

The use of contact lenses among university students in Chengdu: Knowledge and practice of contact lens wearers

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ABSTRACT

Purpose: To assess the prevalence and general knowledge of contact lens wearers among college students in Chengdu, a metropolitan of China and find out the routine habits of use and hygienic conditions when wearing contact lenses.

Method: The questionnaire was distributed to 1,600 ametropic participants who were from 8 different universities. Data about demographics, general contact lens handling habits, personal attitudes, hygiene behaviors and eye health conditions were collected. We made the analysis of the demographics and wearing of contact lenses. Possible reasons for behaviors related to the care of contact lenses were analyzed.

Results: The prevalence of contact lens use was 19.80%. Most users (82.15%) were females. An aesthetic effect was cited as the first reason for using (57.91%). The comfort of eyes was the first consideration (75.76%) when buying. To keep clean and use safe, 86.20% subjects washed hands before handling and 83.50% cleaned the lens carefully after removing. There was significant difference between males and females regarding the replacement of the solution ($p = 0.014$). 32.66% wears knew the removal of protein deposits. A total of 54.88% were not informed of the potential complications of contact lens. The incidence of ocular discomfort was 44.78%. Only 3.03% of the students paid regular visits to ophthalmic clinics.

Conclusion: The prevalence of contact lenses was relatively low in Chengdu. The wears had limited knowledge about using and care of contact lens. More education on standard lens wear and care should be provided to wearers.

1. Introduction

Contact lenses provide an effective and convenient means of refractive error correction. The undercorrected refractive errors could lead to visual impairment and blindness [1]. More than 140 million people around the world wear contact lenses [2]. Multiple and significant corneal changes can occur after wearing contact lenses and these changes vary with specific lens styles (i.e., various contact lens materials and wearing patterns) [3]. Because of close association with the ocular surface and direct interactions with the corneal, limbal, bulbar, tarsal conjunctival epithelia and the tear film, contact lenses can lead to noninfectious and infectious complications [4] such as dry eye [5], keratitis [6], corneal inflammation [7], and corneal allergic reactions. These adverse effects vary in severity from being clinically inconsequential to potentially vision-threatening.

Corneal inflammation occurs in approximately 7–15% of contact lens wearers [8]. Corneal infection is a rare, but severe, complication of

contact lens wear, affecting 4 of 10,000 wearers per year, with higher rates (2 per 1000 per year) in overnight lens users [9]. Compared with extended-wear contact lens, lower rates of severe keratitis and vision loss have been reported with daily disposable type [10]. In a survey of contact lens wearers in the United States, nearly one-third had experienced a contact lens-related condition requiring a doctor's visit [2]. In Asia, one study reported that the prevalence of contact lens use was approximately 37.8% among Japanese high school students [11]. However, there are almost no related studies in China, which also lacks contact lens education. To investigate the use rate and knowledge level of contact lenses in younger generations, and to guide the complication prevention efforts, a population-based survey was conducted among college students in eight different universities in Chengdu, which is the capital city of Sichuan Province as well as the biggest metropolitan area in the southwest region of China.

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2. Methods

2.1. Study design

The questionnaires (shown in supplementary) included 21 questions about habits and hygiene behaviors were handed out by professionally trained investigators. The interpretation of the questions was also checked for similarity across both English and Chinese.

To eliminate inappropriate answers and reduce the margin of error, the interviewers only provided explanations about the purpose and main content of the study to the participants before the study. The whole process did not involve any suggestive or leading question. All of the interviewees filled out the questionnaires independently. This study collected data related to the demographics, clinical characteristics of the patients, and relevant lifestyle habits using the questionnaire. The study protocol was approved by the Human Research Ethics Committee, West China Hospital of Sichuan University, and was carried out in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants before the start of the study. The collected data were analyzed with SPSS v. 21.0 software. Chi-square test was used to test the differences in practices of lens care between males and females. To evaluate the relationship between caring behaviors and ocular discomforts, a contingency analysis (i.e., a crosstable) was conducted.

2.2. Study recruitment

There are 5 key universities (145,000 students), 14 normal universities (260,000 students) and 4 colleges (52,000 students) in Chengdu. According to the different number of students in the three different classes of universities, the percentage of the selected students from three different classes of school is 37.5%, 50%, and 12.5%, respectively. Based on the sample size formula, the minimum sample size was 1067 when the confidence interval was 95% and the sampling error was not more than 3%. The study was conducted at eight universities, including two key universities (Sichuan University; University of Electronic Science and Technology of China), four normal universities (Southwest Jiaotong Universities; Southwest University for Nationalities; Sichuan Normal University; Sichuan Conservatory of Music), and two colleges (Chengdu University of Technology and Chengdu Polytechnic). It was based on the proportion of universities of these three different classes to select number of universities in tertiary schools. Participants with different majors (e.g., literature, art, engineering, business, medicine, law, and science) in the selected schools who were between 17 and 25 years old were invited to take part in the study. To confirm that respondents were ametropic, they all wore spectacles habitually or had a history of the use of spectacles for at least six months for refractive correction. As for the contact lens wearers, this study included any students who had used lenses at least once for any period time and for whatever reason in the recent year. In line with the percentage of the selecting number in different universities, 200 students in each selected school were interviewed to facilitate the selection of the number of samples so that the total number of participants was 1600.

2.3. Questionnaire

Based on the questionnaires from other similar studies [12,13], the questionnaire used in this study was modified and completed with the help of experts in contact lens area. The final questionnaire queried the general attitude toward contact lens, knowledge of contact lens use, habits of using contact lens, hygiene conditions when caring for the lenses and common sense of complications. In detail, the questionnaire included a wide range of questions about gender, major, reasons for using contact lenses, purchasing situations, the type of lens worn, the duration of wearing the lenses, daily use hours, cleaning after removing

the lens from eye, the practice of using enzyme tablets to remove protein, changing storage solution every day, the times when the lens wearer felt uncomfortable, and the frequency of visiting ophthalmologists or eye care practitioners for routine examinations.

3. Results

Of 1600 distributed questionnaires, 1500 were completed. The response rate was 93.75%: 73 respondents did not answer the questions fully, and 27 questionnaires were unreturned.

3.1. Demographic characteristics

Among the 1500 students, only 297 were contact lens users within the age range from 17 years to 25 years, which revealed the prevalence of contact lens use was 19.80% and the 95% confidence interval was 17.78–21.82%. Therefore, the ratio of contact lens users to nonusers was approximately 0.25:1. There were 53 male contact lens users and 244 female users. The difference was statistically significant ($p < 0.001$, $X^2 = 24.556$). Most respondents (75.8%) thought the comfort of wearing the contact lenses was the most important factor when buying contact lenses. Regarding academic levels, the distribution of the contact wearers was as follows: 42.09% from key universities, 49.84% from normal universities, and only 8.08% from technical universities or colleges, respectively.

3.2. Analysis of contact lens wear

The percentage distribution of the reasons for the most important reasons for contact lens use is shown in Fig. 1. Regarding types of contact lenses, most wearers used soft contact lenses. The rest of them made other choices (e.g., rigid gas permeable contact lenses and orthokeratology). Except for a small number of users (41), most had no idea about the necessity to change their contact lenses based on a set schedule. The remaining subjects knew about replacement. Among these users, 43.75% chose monthly disposable soft contact lenses, followed by 28.91% of individuals changing their contact lenses every half-year. Also, 10.55% students wore the conventional yearly replacement lenses, 8.98% wore the quarter-yearly (three months) lenses, and 2.73% wore daily lenses.

When asked how they first heard about contact lenses, some students came to know about contact lenses first through the mass media

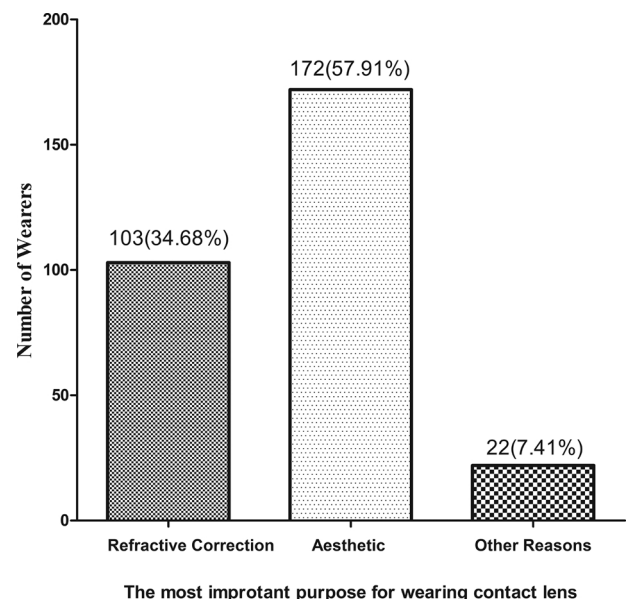


Fig. 1. The most important purpose of wearing contact lens.

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