Awareness about wear and care of contact lenses among undergraduate medical students

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ABSTRACT

This study aims to assess among the undergraduate medical students the knowledge about wear and care of contact lens and also to highlight their awareness about complications of inappropriate contact lens use. A pretested semi-structured questionnaire conducted the study. Fifty students were selected from each year to come up with a sample size of a total of 200 undergraduate medical students. Questions about the use of contact lens, hygienic practices in contact lens use and also complications related to contact lens usage were asked in the questionnaire. Out of 200 students surveyed, only 31 participants were wearing contact lens. It was observed that in our study, 54.84% of students were using contact lens for refractive error, 29.03% for cosmetic purpose and 16.13% for convenience. 66.5% of students did not know about overwear syndrome. 36.5% of students were aware that Pseudomonas is most commonly involved in contact lens-related ulcers. 73.79% spectacle users stated that they are convenient with spectacles preferably than a contact lens. About 53% of students gained knowledge about contact lens through friends and family. A good number of students were aware of most of the hygienic practices of contact lens and complications related to contact lens wear. However, education about do’s and don'ts regarding contact lens should also be taught to medical students during Ophthalmology postings to make them aware of complications of contact lens usage.

INTRODUCTION

Contact lenses are thin optical corrective devices worn on the eyes, resting on the surface of the cornea (Collins and Carney, 1986). They cling to the tear film over the cornea due to surface tension. Contact lenses are devices that can be worn for refractive correction and also for cosmetic and other therapeutic purposes (Bui et al., 2010). Contact lenses have been accepted more among adolescents, mostly of schools and colleges. Contact lenses increase the field of clear vision and also obliterate the prismatic effects of spectacles. The most likely reason for the popularity of contact lens usage is quite many choices that are accessible, not only in lens type and materials used but also in availability at a large number of locations in the country at much affordable rate compared to the past (Bowden and Harknett, 2006).

Throughout the world, it was found that 125 million people use contact lenses accordingly to a survey in 2004 (Dumbleton et al., 2011). In the U.S., an estimate of 45 million people wears contact lens.
Two-thirds of contact lens wearers are female (Cope et al., 2017). According to a report given in 2016, globally, the average age of contact lens wearers is 31 years (Morgan et al., 2013). Despite the considerable advancement of the contact lens, people are not entirely sensible about the various advantages and disadvantages of contact lens (Szczotka-Flynn et al., 2010). The most common complications experienced by contact lens wearers are dry eyes, giant papillary conjunctivitis, corneal abrasion, corneal oedema, corneal ulcer, keratitis and neovascularization (Wu et al., 2000). In the rising generation, knowledge about complications of contact lens wear is absent, and 87% of users opted for contact lens despite related ocular problems (Roberts et al., 2005). Sound knowledge in ocular health education, especially about proper and cautious practice regarding contact lens wear can obviate complications that may arise from the failure of proper use of contact lens. One of the ways of analyzing this is from the person's viewpoint regarding his knowledge about contact lens wear (de Oliveira et al., 2003).

Comparing the students who study in other fields, medical students are expected to have superior knowledge about contact lens as they have studied anatomy and basic physiology of eyes (Ijaz et al., 2017). So the study is conducted among undergraduate medical students who are the upcoming health care providers ascertaining whether they have adequate knowledge about proper usage of contact lens and make them informed about the complications that can develop from contact lens wear (Tajunisah et al., 2008).

METHODOLOGY

Study design
A cross-sectional study.

Sampling method
Random sampling.

Sample size
50 students from each year were included in the study to avail with a sample size of 200 undergraduate medical students.

Study setting and population
The study was conducted among undergraduate medical students studying at Saveetha Medical College during the period of 15th February to 15th March 2020. A total of 200 students were selected, and the study was conducted by getting informed consent from the students.

Inclusion criteria
All male and female students were studying in all years, in the age group of 18-25 years who are willing to participate.

Exclusion criteria
Students who are on leave and who are unwilling to participate

Study tool
Semi-structured pretested questionnaire.

RESULTS

Out of 200 students surveyed, 90 were male, and 110 were female participants. Among 200 undergraduate students, only 31 (15.5%) students were using contact lens, 103 (51.5%) are wearing spectacles and 66 (33%) students use neither of the two which is shown in Table 1. It was observed that in the study among the contact lens users 17 (54.84%) were using contact lens for refractive correction, 9 (29.03%) wore it for cosmetic purpose while 5 (16.13%) were using for convenience. Most of the contact lens users 10 (32.26%), included in the study wear contact lens for 1-2 years, 8 (25.81%) since 2-5 years, 6 (19.35%) for six months-1 years, 4 (12.90%) for more than five years and 3 (9.68%) for less than six months. The duration of usage varied with a maximum of 18 (58.07%) students use contact lens for 8-12 hours followed by 5 (16.13%) for 14-18 hours, 4 (12.90%) use for 14-18 hours while only 4 (12.90%) use for more than 18 hours.

