

## Knowledge and Practice of Spectacles and Contact Lens wear to Correct Refractive Errors Among Medical Students of National Defence University of Malaysia

### ABSTRACT

**Objective:** The objective of this research was to assess the understanding and behavior of medical students at the National Defence University of Malaysia regarding the use of spectacles and contact lenses for correcting refractive errors. This was achieved through the administration of a survey questionnaire.

**Methods:** A cross-sectional study using a questionnaire was conducted over the course of one academic year, involving medical students from the first to fifth year. The questionnaire gathered socio-demographic information, knowledge about refractive errors, methods of vision improvement, as well as knowledge and usage of spectacles and contact lenses. Prior to distributing the questionnaire, the purpose of the study was explained to the students and their written consent was obtained. The questionnaire was then distributed at the end of lectures, on different days for each year. The data collected was analyzed using SPSS version 24 software, calculating frequencies for all variables.

**Results:** A total of 205 medical students from different years participated in the study. The majority of participants were male (59.5%), Malays (65.9%), and military cadets (74.1%). Out of the 201 students who responded to the questions about refractive errors, 63.7% were aware of such errors and 51.7% knew about various treatment options to improve vision. Of the participants, 36.3% wore glasses, and among them, only 8% were aware of alternative treatments such as contact lenses and laser treatment as an alternative to wearing spectacles. Family history revealed that 41 families had a history of wearing glasses, and 15.1% of students were informed about lazy eye. When given the choice, 45.2% preferred to continue wearing spectacles, while only 20.5% opted for contact lenses.

Among the participants, 10.9% wore contact lenses for a period ranging from 6 months to 5 years. Among these students, 63.6% were informed about the complications associated with contact lens wear, and 86.4% practiced handwashing before wearing contact lenses. However, only 68.2% cleaned their contact lenses with prescribed solutions. A small percentage (22.7%) admitted to sleeping with contact lenses, while 59.9% discontinued using contact lenses after experiencing eye problems. The main reason for using contact lenses was increased comfort during military training, outdoor activities, and sports. Factors influencing the choice of contact lenses included comfort, cost, ease of maintenance, and cosmetic purposes.

**Conclusion:** The study revealed that only 36% of medical students wore spectacles, while 11% used contact lenses. The students demonstrated good knowledge about refractive errors, but poor in awareness of their treatment options. The knowledge of contact lenses was good. However, there was a lack of proper care and compliance among many students who used contact lenses, which increases the risk of complications. It is crucial to emphasize education and improve communication when prescribing contact lenses in order to enhance compliance and reduce the occurrence of contact lens-related complications.

**Keywords:** Refractive errors, knowledge, practice, spectacles, contact lenses.

### INTRODUCTION

Refractive errors are a common eye disorder that occur when the eye is unable to focus the image of an object clearly. This condition leads to blurred vision, which can sometimes cause visual

impairment of varying degrees. According to the World Health Organization (WHO), an estimated 153 million people worldwide suffer from visual impairment due to uncorrected refractive errors such as myopia, hypermetropia, and astigmatism. This number does not include individuals with uncorrected presbyopia, which is difficulty in reading or seeing at a close distance. Uncorrected refractive errors, along with cataracts, are the leading causes of vision impairment and blindness. These conditions can affect people of all ages, but the impact is particularly significant when it affects young individuals, resulting in substantial financial burden and productivity losses on a global scale [1].

The "Vision 2020: The Right to Sight" initiative by WHO aims to eliminate avoidable causes of visual impairment, with the correction of refractive errors being one of the key targets [2]. Failure to correct refractive errors can significantly decrease the quality of life for millions of individuals, regardless of their age, gender, or ethnicity. Thankfully, refractive errors can be easily detected, diagnosed, and measured. They can also be corrected through the use of optical devices like eyeglasses and contact lenses, or through surgical procedures such as laser assisted in situ keratomileusis (LASIK) and small incision lenticule extraction (SMILE). The choice of correction method depends on various factors, including availability, affordability, nature of work or profession, socio-economic status, and personal preferences. It is up to the individual or their eye care provider to make the appropriate selection based on these factors [3].

A literature search revealed only two studies on the knowledge and practice of contact lenses and their care among medical students from two universities in Malaysia [4,5]. Similarly, there were no studies on the knowledge and practice of wearing spectacles among medical students in Malaysia. Therefore, this study aims to determine the percentage of medical students at the National Defence University of Malaysia who wear spectacles or contact lenses, as well as their knowledge and practice regarding these corrective measures for refractive errors. This will be done through a survey questionnaire.

