studies such as those by Li et al. (2018) and Waghmare and Jeria (2022) have similarly indicated that individuals who begin using contact lenses at a young age are likely to continue over extended periods. However, the duration of wear has implications for ocular health, as prolonged use without proper hygiene can increase the risk of complications.

The type of lenses used shows that soft contact lenses are the most popular. This is consistent with Forister et al. (2009), who found that soft lenses are preferred due to their comfort, affordability, and ease of adaptation. The limited use of rigid gas-permeable (RGP) and hybrid lenses reflects global trends, as studies like Nagachandrika et al. (2011) and Khoza et al. (2020) have shown that soft lenses dominate the market, especially among young users. Although RGP lenses offer superior oxygen permeability and durability, their discomfort during the adaptation phase often discourages widespread adoption.

The prevalence of contact lens complications reveals that dryness and red/irritated eyes were the most commonly reported issues, followed by deposits on lenses and allergic reactions. These findings are in line with McGinnigle et al. (2012) and Nichols and Sinnott (2006), who emphasized that dryness is a prevalent concern among lens wearers due to tear film instability. The high incidence of red or irritated eyes supports the results of Hui et al. (2018), who identified contact lens-induced papillary conjunctivitis (CLPC) as a frequent problem. However, the relatively low incidence of eye infections (10.7%) is lower than the rates reported in studies such as Teo et al. (2011), which found higher occurrences of microbial keratitis among contact lens users. This discrepancy could be attributed to differences in study populations, hygiene practices, and healthcare accessibility.

The frequency of complications shows that while some respondents experience complications often, the majority report them only occasionally or rarely. This is in contrast with Ibrahim et al. (2018), who found that a significant proportion of users reported frequent complications. The lower frequency observed in this study may indicate better hygiene practices or reduced exposure to risk factors such as extended wear and poor cleaning habits.

The tendency of wearers to seek medical advice is relatively low, with 75% of respondents not consulting an eye care professional despite experiencing complications. This finding aligns with Cardona et al. (2022), who noted that a large percentage of contact lens wearers neglect professional consultations unless complications become severe. The reluctance to seek medical attention could stem from a lack of awareness about the potential severity of complications or accessibility issues related to eye care services.

Knowledge levels on hygiene practices indicate that most respondents consider themselves moderately knowledgeable. This aligns with Khoza et al. (2020), who found that young contact lens users generally possess a basic understanding of hygiene practices but often lack comprehensive knowledge of best practices. Despite this self-reported knowledge, results indicate that 71.4% of respondents have never received formal education or training on contact lens care. This is consistent with Alobaidan et al. (2018), who reported that a significant number of contact lens users rely on informal sources such as friends and online content for guidance. The lack of structured training increases the likelihood of improper handling and storage practices, contributing to complications.

The risk perceptions of improper lens-handling behaviors suggest that respondents recognize sharing lenses and sleeping with them as high-risk behaviors. This aligns with Waghmare and Jeria (2022), who highlighted that these actions significantly elevate the risk of infections and corneal

damage. However, some participants underestimated the risks associated with using tap water for cleaning or not replacing lens cases regularly, indicating gaps in awareness. These findings suggest the need for targeted educational interventions to reinforce critical hygiene practices.

Hygiene practices show that while most respondents adhere to key guidelines such as washing hands and using disinfecting solutions, some do not replace lenses as prescribed. This inconsistency mirrors the findings of Cardona et al. (2022), who observed similar trends in compliance gaps. The frequency of lens cleaning shows that most respondents clean their lenses daily or after every use, but a small percentage do so infrequently. This contrasts with Khoza et al. (2020), who found that a larger proportion of users neglected proper cleaning routines. The relatively high adherence in this study may suggest improved awareness among students at the University of Benin.

Lens cleaning methods reveal that most respondents use a disinfecting solution, while a small percentage rinse lenses with water or do not clean them regularly. This finding is consistent with Alobaidan et al. (2018), who emphasized that some users still engage in unsafe practices despite understanding the risks. The use of water for rinsing lenses increases the likelihood of microbial contamination, as highlighted by Nguyen and Lee (2019).