Of the 200 students who responded, 187 (93.5%) students were sure about using contact lens solution for cleaning contact lens, and 131 (65.5%) students stated that normal duration of wear of contact lens is 8-12 hours. Evaluation of students' knowledge towards contact lens hygiene is tabulated in the Table 2.

Concerning their knowledge about the variety of contact lens and their purpose of service, only a
Table 1: Distribution among study participants based on usage

<table>
<thead>
<tr>
<th>Which among the following do you use?</th>
<th>Number of responses N= 200</th>
<th>Overall percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact lens</td>
<td>31</td>
<td>15.5%</td>
</tr>
<tr>
<td>Spectacles</td>
<td>103</td>
<td>51.5%</td>
</tr>
<tr>
<td>None of the above</td>
<td>66</td>
<td>33%</td>
</tr>
</tbody>
</table>

Table 2: Evaluation of students’ knowledge towards contact lens hygiene

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is it necessary to wash your hands thoroughly before wearing contact lens?</td>
<td>183(91.5%)</td>
<td>8(4%)</td>
<td>9(4.5%)</td>
</tr>
<tr>
<td>Is it necessary to wash your hands thoroughly before removing the contact lens?</td>
<td>181(90.5%)</td>
<td>7(3.5%)</td>
<td>12(6%)</td>
</tr>
<tr>
<td>Is it necessary to rinse the contact lens before and after use?</td>
<td>141(70.5%)</td>
<td>28(14%)</td>
<td>31(15.5%)</td>
</tr>
<tr>
<td>Is it necessary to Change the contact lens storage solution daily?</td>
<td>115(57.5%)</td>
<td>37(18.5%)</td>
<td>48(24%)</td>
</tr>
</tbody>
</table>

few of 23(11.5%) students answered that the therapeutic contact lens is used for therapeutic purpose. A good number of 155(77.5%) students answered that coloured contact lens is preferred for cosmetic purpose. For correction of keratoconus, 43% students had replied that the preference is the usage of a rigid gas permeable lens, 20.5% for therapeutic contact lens, 21.5% for rose K lens and 15% for a scleral lens. 126(63%) students responded that silicone hydrogel lens is the most preferred advanced contact lens nowadays.

A majority of 66.5% of students were unaware of an over-wear syndrome, only 33.5% knew about it. About 36.5% of students were aware that Pseudomonas aeruginosa is the most common infective organism in contact lens-related ulcers. The expertise of students about the complications of contact lens wear is tabulated in the Table 3.

A high percentage of the respondents had rightly responded regarding complications. About 47%, 59.5% and 67% stated that corneal vascularization, corneal ulcer and allergic conjunctivitis are complications of wearing contact lenses respectively. On the other hand, 31.5% of students were sure that corneal distortion might occur due to contact lens wear, 14.5% of students contradicted the statement, and a majority of 54% students confessed that they don’t know whether contact lens wear can lead to corneal distortion or not. Among the signs of complication, 49% of students have chosen irritation as the first sign, followed by 27.5% for redness, 17.5% for itching and 6% for pain. 40.5% of students were not certain whether contact lens wear can lead to blindness or not, whereas 40% of students mentioned that loss of vision could occur due to contact lens wear and a minimum of 19.5% students stated that blindness could not occur from contact lens wear. 113(56.5%) students replied that they would suggest contact lens to others, and 87(43.5%) replied that wouldn’t recommend.

A more significant part of spectacle users 73.79% among the study participants mentioned that they are convenient with spectacles rather than using contact lens and 38.84% of spectacle users stated fear of side effects as their reason for preference of spectacles over contact lenses. 27.19% of spectacle users were solely not interested in wearing contact lens, 10.68% of spectacle users mentioned high cost as the barrier from using contact lens and lack of information had played a role among 4.85% of spectacle users by prompting them to go with spectacles. Table 4 represents the reason for spectacles users for non-usage of contact lens.

About 53% of respondents came to know about contact lens through family and friends, 48.5% of students came across through internet or media, 34% from eye care providers, 25.5% from books and 8.5% students obtained information regarding contact lens from other sources. Source of information on contact lens among the participants is tabulated below in Table 5.

