

**KNOWLEDGE, ATTITUDE, PRACTICE AND EYE PROBLEMS FROM
CONTACT LENS USE IN STUDENTS
AT CHULALONGKORN UNIVERSITY 2010**

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**A thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2011
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ความรู้ ทักษะ การปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในนิสิต
จุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2553

นางสาวภาวิณี วงษ์กระจ่าง

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2554
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title KNOWLEDGE, ATTITUDE, PRACTICE AND
 EYE PROBLEMS FROM CONTACT LENS USE
 IN STUDENTS AT CHULALONGKORN
 UNIVERSITY 2010

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Field of Study Public Health

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Accepted by the College of Public Health Sciences, Chulalongkorn
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ภาวณิ วงษ์กระจ่าง : ความรู้ ทักษะ การปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในนิสิตจุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2553 (KNOWLEDGE, ATTITUDE, PRACTICE AND EYE PROBLEMS FROM CONTACT LENS USE IN STUDENTS AT CHULALONGKORN UNIVERSITY 2010.) อ.ที่ปรึกษาวิทยานิพนธ์หลัก : PROF. KARL J. NEESER ,Ph.D. 82 หน้า.

วัตถุประสงค์ของการศึกษาภาคตัดขวางนี้คือการประเมินความรู้ ทักษะ การปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในนิสิตจุฬาลงกรณ์มหาวิทยาลัย กรุงเทพมหานคร เก็บข้อมูลโดยใช้แบบสอบถามและให้ผู้เข้าร่วมวิจัยตอบแบบสอบถามด้วยตนเอง มีผู้เข้าร่วมการวิจัย 340 คน โดยใช้วิธีสุ่มตัวอย่างตามสะดวกคือเป็นนิสิตจุฬาลงกรณ์มหาวิทยาลัยที่ใช้คอนแทคเลนส์เท่านั้น ผลการศึกษาพบว่า 73.2%มีความรู้เกี่ยวกับการป้องกันการเกิดปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในระดับสูง 93.5%ทราบว่า การล้างมือให้สะอาดด้วยสบู่และทำให้แห้งทุกครั้งก่อนสัมผัสคอนแทคเลนส์สามารถป้องกันการเกิดตาติดเชื้อจากคอนแทคเลนส์ได้ 95.3%ทราบว่า การนอนหลับพร้อมคอนแทคเลนส์สามารถทำให้เพิ่มความเสี่ยงของการติดเชื้อที่ตารุนแรง 80.3%ทราบว่า ห้ามว่ายน้ำในขณะที่ใส่คอนแทคเลนส์เพราะมีความเสี่ยงของการเกิดตาติดเชื้อจากแบคทีเรียในสระว่ายน้ำ 79.1%มีทัศนคติเกี่ยวกับการใช้คอนแทคเลนส์ในระดับปานกลาง ส่วนใหญ่(70.9%)เห็นด้วยว่าการใส่คอนแทคเลนส์ทำให้สวยงามขึ้น 77.1%มีการปฏิบัติเกี่ยวกับการใช้และการดูแลรักษาคอนแทคเลนส์ที่เหมาะสมในระดับสูง พบว่ามี 26.8% เคยชะล้างคอนแทคเลนส์ด้วยน้ำประปา 56.8%เคยหลับพร้อมคอนแทคเลนส์ 95.3%ไม่เคยสลับคอนแทคเลนส์กับผู้อื่น 36.2%เคยว่ายน้ำขณะใส่คอนแทคเลนส์ พบว่ามีปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในการศึกษานี้เป็นจำนวนมาก เช่น ตาแดง ความไม่สะดวกสบาย เจ็บตา ตาแห้ง มองเห็นไม่ชัด กลัวแสง ติดเชื้อ น้ำตามาก และหนอง นอกจากนี้ยังพบว่าระดับความรู้มีความสัมพันธ์กับภูมิฐานะ รายเดือน และสาขาวิชาอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) ระดับการปฏิบัติเกี่ยวกับการใช้และการดูแลรักษาคอนแทคเลนส์ที่เหมาะสมมีความสัมพันธ์กับเพศ อายุ ระดับการศึกษา และรายเดือนอย่างมีนัยสำคัญทางสถิติ ($p < 0.05$) คะแนนความรู้และการปฏิบัติเกี่ยวกับการป้องกันการเกิดปัญหาจากการใช้คอนแทคเลนส์มีความสัมพันธ์เชิงบวก (correlation coefficient = 0.316) นอกจากนี้คะแนนความรู้ยังมีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับคะแนนการปฏิบัติ ($p < 0.001$) การศึกษาครั้งนี้ได้เสนอข้อแนะนำและแนวทางในการควบคุมและลดปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์

สาขาวิชา _____ สาธารณสุขศาสตร์ _____ ลายมือชื่อนิสิต.....
ปีการศึกษา _____ 2554 _____ ลายมือชื่อ อ. ที่ปรึกษาวิทยานิพนธ์หลัก.....

5279139353: MAJOR PUBLIC HEALTH

KEYWORDS: KAP CONTACT LENS/ PRACTICE/ EYE PROBLEM/ STUDENTS

PAWINEE WONGKRAJANG : KNOWLEDGE, ATTITUDE, PRACTICE

AND EYE PROBLEMS FROM CONTACT LENS USE IN STUDENTS

AT CHULALONGKORN UNIVERSITY 2010. ADVISOR : PROF. KARL J.

NEESER ,Ph.D. 82 pp.

The aim of this cross-sectional study was to assess knowledge about contact lens, attitude, practice and eye problems from contact lens use in students at Chulalongkorn University, Bangkok. Data were collected by using self-administered questionnaires. 340 participants were selected by convenience sampling technique, contact lenses users among students at Chulalongkorn University. The result indicated that 73.2% had high knowledge about eye problems protection from contact lens. 93.5% knew that washing hands thoroughly with soap and drying well every time before touching contact lenses can protect eye infection. 95.3% knew that sleeping while wearing contact lenses can lead to an increased risk of severe eye infection. 80.3% knew that they should not swimming while wearing contact lenses. 79.1% of them had a moderate attitude about contact use. Most of the respondents (70.9%) agree that wearing contact lenses make them look more beautiful. 77.1% had good practice about the proper contact lens use and care. It was found that 26.8% used to rinse contact lenses with tap water. 56.8% used to sleep when wearing contacts lenses. 95.3% never swap contact lenses with another person. 36.2% used to swim while wearing contact lenses. There were many eye problems from contact lens use in this study such as red eye, discomfort, pain, dry eye, blur, light phobia, infection, many tear and discharge. Furthermore, the knowledge level was associated with hometown living, monthly income and field ($p<0.05$). The practice level was associated with sex, age, study level and monthly income ($p<0.05$). Knowledge and practice score regarding to eye problem protection from contact lens had a positive correlation (correlation coefficient of 0.316). In addition, knowledge score had a statistically significant correlation with practice score ($p<0.001$). This study proposed recommendation and guideline to control and reduce eye problems from contact lens use.

Field of Study : Public Health..... Student's Signature.....

Academic Year : 2011..... Advisor's Signature.....

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my thesis advisor, Professor Karl J. Neeser for his supervision, advice and invaluable comments.

I also would like to thank Assistant Professor Ratana Somrongsong, Assistant Professor Ngamjit Kasetsuwan, M.D. and Dr. Nanta Auamkul for their encouragement, comments and suggestions.

Special thanks go to the staff of the College of Public Health Sciences and the staff of the faculties of Chulalongkorn University for their coordination and help in the data collection process.

Lastly, I would like to thank my family for their supports and encouragement throughout my study at the College of Public Health Sciences, Chulalongkorn University.

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CHAPTER I

INTRODUCTION

1.1 Background & Rationale

In the United States and throughout the world, prevalence of myopia is increasing. In 2009, there was a report saying that prevalence of myopia in the United States increased from 25 percent (in 1971-1972) to 41.6 percent (in 1999-2004) (Vitale, Sperduto and Ferris, 2009). In Asian countries such as Taiwan the number of myopic school children is approximately 80 percent (Lin et al, 1999) (figure 1).

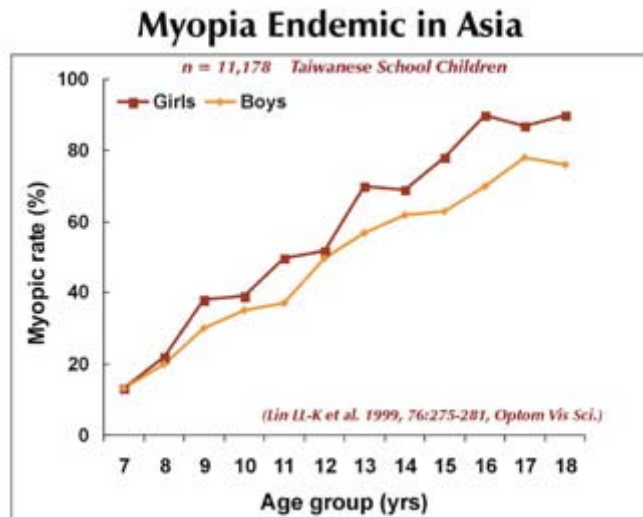


Figure 1 Prevalence of myopic school children in Taiwan

Contact lens is one of the choices to correct myopia. Each year, there is increasing the number of people who use contact lenses, both of corrective lenses and cosmetic lenses (change color or appearance of eyes). People about 125 million in the world wear contact lenses (Barr, 2005). Improper use of contact lenses can cause numerous complications (Mezu-Nnabue, 2009).

In 2006, a New Zealand man lost his eye vision due to eye infection after wearing contact lenses for three days as a consequence of using borrowed decorative contact lenses to party (Kiong, 2007). At that time in Thailand, the Thai Food and Drug Administration (Thai FDA) only controlled and monitored vision correcting

contact lens import, but not decorative contact lens import. In addition, decorative contact lenses were distributed not only in the eyeglasses (optician) shops or clinics but also at stalls in many fashion centers and the Internet. Furthermore, advertising over the Internet comfort consumers to buy decorative contact lenses more easily.

The Thai Food and Drug Administration is concerned about this problem. An inappropriate using of all types of contact lenses, both vision correct contact lenses and decorative contact lenses may affect and be harmful to the users' eyes. The Thai FDA identifies all contact lens types to be as medical devices which manufacturers and importers have to apply for permission. Moreover, the Thai FDA specifies that all leaflets of products must have a clear warning, contraindication, and precaution in order to control manufacturers and importers of contact lenses to meet standards and quality for the consumers' safety (Thai FDA, 2009).

However, even though the Thai FDA enforced contact lens manufacturers and importers manage or make labels of products have to show the message "Using of contact lens should need prescription and following up by ophthalmologists or optometrists every year" (Thai FDA, 2010), the Thai FDA does not specify any condition to manufacturers and importers in matters of distribution of contact lenses to appoint places such as clinics and the eyeglasses / optician shops. So consumers are able to buy decorative contact lenses to wear from stalls in fashion center or on the Internet because there is no control distribution.

Moreover, in Thailand, the trend for decorative contact lens wearing to have "Big Eye", like Japanese or Korean stars, is very popular among teenagers, especially students and young adults. These contact lenses are transparent in the center and black or dark color in the edge making wearers having big black eyes much more than normal. In other words, the decorative contact lenses do not correct vision problem but only use to change the shape or color of the eyes. An inappropriate using of lenses may infect the eye and create blindness (Thai FDA, 2009). For example, in 2011, there is news about teenage patients who admitted to the hospital because they were suffered from microbial corneal infection by *Pseudomonas aeruginosa* as a consequence of wearing decorative contact lenses which purchased from a stall in the market or the Internet all the time (Thai FDA, 2011).

A study about contact lenses use at Chulalongkorn University is overdue. Students in Chulalongkorn University are educated and knowledgeable users and contact lenses are very popular among students. They are able to buy them easily because Chulalongkorn University campus at a vast area in downtown Bangkok, close to the popular teenagers' hangout, Siam Square, MBK department store with many stalls selling this product.

The purpose of this research is to investigate knowledge, attitude and practice of contact lens use and factors associated with eye problems among students at Chulalongkorn University. Hopefully this present study may help to determine an appropriate guideline to control and reduce eye problems from contact lens use.

1.2 Research questions

1.2.1 What are the knowledge, attitude, practice and eye problems from contact lens use in students at Chulalongkorn University?

1.2.2 What are factors associated with eye problems from contact lens use in students at Chulalongkorn University?

1.3 Objectives

1.3.1 To assess the knowledge, attitude, and practice of contact lens use in students at Chulalongkorn University.

1.3.2 To examine the relationship between demographic factor, knowledge, attitude and practice.

1.3.3 To examine the relationship between knowledge and contact lens using practice.

1.3.4 To examine the relationship between variable (socio-demographic characteristic, contact lens information, knowledge, attitude and practice level) and eye problems.

1.4 Expected Benefit & Application

To determine an appropriate guideline to control and reduce eye problems from contact lens use for public.

1.5 Operational Definitions

Knowledge: knowledge about eye problems protection from contact lens.

Attitude: personal opinion about contact lens wear.

Practice: practice of contact lens usage i.e use (insertion and removal of lens), care taking and maintenance.

Students: students who wear contact lenses at Chulalongkorn University during academic year 2005-2010 .

Eye problems: discomfort from using contact lenses. They can be infectious or non-infectious such as dry eye, red eye, tear etc.

1.6 Conceptual Framework

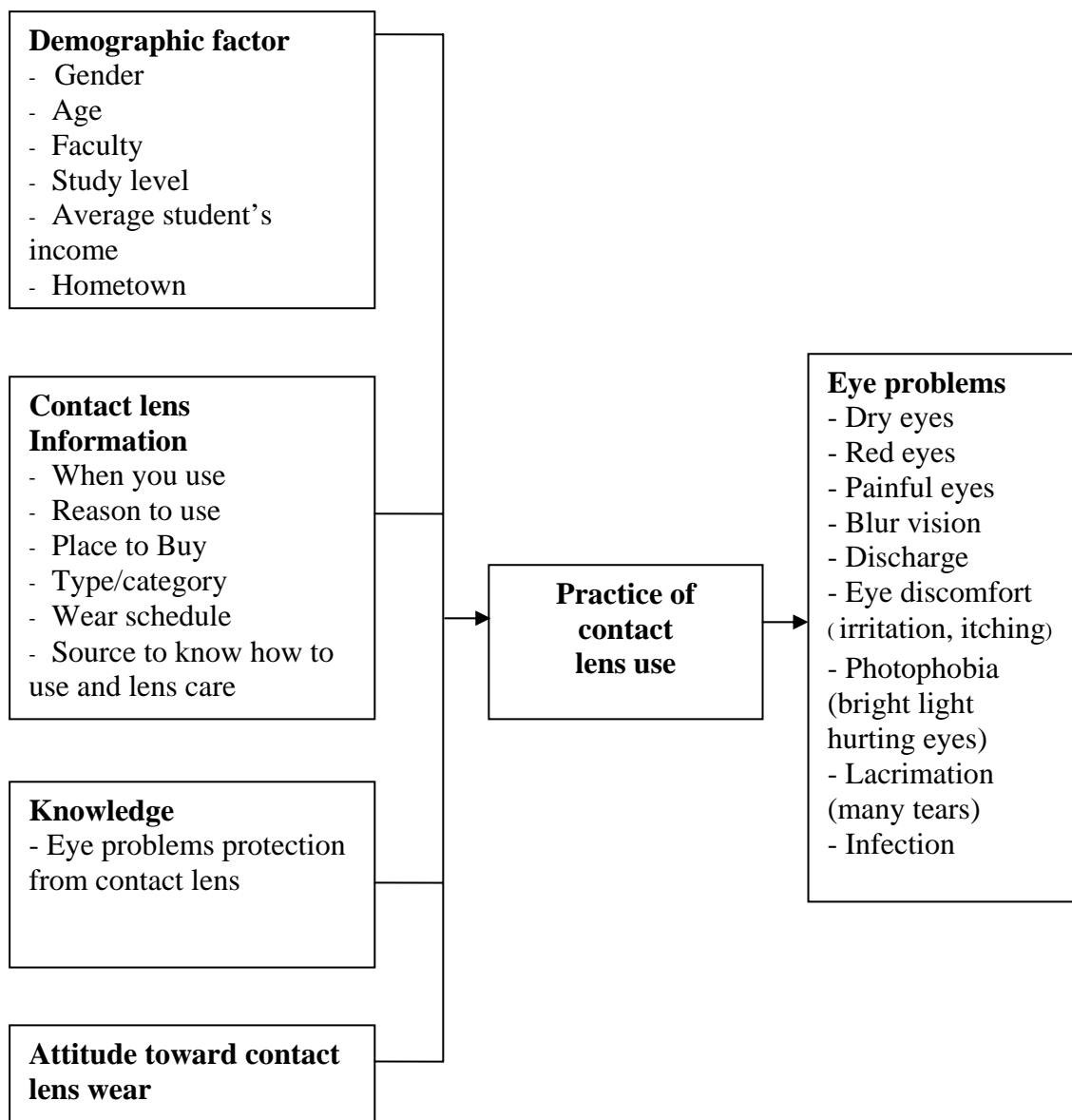


Figure 2 Conceptual Framework

CHAPTER II

LITERATURE REVIEW

The present study focuses on the impact of using contact lenses in youth. This chapter is divided into six sections. In the first section, the types of contact lenses are introduced. The second section reviews literature about the appropriate ways of using contact lenses. This section includes the proper practice of using contact lenses as well as guideline of care and maintenance. Literature about warning and recommendations for using contact lenses is provided in the third section. In the fourth section, eyes problems resulting from inappropriate using contact lenses are reviewed. Regulation of contact lens both of Thailand and other countries such as the United State, Canada and Japan in the fifth section. Last section is related researches about knowledge and practice of contact lens wear among college students, ocular complications from cosmetic contact lenses or contact lenses and risk factors for microbial keratitis.