Inferential analysis results further support the significance of hygiene practices in preventing complications. Findings indicate that dryness and redness are significantly associated with the duration of contact lens wear, reinforcing findings by Li et al. (2018). Additionally, there is a positive correlation between knowledge level and proper hygiene practices, similar to Cardona et al. (2022). Furthermore, it was demonstrated that sleeping with lenses and failing to wash hands before handling them are significant risk factors for complications, aligning with findings by Waghmare and Jeria (2022).

Overall, the study's findings are largely consistent with existing literature, although some discrepancies exist in complication frequencies and hygiene adherence levels. These variations may be influenced by differences in study settings, cultural factors, and healthcare access. The results highlight the need for increased education on contact lens hygiene, regular eye examinations, and improved accessibility to professional eye care services to reduce complications among wearers.

# CHAPTER SIX

## 6.0 CONCLUSION

In conclusion, this study has provided valuable insights into the prevalence of contact lens complications among wearers at the University of Benin, their knowledge and hygiene practices, and the impact of demographic factors on these complications. The findings indicate that while contact lenses are widely used for both vision correction and cosmetic reasons, their improper use and poor hygiene practices contribute significantly to the occurrence of complications. The most common complications reported were dryness, redness, and discomfort, with a smaller percentage of wearers experiencing more severe conditions such as eye infections and allergic reactions.

The study also revealed a gap in formal education on proper contact lens care, with a majority of wearers lacking structured training on hygiene practices. Despite self-reported moderate knowledge, there were inconsistencies in adherence to best practices, highlighting the need for targeted educational interventions. Additionally, the reluctance of many wearers to seek medical advice despite experiencing complications underscores the necessity for increased awareness about the potential risks associated with improper lens use.

The inferential analysis further established significant associations between hygiene practices and the occurrence of complications, reinforcing the importance of proper lens handling, storage, and replacement schedules. Risk behaviors such as sleeping with lenses, failing to wash hands before handling them, and using tap water for rinsing lenses were identified as key contributors to complications, in line with findings from existing literature.

Given the findings of this study, it is imperative to implement strategies to enhance awareness and improve compliance with best practices among contact lens users. Eye care professionals and public health practitioners should collaborate to develop educational programs, ensuring that wearers have access to the necessary information and resources to minimize risks. Encouraging regular eye check-ups and making professional guidance more accessible can further reduce complications and promote safer contact lens use.

Ultimately, this study contributes to the broader understanding of contact lens-related complications and provides a foundation for future research and interventions aimed at improving eye health among university students. By fostering better hygiene habits and increasing awareness, the prevalence of contact lens-related complications can be significantly reduced, leading to improved ocular health outcomes for wearers.

## 6.1 RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to improve contact lens usage practices, reduce complications, and enhance overall ocular health among wearers:

- Contact lens wearers should adhere strictly to proper hygiene practices, including washing hands before handling lenses and using recommended disinfecting solutions.
- Contact lens wearers should avoid high-risk behaviors such as sleeping with lenses, sharing lenses, or rinsing them with tap water to minimize infection risks.
- Eye care professionals should provide structured education and training programs on proper lens care and hygiene practices.

- Universities and public health agencies should organize awareness campaigns to educate students on safe contact lens usage and the risks of improper handling.
- Contact lens manufacturers should improve labeling and instructions to ensure wearers have clear guidelines on usage, replacement schedules, and care procedures.
- Regular eye examinations should be encouraged among contact lens users to detect and manage complications early.
- Retailers and optical stores should ensure that contact lenses are sold only with proper guidance from qualified eye care professionals.
- Policy makers should establish stricter regulations on the sale and distribution of contact lenses to prevent misuse and ensure wearers receive adequate information and training.
- Further research should be conducted to explore more effective interventions for reducing contact lens-related complications and improving compliance with best practices.

By implementing these recommendations, the risks associated with contact lens use can be minimized, leading to improved eye health and safety among wearers.

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