DISCUSSION

The contact lens has been used for more than a century for refractive correction, cosmetic purpose and
Table 3: Knowledge about complications of contact lens wear

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is corneal vascularization, a...</td>
<td>94(47%)</td>
<td>18(9%)</td>
<td>88(44%)</td>
</tr>
<tr>
<td>Is corneal ulcer, a complication of...</td>
<td>119(59.5%)</td>
<td>16(8%)</td>
<td>65(32.5%)</td>
</tr>
<tr>
<td>Is allergic conjunctivitis, a...</td>
<td>134(67%)</td>
<td>18(9%)</td>
<td>48(24%)</td>
</tr>
<tr>
<td>Can wearing contact lens lead to...</td>
<td>63(31.5%)</td>
<td>29(14.5%)</td>
<td>108(54%)</td>
</tr>
<tr>
<td>Can complications due to contact lens...</td>
<td>80(40%)</td>
<td>39(19.5%)</td>
<td>81(40.5%)</td>
</tr>
<tr>
<td>Which among the following is the...</td>
<td>Pain</td>
<td>Redness</td>
<td>Irritation</td>
</tr>
<tr>
<td></td>
<td>12(6%)</td>
<td>55(27.5%)</td>
<td>98(49%)</td>
</tr>
</tbody>
</table>

Table 4: The reason for the preference of spectacles over the contact lens

<table>
<thead>
<tr>
<th>Reason for the preference of spectacles over CL among spectacle users</th>
<th>Number of responses N = 103</th>
<th>Overall percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of information</td>
<td>5</td>
<td>4.85%</td>
</tr>
<tr>
<td>High cost</td>
<td>11</td>
<td>10.68%</td>
</tr>
<tr>
<td>Fear of side effects</td>
<td>40</td>
<td>38.84%</td>
</tr>
<tr>
<td>Convenient with specs</td>
<td>76</td>
<td>73.79%</td>
</tr>
<tr>
<td>Not interested</td>
<td>28</td>
<td>27.19%</td>
</tr>
</tbody>
</table>

Table 5: A source of knowledge about contact lens

<table>
<thead>
<tr>
<th>Source of information</th>
<th>Number of Responses N = 200</th>
<th>Overall percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet/media</td>
<td>97</td>
<td>48.5%</td>
</tr>
<tr>
<td>Family and friends</td>
<td>106</td>
<td>53%</td>
</tr>
<tr>
<td>Eye care provider</td>
<td>68</td>
<td>34%</td>
</tr>
<tr>
<td>Books</td>
<td>51</td>
<td>25.5%</td>
</tr>
<tr>
<td>others</td>
<td>17</td>
<td>8.5%</td>
</tr>
</tbody>
</table>

for treating corneal pathologies. Advancement in production technologies and usage of finer material has paved the way for its increased usage in recent years. Knowledge about contact lens wear, care, hygiene and complications among medical students is essential. Contact lens is broadly classified into soft and hard lenses. However, soft lenses are more comfortable to wear than hard lenses.

There are only a few articles published about contact lens usage prevalence and pattern in our country, even though many young adults wear the contact lens. Contact lens is used for many purposes among students. Out of 200 medical students surveyed, 31 were using contact lens. Therefore the prevalence of contact lens wearers is 15.5% in our study which is much lower than a similar study reported by Vidotti and Kamegasawa (2006) from Brazil in which the prevalence is 27.4%. Contact lenses are prescribed for the treatment of refractive errors, anisometropia, nystagmus, keratoconus, and unilateral aphakia and also for a cosmetic purpose Mannis et al. (2004). In this study, a majority of 54.84% students were using contact lens for refractive purpose, and 29.03% were used for cosmetic purpose, and few of 16.13% of students were wearing for convenience purpose. While in a study conducted by Taju-nisah et al. (2008), only 14.10% students wear contact lens for refractive correction and 43.80% students wear for cosmetic purpose and 23.10% students wear contact lens for convenience which is in contrast to the results of our study. Whereas, in a
study conducted by Ijaz et al. (2017), 42% students use contact lens for refractive purpose and 31% wear contact lens for a cosmetic purpose which is more or less coincides with the results of our study.

In the present study, 58.07% of students wore contact lens for 8-12 hours a day. This observation coincides with the results of the study conducted by Tajunisah et al. (2008) in which 65.55% of students were using contact lens for 8-12 hours a day. Also, in a study conducted by Giri et al. (2012) 65.5% of students wore contact lens for 10-12 hours per day which is nearly similar to our study. A study was done by Mahadevan et al. (2014) in Karnataka, among the contact lens users, 33% students had been wearing contact lens for less than one year however in our study 32.26% students had been wearing contact lens since 1-2 years which shows the prevalence of increased hours of wear of contact lens among students.