## **MATERIAL AND METHODS**

A cross sectional study was conducted among medical students at the Faculty of Medicine and Defence Health, National Defence University of Malaysia, over the course of one academic year. The study utilized a self-administered questionnaire that was adapted from a previous study conducted in Malaysia [4], with some minor modifications to wording and format. The questionnaire consisted of several sections, including socio-demographic data of the students (Part A), knowledge about refractive errors and methods for improving vision (Part B), knowledge and practices regarding spectacles (Part C), and knowledge and practices regarding contact lenses (Part D).

Before the main study, a pretest of the questionnaire was conducted with a group of ten ophthalmology students from the previous academic year. Prior to their participation, the purpose of the study was explained to them, and written consent was obtained from each student. They were assured that their anonymity and the confidentiality of their responses would be maintained. All students agreed to participate, and the questionnaire was distributed to them at the end of different lectures on separate days, depending on their academic year. After completing Parts A and B of the questionnaire, students who wore spectacles were asked to answer Part C questions, while those who wore contact lenses were asked to answer Part D questions. The data collected from the questionnaires were entered into SPSS software for analysis. Frequencies were calculated for all variables in order to examine the distribution of responses.

## **RESULTS**

The study involved a total of 205 medical students across various academic years. The majority of the participants were males, accounting for 59.5% of the total. The age range of the participants was between 20 and 24 years, with an average age of 22.4 years. In terms of ethnicity, Malays constituted the largest portion, comprising 65.9% of the participants. Additionally, a significant

majority of the participants, 74.1%, were military cadet officers. Among the medical students, those in their fourth year represented the largest group, accounting for 25.9% of the participants, as shown in Table 1.

**Table 1. Socio-demographic characteristics of study participants (N=205)**

Variables	Number	Percentage (%)
<b>GENDER</b>		
Male	122	59.5%
Female	63	40.5%
<b>MBBS COURSE</b>		
Year 1	43	21.0%
Year 2	36	17.5%
Year 3	40	19.5%
Year 4	53	25.9%
Year 5	33	16.1%
<b>RACE</b>		
Malay	135	65.9%
Chinese	29	14.1%
Indian	41	20.0%
<b>TYPE OF STUDENT</b>		
Military cadet	152	74.1%
Civilian	53	25.9%

Among the total of 205 participants, a comprehensive response to the inquiries regarding refractive errors was received from 201 individuals, whereas 4 students provided incomplete responses. As a result, the incomplete responses were not considered in the analysis. The response rate achieved was 98%. It is noteworthy that approximately two-thirds of the students (63.7%) possess knowledge about refractive errors. However, only 48.7% of the students are aware of the different types of refractive errors, and 51.7% have knowledge about various treatment options to enhance their vision, refer to Table 2.

**Table 2: Knowledge of refractive errors (n=201)**

Questions	YES	NO
	No. (%)	No. (%)
1. Do you know what a refractive error is?	128 (63.7%)	73 (36.3%)
2. Do you know the different types of refractive errors?	98 (48.7%)	103 (51.2%)
3. Do you know the treatment options to treat the refractive errors?	104 (51.7%)	97 (48.2%)

Regarding question Q.1 concerning students' knowledge of refractive error, the responses provided by those who answered affirmatively exhibited multiple modes. These modes were derived from various sources, including the secondary school syllabus (42.2%), completion of an ophthalmology posting (32.8%), information obtained from parents (31.2%), internet and books (12.5%), friends who wear glasses (5.4%), the matriculation course (3.1%), and input from optometrists (2.3%). Moving on to question Q.2, which inquired about different types of refractive errors, slightly more than two-thirds of the students (67.3%) mentioned myopia and hypermetropia, while 32.7% of students mentioned myopia, hypermetropia, and astigmatism. Lastly, question Q.3 explored the various treatment options proposed by the students. The majority (41.2%) suggested spectacles as a viable treatment, while a smaller percentage

mentioned contact lenses (22%) and a combination of spectacles, contact lenses, and laser surgery treatment was written by 36.3% of students.

Out of a total of 201 students, a significant number of seventy-three (73) responded affirmatively that they wear spectacles, accounting for approximately 36.3% of the student population. The vast majority of these individuals, approximately 87.7%, were prescribed glasses by an optometrist, while the remaining 12.3% had their glasses prescribed by an ophthalmologist. When considering the power of the prescribed glasses, it was observed that students with myopia or myopia with astigmatism had a range of power from 1.00 to 6.00 D in both eyes. Additionally, there was one student with hypermetropia whose glasses had a power of 6.50 D in both eyes.

Out of the total 73 students who wear glasses, a significant majority of 87.7% are aware of the prescription strength of their spectacles. Additionally, an overwhelming 91.8% of these students are knowledgeable about alternative treatments such as contact lenses and laser treatment, which enables them to avoid the use of glasses. About 43.8% of the students have been informed about the specific diagnosis of their vision issue, with 31 cases of myopia/myopia with astigmatism and 1 case of hypermetropia being reported.

Moreover, the presence of lazy eye has been communicated to 15.1% of the students, with 7 students having it in their right eye, 2 students in their left eye, and 2 students experiencing it in both eyes. In terms of family history, approximately 56.2% of the families have a background of wearing glasses. Specifically, 19 mothers, 16 fathers, and 6 sets of parents (both mother and father) have a history of using glasses. Remarkably, in one particular family, all the siblings are reliant on glasses for their vision correction.

When it comes to the timeline of when these students started using glasses, 27 students began wearing them during their primary school years, while 34 students started using glasses during high school. A smaller group of 12 students initiated the use of glasses during their college studies.

Approximately 37% of students encountered certain issues following the usage of eyeglasses. These problems encompassed mild headaches, blurry vision, dizziness, eye fatigue, slight eye pain, and difficulties during sports activities. Among the participants, 45.2% expressed their desire to persist with eyeglasses due to their affordability and effortless upkeep. Conversely, a smaller proportion of students, specifically 20.5% (15 individuals), favored using contact lenses over spectacles due to improved vision quality and convenience during training sessions and outdoor sports, as displayed in Table 3.

**Table 3: Knowledge and practice of spectacle usage (n=73)**

Questions	YES	NO
	No. (%)	No. (%)
1. Do you know the power of your spectacles?	64 (87.7%)	9 (12.3%)
2. Were you told about alternative treatment without wearing spectacles	67 (91.8%)	6 (8.2%)
3. Were you told the diagnosis of your vision problem?	32 (43.8%)	41 (56.2%)
4. Were you told that you have lazy eyes?	11 (15.1%)	62 (84.9%)
5. Any of your parents using spectacles?	41 (56.2%)	32 (43.8%)
6. Did you experience any problems after wearing spectacles?	27 (37%)	46 (63%)
7. Do you want to continue wearing spectacles?	33 (45.2%)	40 (54.8%)
8. Would you like to wear contact lenses instead of spectacles?	15 (20.5%)	58 (79.5%)

The rationales provided for the continuation of wearing glasses (spectacles) were found to be practical and comfortable, as they offer clear vision. Some individuals expressed their reluctance to wear and maintain contact lenses due to laziness. Additionally, there was a fear of undergoing

laser treatment, which further contributed to the preference for glasses. Moreover, glasses were considered a more cost-effective and economical option when compared to the other two treatment methods.

However, students highlighted several reasons that necessitated a change in their glasses. These included experiencing blurred vision while wearing glasses, indicating a potential increase in their prescription power. Other reasons included broken frames or scratches on the glasses, frames becoming worn out, loss of spectacles, or a desire for a more aesthetically pleasing appearance with a stylish frame.

On the other hand, some individuals preferred wearing contact lenses over glasses for various reasons. Contact lenses were deemed convenient for engaging in sports activities and military training. Furthermore, they were seen as enhancing the cosmetic appearance of the face.

Among the surveyed group of 201 students, a total of 22 individuals (10.9%) were wearing monthly disposable contact lenses. Notably, the majority of contact lens wearers were female, accounting for 59.1% of the total. Among these contact lens wearers, the highest proportion was found among 4th-year students, making up 31.8% of the total. It is worth mentioning that a significant portion of contact lens wearers (63.6%) were military cadet students.

**Table 4: Socio-demographic characteristics of students wearing contact lenses (N=22)**

Variables	Male (9)	Female (13)	Total (22)	Percentage
<b>MBBS COURSE</b>				
1 <sup>st</sup> year	2	2	4	18.2%
2 <sup>nd</sup> year	4	2	6	27.3%
3 <sup>rd</sup> year	0	3	3	13.6%
4 <sup>th</sup> year	3	4	7	31.8%
5 <sup>th</sup> year	0	2	2	9.1%
<b>RACE</b>				
Malay	5	8	13	59.1%
Chinese	2	3	5	22.7%
Indian	2	2	4	18.2%
<b>TYPE OF STUDENT</b>				
Military cadet	7	7	14	63.6%
Civilian	2	6	8	36.4%

The entire group of 22 students possessed knowledge concerning contact lenses. The students offered various explanations for their knowledge, including learning about contact lenses from acquaintances or relatives who use them, acquiring knowledge during their ophthalmology training (specifically those who have completed the training), coming across advertisements on social media, and obtaining information from the internet or books. The majority of students, (63.6%) were informed about the potential complications associated with wearing contact lenses. These complications encompassed redness of the eyes, corneal infections, conjunctivitis, and dry eyes. Interestingly, over half of the students, accounting for 54.5%, lacked awareness regarding the various types of contact lenses available. Among the students who were knowledgeable about the different types, their awareness was limited to soft lenses and colored contact lenses exclusively.

In terms of hygiene practices, a significant majority of students, around 86.4%, reported washing their hands before putting on contact lenses. Additionally, 68.2% of the students adhered to cleaning their contact lenses using the prescribed solutions. However, a small proportion of

students, only 22.7%, admitted to sleeping with their contact lenses still in their eyes. Furthermore, 59.9% of the students disclosed that they discontinued the use of contact lenses after experiencing an eye problem, as shown in Table 5.

**Table 5: Knowledge and Practice of Contact Lens wear (n=22)**

Questions	YES	NO
	No. (%)	No. (%)
1. How did you come to know about contact lenses?	22 (100%)	0 (0%)
2. Were you told about complications of contact lens usage?	14 (63.6%)	8 (36.4%)
3. Do you know the different types of contact lenses available?	10 (45.5%)	12 (54.5%)
4. Do you wash your hands before wearing your contact lens?	19 (86.4%)	3 (13.6%)
5. Do you clean your contact lens with prescribed solutions?	15 (68.2%)	7 (31.8%)
7. Do you change the solution daily in the storage containers?	10 (45.5%)	12 (54.5%)
9. Do you sleep with contact lenses in your eyes?	5 (22.7%)	17 (77.3%)
10. Do you continue to use contact lenses after eye problems?	9 (40.1%)	13 (59.9%)

Several students provided multiple reasons for their preference for wearing contact lenses. The reasons mentioned included enhanced comfort during military training (14 students), engagement in outdoor activities and sports (7 students), cosmetic purposes (3 students), and better visual clarity compared to spectacles (3 students). The factors that influenced their decision to choose contact lenses were primarily comfort (15 students), cost of the lenses (2 students), ease of maintenance (2 students), and cosmetic purposes (3 students). The duration of contact lens usage among the students varied from 6 months to 5 years. The majority of students (15) wore contact lenses for approximately 8 -10 hours daily, while others (7) reported wearing them for 3-6 hours.

Some students experienced minor symptoms after wearing contact lenses. These symptoms included occasional redness of the eyes in 10 students, dry eyes in 6 students, a gritty sensation/itching/watering of the eyes in 4 students, and mild pain in 2 students. All of these students sought treatment from eye specialists at the military teaching hospital. Fortunately, none of them encountered any major complications with their eyes. Out of the surveyed students, 10 (45.5%) were aware that wearing contact lenses can lead to allergic reactions and corneal ulcers as potential complications.

## DISCUSSION

Spectacles, commonly known as glasses, are the most prevalent method of correcting refractive errors due to their perceived simplicity compared to contact lenses or refractive surgery. However, the use of contact lenses is also growing on a global scale, driven by factors such as enhancing one's appearance, in addition to providing comfort, convenience, improved vision quality, and a broader field of view. This emerging trend is particularly observed among the younger population residing in urban areas across various countries worldwide. The aesthetic aspect has gained immense popularity among individuals opting for contact lenses or refractive surgery as a means to correct their refractive errors [6]. It is estimated that approximately 125 million people worldwide rely on contact lenses as their primary method of refractive correction. Over the past few decades, there has been a significant surge in research focused on enhancing the materials, quality, and design of contact lenses [7].

The occurrence of vision problems among medical students has been documented to range from 21.4% to 59.5% in various countries. Specifically, in Pakistan, the prevalence is reported as 59.5% [8], while in India it is 49.6% [9], Saudi Arabia 48.8% [10], Iraq 33.3% [11], Malaysia 32.2%

[12], and Nepal 21.4% [13]. Unfortunately, we are unable to provide the prevalence of refractive errors in our study since we did not conduct refraction tests or subjective corrections to determine the specific type and severity of vision problems among the students. The figures mentioned in our results are based on the analysis of the students' responses to the questionnaire. On a global scale, uncorrected refractive errors have been estimated to cause an economic loss of approximately \$269 billion in terms of reduced productivity. Additionally, uncorrected presbyopia contributes to a loss of \$11.023 billion [14].

### **Spectacles/ eyeglasses:**

There are multiple factors that can hinder the utilization of eye care services that are readily accessible, affordable, and available. Some of these factors include a lack of awareness regarding free eye care services, uncertainty about the potential consequences of an eye disease, and confusion regarding the appropriate healthcare professional to consult for the management of eye conditions. Furthermore, demographic, personal, social, and cultural considerations can also play a role in influencing or impeding access to eye care services [15]. While these factors may have an impact in developing countries, they are not as relevant in developed nations like Malaysia. Additionally, it is worth noting that all the participants in our study had resided in urban areas for a considerable period of time, where various eye care facilities are accessible, including both optometrists and ophthalmologists specializing in vision correction.

A study conducted among university students studying in the faculty of health sciences (including medicine, dentistry, pharmacy, nutrition, optometry, and nursing) in Mozambique revealed that 58.1% of the students were wearing eyeglasses [16]. However, in our own study, a smaller proportion of students (36.3%) were observed wearing glasses. Eyeglasses are the most popular method of correcting refractive errors due to their affordability, ease of use, and minimal maintenance requirements. Consequently, they represent the simplest option for addressing refractive errors in any country.

In the study conducted by Kobia-Acquah et al [17], they examined the attitudes and beliefs of 500 undergraduate students regarding spectacle wear. The findings revealed that 75.8% of the participants were knowledgeable about refractive errors, and among them, 36.3% identified spectacles as the primary means of correction. In our own study, a slightly lower percentage of students (63.7%) demonstrated awareness of refractive error. However, a significantly higher proportion (78.8%) acknowledged spectacles as the primary method of correction. Specifically, 42.3% preferred spectacles, 21.2% opted for contact lenses, and 36.5% considered a combination of spectacles, contact lenses, and laser surgery treatment as potential solutions.

In a research conducted by Ebeigbe et al [18], a group of five hundred undergraduate students from seven different faculties at the University of Benin were examined to assess their attitudes and beliefs towards wearing spectacles. The findings revealed that 38% of the students had knowledge about eyeglasses, while 22.8% were aware of contact lenses and only 14% knew about surgery as a method for correcting refractive errors. When comparing these results to their study, it was observed that a higher percentage of students (42.3%) were familiar with spectacles, indicating a greater awareness. Additionally, a considerable number of students (36.5%) were aware of laser surgery treatment as an alternative for improving vision in cases of refractive errors.

In a study by Ayanniyi et al, a survey was conducted among 214 individuals who wear spectacles in seven Nigerian hospitals. The participants were asked questions using a semi-structured questionnaire to gather information about their awareness and attitudes towards contact lenses and refractive eye surgery. The study found that 45.8% of patients were aware of contact lenses as an option, while 52.8% were aware of refractive eye surgery. However, 80% of participants were not interested in wearing contact lenses or undergoing refractive eye surgery. The reasons for this lack of interest included a lack of information, high costs, and concerns about potential

complications. In our own study, a smaller percentage of students (21.2%) were aware of contact lenses as an option, and an even smaller percentage (36.5%) were aware of laser surgery treatment.

These findings highlight the importance of eye care practitioners educating and counseling their patients who have been diagnosed with refractive errors. It is crucial to inform them about the benefits of wearing prescribed glasses and the potential risks of not using them when necessary. This education is essential for improving vision and enabling students to perform well in their studies.

### **Contact lenses:**

Contact lenses are corrective lenses that are worn on the cornea to improve vision. They stay in place because of the surface tension created by the tear film on the cornea. Nowadays, soft contact lenses have gained popularity, particularly among college students in urban areas. This is because these lenses provide a more comfortable experience, without causing any foreign body sensation in the eyes. To avoid complications resulting from improper or negligent behavior, it is essential for ophthalmologists and dispensing optometrists to educate patients about proper hygiene and careful practices when wearing contact lenses.

In our study, the prevalence of contact lens wear was found to be 10.9%, which is lower than the rates reported in Malaysia (14% from 121 out of 864 medical students) [4] and India (21.3% from 128 out of 600 medicos) [20]. This difference could be attributed to the smaller sample size in our study. Furthermore, the percentage of females wearing contact lenses in our study (59%) was also lower compared to other studies conducted in Malaysia (87.6% [4] and 89.4% [5]) and India (62.5% [20]). This trend is commonly observed in educational institutions and countries, as many individuals prefer contact lenses over spectacles to achieve improved vision comfort.

Among the participants in our study, the proportion of Malays wearing contact lenses was 59.1%, which is higher compared to two other universities in Malaysia (36.4% [4] and 48.4% [5]). This higher prevalence among Malays can be attributed to their larger population proportion in Malaysia compared to other races.

**Knowledge of contact lens wear:** Regarding knowledge about contact lenses, the responses provided by our students were similar to those published by the University of Malaya (UM), with the exception that our study showed a higher percentage (11%) of optometrist recommendations compared to 5% in the UM study [4]. In our study, the main reason for wearing contact lenses was for comfort during military training and outdoor activities (63.6%), whereas in the UM study, the primary motivation was for cosmetic or aesthetic purposes (43.8%) [4]. The key factor influencing the choice of contact lenses in our study was comfort (68.2%), which is slightly lower than the corresponding figure in the aforementioned study (84.3%) [4]. More than two-thirds of the students (68.2%) in our study wore contact lenses for a duration of 8 to 10 hours per day, while a smaller proportion of students (55.5%) wore them for a period between 8 and 12 hours per day in the UM study [4]. Regarding the complications associated with wearing contact lenses, 36.4% of the students in our study were not informed about the potential risks that may arise after wearing contact lenses. Similarly, a slightly lower percentage of students (30.6%) were not provided with this information in the UM study [4]. Moreover, the UM study reported a higher percentage (68.7%) of students being aware of the occurrence of allergic reactions and corneal ulcers compared to our present study (45.5%) [4].

**Practice of hygiene and care of contact lenses:** The handwashing rate before putting on contact lenses in our study was 86.4%, which was lower than the 90.9% reported in the UM study and the 95.3% reported in a study conducted in India [20]. In our study, only 68.2% of participants cleaned their contact lenses before wearing them, while the UM study showed a higher rate of 84.3%. Additionally, only 45.5% of participants in our study changed the storage solution in their lens containers, compared to a much higher rate of 79.3% in the UM study [4].

Interestingly, our study found that 40.1% of students continued to use their contact lenses even after experiencing eye symptoms, whereas the UM study reported a significantly lower rate of 14% [4]. Moreover, our study revealed that 22.7% of students slept with their contact lenses, which was higher than the rates reported in the UM study (13.2%) [4], the Indian study (8.6%) [20], and the Pakistan study (8.7%) [21].

It is important to note that wearing contact lenses while sleeping increases the risk of eye complications due to the prolonged contact of the lens with the cornea, leading to corneal anoxia [22]. In fact, a study conducted by Morgan et al. from the UK reported a higher incidence (96.4%) of severe keratitis in individuals who slept with their contact lenses compared to those who only used them during waking hours [23].

Our research found that the majority of students (68.2%) followed the recommended practice of cleaning their contact lenses with prescribed solutions. Additionally, almost half of the students (45.5%) were changing the solution in their storage containers on a daily basis. It is crucial to regularly change the storage solutions to prevent the risk of contamination with harmful pathogens. When the solution adheres to the contact lens, it can become a carrier for corneal infections.

However, it is concerning that some contact lens users resort to using self-prepared solutions such as boiled water or tap water to clean their lenses and storage cases. This practice is highly dangerous and puts them at risk of developing *Acanthamoeba* keratitis, as these harmful organisms are commonly found in tap water [22]. A study conducted by Janti et al in India revealed that 5.5% of the 128 medical students who wore contact lenses cleaned them with bottle water or tap water. Furthermore, the same study demonstrated that 57% of students were aware of the risk of *acanthamoeba* infection associated with the use of water for cleaning contact lenses [20].

Minor eye symptoms such as a gritty sensation, redness, excessive watering, mild pain, and blurred vision may arise in individuals who wear contact lenses. Prolonged use of contact lenses throughout the day can lead to the development of these eye symptoms. In our study, a small number of students experienced such symptoms. However, the majority of students (59.9%) decided to discontinue the use of contact lenses after experiencing these eye symptoms and sought advice from an eye specialist. Following the use of eye drops prescribed by the specialist, the symptoms subsided in all students. They resumed wearing contact lenses only after receiving approval from the eye specialist.

It is imperative to educate all contact lens users about the importance of promptly removing the lenses at the first sign of any eye symptoms. This is crucial for ensuring early recovery from potential complications. Contact lens wearers should diligently adhere to all precautions, including maintaining hand hygiene before wearing lenses, strictly adhering to the recommended wearing time, cleaning the lenses and storage case with prescribed solutions, removing lenses before sleeping, and refraining from using lenses beyond the recommended period set by the manufacturer. These precautions are essential in preventing eye complications, especially vision-threatening corneal infections. The risk of complications in the eyes is believed to increase when individuals lack knowledge or fail to comply with the instructions provided.

Research conducted by Steinemann et al in the United States explored the usage of over-the-counter decorative contact lenses. The study revealed that individuals who obtained these lenses from unauthorized providers were significantly less likely to receive information about proper lens use and care. Consequently, these individuals had a higher incidence of acute corneal infections that posed a threat to their vision [24]. It is worth noting that possessing basic knowledge alone may not guarantee the correct practice of contact lens care and usage, even among individuals with a medical background.

In a comparative study conducted by Riaz et al in Pakistan, an equal number of medical (127) and non-medical allied health science students (127) were examined. The study concluded that while medical students displayed better knowledge regarding the usage of contact lenses compared to non-medical students, they still did not exhibit sufficient contact lens practices. Compliance was identified as the most critical factor influencing their behavior. Conversely, non-medical students demonstrated good compliance with lens hygiene practices but lacked knowledge regarding the risks and consequences associated with wearing contact lenses [21].

Neglecting proper hygiene practices while wearing contact lenses is considered a significant risk factor for complications related to contact lens usage. Despite advancements in lens materials and care solutions, non-compliant behavior continues to hinder efforts in enhancing contact lens safety. In a study carried out by Raja Laxshimi et al [5], the investigators examined the knowledge, compliance, and complications associated with contact lens usage among 188 medical students at University Kebangsaan Malaysia Medical Centre. They concluded that there exists a correlation between the knowledge and compliance levels of medical students who use contact lenses, indicating that higher knowledge leads to higher compliance. Furthermore, the study found a link between compliance and the occurrence of complications in contact lens users among medical students, suggesting that higher compliance results in lower complication rates.

Another study conducted by Kumar et al [25] in India involved 50 medical students from all five years of a college. The findings indicated that although healthcare professionals possessed a better understanding of contact lenses, they did not consistently practice correct usage. Compliance remained a major influencing factor in their behavior. Thus, it is evident that education, effective communication, and behavioral modifications are imperative in order to improve compliance with proper contact lens usage.

## **LIMITATIONS**

The survey included a limited number of students due to the fact that only 50 students were accepted annually for the first year of the medical course. A future study involving the students from all faculties in the university will overcome the small number of students. However, it is important to note that this study did not examine the refractive errors among medical students in different years of the course, which could have provided valuable insights into the prevalence of various types of refractive errors.

## **CONCLUSION**

The current research revealed that only 36% of students wore glasses, while 11% opted for contact lenses. It was observed that medical students possessed a commendable understanding of refractive errors and the available treatment methods. Their knowledge regarding contact lenses was also satisfactory. However, the majority of medical students demonstrated poor

adherence to proper usage and care of contact lenses, which could potentially lead to complications. Therefore, it is crucial to enhance education and communication when prescribing contact lenses, as well as encourage behavioral changes to promote compliance and minimize eye-related complications associated with contact lens wear. Furthermore, there is a need to intensify visual health education among students to ensure effective dissemination of information within the surrounding communities, focusing on the correction of refractive errors.

### CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

### ETHICAL APPROVAL

This study was approved by the Research committee and ethics committee of National Defence University of Malaysia (No.UPNM/2015/SF/SKK/9).

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