2.1 Types of Contact Lenses

The United States Food and Drug Administration (USFDA) divided contact lens into 6 types (USFDA, 2008):

- **Soft Contact Lenses** are made of flexible plastics which can lead oxygen to pass through the cornea regularly. Users usually feel comfortable and less irritating when wearing the soft-contact lenses. Many users are recommended to prescribe a frequent replacement schedule such as replacing the new one every two weeks.

- **Rigid Gas Permeable (RGP) Lenses** are last longer and more durable than soft contacts. They also offer a clear and crisp vision to the users and prevent from depositing build up. They are easy to handle and results in less tear. The critical issue of this type of contact lenses is that users may need a few weeks to get accustomed to it.

- **Extended Wear Contacts Lenses** offer the users to wear lenses overnight or continuous wearing from one to six nights, or up to a month. However, it is

recommended that the users should allow their eyes to have a rest by not wearing lenses for at least one night after each scheduled removal

- **Disposable (Replacement Schedule) Contacts Lenses.** To FDA “disposable” refers to “to be used once and discarded. Some soft contacts which are referred as “disposable contact lenses” by sellers tend to usually be advised on a frequent replacement schedule such as two weeks. Therefore, the lenses have to be cleaned between uses, for example.

- **Lenses Designed for "Ortho-K."** is a lens-fitting procedure which can temporarily increase the ability of the users to focus by designing the RGP contact lenses to change the curvature of the cornea. This type of lenses is mostly used for the correction of near-sightedness. The most common one is an overnight Ortho-K. Moreover, the FDA also requires eye care professionals to be trained and certified prior to using the lenses.

- **Decorative (Plano) Contact Lenses** are actually worn with an aim for decoration. However, it is often warned by the FDA for the users to be aware of risks that may result from wearing this type of lenses without appropriate professional involvement. The main issue is that these lenses do not correct vision and tend to change the appearance of users’ eye.

2.2 The proper contact lenses using practice

Kalaiyaran (2004) recommended the proper contact lenses using practice such as use (insertion and removal), care and maintenance should be the following:

2.2.1 Use (Insertion and removal)

- Before insertion, wash and clean the hands thoroughly with soap and dry every time before touching lenses
- Take the lens out, clean and rinse it well
- place the lens on the tip of the index finger
- Look up, and retract the lower lid with the middle finger and while looking upward, gently apply the lens to the lower part of the eye.
- Remove the finger and then slowly release the lid.
- Close the eye and gently massage the lids.
- Cover the other eye and focus it to make the correct centration.

- Repeat the same procedure to the next eye.
- While removing, Look upward and retract the lower lid with middle finger and place the index finger tip on the lower edge of the lens.
- Slide the lens down to the white of the eye.
- Compress the lens between the thumb and the index finger, so that the air breaks the suction under the lens. Remove the lens for cleaning and sterilizing.

2.2.2 Contact lenses care and maintenance (Kalaiyarasan, 2004)

Contact lens care and maintenance is one of the most crucial aspects of wearing contact lenses. It can influence the success of contact lenses wear and patient's satisfaction.

The lens care and maintenance procedure contains with 4 steps which are cleaning, rinsing, disinfecting and storing the lenses.

- **Cleaning**

This first step usually begins with the daily cleaner which the users use it in order to remove loosely bound external bodies on the lens. This may include cell debris, lipid, protein, mucus, and micro organisms. The rubbing action results in the decreasing of the amount of loose debris and also increases the ability of the solutions surfactant properties.

- **Rinsing**

After a cleaning process, the lenses should be rinsed. The rinsing procedure assists the lenses to remove the loosened deposits and some microorganisms.

- **Disinfecting and storage**

The disinfecting process is a way to deactivate or kill the microorganisms which may be found in the lenses. Ideally, there are two types of disinfecting systems.

- Thermal disinfection: The lenses are placed in the case with salinesolution and heated up to 70°c - 80°c for 10 –20 minutes.

- Chemical Disinfecting: Hydrogen peroxide based solutions are used in this disinfecting system. It is advised to proceed for 10 – 15 minutes.

These disinfecting solutions are also used for storing contact lenses because a hydrating medium in the solution can maintain the stability of contact lens parameters and physical parameters.

Multipurpose solutions

Recently, many modern lens care systems employ one solution to perform the functions of a number of components. For ease of use and convenience reason, multipurpose solutions are formulated to allow the users to use for cleaning, rinsing, soaking and disinfecting by one solution. In addition, to avoid lens contaminations, the lens case should be rinsed and cleaned after every use and the lenses should be stored in fresh solution. It is also advised that the users should change the lens case monthly.

2.3 Warnings and recommendations

Southern Eye Associates (2010) stated about contact lens warnings and recommendations as the following:

- If eyes are red and/or irritated, do not insert contact lenses. If irritation occurs during wear, the users should remove lenses immediately. If irritation and redness continues upon removal, go to see doctor immediately.
- Inspect contact lenses for any defects every time before insertion and do not wear a lens when it appears any damaged.
- Insert contact lenses prior to applying any makeup or lotions to avoid contaminating contact lenses.
- Do not use any over-the-counter eye drops which is not prescribed or recommended by the practitioner. This is specifically for medications to reduce redness or dry eyes unless prescribed by the prescriber.
- Do not wear lenses longer than prescribed. Closely monitor advised daily wearing schedules and increase wearing time only as recommended.
- Try to remove contacts lens before sleeping because while eyes are close, tears cannot carry amounts of oxygen to the eye. As a result, contact lenses will become dry and stick to eyes.
- Avoid wearing contact lenses in environments containing air-borne chemicals or irritating fumes.

- Do not swap or use contact lens with another person. Swapping can provide a risk of transferring germs between people. As contact lenses are individually fitted, incorrectly fitted lenses may lead to permanent eye infection and may potentially result in blindness.

- Do not swim while wearing contact lenses. There is a risk of eye infection from bacteria in swimming pool water, lakes and the ocean.

- Avoid using aerosols such as hairsprays, perfumes, air fresheners, cleaning products, etc., when wearing contact. Because aerosol residue can remain in the air for several minutes, areas in which an aerosol product has been used should be avoided for several minutes to allow the chemicals to disperse and settle.

- Dispose of contact lenses as prescribed and advised. Disposable and planned replacement lenses are permitted for specific length of time only. Therefore, disposal dates should be carefully followed and monitored.

- Store lenses in the recommended solutions when not wearing. Do not store lenses in a dry case with no solution. Soft lenses will dry out quickly and become brittle. If any soft lens has become dry, the users should discard it straightaway.

- Do not reuse disinfecting solutions. Solutions should be discarded every time after using.

- Replace contact lens storage cases on a frequent basis.

- Monitor and inspect expiration dates on all solutions. Discard any remaining solution that has been already due to the expiration date.

- Do not store or rinse lenses in tap water.

- Do not use saliva or put lenses in mouth to rewet. Saliva contains bacteria that can cause serious infection and damage to the eye.

- Every contact lens wearer should have a current pair of eyeglasses. If eyes become irritated because of allergies, infection, or any other ocular condition or injury, contact lens wear may be suspended for an indefinite length of time requiring the patient to wear eyeglasses with their most current prescription.

2.4 Eye problems from an inappropriate contact lens use.

Mezu-Nnabue (2009) stated about contact lens complications in QEI winter 2009 Newsletter and review again by Boles that contact lenses are normally used to correct refractive error, increase visual perception and improve users' appearances. Inappropriate use of contact lenses can cause a number of complications. This includes in different clinical signs and symptoms. There are about 4 percent of the ophthalmic patient population who are affected by these complications which can have long-term effects such as increasing cornea curvature, decreasing in corneal thickness and surface irregularities. Contact lenses, furthermore, can lead to eye injury, especially to the area of cornea. Contact lens complications or eye problems can be infectious or non-infectious.

- Dry Eyes

Dry eye is a common disorder of the tear film characterized because of tear volume deficiency or excessive tear evaporation. The patients who have dry eyes, often complaint about irritation, dryness, burning, blurry vision when wearing contacts for a prolonged period. Dry eyes can worsen and complicate contact lens wear in about 50 percent of patients such that those patients are often intolerant of contact lens wear.

- Neovascularization

Neovascularization (new vessel growth) is characterized by the growth of blood vessels into the normally avascular cornea to supply oxygen and nutrients to this tissue. This is more commonly seen in patients using soft extended contact lenses or wearing daily wear contacts.

- Corneal Hypoxia

Corneal hypoxia is the cornea is deprived of oxygen this condition is one of the most common complications of contact lens wear. The cornea has no blood supply of its own, so it gets oxygen only from tears and directly from the atmosphere. Contact lenses reduce the oxygen supply to the cornea, making the cornea swell. Thus, hypoxia can cause corneal changes like microcysts, central corneal clouding, reduced sensitivity, adhesions and in some instances infiltrates.

- Microcysts

Microcysts are small (15 μm to 50 μm), irregularly shaped inclusions commonly found in the paracentral to mid-peripheral zones of the cornea, which develop secondary to hypoxia and reduced epithelial regeneration.

- Contact Lens-induced Acute Red Eye (CLARE)

This is defined as a sudden onset of corneal infiltration during extended wear of hydrogel contact lenses seemingly occurring with sleep. Patients often wake up with unioocular pain, irritation, redness and watering. It is characterized as a non-ulcerative, sterile keratitis associated with colonization of Gram-negative bacteria and these bacteria release endotoxins and recruit inflammatory cells on contact lenses. Mostly these bacteria are *Pseudomonas* specie, but can find *Serratia marcescens* and *Haemophilus influenza* sometimes.

- Contact Lens-Related Superior Limbic Keratoconjunctivitis (CLKC)

Contact Lens-Related Superior Limbic Keratoconjunctivitis usually starts after 2 months to as long as 3 years of lens wear, during which the patient may complain of burning, itching, red eyes with increased secretions and photophobia.

The corneal changes seen with CLKC often reduce visual acuity due to the inflammatory events which often encroach into the pupillary zone. The corneal changes often start at the superior limbus and progress toward the pupil.

- Contact Lens-induced Peripheral Ulcer (CLPU)

Contact Lens-induced Peripheral Ulcer is defined as a circular, well-circumscribed, dense, yellowish-white, focal corneal infiltrate (0.2 mm to 2.0 mm in diameter) located in the peripheral to mid-peripheral cornea. It is always located in the anterior stroma and has a complete loss of overlying epithelium. Symptoms can vary but may include pain or soreness, irritation and watering.

Differentiate CLPU from Microbial Keratitis (MK) by noting that in CLPU, there is reduction of severity of signs and symptoms after lens wear is discontinued. There is less likely to be significant inflammation and anterior chamber reaction (flare and cells, possible hypopyon).

- Superior Epithelial Arcuate Lesion (SEAL)

Superior Epithelial Arcuate Lesion is defined as a thin, arcuate white lesion in the superior cornea, usually located within 1 mm to 3 mm of the superior limbus.

They can be up to 0.5 mm wide and range from 1 mm to 5 mm in length. High Dk silicone hydrogel lenses have overcome many of the hypoxic problems associated with traditional extended wear, but seem to contribute to the formation of these non-inflammatory lesions as a result of mechanical disturbances or trauma when wearing silicone hydrogel lenses. The characteristic finding in SEAL is the presence of the peripheral white lesion, which should be obvious even without the use of vital stains.

- Contact Lens-induced Papillary Conjunctivitis (CLPC)

Contact Lens-induced Papillary Conjunctivitis can occur from mechanical abrasion from poor edge design and protein film abrasiveness. It may present as a localized or generalized response. Symptoms include itching and a stringy or ropy mucous discharge. Excessive lens movement or decentration and blurred vision have also been known to occur.

Signs of CLPC range from mild hyperemia of the upper tarsal conjunctiva with a few, small papillae to severe hyperemia with large, raised cobblestone-like papillae.

- Microbial Keratitis (MK)

Microbial keratitis occurs due to a corneal infection by replicating microorganisms (bacterial, viral, fungal or amoebae). In contact lens wear, it is usually preceded by hypoxia and/or an epithelial break. Extended contact lens wearers are more prone to develop MK. Contact lens-related MK is most commonly caused by the *Staphylococcus* species. Symptoms of MK include rapidly increasing pain, severe redness, intense epiphora and photophobia.

- Exposure Keratitis

Exposure keratitis or Keratoconjunctivitis occurs due to incomplete closure of the eyelid causing dry, inflamed eye.

- Infiltrates

These can be round or dendritic and may be caused by contact lens solution sensitivities, hypoxia, microbial infection, or unrelated complications such as adenoviral infection. Be cautious to rule out herpes virus infection or acanthamoeba keratitis masquerading as sterile infiltrate. Infiltrates are usually of infectious etiology if they are single rather than multiple; are large rather than small; and are associated with pain, photophobia; and an epithelial defect. Presence of adnexal inflammation

(injected conjunctiva, swollen lid and anterior chamber reactions) also suggests infection.

- Contact Lens Solution Reaction

There are several lens cleaning options currently available like multipurpose solutions, hydrogen peroxide solution and enzymatic cleaners. Multipurpose solutions are the most popular cleaning solution for contact lenses and are used for rinsing, disinfecting, cleaning and storing the lenses, thus eliminating the need for protein removal enzyme tablets in most cases. Some multipurpose solutions are ineffective at disinfecting *Acanthamoeba* from the lens.

Hydrogen peroxide solution: These are available as 'two-step' or 'one-step' systems. If using a 'two-step' product, ensure that the lens taken out of the hydrogen peroxide is neutralized before it is worn to avoid extreme pain. Saline must be used to rinse away the peroxide.

Enzymatic cleaner – These are used for cleaning protein deposits off lenses. Typically, this cleaner is in tablet form. Protein deposits make use of contact lenses uncomfortable and may lead to various eye problems. To counteract minor contamination of the product and kill microorganisms on the contact lens, some products may contain preservatives such as thiomersal, benzalkonium chloride, benzyl alcohol, and other compounds. In 1989, thiomersal was responsible for about 10% of problems related to contact lenses. As a result, many products no longer contain thimerosal. Preservative-free products usually have shorter shelf life. With the introduction of silicone-hydrogel polymers, some soft contact lens materials may be incompatible with some solutions resulting in corneal staining, therefore a careful selection of cleaning products is recommended.

Most solution reactions are cell-mediated reactions to preservatives, such as thimerosal, and usually have non-specific anterior segment signs. A good history including lens cleaning method is important in diagnosing a contact lens complication. Some solutions can result in toxic reactions in patients and can present as mild to severe patient discomfort, corneal staining (usually fine) with or without infiltrates, and conjunctival injection and/or edema. There may be tarsal follicles or papillae.

2.5 Contact lenses Regulation

2.5.1 Thailand

The Thai Food and Drug Administration is concerned about this problem. An inappropriate using of all types of contact lenses, both vision correct contact lenses and decorative contact lenses may affect and be harmful to the users' eyes. The Thai FDA identifies all contact lens types to be as medical devices which manufacturers and importers have to apply for permission. Moreover, the Thai FDA specifies that all leaflets of products must have a clear recommendation, warning, contraindication, and precaution in order to control manufacturers and importers of contact lenses to meet standards and quality for the consumers' safety (Thai FDA, 2009).

However, even though the Thai FDA enforced contact lens manufacturers and importers manage or make labels of products have to show the message "Using of contact lens should need prescription and following up by ophthalmologists or optometrists every year" (Thai FDA, 2010), the Thai FDA does not specify any condition to manufacturers and importers in matters of distribution of contact lenses to appoint places such as clinics and the eyeglasses / optician shops. So consumers are able to buy decorative contact lenses to wear from stalls in fashion center or on the Internet because there is no control distribution.

2.5.2 Other countries

2.5.2.1 The United States

FDA has reviewed premarket notification submissions (510(k)s) under section 510(k) of the Act (21 U.S.C. 360(k)) and premarket approval applications (PMAs) under section 515 of the Act (21 U.S.C. 360(e)) for most corrective and non-corrective contact lenses marketed in the United States, including certain decorative contact lenses intended to change the appearance of a normal eye. All currently approved or cleared decorative contact lenses are legally marketed only as prescription devices (21 CFR 801.109). However, some non-corrective, decorative contact lenses have not been reviewed by FDA and are sold without a prescription. Although FDA had taken the position that contact lenses intended solely for

decorative use may be regulated as cosmetics under section 201(i) of the Act, enactment of section 520(n) requires that all contact lenses be regulated as devices.

Thus, all contact lenses in commercial distribution, including decorative contact lenses that are non-corrective, require either a cleared 510(k), an approved PMA, or an exemption for investigational use (IDE). Without such premarket authorization by FDA decorative contact lenses are adulterated under section 501(f)(1)(B) of the Act (21 U.S.C 351(f)(1)(B)), and misbranded under section 502(o) of the Act (21 U.S.C. 352(o)) (USFDA, 2006).

2.5.2.2 Canada

Corrective contact lenses are medical devices, before they can be imported and sold in Canada must be have licensed by Health Canada. Non-corrective color contact lenses or cosmetic contact lenses are not considered to be medical devices in Canada as they do not correct or modify a body function or structure. Therefore, they can purchase them without a prescription. Non-corrective color contact lenses are currently managed by the Cosmetics Division. Manufacturers and importers must notify Health Canada that they intend to market the product, and are required to provide safety data (Health Canada, 2003).

2.5.2.3 Japan

Ministry of Health, Labour and Welfare (MHLW) decided to regulate corrective contact lenses and non-corrective colored contact lenses as a “medical device” regulated under the Law. (Pharmaceutical and Medical Devices Agency, 2010).

2.6 Related research

There were some studied that evaluated about knowledge and practice of contact lens wear among college students in India and Malaysia.

Unnikrishnan and Hussain (2009) determined the knowledge about pattern of use of contact lens among college students in coastal Karnataka, India. They collected data from 371 college students who were current user of contact lens from 18 colleges. The result found that the daily wear contact lenses were used more than other types. The number of hours of daily wear was significantly associated with problems ($p=0.04$). The main reason for contact lens use was comfort and

convenience cosmetic reasons and the most complication related to contact lens use was discomfort followed by dry eyes and watering eyes. This study showed only the data about the typed of contact lens, the reason for contact lens use and the complication related to contact lens but not evaluated any practice of contact lens wear and care except the number of hours of daily wear was significantly associated with eye problems.

While the study performed by Tajunisah et al. (2008) in Malaysia, they evaluated about knowledge and practice among medical students. They found that lacking of proper practice even in educated and knowledgeable users such as medical students may increase the risk of complications associated with contact lens wear. In conclusion, there was a need for more information about the contact lens care and complication related to contact lens to the customer.

From these two studies, they did not determined the source of contact lenses purchased and the information about contact lenses and eye care health practices. There were 2 studies from the United State mentioned about this issue.

Fogal and Zidile (2008) studied relationship between contact lenses purchase category (doctor's offices, store and Internet) and FDA recommendations for contact lens purchase and relationship between time pressure attitudes with the behaviors and beliefs of those purchasing contact lens. The sample consisted of 151 college students. The result found that contact lenses purchase categories included store (55.0%), doctor's office (43.0%), and Internet (22.5%). The study reported those who purchased contact lenses at a doctor's office more often adhered to the recommendations, whereas those who purchased contact lenses at a store or the Internet did not. The researchers also found higher time pressure scale scores trust possible non-evidence based information on the Internet.

Moreover, Steinemann et al. (2003, 2005) evaluated association between ocular complications with the use of cosmetic contact lenses from unlicensed providers. They found that there were many ocular complications from cosmetic contact lenses like Pseudomonal keratitis, presumed bacterial keratitis, iridocyclitis, giant papillary conjunctivitis after using contact lenses from unlicensed vendors due to they did not get proper information about contact lens using which lead to vision-threatening infections and inflammation.

The most dangerous complication from contact lens use is microbial keratitis because in worse situation the patient required therapeutic penetrating keratoplasty or even blind.

According to the studied performed by Preechawat et al. (2007) from Department of Ophthalmology at Ramathibodi Hospital, Thailand, it was demonstrated that from 435 patients with a diagnosis of microbial keratitis, there were 18.6% related to contact lens use and *Pseudomonas aeruginosa* was the most common organism. The most important risk factor was improper practice contact lens care such as contact lenses overnight wearing. There were some patients required therapeutic penetrating keratoplasty so ophthalmologist should warn contact lens user of this problem and give the appropriate information about proper practice.

There was another research about risk factors for microbial keratitis from United kingdom performed by Dart JKG et al. (2008). They found the risk factors were contact lens type, wear schedule, days of contact lens wear per week, hand washing before cleaning, age and gender.

Fogal and Zidile (2008) studied relationship between Internet purchased contact lenses and eye care health practices in USA. The sample consisted of 151 college students. The study compared purchase category (doctor's offices, store and Internet) with FDA recommendations for contact lens purchase and relationship between time pressure attitudes with the behaviors and beliefs of those purchasing contact lens. The result found that contact lens purchase categories included store (55.0%), doctor's office (43.0%), and Internet (22.5%). The study reported those who purchased contact lenses at a doctor's office more often adhered to the recommendations, whereas those who purchased contact lenses at a store or the Internet did not. The researchers found some correlations between time pressure scale and beliefs about information on the Internet.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

The research design was a cross-sectional study by using questionnaires to the sample group on knowledge about contact lens, attitude and practice and eye problems from contact lens use in students at Chulalongkorn University, Bangkok.

3.2 Study Area

The study area of this study was students who use contact lenses at Chulalongkorn University, Bangkok.

3.3 Study Population

The study population of this study students who use contact lenses at Chulalongkorn University, Bangkok.

3.4 Sampling Technique

Convenient sampling including explore furthermore the new subjects by interview interviewees by finding students who use contact lenses at Chulalongkorn University such as classes, the cafeteria, library, or other public areas of the college. The number of student in each faculty calculated from ratio between number of students which is the sample size (323 cases) and total of students at Chulalongkorn University (35,595 students). The number of the students in table 1 is not the exactly number because the number is calculated from total of students at Chulalongkorn University which is not representative the contact lens users. But It is difficult to get the information about the exactly number of contact lens users so we must calculate from total of students at Chulalongkorn University.

The faculties in this study are Faculty of Education, Faculty of Dentistry, Faculty of Law, Faculty of Communication Arts, Faculty of Commerce and Accountancy, Faculty of Medicine, Faculty of Pharmaceutical Sciences, Faculty of Political Science, Faculty of Science, Faculty of Engineering, Faculty of Fine and Applied Arts, Faculty of Economics, Faculty of Arts, Faculty of Allied Health Sciences, Faculty of Veterinary Science and Faculty of Architecture.

Inclusion criteria: Students who use contact lens at least 1 month and allow to collect data.

Exclusion criteria: Students who do not wear contact lens or students who use contact lens at least 1 month but not allow to collect data or have eye problem not cause by contact lens.

3.5 Sample size

The populations of the study are students at Chulalongkorn Universities who use contact lens. This study used a sample sizes by applying the W.G.cochran as follows:

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

When n = the sample size

P = the proportion of population sampling = 0.3

Z = 95% confidential interval = 1.96

d = error of sampling = 0.05

From research in Malaysia (Tajunisah, 2008), there were 30.6% students had no complications due to contact lens use so the proportion of population sampling was 0.3.

Therefore, according to the formula, the sample size is as follows

$$\begin{aligned} n &= \frac{0.3(1-0.3)1.96^2}{(0.05)^2} \\ &= 323 \text{ cases} \end{aligned}$$

The minimum sample size required was 323 subjects

With estimate 5 % was add to account for incomplete or missing data, therefore the total sample size was 340 subjects.

Table1 : The number of students in faculty to collect data

Name of Faculty	Bachelor degree	Master degree	Doctorate	Certificate	High Certificate	Total	Estimate Number of subjects
Health Science Field							
Faculty of Medicine	1657	265	29	0	551	2502	25
Faculty of Dentistry	798	129	10	35	35	1007	10
Faculty of Pharmaceutical Sciences	859	161	87	0	0	1107	11
Faculty of Veterinary Science	786	81	48	9	0	924	10
Faculty of Allied Health Sciences	776	44	12	0	0	832	9
Science Field							
Faculty of Science	2664	1103	451	0	0	4218	42
Engineer Field							
Faculty of Engineering	2886	1547	227	0	0	4660	47
Art Field							
Faculty of Architecture	1066	253	22	0	0	1341	13
Faculty of Fine and Applied Arts	467	141	61	0	0	669	7
Social Field							
Faculty of Arts	1212	404	97	0	0	1713	17
Faculty of Communication Arts	585	299	34	0	0	918	10
Faculty of Political Science	918	459	35	0	0	1412	14
Faculty of Law	1338	488	2	0	0	1828	18
Faculty of Commerce and Accountancy	2243	2307	35	0	0	4585	46
Faculty of Economics	712	503	13	0	0	1228	12
Faculty of Education	1880	699	614	0	0	3193	32
Total							323

3.6 Measurement Tools

The questionnaire was developed from a review of related theories and conceptual framework and research. The questionnaire consisted of six parts as follows:

Part 1: Personal information of the contact lens user

There were 5 questions in this part. The question including gender, age, faculty, average student's income, and hometown.

Part 2: Contact lens information

There were 7 questions in this part. The question including first time to use contact lens, reason to use contact lens, recommendation by ophthalmologist/expert before use contact lens, time to use contact lens, place to purchase, type of contact lens, wear schedule and source to know information about contact lens used

Part 3: Eye problems from contact lens use

There were 4 questions in this part. The question including any allergies, eye problem from contact lens, visiting ophthalmologist 6 month ago for treat eye problem and visiting ophthalmologist after starting to use contact lens.

Part 4: Knowledge about eye problems protection from contact lens

There were 10 questions in this part. The question were on the knowledge about out eye problems protection from contact lens such as washing the hands before touch contact lenses, contact lens care and maintenance, cleaning contact lens, sleeping in contact lenses, swim while wearing contact lenses. Each correct answer was assigned a score of 1 point and incorrect answer was assigned a score of 0 point.

Scoring Criteria:

Score	Reverse Score
Yes : 1	Yes : 0
No: 0	No : 1
Not sure : 0	Not sure : 0

Only question 4 and 5 used reverse score.

The scores varied from 0-10 points and were classified into 3 levels as follows. Bloom's cut off point, 60-80 %

High knowledge level (80-100%)	:	8 – 10
Moderate knowledge level (60-79%)	:	6 – 7
Low knowledge level (less than 60 %)	:	0 – 5

Part 5: Attitude toward contact lens wear

There were 10 questions in this part. The question were attitude toward contact lens wear like necessary in your daily life, increase cost of living, beautiful, personality, comfort more than glasses, easy maintenance more than glasses. It was assessed by Likert's scale. There were 10 statements which include both positive and negative. The rating scale was measured as follows:

Positive Statement		Negative Statement	
Choice	Score	Choice	Score
Strongly disagree:	1	Strongly disagree:	5
Disagree:	2	Disagree:	4
Neutral:	3	Neutral:	3
Agree :	4	Agree:	2
Strongly agree:	5	Strongly agree:	1

From informal interview found that attitude 3-8 were positive and attitude 1,2,9 and 10 were negative.

The scores varied from 10-50 points and were classified into 3 levels as follows. Bloom's cut off point, 60-80 %

Good attitude level (80-100%)	:	40 – 50
Moderate attitude level (60-79%)	:	30 – 39
Poor attitude level (less than 60 %)	:	10 – 29

Part 6: The proper contact lens use and care practice

There were 20 questions in this part. The question including practice of contact lens using, lens care taking and maintenance and warning or recommendation for example hand washing before handling contact lens, clean and rinse well before insert contact lens, contact lens solution to clean contact lenses, rub contact lenses with their fingers during cleaning, use contact lens disinfecting solution to disinfect contact lenses, store contact lenses in the recommended solutions, clean contact lens

storage case with contact lens solution, sleep in contacts lenses, swap contact lens with another person, swim while wearing contact lenses, replace contact lens storage cases on a frequent basis and If they have eye complication from contact lens, they will go to see the doctor immediately. 20 practice which include both best and worse practice. The rating scale was measured as follows:

Best Practice		Worse Practice	
Choice	Score	Choice	Score
Never:	1	Never:	4
Sometimes:	2	Sometimes:	3
Often:	3	Sometimes:	2
All the times :	4	All the times:	1

For this research, never meant none (0 time/every contact lens used)), Sometimes (2-3 times/every contact lens used), Often (almost of contact lens used), All the time (All the time of contact lens used)

Practice 1-5, 7, 8, 10, 13, 14, 19 and 20 were best practice and the rest of practice were worse practice.

The scores varied from 20-80 points and were classified into 3 levels as follows. Bloom's cut off point, 60-80 %

Good practice level (80-100%):	64 – 80
Moderate practice level (60-80%):	48 – 63
Poor practice level (less than 60 %) :	20 – 47

3.7 Content validity and reliability

The questionnaire was developed from reviewing past studied and guidelines from the advisor, professor of the college of Public health Science, professor of Pharmaceutical, Chulalongkorn University and Senior professional pharmacist from Medical Device Control Division, Food and Drug Administration. Reliability was assessed after a pretest of 30 questionnaires in students at Mahidol University.

3.8 Data collection

The data collection process of this research was conducted as follows:

1. The researcher submitted letters of request from the Dean of the College of Public Health Science, Chulalongkorn University to the deans of other faculty to collect data.

2. The researcher and assistant researchers then collected the data of the questionnaire. Before collect the data of questionnaire the researcher will train assistant researchers to have the same standard by explain how to collect data and detail of the questionnaire.

3. Data collection will continue until the information from 340 subjects has been obtained. Finally, the questionnaires were verified for data analysis.

3.9 Data analysis

After reviewing the data for completeness, the data are then encoded and processed for statistical analysis. Data analysis is performed as follows:

1. Using percentage, mean and standard deviation for general information, knowledge, attitude and practice.

2. Using chi-square test to find out relationship between demographic factor and knowledge, attitude and practice contact lens using practice and relationship between variable (socio-demographic characteristic ; sex, age, study level, hometown and field, contact lens information; time of used contact lens, contact lens type, wear schedule, knowledge, attitude and practice level) and eye problems.

3. Using co-relation co-efficient to identify the relationship between knowledge and contact lens using practice.

3.10 Ethical Consideration

The proposal was submitted and it was approved by the Ethics Committee for research Involving Human Research Subjects, Health Science Group Chulalongkorn University.

CHAPTER IV

RESEARCH RESULT

This study was a cross sectional research on knowledge, attitude, practice and eye problem from contact lens in students at Chulalongkorn University. Total subjects in the study were 340 participants.

The findings from the data analysis are presented in this order:

1. Socio-demographic characteristics of the respondents
2. Contact lens information
3. Eye problems from contact lens use
4. Knowledge about contact lens about eye problems protection from contact lens
5. Attitude toward contact lens wear
6. The proper contact lens use and care practice
7. Association between social-demographic and knowledge
8. Association between social-demographic and attitude
9. Association between social-demographic and practice
10. Association between knowledge score and practice score
11. Association between risk factor and eye problems

The total number of subjects in this study was 340. The participants in this study were students at Chulalongkorn University who are responding. Table 2 show the number and percent distribution of respondents of each field. Health science field consisted of Medicine (5.9%), Pharmaceutical Sciences (5.6%), Dentistry (3.5%), Veterinary Science (3.2%) and Allied Health Sciences (2.9%). Science field was Science (12.4%). Engineer field was Engineering (11.8%).Architecture (5.0%) and Fine and Applied Arts (1.5%) were Art field. Social field were Commerce and Accountancy (20.3%), Arts (9.4%), Economics (5.3%), Communication Arts (4.4%), Education (3.8%), Law (2.9%) and Political Science (2.1%).

Table 2: the number and percent distribution of respondents of each field

Faculty	Estimate number of subject	Number(N) of subject	Percentage (N/340)
Health Science Field		(N=72, 21.2%)	
<i>Medicine</i>	25	20	5.9
<i>Dentistry</i>	10	12	3.5
<i>Pharmaceutical Sciences</i>	11	19	5.6
<i>Veterinary Science</i>	10	11	3.2
<i>Allied Health Sciences</i>	9	10	2.9
Science Field		(N=42, 12.4%)	
<i>Science</i>	42	42	12.4
Engineer Field		(N=40, 11.8%)	
<i>Engineering</i>	47	40	11.8
Art Field		(N=22, 6.5%)	
<i>Architecture</i>	13	17	5
<i>Fine and Applied Arts</i>	7	5	1.5
Social Field		(N=164, 48.2%)	
<i>Arts</i>	17	32	9.4
<i>Communication Arts</i>	10	15	4.4
<i>Political Science</i>	14	7	2.1
<i>Law</i>	18	10	2.9
<i>Commerce and Accountancy</i>	46	69	20.3
<i>Economics</i>	12	18	5.3
<i>Education</i>	32	13	3.8
Total	323	340	100

4.1 Socio-Demographic Information

This part showed number and percent of selected variable describing background characteristic of the respondents. Table 3 showed about socio-demographic characteristics such as sex, age, study level, monthly income and hometown.

The majority of respondent were female (80.0%), the majority of respondent were in the age ranged from 21-24 years (46.8%) and 10.6% were older than 24 years. Most of them were study in Bachelor degree (87.6%). More than half of respondent (60.9%) had monthly income 5,000-10,000 bath. More than half of them (67.4%) lived in Bangkok.

Table 3 : distribution of respondent by socio-demographic characteristics

Socio-demographic Characteristic	Number (N=340)	Percentage (%)
Sex		
Male	68	20.0
Female	272	80.0
Age (Year)		
17 - 20	145	42.6
21 - 24	159	46.8
> 24	36	10.6
Mean = 21.5, S.D = ± 2.9 , Range = 17 - 37		
Study level		
Bachelor	298	87.6
Master/PhD	42	12.4
Monthly income		
< 5,000	83	24.4
5,000 - 10,000	207	60.9
>10,000 - 15,000	50	14.7
Hometown		
Bangkok	229	67.4
Other	111	32.6

4.2 Contact lens information

From this part, it was about contact lens information of respondents such as reason to used contact lens, recommendation by ophthalmologist/expert before use contact lens, time to use contact lens, place to purchase, type of contact lens, wear schedule and source to know information about contact lens used. More than a half of respondents used contact lens for correcting vision (57.9%), 32.1% used for correcting vision and cosmetic and 10% used for cosmetic only. 53.8% got recommendation from ophthalmologist/expert before use contact lens. Most of them used contact lens for 2 years (16.8%) as shown in table 4.

Table 4 : Contact lens information

Contact lens information	Number (N=340)	Percentage (%)
Reason to use contact lens		
Correct vision	197	57.9
Cosmetic	34	10.0
Both	109	32.1
Recommendation before ophthalmologist/expert		
No	157	46.2
Yes	183	53.8
Time to use contact lens (Year)		
Less than 1	18	5.3
1	53	15.6
2	57	16.8
3	49	14.4
4	44	12.9
5	38	11.2
6	35	10.3
More than 6	46	13.5

Place to purchased contact lens

From table 5, Glass shop was the most purchased place of contact lens (73.3%), The second place to purchased contact lens was stall (12.3%). The rest of the purchase place were 7.9%, 6.3% and 0.2% from Clinic, internet and other respectively.

Table 5 : Place to purchased contact lens

Place of purchase	Number	Percentage (%)
Clinic	33	7.9
Glass shop	305	73.3
Stall	51	12.3
Internet	26	6.3
Other	1	0.2
Total	416	100.0

Type of contact lens

From table 6, monthly contact lens was the most of contact lens type (53%) which respondents used, 24.6% were daily, 13.7 were yearly, 6.9% were weekly and 1.8% were other.

Table 6 : Type of contact lens

Type of Contact lens	Number	Percentage (%)
Daily	138	24.6
Weekly	39	6.9
Monthly	298	53.0
year	77	13.7
other	10	1.8
Total	562	100.0

Wear schedule

Among the respondents, 52.9% used contact lens for occasionally and 47.1% used contact lens for everyday as shown in figure 3.

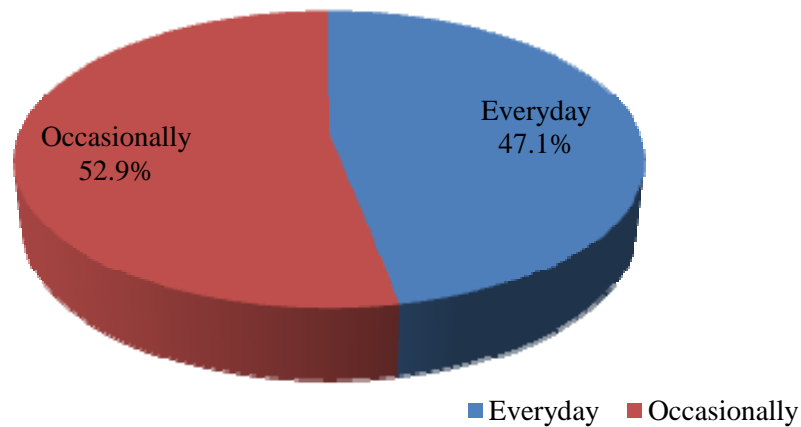


Figure 3 Wear schedule of respondents

Activity for respondents who use contact lens for occasionally, most of them (40.0%) used contact lens for party, 33.4% for study, 16.4 for sport, 5.5% for read and 4.7% for other as shown in table 7.

Table 7 : Activity for using contact lens in occasionally

Activity	Number	Percentage (%)
Study	122	33.4
Read	20	5.5
Party	146	40.0
Sport	60	16.4
Other	17	4.7
Total	365	100.0

Source to know information

Table 8 presented about source to know contact lens use information. Majority of source to know about contact lens use information (62.9%) was Glass shop, 15.8 % from Clinic, 12.7%, 5.5% and 3.1% from internet, other and stall respectively.

Table 8 : Source to know about contact lens use information

Source to know information	Number	Percentage (%)
Clinic	66	15.8
Glass shop	263	62.9
Stall	13	3.1
Internet	53	12.7
Other	23	5.5
Total	418	100.0

4.3 Eye problems from contact lens use

Among the respondents, 50.3% had no eye problem from contact lens. 49.7% had eye problems from contact lens as shown in figure 4.

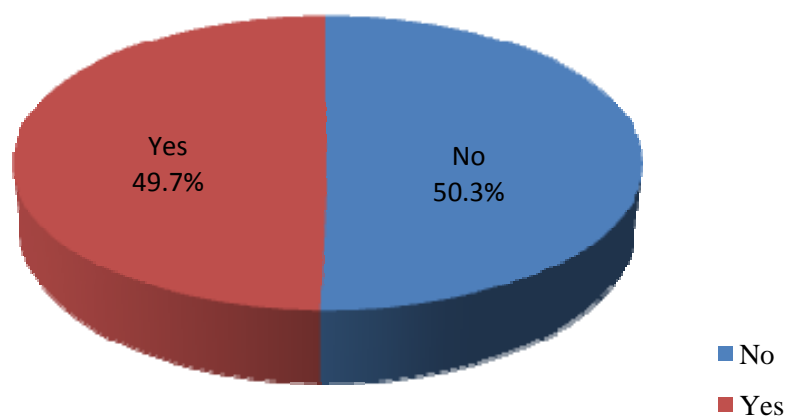


Figure 4 Eye problems of respondents

Eye problems from contact lens use as shown in table 9. 34.3% had red eye, 22.8% had discomfort, pain were 11.8%, 11.5% had dry eye, 9.9% had blur, 2.9% had light phobia, 2.7% had infection and other,0.8% had many tear and 0.5% had discharge.

Table 9 : Eye problems from contact lens use

Eye Problem	Number	Percentage (%)
Redeye	128	34.3
Dry Eye	43	11.5
Pain	44	11.8
Blur	37	9.9
Discharge	2	0.5
Discomfort	85	22.8
Light phobia	11	2.9
Many tear	3	0.8
Infection	10	2.7
Complication infection	0	0.0
Other	10	2.7
Total	373	100.0

From table 10, there were only 9.7% go to see ophthalmologist for threat eye problem from contact lens from 6 months ago.

Table 10 : Distribution of respondent go to see ophthalmologist for threat eye problem from contact lens from 6 months ago

6monseedr	Number	Percentage (%)
No	307	90.3
Yes	33	9.7
Total	340	100.0

From table 11, most of subject did not go to follow up by ophthalmologist (68.8%) , every month/year 1.8%, every 3 month/year 2.4%, every5-6 month/year 4.4%, every year13.5% and other 9.1%

Table 11 : Distribution of respondent go to follow up by ophthalmologist

Follow up	Number	Percentage (%)
Every Month/Year	6	1.8
Every 3 Month/Year	8	2.4
Every5-6 Month/Year	15	4.4
Every Year	46	13.5
No	234	68.8
Other	31	9.1
Total	340	100.0

From table12, there were allergy participants 66.8%.

Table 12 : Distribution of respondent were allergy

allergy	Number	Percentage (%)
No	227	66.8
Yes	113	33.2
Total	340	100.0

4.4 Knowledge about contact lens about eye problems protection from contact lens

Participants answered a total of 10 questions. Each correct answer was given 1 point with a total of 10 points. The average knowledge score from the respondents was 8.1 (S.D. =1.2). The knowledge score was in the range of 4-10.

The distribution of the knowledge about eye problems protection from contact lens showed that 73.2% of subjects had “High knowledge”, 24.7% of them had “Moderate knowledge” while only 2.1% had “Low knowledge” as shown in table 13

Table 13 : Level of knowledge about contact lens about eye problems protection from contact lens

Level of Knowledge	Number	Percentage (%)
High (8-10 scores)	249	73.2
Moderate (6-7 scores)	87	24.7
Low (0-5 scores)	4	2.1
Total	340	100.0

Mean = 8.1, S.D = ± 1.2 , Range = 4-10

Table 14 showed the frequency and percentage of respondents who answered question about knowledge about contact lens about eye problems protection from contact lens. There were 93.5% who answer washing the hands thoroughly with soap and dry every time before touch contact lenses can protect eye infection from contact lens. More than half of respondents (90.3%) knew that putting in contact lenses before applying any makeup or lotions to avoid contaminating contact lens. 98.5% knew which contact lens care and maintenance is one of the most crucial aspects of contact lens wear. Most of respondent (85.9%) knew that did not cleaning contact lens with tap water. There were 96.2% who answer one of reason of eye complication from contact lens because of an inappropriate hygiene. 95.3% knew that did not sleeping in contact lenses can lead to an increased risk of severe eye infection. 80.3% knew that did not swim while wearing contact lenses. There is a risk of eye infection from bacteria in swimming pool water, hot tubs etc. More than half of respondents (57.9%) were not sure Smokers who wear contacts have high risk to develop corneal ulcers than nonsmokers who wear contacts, regardless of lens type. 92.1 % knew do not swap contact lens with another person.

Table 14 : The frequency and percentage of knowledge about eye problems protection from contact lens.

Knowledge	Yes	[n(%)]	
		No	Not Sure
Washing the hands thoroughly with soap and dry every time before touch contact lenses can protect eye infection from contact lens.	318 (93.5)	12 (3.5)	10 (2.9)
Putting in contact lenses before applying any makeup or lotions to avoid contaminating contact lens.	307(90.3)	15(4.4)	18 (5.3)
Contact lens care and maintenance is one of the most crucial aspects of contact lens wear.	335 (98.5)	3 (0.9)	2 (0.6)
Cleaning contact lens with tap water *	27 (7.9)	292 (85.9)	21 (6.2)
Store lenses in the solutions when not * wearing such as multipurpose solution, tap water, saline.	151 (44.4)	157 (46.2)	32 (9.4)
One of reason of eye complication from contact lens because of an inappropriate hygiene.	327 (96.2)	9 (2.6)	4 (1.2)
Sleeping in contact lenses can lead to an increased risk of severe eye infection.	324 (95.3)	8 (2.4)	8 (2.4)
Do not swim while wearing contact lenses. There is a risk of eye infection from bacteria in swimming pool water, hot tubs etc.	273 (80.3)	17 (5.0)	50 (14.7)
Smokers who wear contacts have high risk to develop corneal ulcers than nonsmokers who wear contacts, regardless of lens type.	117 (34.4)	26 (7.6)	197 (57.9)
Do not swap contact lens with another person. Swapping provides a way to transfer germs between people.	313 (92.1)	6 (1.8)	21 (6.2)

* reverse score

4.5 Attitude toward contact lens wear

Participants answered the total of 10 questions with the total score of 50. The distribution of the attitude toward contact lens wear were shown in table 15, there were 79.1% of them had “Moderate attitude”, 20.0% of subjects had “Poor attitude” while only 0.9% had “Good attitude”. The average attitude score for all respondents were 32.2 (SD = 3.2). The attitude score was in the range of 18-44.

Table 15 : Attitude level toward contact lens wear

Level of attitude	Number	Percentage (%)
Good (40-50 scores)	3	0.9
Moderate(30-39 scores)	269	79.1
Poor (10-29 scores)	68	20.0
Total	340	100.0

Mean =32.2, S.D.= ± 3.2 , Range =18-44

Table 16 showed the frequency and percentage of respondent attitude toward each question regarding attitude toward contact lens wear. There were 65.8% agree that contact lenses were necessary in your daily life. More than a half of respondents (50.9%) agree that contact lenses wearer increase cost of living. Most of respondents (70.9%) agree that contact lenses wearer make them more beautiful. 82.9% agree that contact lenses wearer make you more good personality. There were 68.5% agree that contact lens wearer was comfort more than glasses. 45.9% feel neutral that contact lenses wearer make you more up to date. More than a half of respondents (50.6%) feel neutral that contact lenses wearer make you more wealthy. 69.4% agree that contact lenses wearer make you more convenient to travelling. 54.1% agree that contact lenses wearer have to always following up by ophthalmologists or optometrists. 63.5% agree that contact lens care and maintenance is easy more than glasses.

Table 16 : The frequency and percentage of attitude toward contact lens wear

Attitude	[n(%)]				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Contact lenses are necessary in your daily life*	6(1.8)	11(3.2)	96(28.2)	161(47.4)	66(19.4)
Contact lenses wearer increase cost of living*	10(2.9)	24(7.1)	133(39.1)	120(35.3)	53(15.6)
Contact lenses wearer make you more beautiful	3(0.9)	5(1.5)	91(26.8)	167(49.1)	74(21.8)
Contact lenses wearer make you more good personality	3(0.9)	6(1.8)	49(14.4)	185(54.4)	97(28.5)
Contact lens wearer is comfort more than glasses	10(2.9)	39(11.5)	58(17.1)	129(37.9)	104(30.6)
Contact lenses wearer make you more up to date	10(2.9)	33(9.7)	156(45.9)	100(29.4)	41(12.1)
Contact lenses wearer make you more wealthy	47(13.8)	96(28.2)	172(50.6)	15(4.4)	10(2.9)
Contact lenses wearer make you more convenient to travel	10(2.9)	28(8.2)	66(19.4)	140(41.2)	96(28.2)

Table 16 : The frequency and percentage of attitude toward contact lens wear (cont.)

Attitude	[n(%)]				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Contact lenses wearer have to always following up by ophthalmologists or optometrists*	1(0.3)	12(3.5)	143(42.1)	135(39.7)	49(14.4)
Contact lens care and maintenance is easy more than glasses*	66(19.4)	149(43.8)	79(23.2)	26(7.6)	20(5.9)

* Negative statement

4.6 The proper contact lens use and care practice

Participants answered the total of 20 questions. The distribution of the proper contact lens use and care practice were shown in table 17, there were more than half of respondents (77.1%) had “Good practice” while 22.0% of them had “Moderate practice”. The average practice score for all respondents were 67.4 (SD = 6.7). The practice score was in the range of 44-79. Practice of the proper contact lens use and care practice consisted of use, lens care and maintenance and warning and recommendation. There were more than a half had 60.3% had “Good level of use practice”, 68.2% had “Good level of lens care and maintenance practice” and 62.4% had “Good level of lens warning and recommendation practice”

Table 17 : The proper contact lens use and care practice level

Level of practice	Number	Percentage (%)
Total of practice		
Good (64-80 scores)	262	77.1
Moderate (48-63 scores)	75	22.0
Poor (20-47 scores)	3	0.9
Mean = 67.4, S.D.= ± 6.7 , Range = 44-79		

Table 17 : The proper contact lens use and care practice level (cont.)

Level of practice	Number	Percentage (%)
Level of use practice		
Good (10-12 scores)	205	60.3
Moderate (7-9 scores)	112	32.9
Poor (1-6 scores)	23	6.8
Level of lens care and maintenance practice		
Good (33-40 scores)	232	68.2
Moderate (24-32 scores)	82	24.1
Poor (1-23 scores)	24	7.6
Level of warning and recommendation practice		
Good (23-28 scores)	212	62.4
Moderate (15-22 scores)	128	37.6
Total	340	100.0

Table 18, there were 55.9% wash hands thoroughly with soap and dry before handling contact lens all the time. 48.2% take the lens out, clean and rinse it well before insert contact lens to their eye all the time. 59.1% after remove the contact lenses, they clean rinse and sterilize contact lenses all the time. 74.7% use contact lens solution to clean contact lenses after used all the time. 53.2% they rub contact lenses with their fingers during cleaning all the time. 73.2% never rinse contact lenses with tap water. 66.5% After cleaning, they rinse contact lenses with solution all the time. 63.8% use contact lens disinfecting solution to disinfect contact lenses all the time. 58.2% never use saline solution to disinfect contact lenses. 75.9% store contact lenses in the recommended solutions when not wearing all the time. 84.1% never store contact lenses in tap water. 70.0% never reuse cleaning or disinfecting solutions. 37.4% clean contact lens storage case with contact lens solution after every use all the time. 69.4% put in contact lenses before applying any makeup or lotions to avoid contaminating contact lens all the time. 45.6% never wear contacts lenses longer than prescribed. 48.8% sometimes sleep in contacts lenses. 95.3% never swap contact lens with another person. 63.8% never swim while wearing contact lenses. 37.1% often

replace contact lens storage cases on a frequent basis. 31.5 % If they have eye complication from contact lens, they will go to see the doctor immediately.

Table 18 : The frequency and percentage of proper contact lens use and care practice

Practice	[n(%)]			
	Never	Sometimes	Often	All the time
Use (Insertion and removal)				
Do you wash hands thoroughly with soap and dry before handling contact lens?	5 (1.5)	49(14.4)	96(28.2)	190(55.9)
Do you take the lens out, clean and rinse it well before insert contact lens to your eye?	29(8.5)	63(18.5)	84(24.7)	164(48.2)
After remove the contact lenses, Do you clean rinse and sterilize contact lenses?	13(3.8)	52(15.3)	74(21.8)	201(59.1)
Contact lens care and maintenance				
Do you use contact lens solution to clean contact lenses after used?	9(2.6)	24(7.1)	53(15.6)	254(74.7)
During cleaning, Do you rub contact lenses with your fingers?	27(7.9)	61(17.9)	71(20.9)	181(53.2)
Do you ever rinse contact lenses with tap water?*	249(73.2)	70(20.6)	13(3.8)	8(2.4)
After cleaning, Do you rinse contact lenses with solution?	5(1.5)	34(10.0)	75(22.1)	226(66.5)

Table 18 : The frequency and percentage of proper contact lens use and care practice (cont.)

Practice	[n(%)]			
	Never	Sometimes	Often	All the time
Do you use contact lens disinfecting solution to disinfect contact lenses?	9(2.6)	38(11.2)	76(22.4)	217(63.8)
Do you use saline solution to disinfect contact lenses?*	198(58.2)	73(21.5)	37(10.9)	32(9.4)
Do you store contact lenses in the recommended solutions when not wearing?	19(5.6)	16(4.7)	47(13.8)	258(75.9)
Do you store contact lenses in tap water?*	286(84.1)	35(10.3)	13(3.8)	6(1.8)
Do you reuse cleaning or disinfecting solutions?*	238(70.0)	77(22.6)	17(5.0)	8(2.4)
Do you clean contact lens storage case with contact lens solution after every use?	33(9.7)	102(30.0)	78(22.9)	127(37.4)
Warning and recommendation				
Do you put in contact lenses before applying any makeup or lotions to avoid contaminating contact lens?	17(5.0)	25(7.4)	62(18.2)	236(69.4)

Table 18 :The frequency and percentage of proper contact lens use and care practice (cont.)

Practice	[n(%)]			
	Never	Sometimes	Often	All the time
Do you wear contacts lenses longer than prescribed?*	155(45.6)	143(42.1)	40(11.8)	2(0.6)
Do you sleep in contacts lenses?*	147(43.2)	166(48.8)	25(7.4)	2(0.6)
Do you swap contact lens with another person?*	324(95.3)	11(3.2)	4(1.2)	1(0.3)
Do you ever swim while wearing contact lenses?*	217(63.8)	89(26.2)	24(7.1)	10(2.9)
Do you replace contact lens storage cases on a frequent basis?	41(12.1)	126(37.1)	93(27.4)	80(23.5)
If you have eye complication from contact lens, you will go to see the doctor immediately.	67(19.7)	94(27.6)	72(21.2)	107(31.5)

* Worse practice

4.7 Association between Socio-demographic and knowledge.

To compare the knowledge level and socio-demographic characteristic (sex, age, study level, hometown, monthly income and field), Chi-square was used. The knowledge about eye problems protection from contact lens was not statistically significant association among sex, age, and study level. However, hometown, monthly income and field were statistically significant association with knowledge about eye problems protection from contact lens (Chi-square, $p < 0.05$) as shown in table 19.

Table 19 : Association between Socio-demographic and knowledge

Socio-demographic Characteristic	Total Respondents (N=340)	Knowledge[n(%)]		p-value
		High	Moderate & Low	
Sex				
Male	68	49 (72.1)	19 (27.9)	0.806
Female	272	200 (73.5)	72 (26.5)	
Age (Years)				
17-20	145	109 (75.2)	36 (24.8)	0.699
21-24	159	113 (71.1)	46 (28.9)	
> 24	36	27 (75.0)	9 (25.0)	
Study level				
Bachelor	298	217 (72.8)	81 (27.2)	0.644
Master/ PhD	42	32 (76.2)	10 (23.8)	
Monthly income				
< 5,000	83	57 (68.7)	26 (31.3)	0.034*
5,000 - 10,000	207	148 (71.5)	59 (28.5)	
>10,000 - 15,000	50	44 (88.0)	6 (12.0)	
Hometown				
Bangkok	229	159 (69.4)	70 (30.6)	0.023*
Other	111	90 (81.1)	21 (18.9)	
Field				
Health Science Field	72	63 (87.5)	9 (12.5)	0.002*
Science Field	42	35 (83.3)	7 (16.7)	
Engineer Field	40	23 (57.5)	17 (42.5)	
Art Field	22	17 (77.3)	5 (22.7)	
Social Field	164	111 (67.7)	53 (32.3)	

4.8 Association between Socio-demographic and attitude

To compare the attitude level and socio-demographic characteristic (sex, age, study level, monthly income, hometown and field), Chi-square was used. The attitude toward contact lens wear was not statistically significant association among sex, age, study level, monthly income, hometown and field as shown in table 20

Table 20 : Association between Socio-demographic and attitude

Socio-demographic Characteristic	Total Respondents (N=340)	Attitude[n(%)]		p-value
		Good & Moderate	Poor	
Sex				
Male	68	52 (76.5)	16 (23.5)	0.416
Female	272	220 (80.9)	52 (19.1)	
Age (Years)				
17-20	145	115 (79.3)	30 (20.7)	0.625
21-24	159	126 (79.2)	33 (20.8)	
> 24	36	31 (86.1)	5 (13.9)	
Study level				
Bachelor	298	238 (79.9)	60 (20.1)	0.869
Master/ PhD	42	34 (81.0)	8 (19.0)	
Monthly income				
< 5,000	83	65 (78.3)	18 (21.7)	0.800
5,000 - 10,000	207	168 (81.2)	39 (18.8)	
>10,000 - 15,000	50	39 (78.0)	11 (22.0)	
Hometown				
Bangkok	229	182 (79.5)	47 (20.5)	0.729
Other	111	90 (81.1)	21 (18.9)	
Field				
Health Science Field	72	53 (73.6)	19 (26.4)	0.581
Science Field	42	36 (85.7)	6 (14.3)	
Engineer Field	40	32 (80.0)	8 (20.0)	

Table 20 : Association between Socio-demographic and attitude (cont.)

Socio-demographic Characteristic	Total Respondents (N=340)	Attitude[n(%)]		p-value
		Good & Moderate	Poor	
Art Field	22	18 (81.8)	4 (18.2)	
Social Field	164	133 (81.1)	31 (18.9)	

4.9 Association between Socio-demographic and practice

To compare the practice level and socio-demographic characteristic (sex, age, study level, hometown, monthly income and field), Chi-square was used. The proper contact lens use and care practice were statistically significant association among sex, age, study level and monthly income (Chi-square, $p < 0.05$) as shown in table 20.

Table 21 : Association between Socio-demographic and practice level

Socio-demographic Characteristic	Total Respondents (N=340)	Practice [n(%)]		p-value
		Good	Moderate & Poor	
Sex				
Male	68	45 (66.2)	23 (33.8)	0.017*
Female	272	217 (79.8)	55 (20.2)	
Age (Years)				
17-20	145	114 (78.6)	31 (21.4)	
21-24	159	127 (79.9)	32 (20.1)	0.018*
> 24	36	21 (58.3)	15 (41.7)	
Study level				
Bachelor	298	235 (78.9)	63 (21.1)	
Master/ PhD	42	27 (64.3)	15 (35.7)	0.035*
Monthly income				
< 5,000	83	65 (78.3)	18 (21.7)	
5,000 - 10,000	207	166 (80.2)	41 (19.8)	0.022*
>10,000 - 15,000	50	31 (62.0)	19 (38.0)	

Table 21 : Association between Socio-demographic and practice level (cont.)

Socio-demographic Characteristic	Total Respondents (N=340)	Practice [n(%)]		
		Good	Moderate & Poor	p-value
Hometown				
Bangkok	229	174 (76.0)	55 (24.0)	0.498
Other	111	88 (79.3)	23 (20.7)	
Field				
Health Science Field	72	54 (75.0)	19 (25.0)	0.853
Science Field	42	35 (83.3)	6 (16.7)	
Engineer Field	40	31(77.5)	8 (22.5)	
Art Field	22	16 (72.7)	4 (27.3)	
Social Field	164	126 (76.8)	31 (23.2)	

4.10 Association between knowledge score and practice score by using Spearman rho

Table 22 presented the result of Spearman rho analysis of association between knowledge score and practice score of the respondents. Knowledge and practice score regarding to eye problem protection from contact lens use were also as treated as continuous variable and correlation coefficients were computed. The correlation coefficient of 0.316 indicated a positive correlation between knowledge score and practice score. In addition, knowledge score had a statistically significant correlation with practice score (p-value = 0.000).

Table 22 : Association between knowledge score and practice score by using Spearman rho

Variable	Knowledge score	
	Correlations Coefficient	p-value
Practice score	0.316	0.000

Correlation is significant at the 0.01 level (2-tailed).

4.11 Association between variable and eye problems

To compare variable (socio-demographic characteristic ; sex, age, study level, hometown and field, contact lens information; time of used contact lens, contact lens type, wear schedule, knowledge, attitude and practice level) and eye problems, Chi-square was used. The variable was not statistically significant association with eye problems (Chi-square, $p < 0.05$) as shown in table 23.

Table 23 : Association between variable and eye problems

Variable	Number (N=340)	Eye problems [n(%)]		p-value
		Yes	No	
Sex				
Male	68	31 (45.6)	37 (54.4)	0.448
Female	272	138 (50.7)	134 (49.3)	
Age (Years)				
17-20	145	71 (49.0)	74 (51.0)	0.759
21-24	159	78 (49.1)	81 (50.9)	
> 24	36	20 (55.6)	16 (44.4)	
Study level				
Bachelor	298	145 (48.7)	153 (51.3)	0.303
Master/ PhD	42	24 (57.1)	18 (42.9)	
Monthly income				
< 5,000	83	42 (50.6)	41 (49.4)	0.757
5,000 - 10,000	207	100 (48.3)	107 (51.7)	
>10,000 - 15,000	50	27 (54.0)	23 (46.0)	
Hometown				
Bangkok	229	108 (47.2)	121 (52.8)	0.178
Other	111	61 (55.0)	50 (45.0)	
Field				
Health Science Field	72	40 (55.6)	32 (44.4)	0.561
Science Field	42	19 (45.2)	23 (54.8)	
Engineer Field	40	17(42.5)	23 (57.5)	

Table 23 : Association between variable and eye problems (cont.)

Variable	Number (N=340)	Eye problems [n(%)]		p-value
		Yes	No	
Art Field	22	9 (40.9)	13 (59.1)	
Social Field	164	84 (51.2)	80 (48.8)	
Time of use contact lens				
0.5	18	12(66.7)	6(33.3)	
1	53	26(49.1)	27(50.9)	
2	57	27(47.4)	30(52.6)	
3	49	24(49.0)	25(51.0)	
4	44	23(52.3)	21(47.7)	0.660
5	38	15(39.5)	23(60.5)	
6	35	16(45.7)	19(54.3)	
7	46	26(56.5)	20(43.5)	
Type of Contact lens				
Daily	41	24(58.5)	17(51.4)	
Weekly	14	6(42.9)	8(57.1)	
Monthly	254	120(47.2)	134(52.8)	0.384
year	27	16(59.3)	11(40.7)	
other	4	3(75.0)	1(25.0)	
Wear schedule				
everyday	160	75(46.9)	85(53.1)	0.325
occasionally	180	94(52.2)	86(47.8)	
Knowledge Level				
High	249	123(49.4)	126(50.6)	
Moderate + Low	91	46(50.5)	42(49.5)	0.851
Attitude Level				
Good + moderate	272	132(48.5)	140(51.5)	
Poor	68	37(54.4)	31(45.6)	0.386

Table 23 : Association between variable and eye problems (cont.)

Variable	Number (N=340)	Eye problems [n(%)]		p-value
		Yes	No	
Practice Level				
Good	262	125(47.7)	137(52.3)	0.177
Moderate + Poor	78	44(56.4)	34(43.6)	
Level of use practice				
Good	205	102(49.8)	103(50.2)	0.543
Moderate	112	58(51.8)	54(48.2)	
Poor	23	9(39.1)	14(60.9)	
Level of lens care				
Good	232	115(49.6)	117(50.4)	0.997
Moderate	82	41(50.0)	41(50.0)	
Poor	24	13(50.0)	50(50.0)	
Level of warning and recommendation				
Good	212	98(46.2)	114(53.8)	0.090
Moderate	128	71(55.5)	57(44.5)	

CHAPTER V

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This is a cross-sectional analytic study with aim to evaluate knowledge, attitude and practice about contact lens use in students at Chulalongkorn University. The findings are discussed as follow

5.1 Discussion of socio-demographic, contact lens information, eye problems from contact lens use, knowledge about contact lens about eye problems protection from contact lens, attitude toward contact lens wear, the proper contact lens use and care practice, association between socio-demographic and knowledge, attitude and practice from contact lens use, association between knowledge score and practice score, association between risk factor and eye problems

5.2 Conclusion

5.3 Limitations

5.4 Recommendations

5.5 Further study

5.1 Discussion

- Socio-demographic

In this study, most of students who used contact lenses were female (80.0%), because they wanted to have more good looking, wearing glasses make them learned or plain students. Similarly, the study in Malaysia showed that majority of the contact lens users were female (87.6%, Tajunisah, 2008). The majority (46.8%) of respondents were in the age ranged from 21-24 years like the study in Malaysia (Tajunisah, 2008) because both of study survey took place at university. More than half of respondent (60.9%) had monthly income of 5,000-10,000 baht, living with their parents – more than half of them in Bangkok (67.4%) – and having less expenses may play a role.

- Contact lens information

More than half of respondents using contact lenses to correct vision (57.9%) - unlike in the other study in neighboring country where the main reason for contact lens use was cosmetic or aesthetic effect (Tajunisah, 2008), 53.8% got recommendation from ophthalmologist/expert. In the USA, every contact lens user has to get recommendation from ophthalmologist/expert and prescription to purchase contact lens (USFDA, 2010). Majority of respondents purchase contact lens and know contact lens information from glass shop because in Thailand we can purchase contact lens freely (purchase without prescription). Most of contact lens type which respondents used were monthly disposable soft contact lens (53%).

- Eye problems from contact lens use

Eye problems from contact lens use in this study were red eye 34.3%, follow by discomfort (22.8%) , pain (11.8%), dry eye (11.5%), blur (9.9%), light phobia (2.9%) , infection (2.7%) , many tears (0.8%) and discharge (0.5%). 31.4% did not have any eye problems from contact lens. Eye problems in this study were much lower than in a similar study report from India, with 47.7% for discomfort, 38 % dry eye, watering eye 31.5%, red eye 19.4% and 20.7% with no problems associated with contact lens use (Unniktishnan, 2009). Most of subject did not have to follow up by an ophthalmologist (68.8%) after use contact lens.

- Knowledge about eye problems protection from contact lens

73.2% of the respondents had “High knowledge”. 93.5% knew that washing hands thoroughly with soap and dry every time before touching contact lenses can protect eye infection. 95.3% knew that wearing contact lenses during sleep can lead to an increased risk of severe eye infection. 80.3% knew that they shouldn’t swim while wearing contact lenses. The percental answer for this three questions should be 95 % to 100% at least because information about hand washing, not sleeping and swimming with contact lenses states as a warning and a recommendation at contact lenses label (Thai FDA, 2009). Ignoring theses recommendations means that contact lens users did not read contact lens label or read but not carefully. 96.2% knew that one of the reason of eye complication from contact lenses was an inappropriate hygiene.

- Attitude toward contact lens wear

76.8% of the respondents had “Moderate attitude” Most of them (70.9%) agree that wearing contact lenses make them more beautiful. This finding is consistent with the finding of Tajunisah (2008) which state the main reason for contact lens use was cosmetic or aesthetic effect. 68.5% agree that wearing contact offer more comfort than glasses. This finding was also in conformity with the finding of Tajunisah (2008) with state the main factors that influenced the students in choosing their contact lens were feeling the comfort of wearing contact lenses. This also similar to the finding from Unnikrishnan (2009) which state that the most reason for using contact lens was comfort and convenience. There were 65.8% agree that contact lenses were necessary in their daily life. This attitude was negative statement but more than a half agree with this attitude. Because this research was studied at Chulalongkorn University, Many students had monthly income more than 5,000 bath and the campus was in downtown so the respondents had opinion that contact lens were necessary in their daily life.

- The proper contact lens use and care practice

71.2% had “Good practice”. 55.9% washing hands thoroughly with soap and drying before handling contact lens all the time, a percentage much lower than in a similar study report by Tajunisah (2008). According the finding in this study, it found that about 50% washing hand all the time so should be promoting washing hand before handling contact lens all the time because this practice was the first step to protect eye problems from contact lens. The study about contact lens related Microbial keratitis in patients with microbial keratitis for not practicing proper contact lens care - using drinking water for lens cleaning or wearing contact lenses while swimming and overnight lens wearing (Pisit, 2007). This study found that 26.8% used to rinse contact lenses with tap water. 56.8% used to sleep with contacts lenses. 36.2% used to swim while wearing contact lenses. Rinsing contact lens with tap water, sleeping or swimming with contact lens can cause of eye problems from contact lens which found in this study.

- Association between Socio-demographic and knowledge, attitude and practice

Results of the study, the knowledge level and socio-demographic characteristic showed that hometown, monthly income and field was statistically

significant association with knowledge about eye problems protection with reference to contact lenses (Chi-square, $p < 0.05$). The students who lived in Bangkok and had high monthly income may be had high knowledge about eye problems protection from contact lens more than students who lived in outside of Bangkok and had low monthly income because in Bangkok have many glass shop and hospital more than the other. They can find information about contact lens use and care to protect eye problem easy. Normally, Health Science field had high knowledge more than other field because Health Science field had to study about health care more than other field.

None of socio-demographic characteristic had any significant relation with attitude toward contact lens wear.

The results of the study show that sex, age, study level and monthly income were statistically in significant association with the proper contact lens use and care practice (Chi-square, $p < 0.05$). Females probably have better practice than males. Students who elder, study in high level and high monthly income may be have better practice than students who younger, study in low level and low monthly income because they used longer and may be have good hygiene than younger.

- Association between knowledge score and practice score by using Spearman rho

Knowledge and practice score regarding to eye problem protection from contact lens had a positive correlation (correlation coefficient of 0.316). In addition, knowledge score had a statistically significant correlation with practice score ($p\text{-value} < 0.05$).

- Association between variable and eye problems

The variable (socio-demographic characteristic ; sex, age, study level, monthly income, hometown and field, contact lens information; time of used contact lens, contact lens type, wear schedule, knowledge, attitude and practice level) was not in a statistically significant association with eye problems.

5.2 Conclusion

Nowadays, there are many people using contact lens for correcting refractive error or for aesthetic reason, especially young people like students in Thailand.

Improper use of contact lenses can cause numerous complications, serious eye complication, and even blindness (ablepsia). It is important to find out what is the causing factor associated with eye problem from contact lenses. This is a pilot study to assess knowledge, attitude and practice of contact lens use and factors associated with eye problems of contact lens use in students at Chulalongkorn University. It may help to determine an appropriate guideline to control and reduce contact lens specific problems.

Most of students who used contact lenses were female. The majority of respondents were in the age ranged from 18-24 years. More than half of respondent had monthly income 5,000-10,000 bath. and more than half of them lived in Bangkok.

More than a half of subjects used contact lens for correcting their eye vision. The majority of respondents purchase contact lens and get contact lens information from glass shop. Most of contact lens type which respondents used were monthly disposable soft contact lenses. There were many eye problems from contact lens use in this study such as red eye, discomfort, pain, dry eye, blur, light phobia, infection, many tear and discharge.

Most of the respondents had “High knowledge”. Almost most of them knew that washing the hands thoroughly with soap and dry every time before touching contact lenses can protect from eye infection, that sleeping with contact lenses can lead to an increased risk of severe eye infection, and that swimming while wearing contact lenses was another reason of eye complication due to inappropriate hygiene.

Many of them had a “Moderate attitude”. Most of respondents agree that wearing contact lenses make them more beautiful, and wearing contact lenses was more comfortable than wearing glasses.

More than half of them had “Good practice”. They wash hands thoroughly with soap and dry before handling contact lens all the time, but sometimes sleep with contacts lenses. Most of them never swap contact lens with another person. Their high knowledge and good practice is probably based on education and knowledge as students at Chulalongkorn University. This study may help to determine an appropriate guideline to control and reduce problems from contact lens use. In general wearing contact lenses can help correction of myopia or hyperopia or toric vision or increase

your appearance and personality. Before you decide on purchasing contact lenses you must:

1. Consult a doctor and find out that you are suitable for wearing contact lenses.
2. Search information and learn about contact lens such as type, eye and contact lens care and maintenance, warning and recommendation .
3. Ask the doctor's or optician's about how to wear a lens, eye and contact lens care and maintenance, warning and recommendations at their office when buying a lens.
4. Always have discipline about the proper contact lenses using practice such as use (insertion and removal), care and maintenance.

If you can do all above, it will help you to control and reduce eye problems from contact lenses.

5.3 Limitations

This study was conducted at Chulalongkorn University which may not fully represent the habits of the whole contact lens user community so the generalizability of the results is somewhat limited. The study had estimated number of subjects before collected data. When collected data in each faculty, It found that it was difficult to collected to equal estimated number of subjects. There were the faculty which have \pm 50 % from estimated number of subjects. Pharmaceutical Sciences, Commerce and Accountancy, Arts, Economics, Communication Arts had more over 50 % from estimated number of subjects because Pharmaceutical Sciences, Commerce and Accountancy, Arts, Communication Arts had female about 70 %. Female had trend to use contact lens more than male because they wanted to more good looking. They though using contact lens make them more beautiful , good personality and in trend while Education had female about 70% but can collect data lower 50% from estimated number of subjects. The reason was socio-demographic and style of students in faculty. Economics had more over 50 % from estimated number of subjects even though the faculty had female about 50% because of they had high monthly income and style of students in faculty. Majority of this study was female because they wanted to have more good looking so sex have influence to practice because female probably have better hygiene than male.

Moreover, this questionnaire was conducted by researcher and approved by advisor and experts, so this study can be used as a pilot study for further development of standardized questionnaires. This study relied on self-report;

therefore there was a source of information bias like eye problems, attitude and practice.

5.4 Recommendations

From this study, it found 55.9% washing hands thoroughly with soap and drying before handling contact lens all the time. It was very low so should be promoting washing hand before handling contact lens all the time because this practice was the first step to protect eye problems from contact lens by Food and Drug administration should be in favor of more public information about knowledge of contact lens use, warning and recommendations and eye problem by means of brochures, advertising etc such as washing hands before handling contact lens, never sleep, swim or swap contact lens and have course training about how to use contact lens, lens care and maintenance and how to protect and reduce eye problem from contact lenses for distributors or users . This should reduce eye problem from contact lenses.

5.5 Further study

As this study was conducted at one university only further studies should extend research to users from other educational institutions to universalize the results such as more schools, more colleges/universities which may represent generalizability of results and study in qualitative research for gain more understanding why younger people like to use contact lens .

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APPENDICES

APPENDIX A : QUESTIONNAIRE (English version)**KNOWLEDGE, ATTITUDE, PRACTICE AND EYE PROBLEMS FROM
CONTACT LENS USE IN STUDENTS
AT CHULALONGKORN UNIVERSITY**

My name is Miss Pawinee Wongkrajang. I'm doing my Master degree at the college of public health science, Chulalongkorn University. I'm doing my research Knowledge, Attitude Practice and eye problems from contact lens use at Chulalongkorn University.

I'm here by requesting you to participate in the study. If you agree to participate I would ask you to completed a self-administered questionnaire about your personal information, what you think about contact lens used, knowledge and practice to avoid eye problems.

Any information that is obtained with this study will keep confidential. Your name will not be mentioned or identified in any report.

Researcher
The college of public health science
Chulalongkorn University

Questionnaire

Part 1: Personal information

Direction: Please make the mark / in the parenthesis () and fill in the space in front of the statement, which is correct and true.

1. Gender

() 1. Male

() 2. Female

2. Age..... years old (Full age)

3. FacultyLevel.....year.....

4. Average parent's income (Baht per month)

() 1. Less than 10,000 Baht () 2. 10,000 – 30,000 Baht

() 3. 30,001 –50,000 Baht () 4. More than 50,000 Baht

5. Average student's

income (Baht per month)

() 1. Less than 5,000 Baht () 2. 5,000 – 10,000 Baht

() 3. 10,001 – 15,000 Baht () 4. More than 15,000 Baht

() 5. Other (Specify).....

6. Hometown

() 1. Bangkok

() 2. Other (specify) but live in Bangkok

when Years

7. Eye problem vision

- Myopia () 1. Yes () 2. No

- How old are you when you have myopiayears

- What treatment of myopia () 1. Glasses () 2. Contact lens

Part 2: Contact lens information

1. When you wear contact lens first time (age)years. Now you wear contact lens for.....years.....month.....day

2. Reason for wearing contact lens

- 1. corrective vision
- 2. alter eye size or color
- 3. both

3. Did you get the advise of an ophtalmoloigist or other eye care professional before starting the use of contac lenses?

- 1. Yes
- 2. No

4. Where are you buying contact lens?

- 1. Clinic/hospital
- 2. The eye glass shop
- 3. Stall in fashion center
- 4. Internet
- 5. Other

5. Contact lens type/category (answer more than 1 choice)

- 1. Daily disposable lenses
- 2. 1-2 week disposables
- 3. Monthly disposables
- 4. Conventional
- 5. Extended wear contacts lens

Now you wear and what type that you use many times.....

6. Wear schedule

- 1. Daily
- 2. Occasionally
 - a. Study 2.2 Read book 2.3 Go to party 2.4 Play sport 2.5 other (specify).....

7. Where are you know information about contact lens use?

- 1. Clinic/hospital
- 2. The eye glass shop
- 3. Stall in fashion center
- 4. Internet
- 5. Other

Part 3: Eye problems from contact lens use

1. Do you have any systemic allergies?

- 1. No
- 2. Yes

2. Do you have eye problem from contact lens during last 6 months ?

- 1. No
- 2. Yes, What is it ? (last 6 months) and how often?
 - 1. Dry eyes
 - 2. Red eyes
 - 3. Painful eyes
 - 4. Blur vision
 - 5. Discharge
 - 6. Eye discomfort (irritation, itching)
 - 7. Photophobia (bright light hurting eyes)
 - 8. Lacrimation (many tears)
 - 9. Infection diagnosed by an eye care professional
 - 10. Infection complications diagnosed by an eye care professional
 - 11. Other (specify)

and Do you visit ophthalmologist to treat eye problems from contact lens?

- 1. No
- 2. Yes

3. How many times have you visited ophthalmologist after starting to use contact lens?

- () 1. every month/year
 () 2. every 3 month/year
 () 3. every 5-6 months/year
 () 4. every year
 () 5. other(specify).....

Part 4 Knowledge about eye problems protection from contact lens

Knowledge	Yes	No	I'm not sure
1. Washing the hands thoroughly with soap and dry every time before touch contact lenses can protect eye infection from contact lens.			
2. Putting in contact lenses before applying any makeup or lotions to avoid contaminating contact lens.			
3. Contact lens care and maintenance is one of the most crucial aspects of contact lens wear.			
4. Cleaning contact lens with tap water			
5. Store lenses in the solutions when not wearing such as multipurpose solution, tap water, saline.			
6. One of reason of eye complication from contact lens because of an inappropriate hygiene.			
7. Sleeping in contact lenses can lead to an increased risk of severe eye infection.			
8. Do not swim while wearing contact lenses. There is a risk of eye infection from bacteria in swimming pool water, hot tubs etc.			
9. Smokers who wear contacts have high risk to develop corneal ulcers than nonsmokers who wear contacts, regardless of lens type.			
10. Do not swap contact lens with another person. Swapping provides a way to transfer germs between people.			

Part 5 The attitude about contact lens wear.

No.	Attitude	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
1.	Contact lenses are necessary in your daily life					
2.	Contact lenses wearer increase cost of living					
3.	Contact lenses wearer make you more beautiful.					
4.	Contact lenses wearer make you more good personality					
5.	Contact lens wearer is comfort more than glasses.					
6.	Contact lenses wearer make you more up to date					
7.	Contact lenses wearer make you more wealthy					
8.	Contact lenses wearer make you more convenient to travel					
9.	Contact lenses wearer have to always following up by ophthalmologists or optometrists					
10.	Contact lens care and maintenance is easy more than glasses.					

Part 6 The proper contact lens use and care practice

Never = 0 time , Sometimes = 2-3 time/every use, Often = almost every time of use,
All the time = every time of use

No.	Practice	Never	Sometimes	Often	All the time
	Use (Insertion and removal)				
1.	Do you wash hands thoroughly with soap and dry before handling contact lens?				
2.	Do you take the lens out, clean and rinse it well before insert contact lens to your eye?				
3.	After remove the contact lenses, Do you clean rinse and sterilize contact lenses?				
	Contact lens care and maintenance				
4.	Do you use contact lens solution to clean contact lenses after used?				
5.	During cleaning, Do you rub contact lenses with your fingers?				
6.	After cleaning, Do you rinse contact lenses with solution?				
7.	Do you ever rinse contact lenses with tap water?				
8.	Do you use contact lens disinfecting solution to disinfect contact lenses?				
9.	Do you use saline solution to disinfect contact lenses?				

No.	Practice	Never	Sometimes	Often	All the time
10.	Do you store contact lenses in the recommended solutions when not wearing?				
11.	Do you store contact lenses in tap water.				
12.	Do you reuse cleaning or disinfecting solutions?				
13.	Do you clean contact lens storage case with contact lens solution after every use?				
Warning and recommendation					
14.	Do you put in contact lenses before applying any makeup or lotions to avoid contaminating contact lens?				
15.	Do you wear contacts lenses longer than prescribed?				
16.	Do you sleep in contacts lenses?				
17.	Do you swap contact lens with another person?				
18.	Do you ever swim while wearing contact lenses?				
19.	Do you replace contact lens storage cases on a frequent basis?				
20.	If you have eye complication from contact lens, you will go to see the doctor immediately.				

APPENDIX B : QUESTIONNAIRE (Thai version)

**ความรู้ ทัศนคติ การปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทกเลนส์ในนิสิตจุฬาลงกรณ์
มหาวิทยาลัย ปีการศึกษา 2553**

ดิฉันชื่อ นางสาวภาวิณี วงษ์กระจำง ขณะนี้กำลังศึกษาปริญญาโทบัณฑิตที่วิทยาลัย
วิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย และกำลังทำวิจัยเกี่ยวกับความรู้ ทัศนคติ การ
ปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทกเลนส์ในนิสิตจุฬาลงกรณ์มหาวิทยาลัย

ดิฉันขอความอนุเคราะห์ท่านช่วยตอบคำถามเกี่ยวกับข้อมูลส่วนตัว การใช้คอนแทกเลนส์
ความรู้ ทัศนคติ และการปฏิบัติเพื่อหลีกเลี่ยงการเกิดปัญหาเกี่ยวกับตาจากการใช้คอนแทกเลนส์

ผู้วิจัย

วิทยาลัยวิทยาศาสตร์สาธารณสุข

จุฬาลงกรณ์มหาวิทยาลัย

Questionnaire #

แบบสอบถามความรู้ ทักษะการปฏิบัติ และปัญหาเกี่ยวกับตาจากการใช้คอนแทกเลนส์ในนิสิต
จุฬาลงกรณ์มหาวิทยาลัย ปีการศึกษา 2553

ส่วนที่ 1 : ข้อมูลส่วนตัว

คำแนะนำ : กรุณาทำเครื่องหมาย / ในวงเล็บ หรือเติมข้อความในช่องว่าง

1. เพศ

() 1. ชาย

() 2. หญิง

2. อายุ ปี

3. คณะ

4. ระดับ () 1.ปริญญาตรี ชั้นปี.....

() 2. ปริญญาโท

() 3. ปริญญาเอก

5. รายได้เฉลี่ยของท่าน (ต่อเดือน) บาท

6. ภูมิลำเนา

() 1. กรุงเทพมหานคร

() 2. อื่นๆ (ระบุจังหวัด) แต่เข้ามาอาศัยในกรุงเทพมหานครเป็น
เวลา ปี

7. ปัญหาเกี่ยวกับสายตา

- สายตาสั้น () 1. ใช่ () 2. ไม่

- สายตาเอียง () 1. ใช่ () 2. ไม่

- อายุเท่าไรตอนสายตาสั้น/เอียง

ส่วนที่ 2 ข้อมูลคอนแทกเลนส์

1. ท่านใส่คอนแทกเลนส์ครั้งแรกเมื่ออายุ.....ปี ตอนนี้ท่านใส่คอนแทกเลนส์มาแล้ว..... ปี
.....เดือน

.....วัน

2. สาเหตุในการใส่คอนแทกเลนส์

() 1. แก้ไขค่าสายตา

() 3. ทั้งสองอย่าง

() 2. เพื่อความสวยงาม เช่น เพิ่มขนาดตาดำ หรือ เปลี่ยนสีตา

3. ท่านได้รับคำแนะนำจากจักษุแพทย์หรือผู้เชี่ยวชาญทางตา ก่อนเริ่มต้นใช้คอนแทกเลนส์หรือไม่?

- () 1. ได้รับ
() 2. ไม่ได้รับ

4. ท่านซื้อคอนแทกเลนส์ที่ไหน? (ตอบได้มากกว่า 1 ตัวเลือก)

- () 1. คลินิก/โรงพยาบาล
() 2. ร้านขายแว่นตา
() 3. ร้านแผงลอยทั่วไปในแหล่งแฟชั่นหรือห้างสรรพสินค้า
() 4. อินเทอร์เน็ต
() 5. อื่นๆ (ระบุ)

5. ท่านเคยใส่คอนแทกเลนส์ชนิด/ประเภทใดบ้าง (ตอบได้มากกว่า 1 ตัวเลือก)

- () 1. คอนแทกเลนส์ชนิดนุ่ม/รายวัน
() 2. คอนแทกเลนส์ชนิดนุ่ม/ราย สัปดาห์
() 3. คอนแทกเลนส์ชนิดนุ่ม/รายเดือน
() 4. คอนแทกเลนส์ชนิดนุ่ม/รายปี
() 5. อื่นๆ ระบุ.....

ในขณะที่ท่านใส่คอนแทกเลนส์ชนิด/ประเภทไหน.....

6. ช่วงเวลาการใส่

- () 1. ทุกวัน
() 2. บางโอกาส (ตอบได้มากกว่า 1 ตัวเลือก)
() 2.1 ศึกษาที่มหาวิทยาลัย () 2.2 อ่านหนังสือ () 2.3 ไปงานเลี้ยง () 2.4 เล่นกีฬา
() 2.5 อื่นๆ (ระบุ)

7. ท่านทราบวิธีการใช้และการดูแลรักษาความสะอาดคอนแทกเลนส์จากที่ใด

- () 1. คลินิก/โรงพยาบาล
() 2. ร้านขายแว่นตา
() 3. ร้านแผงลอยทั่วไปในแหล่งแฟชั่นหรือห้างสรรพสินค้า
() 4. อินเทอร์เน็ต
() 5. อื่นๆ (ระบุ)

ส่วนที่ 3 : ปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์

1. ท่านเป็นภูมิแพ้หรือไม่?

() 1. ไม่เป็น

() 2. เป็น

2. ท่านมีปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์ในช่วง 6 เดือนที่ผ่านมาหรือไม่?

() 1. ไม่มี (ข้ามไปทำส่วนที่ 4)

() 2. มี ได้แก่อะไรบ้าง? (ตอบได้มากกว่า 1 ข้อ)

() 1. ตาแห้ง

() 2. ตาแดง

() 3. เจ็บตา

() 4. สายตามองไม่ชัด

() 5. หนอง

() 6. ไม่สบายตา (เคืองตา, คันตา)

() 7. กลัวแสง (แสงทำให้เจ็บตา)

() 8. น้ำตามาก

() 9. ตาติดเชื้อ

() 10. ตาติดเชื้อแทรกซ้อน

() 11. อื่นๆ (ระบุ)

3. ใน 6 เดือนที่ผ่านมาท่านเคยไปหาจักษุแพทย์เพื่อรักษาปัญหาเกี่ยวกับตาที่เกิดจากการใช้คอนแทคเลนส์ที่เกิดขึ้น?

() 1. ไม่ไป

() 2. ไป

4. ท่านไปหาจักษุแพทย์เพื่อรักษาปัญหาเกี่ยวกับตาที่เกิดจากการใช้คอนแทคเลนส์ที่เกิดขึ้นหลังจากเริ่มใช้คอนแทคเลนส์บ่อยแค่ไหน?

() 6. ทุกเดือน/ปี

() 7. ทุก 3 เดือน/ปี

() 8. ทุก 5-6 เดือน/ปี

() 9. ทุก 1 ปี

() 10. ไม่เคยไป

() 11. อื่นๆ (ระบุ).....

ส่วนที่ 4 ความรู้เกี่ยวกับการป้องกันการเกิดปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์

ความรู้	ใช่	ไม่ใช่	ไม่แน่ใจ
1. การล้างมือให้สะอาดด้วยสบู่และทำให้แห้งทุกครั้งก่อนสัมผัสคอนแทคเลนส์สามารถป้องกันการเกิดติดเชื้อจากคอนแทคเลนส์ได้			
2. การใส่คอนแทคเลนส์ก่อนการแต่งหน้าหรือทาโลชั่นเพื่อหลีกเลี่ยงการปนเปื้อนคอนแทคเลนส์			
3. การดูแล ทำความสะอาด และเก็บรักษาคอนแทคเลนส์เป็นสิ่งที่สำคัญที่สุดในการใส่คอนแทคเลนส์			
4. สามารถล้างคอนแทคเลนส์ด้วยน้ำประปาได้			
5. ควรเก็บคอนแทคเลนส์เมื่อไม่ได้ใช้งานในน้ำยา เช่น น้ำยาอเนกประสงค์ น้ำประปา น้ำเกลือ			
6. หนึ่งในสาเหตุของปัญหาเกี่ยวกับตาจากการใช้คอนแทคเลนส์คือการไม่ทำความสะอาดคอนแทคเลนส์			
7. การนอนหลับพร้อมคอนแทคเลนส์สามารถทำให้เพิ่มความเสี่ยงของการติดเชื้อที่ตารุนแรง			
8. ห้ามใส่คอนแทคเลนส์ขณะว่ายน้ำเพราะมีความเสี่ยงของการติดเชื้อที่ตาจากแบคทีเรียในสระว่ายน้ำ			
9. คนสูบบุหรี่มีความเสี่ยงสูงในการเกิดแผลที่กระจกตามากกว่าคนที่ไม่สูบบุหรี่ (ไม่เกี่ยวกับชนิดเลนส์)			
10. ห้ามสลับคอนแทคเลนส์กับผู้อื่นเพราะเป็นการเคลื่อนย้ายแบคทีเรียระหว่างบุคคล			

ส่วนที่ 5 ทักษะเกี่ยวกับการใส่คอนแทคเลนส์

ข้อ	ทักษะ	เห็น ด้วย อย่างยิ่ง	เห็น ด้วย	เฉยๆ	ไม่ เห็น ด้วย	ไม่เห็น ด้วย อย่าง ยิ่ง
1.	คอนแทคเลนส์จำเป็นในชีวิตประจำวัน					
2.	การใส่คอนแทคเลนส์ทำให้ค่าดำรงชีพสูงขึ้น					
3.	การใส่คอนแทคเลนส์ทำให้ดูสวยขึ้น					
4.	การใส่คอนแทคเลนส์ทำให้มีบุคลิกดีขึ้น					
5.	การใส่คอนแทคเลนส์สบายกว่าการใส่แว่นตา					
6.	การใส่คอนแทคเลนส์ทำให้ดูเป็นคนทันสมัย					
7.	การใส่คอนแทคเลนส์ทำให้ดูมีฐานะ					
8.	การใส่คอนแทคเลนส์ทำให้สะดวกต่อการเดินทาง					
9.	การใส่คอนแทคเลนส์ต้องตรวจติดตามโดยจักษุแพทย์เป็นประจำ					
10.	การดูแลและเก็บรักษาคอนแทคเลนส์ง่ายกว่าการดูแลและเก็บรักษาแว่นตา					

ส่วนที่ 6 การใช้และดูแลเก็บรักษาคอนแทกเลนส์อย่างเหมาะสม

ไม่เคย = 0 ครั้ง , บางครั้ง = 2-3 ครั้ง/ทุกครั้งที่ใช้, บ่อยๆ = เกือบทุกครั้งที่ใช้, ทุกครั้ง = ทุกครั้งที่ใช้

คอนแทกเลนส์

ข้อ	การปฏิบัติ	ไม่เคย	บางครั้ง	บ่อยๆ	ทุกครั้ง
	การใช้ (การใส่และถอดออก)				
1.	ท่านล้างมือให้สะอาดด้วยสบู่และทำให้แห้งทุกครั้งก่อนสัมผัสคอนแทกเลนส์				
2.	ท่านเอาคอนแทกเลนส์ออกจากตลับแล้วท่านทำความสะอาด (cleaning) และ ชะล้าง (rinsing) คอนแทกเลนส์ก่อนจะใส่ในตา				
3.	หลังจากเอาคอนแทกเลนส์ออกจากตาแล้วท่านทำความสะอาด (cleaning) ชะล้าง (rinsing) และฆ่าเชื้อ (disinfecting) คอนแทกเลนส์				
	การดูแลและเก็บรักษาคอนแทกเลนส์				
4.	ท่านใช้น้ำยาคอนแทกเลนส์ทำความสะอาด (cleaning) คอนแทกเลนส์หลังการใช้				
5.	ท่านถูคอนแทกเลนส์ด้วยนิ้วระหว่างทำความสะอาด (cleaning) คอนแทกเลนส์				
6.	ท่านเคยทำความสะอาด (cleaning) คอนแทกเลนส์ด้วยน้ำประปา				
7.	หลังทำความสะอาด ท่านชะล้าง (rinsing) คอนแทกเลนส์ด้วยน้ำยาคอนแทกเลนส์				
8.	ท่านใช้น้ำยาคอนแทกเลนส์ในการฆ่าเชื้อ (disinfecting) คอนแทกเลนส์				
9.	ท่านเคยใช้น้ำเกลือในการฆ่าเชื้อ (disinfecting) คอนแทกเลนส์				

ข้อ	การปฏิบัติ	ไม่เคย	บางครั้ง	บ่อยๆ	ทุกครั้ง
10.	ท่านใช้น้ำยาคอนแทกเลนส์แช่ (storage) คอนแทกเลนส์เวลาที่ไม่ได้ใช้คอนแทกเลนส์				
11.	ท่านเคยแช่ (storage) คอนแทกเลนส์ในตลับ คอนแทกเลนส์ด้วยน้ำประปา				
12.	ท่านเคยนำน้ำยาคอนแทกเลนส์มาใช้ซ้ำ				
13.	ท่านทำความสะอาดตลับใส่คอนแทกเลนส์ ด้วยน้ำยาคอนแทกเลนส์หลังการใช้ทุกครั้ง				
	คำแนะนำและข้อควรระวัง				
14.	ท่านใส่คอนแทกเลนส์ก่อนการแต่งหน้าหรือทาโลชั่นเพื่อหลีกเลี่ยงการปนเปื้อน คอนแทกเลนส์				
15.	ท่านใส่คอนแทกเลนส์นานกว่าอายุ คอนแทกเลนส์				
16.	ท่านเขยอนหลับพร้อมคอนแทกเลนส์				
17.	ท่านเคยสลับคอนแทกเลนส์กับคนอื่น				
18.	ท่านเคยว่ายน้ำขณะใส่คอนแทกเลนส์				
19.	ท่านเปลี่ยนตลับใส่คอนแทกเลนส์ตามเวลาที่ กำหนด				
20.	ถ้าท่านมีปัญหาเกี่ยวกับตาจากการใช้คอนแทกเลนส์ท่านจะไปพบจักษุแพทย์ทันที				

APPENDIX C: Ministerial Notification “Contact lens”

หน้า ๔๑
 เก็บ ๑๒๖ ตอนพิเศษ ๑๒๐ ง ราชกิจจานุเบกษา ๑๔ ตุลาคม ๒๕๕๓

ประกาศกระทรวงสาธารณสุข เรื่อง เลนส์สัมผัส

โดยที่เป็นการสมควรปรับปรุงประกาศกระทรวงสาธารณสุข เรื่อง เลนส์สัมผัส ที่ประกาศ เมื่อวันที่ ๒๐ มีนาคม ๒๕๕๒ เพื่อกำหนดรายละเอียดเกี่ยวกับการบรรจุ ฉลาก เอกสารกำกับ เครื่องมือแพทย์ อาชญากรใช้ ค่าเตือน ข้อห้ามใช้ หรือข้อควรระวังในการใช้ของเลนส์สัมผัสให้มีความเหมาะสม มีความสะดวกในการกำกับดูแล และเพื่อประโยชน์ในการคุ้มครองความปลอดภัยแก่ ผู้บริโภคในการใช้เลนส์สัมผัสทุกประเภท รวมทั้งเป็นการป้องกันการนำเลนส์สัมผัสไปใช้ในทางที่ผิด

อาศัยอำนาจตามความในมาตรา ๔ (๓) มาตรา ๕ มาตรา ๖ (๑) และ (๓) มาตรา ๔๔ และมาตรา ๔๕ แห่งพระราชบัญญัติเครื่องมือแพทย์ พ.ศ. ๒๕๕๑ อันเป็นกฎหมายที่มีบทบัญญัติ บางประการเกี่ยวกับการจำกัดสิทธิและเสรีภาพของบุคคล ซึ่งมาตรา ๒๘ ประกอบกับมาตรา ๓๓ มาตรา ๔๑ มาตรา ๔๓ และมาตรา ๔๕ ของรัฐธรรมนูญแห่งราชอาณาจักรไทยบัญญัติให้กระทำได้ โดยอาศัยอำนาจตามบทบัญญัติแห่งกฎหมาย รัฐมนตรีว่าการกระทรวงสาธารณสุขโดยคำแนะนำของ คณะกรรมการเครื่องมือแพทย์ออกประกาศไว้ดังต่อไปนี้

ข้อ ๑ ให้ยกเลิกประกาศกระทรวงสาธารณสุข เรื่อง เลนส์สัมผัส ลงวันที่ ๒๐ มีนาคม พ.ศ. ๒๕๕๒

ข้อ ๒ เลนส์สัมผัส (Contact Lens) หมายความว่า ผลิตภัณฑ์ที่ผลิตจากโพลีเมอร์ หรือวัสดุอื่น มีลักษณะเป็นแผ่นใช้ครอบบนกระจกตา (Cornea) เพื่อแก้ไขความผิดปกติของสายตา เพื่อรักษาโรค ที่เกี่ยวข้องกับตา เพื่อความสวยงาม หรือเพื่อวัตถุประสงค์อื่น

ข้อ ๓ กำหนดให้เลนส์สัมผัสเป็นเครื่องมือแพทย์

ข้อ ๔ ให้เลนส์สัมผัสเป็นเครื่องมือแพทย์ที่ผู้ผลิต หรือนำเข้าต้องได้รับใบอนุญาต

ข้อ ๕ ให้ผู้รับอนุญาตผลิตหรือนำเข้าเลนส์สัมผัสจัดให้มีฉลากบนภาชนะบรรจุหรือหีบห่อ บรรจุเลนส์สัมผัสที่ขายหรือมีไว้เพื่อขายต่อผู้บริโภคต้องแสดงข้อความภาษาไทยที่อ่านได้ชัดเจน ทั้งนี้ จะมีภาษาอื่นด้วยก็ได้ แต่ข้อความภาษาอื่นนั้นต้องมีความหมายตรงกับข้อความภาษาไทย โดยอย่างน้อย แสดงรายละเอียดดังต่อไปนี้

- (๑) ชื่อเลนส์สัมผัสและวัสดุที่ใช้ทำเลนส์สัมผัส
- (๒) พารามิเตอร์ของเลนส์สัมผัส (contact lens parameter) เช่น กำลังหักเห ขนาดเส้นผ่านศูนย์กลาง รัศมีความโค้ง เป็นต้น
- (๓) ชื่อของสารละลายที่เลนส์สัมผัสแช่อยู่ และระบุรายละเอียดขวดกันเสีย หากมีการใช้
- (๔) ระยะเวลาการใช้งานให้แสดงด้วยตัวอักษรขนาดความสูงไม่น้อยกว่า ๒ มิลลิเมตร ยกเว้นเลนส์สัมผัสชนิดแข็งที่ไม่กำหนดระยะเวลาการใช้งาน
- (๕) เลขที่หรืออักษรแสดงครั้งที่ผลิต
- (๖) จำนวนเลนส์สัมผัสที่บรรจุ
- (๗) เดือน ปีที่หมดอายุ โดยใช้คำว่า “หมดอายุ” หรือ “ต้องใช้ก่อน” หรือข้อความอื่นที่มีความหมายในทำนองเดียวกันกำกับ
- (๘) เลขที่ใบอนุญาตเครื่องมือแพทย์
- (๙) ชื่อ และสถานที่ตั้งของผู้ผลิตหรือผู้นำเข้า แล้วแต่กรณี ในกรณีเป็นผู้นำเข้าให้แสดงชื่อผู้ผลิต เมืองและประเทศผู้ผลิตเครื่องมือแพทย์นั้นด้วย
- (๑๐) ข้อความว่า “ปราศจากเชื้อ” และกรรมวิธีการทำให้ปราศจากเชื้อ กรณีเป็นเลนส์สัมผัสปราศจากเชื้อ โดยอาจแสดงกรรมวิธีการทำให้ปราศจากเชื้อเป็นสัญลักษณ์แทนก็ได้
- (๑๑) ข้อความว่า “ใช้ได้ครั้งเดียว” แสดงด้วยตัวอักษรสีแดง กรณีเป็นเลนส์สัมผัสที่มีวัตถุประสงค์เพื่อใช้งานเพียงครั้งเดียว
- (๑๒) ข้อความว่า “ชนิดใส่และถอดทุกวัน” กรณีเป็นเลนส์สัมผัสที่ต้องใส่และถอดทุกวัน (daily wear)
- (๑๓) ข้อความว่า “โปรดอ่านเอกสารกำกับเครื่องมือแพทย์ก่อนใช้” แสดงด้วยตัวอักษรสีแดง
- (๑๔) ข้อความว่า “การใช้เลนส์สัมผัสควรได้รับการสั่งใช้และตรวจติดตามทุกปี โดยจักษุแพทย์ หรือผู้ประกอบโรคศิลปะโดยอาศัยมาตรฐานศาสตร์เท่านั้น” แสดงด้วยตัวอักษรสีแดง
- (๑๕) ข้อความว่า “ห้ามแบ่งขาย”
- การแสดงข้อความตาม (๔) หากภาชนะบรรจุมีขนาดเล็กไม่สามารถแสดงด้วยตัวอักษรขนาดไม่น้อยกว่า ๒ มิลลิเมตรได้ ให้แสดงด้วยตัวอักษรขนาดน้อยกว่า ๒ มิลลิเมตร แต่ต้องอ่านได้ชัดเจน ทั้งนี้ต้องได้รับความเห็นชอบจากผู้อนุญาต

การแสดงฉลากตาม (๒) (๓) (๕) และการแสดงชื่อผู้ผลิต เมืองและประเทศผู้ผลิตเครื่องมือแพทย์ ในต่างประเทศตาม (๕) หากไม่สามารถแสดงข้อความเป็นภาษาไทย ให้แสดงเป็นภาษาอังกฤษแทนได้ ทั้งนี้ หากการแสดงฉลากตาม (๒) มีการใช้ข้อความหรือคำย่อภาษาอังกฤษหรือสัญลักษณ์กำกับ ให้อธิบายความหมายของข้อความหรือคำย่อหรือสัญลักษณ์นั้น ไว้ในเอกสารกำกับเครื่องมือแพทย์ด้วย

การแสดงเดือนปีที่หมดอายุตาม (๑) หากไม่สามารถแสดงได้ และปรากฏว่ามีคำภาษาอังกฤษ หรือสัญลักษณ์กำกับเดือนปีที่หมดอายุบนภาชนะบรรจุหรือหีบห่อบรรจุ จะแสดงข้อความ “เดือนปีที่หมดอายุให้ดูที่” แล้วตามด้วยคำภาษาอังกฤษหรือสัญลักษณ์นั้นแล้วแต่กรณี แทนก็ได้

กรณีภาชนะบรรจุเลนส์สัมผัสมีขนาดเล็กไม่สามารถแสดงรายละเอียดตาม (๓) (๕) หรือ (๑๔) ข้อหนึ่งข้อใดหรือทั้งหมดบนฉลาก จะขอยกเว้นไม่แสดงบนฉลากก็ได้ ทั้งนี้ ต้องได้รับความเห็นชอบจากผู้อนุญาต

ข้อ ๖ ให้ผู้อนุญาตผลิตหรือนำเข้าเลนส์สัมผัสให้มีฉลากบนภาชนะบรรจุเลนส์สัมผัส ที่มีลักษณะเป็นชิ้นเดี่ยว (individual) หรือเป็นชิ้นเดี่ยวที่ต่อกันเป็นแถบ (blister strip) ซึ่งบรรจุภายในภาชนะบรรจุหรือหีบห่อบรรจุตามข้อ ๕ อีกชั้นหนึ่ง แสดงข้อความบนภาชนะบรรจุเป็นภาษาไทย หรือภาษาอังกฤษ ทั้งนี้จะมีภาษาอื่นด้วยก็ได้ โดยอย่างน้อยแสดงรายละเอียดดังต่อไปนี้

(๑) เลขที่หรืออักษรแสดงครั้งที่ผลิต

(๒) เดือน ปีที่หมดอายุ

(๓) พารามิเตอร์ของเลนส์สัมผัส เช่น กำลังหักเห ขนาดเส้นผ่านศูนย์กลาง รัศมีความโค้ง เป็นต้น

ข้อ ๗ ให้ผู้อนุญาตผลิตหรือนำเข้าเลนส์สัมผัสที่ขายหรือมีไว้เพื่อขายต่อผู้บริโภคให้มีเอกสารกำกับเครื่องมือแพทย์เป็นภาษาไทยที่อ่านได้ชัดเจน และจะมีภาษาอื่นนอกจากภาษาไทย ด้วยก็ได้ แต่ข้อความภาษาอื่นนั้นต้องมีความหมายตรงกับข้อความภาษาไทยโดยอย่างน้อยแสดงรายละเอียดดังต่อไปนี้

(๑) ชื่อเลนส์สัมผัสและวัสดุที่ใช้ทำเลนส์สัมผัส

(๒) พารามิเตอร์ของเลนส์สัมผัส เช่น กำลังหักเห ขนาดเส้นผ่านศูนย์กลาง รัศมีความโค้ง เป็นต้น

(๓) ชื่อของสารละลายที่เลนส์สัมผัสแช่อยู่ และระบุรายละเอียดด้วยกันเสียหากมีการใช้

หน้า ๔๔

เล่ม ๑๒๗ ตอนพิเศษ ๑๒๐ ง ราชกิจจานุเบกษา ๑๔ ตุลาคม ๒๕๕๓

(๔) ชื่อ และสถานที่ตั้งของผู้ผลิตหรือผู้นำเข้า แล้วแต่กรณี โฉมฉลากเป็นผู้นำเข้าให้แสดงชื่อผู้ผลิต เมืองและประเทศผู้ผลิตเครื่องมือแพทย์นั้นด้วย

(๕) วัตถุประสงค์การใช้ วิธีการใช้ และวิธีการเก็บรักษา

(๖) ระยะเวลาการใช้งานให้แสดงด้วยตัวอักษรขนาดความสูงไม่น้อยกว่า ๒ มิลลิเมตร ยกเว้นเลนส์สัมผัสชนิดแข็งที่ไม่กำหนดระยะเวลาการใช้งาน

(๗) คำแนะนำ คำเตือน ข้อห้ามใช้ และข้อควรระวังในการใช้ที่จำเป็นเพื่อความปลอดภัยในการใช้เลนส์ รวมถึงข้อความแสดงรายละเอียดดังต่อไปนี้

(ก) คำแนะนำโดยแสดงข้อความ “การใช้เลนส์สัมผัสควรได้รับการสั่งใช้และตรวจติดตามทุกปีโดยจักษุแพทย์ หรือผู้ประกอบโรคศิลปะโดยอาศัยทัศนมาตรศาสตร์เท่านั้น”

(ข) คำเตือนโดยแสดงข้อความว่า “การใช้เลนส์สัมผัสโดยเฉพาะอย่างยิ่งการใช้ที่ผิดวิธี มีความเสี่ยงต่อการอักเสบหรือการติดเชื้อของดวงตา อาจรุนแรงถึงขั้นสูญเสียสายตาอย่างถาวรได้”

(ค) ข้อห้ามใช้ โดยแสดงข้อความต่อไปนี้

- “ห้ามใส่เลนส์สัมผัสนานเกินระยะเวลาใช้งานที่กำหนด”
- “ห้ามใช้เลนส์สัมผัสร่วมกับบุคคลอื่น”
- “ห้ามใส่เลนส์สัมผัสทุกชนิดเวลานอน ถึงแม้จะเป็นชนิดใส่นอนได้ก็ตาม ควรถอดล้าง ทำความสะอาดทุกวัน”

(ง) ข้อควรระวังในการใช้ โดยแสดงข้อความต่อไปนี้

• “ผู้ที่มีสถานะของดวงตาผิดปกติ เช่น ค้อเนื้อ ค้อลม ตาแดง กระจกตาไวต่อความรู้สึกลดลง ตาแห้ง กระจกตาไม่เต็มที่ไม่ควรใช้เลนส์สัมผัส”

• “ควรใช้น้ำยาล้างเลนส์สัมผัสที่ใหม่ และเปลี่ยนน้ำยาฆ่าเชื้อโรคสำหรับเลนส์สัมผัสทุกครั้งที่ใช้เลนส์สัมผัส และแม้ไม่ใส่เลนส์สัมผัส ควรเปลี่ยนน้ำยาใหม่ในคืนทุกวัน” ยกเว้นเลนส์สัมผัสที่มีระยะเวลาการใช้งาน ๑ วัน

• “ควรเปลี่ยนกลับใส่เลนส์สัมผัสทุกสามเดือน”

• “ไม่ควรใส่เลนส์สัมผัสขณะว่ายน้ำ เพราะอาจทำให้เกิดการติดเชื้อที่ตาได้” หรือ “ห้ามใส่เลนส์สัมผัสขณะว่ายน้ำ เพราะอาจทำให้เกิดการติดเชื้อที่ตาได้” แล้วแต่กรณี ตามที่ผู้ผลิตกำหนด

• “ล้างมือฟอกสบู่ให้สะอาดทุกครั้งก่อนสัมผัสเลนส์”

• “หากเกิดอาการผิดปกติ เช่น เจ็บหรือปวดตาเป็นอย่างมากร่วมกับอาการแพ้แสง คันวุ้น น้ำตาไหลมากหรือตาแดง ให้หยุดใช้เลนส์สัมผัสทันที และรีบพบจักษุแพทย์โดยเร็ว”

• “ห้ามใช้เลนส์สัมผัสที่ภาชนะบรรจุอยู่ในสภาพชำรุดหรือถูกเปิดก่อนใช้งาน”
หรือข้อความอื่นที่มีความหมายในทำนองเดียวกัน

ข้อ ๘ ให้ผู้รับอนุญาตผลิตหรือนำเข้าเลนส์สัมผัสเพื่อการผลิตหรือแบ่งบรรจุ จัดให้มีฉลากภาษาไทย หรือภาษาอังกฤษอย่างน้อยแสดงรายละเอียดดังต่อไปนี้

- (๑) ชื่อเลนส์สัมผัสและวัสดุที่ใช้ทำเลนส์สัมผัส
- (๒) เลขที่หรืออักษรแสดงครั้งที่ผลิต
- (๓) จำนวนเลนส์สัมผัสที่บรรจุ
- (๔) เดือน ปีที่หมดอายุ
- (๕) เลขที่ใบอนุญาตเครื่องมือแพทย์
- (๖) ชื่อและประเทศผู้ผลิต

ข้อ ๙ ผู้รับอนุญาตนำเข้าเลนส์สัมผัสจะไม่จัดทำฉลากเป็นภาษาไทยที่ภาชนะบรรจุหรือหีบห่อบรรจุ ให้ถูกต้องแล้วเสร็จก่อนขายตามข้อ ๕ ในขณะที่นำเข้าที่ด่านตรวจสอบเครื่องมือแพทย์ที่รัฐมนตรีกระทรวงสาธารณสุขประกาศกำหนดก็ได้ แต่ต้องจัดทำฉลากให้ถูกต้องแล้วเสร็จก่อนนำออกขายภายในเวลา ๓๐ วันนับแต่พนักงานเจ้าหน้าที่ได้ตรวจสอบปล่อยให้นำเข้า

ข้อ ๑๐ ให้ผู้รับอนุญาตผลิตหรือนำเข้าเลนส์สัมผัส จัดทำรายงานการผลิต นำเข้าและขายเลนส์สัมผัส คมหลักเกณฑ์ วิธีการ และเงื่อนไขที่ผู้อนุญาตประกาศกำหนด

ข้อ ๑๑ ผู้จดทะเบียนสถานประกอบการที่ได้ยื่นขออนุญาตผลิตหรือนำเข้า เลนส์สัมผัส ความประกาศกระทรวงสาธารณสุข เรื่อง เลนส์สัมผัส อยู่ก่อนวันที่ประกาศนี้ใช้บังคับและ ยังไม่ได้รับใบอนุญาต ให้ถือว่าเป็นผู้ยื่นคำขออนุญาตผลิตหรือนำเข้าเลนส์สัมผัสตามประกาศฉบับนี้ แต่ต้องมาแก้ไขเปลี่ยนแปลงรายการในคำขอให้มีการทะเบียนถูกต้องตามประกาศฉบับนี้ภายในสามสิบวันนับแต่วันที่ประกาศนี้ใช้บังคับ และให้ฉลากเดิมยังคงใช้ได้ต่อไปภายในเวลาหนึ่งร้อยแปดสิบวันนับแต่วันที่ได้รับใบอนุญาต

ข้อ ๑๒ ให้ผู้รับอนุญาตผลิตหรือนำเข้าเลนส์สัมผัสอยู่ก่อนวันที่ประกาศนี้ใช้บังคับมายื่นขอแก้ไขเปลี่ยนแปลงรายการที่ได้รับอนุญาตให้มีการทะเบียนถูกต้องตามประกาศฉบับนี้ภายในสามสิบวันนับแต่วันที่ประกาศนี้ใช้บังคับ และให้ฉลากเดิมที่ได้รับอนุญาตเดิมยังคงใช้ได้ต่อไปภายในเวลาหนึ่งร้อยแปดสิบวันนับแต่วันที่ได้รับอนุญาตให้แก้ไขเปลี่ยนแปลงรายการ

ข้อ ๑๓ ประกาศนี้ให้ใช้บังคับนับแต่วันถัดจากวันประกาศในราชกิจจานุเบกษาเป็นต้นไป

ประกาศ ณ วันที่ ๓๑ สิงหาคม พ.ศ. ๒๕๕๓

จурินทร์ ตักณวิสิษฎ์

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