Most of the ophthalmologists suggest that contact lens has to be cleaned daily using contact lens solution, and the lens has to be replaced for at least every 90 days. Amidst the contact lens users, 77.42% students reported that they clean contact lens daily which is lesser than the results reported by Ijaz et al. (2017) in their study that 98% students clean their contact lens daily. In the study, 93.55% students washed their hands before handling contact lenses, which slightly higher than the study conducted by Tajunisah et al. (2008) stating that 90.9% students wash their hands before handling contact lens. (Ijaz et al., 2017) Reported that 89% of students wash their hands before handling the contact lens, which is lower than in our study.

As there is a high potential for contamination by pathogens, it is vital to change the contact lens solution daily. Moreover, storage of contact lens for a long time without changing the solution can lead to multiplication of pathogens and their further adherence to the contact lens making it a relatively good vector for causing infection in the eyes upon wearing those (Feys, 2004). In the current study, 74.19% of students change their contact lens solution daily. A study was done by Tajunisah et al. (2008) 79.3% of students reported that they change contact lens solution daily. The results of both the studies mentioned above were almost similar to each other.

Overwear syndrome is also a source for causing bacterial keratitis in addition to poor hygiene, contamination of storage case and contamination of lens solution, stated in another study by Smith and Orsborn (2012). In our study among 200 students surveyed, only 33.5% of students were aware of overwear syndrome, 66.5% of students did not know about it. (Mahadevan et al., 2014) concluded that 52.38% of students were not aware of overwear syndrome; only 27% knew about it. Also, in a study by Kumar et al. (2017) 34% of students were aware of overwear syndrome while 66% were not. On comparing the results of the above-mentioned two studies with the current study, the outcome of both studies corresponds to the present study portraying that only a few numbers of medical students were aware of overwear syndrome. Meanwhile, in a study by Giri et al. (2012), nearly half of students, 46.55% were aware of overwear syndrome contradicting the above statement.

In our study, 36.5% of students were apprehensive that Pseudomonas is commonly involved in contact lens-related corneal ulcers. (Tajunisah et al., 2008) Reported that 67.8% of students were aware of Pseudomonas as the commonest organism involved in corneal ulcers. Awareness about corneal ulcer is relatively higher in the latter than in the earlier. In our study, 47%, 59.5% and 67% appreciated that corneal vascularization, corneal ulcer and allergic conjunctivitis are complications from wearing contact lens, however, in a study conducted by Khan et al. (2013) only 7%, 18% and 4% were aware of corneal vascularization, corneal ulcer and allergic conjunctivitis as complications of contact lens usage. This shows that a more significant percentage of students in our study had a sound knowledge about complications of contact lens compared to the study above. In the study, 54% of students didn’t know that wearing contact lens can lead to corneal distortion which is almost congruent with results 42% reported by Khan et al. (2013). 40% students were sure that complications from wearing contact lens could lead to blindness which is slightly lower than (Khan et al., 2013) where a majority of 50% students were sure that loss of vision could occur due to complications from a contact lens.

Among the students using spectacles, about 73.79% of students mentioned that they feel convenient with spectacles rather than going for a contact lens. Considering that, in a study by Pascal et al. (2017) only a fewer of 18.3% spectacle users stated that they are convenient with spectacles rather than wearing contact lens but a majority of spectacle users 47.5% stated that they are afraid of the side effects from wearing contact lens. In our study, 38.84% of spectacle users mentioned their fear of side effects as a reason for opting spectacles over the contact lens. This shows that in our study, the fear of side effects from contact lens usage is comparatively lesser than a study by Pascal et al. (2017) among the spectacle users. About 53% of medical students gained knowledge about contact lens from
their friends and family, which is in concordance with the study 56% conducted by Khan et al. (2013). This study would validate the appropriate measures to be taken for bringing awareness about the contact lens and also to train how to use and maintain contact lenses.

CONCLUSION

The main objective of the study was to evaluate awareness among the medical students about the practice of contact lens, care and maintenance and prevent complications due to contact lens usage. Lack of knowledge about contact lens can lead to severe complications like corneal opacities, vascularization and corneal ulcer. In our study, nearly half of the students were aware of safe, hygienic practices and complications of contact lens. We conclude that knowledge about wear and care of contact lens among the users alone cannot reduce the complications and risks from contact lens usage. Inadequate knowledge about the practice and care of contact lens among educated and knowledgeable people like medical students is necessary to reduce the risk and complications associated with contact lens. Hence there is a need for creating awareness about contact lens among the consumers as well as the medical students who are the future practitioners in such a way that the incidence of ocular complications will be reduced among the contact lens users.

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Ethical consideration

Before the commencement of the study, the Institution Review Board of Saveetha University has approved our protocol, later grant sanction form was obtained from HOD's of the all departments in Saveetha Medical College. Students were informed about the study, and prior instructions were given, and the study was conducted after getting informed consent from the students.

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The authors declare that they have no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES


