



Knowledge and Behavior of Contact Lens Wear in Medical Students and Medical Residents in Vajira Hospital

Chantaka Supiyaphun, MD^{1*}

Puncharut Preechaharn, MD¹

¹ Department of ophthalmology, Faculty of Medicine Vajira Hospital, Navamindradhiraj University. Bangkok, Thailand

* Corresponding author, e-mail address : chantaka@nmu.ac.th

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Abstract

Objective: To determine knowledge and behavior of contact lens wear in medical students and medical residents in Vajira hospital.

Methods: A cross-sectional study using questionnaire was conducted among medical students and medical residents who wore contact lenses within the recent one year in Vajira hospital.

Results: A total of 660 (480 of medical students and 180 of residents) were recruited in this study. Twenty-four percent in medical student group and 17% in resident group wore contact lens in recent one year. The majority was female in both groups (79.3% and 80.6%, respectively). The average age was 21.4 years in medical student group and 27.8 years in resident group. The main reason for wearing contact lens is visual correction (67.3%). Approximately sixty percent in both groups wore monthly soft contact lens following by daily disposable lens (43.5%). Six improper contact lens compliance and care practices were reported as sleeping with their lens (22.6%), swimming with lens (26.5%), topping off lens storage solution (20.0%), not cleaning lens case daily (57.7%), prolonged wear over replacing schedule (18.4%) and no rubbing and rinsing (33.7%). Seventy-three percent in medical student group and 48.4% in residency group were classified as good behavior. The prevalence of good contact lens behavior in medical students were significantly higher than that of medical resident ($p=0.013$). However, the majority of participants in both groups were categorized in good knowledge ($p=0.297$). In all participants, we found statistical significant different between behavior and knowledge ($p=0.001$)

Conclusion: The majority of participants in both groups have good knowledge. However, medical student group has better behavior in contact lens wear and care compare with medical resident group.

Keywords : contact lens, medical student, resident, behavior, knowledge



สำรวจเปรียบเทียบความรู้และพฤติกรรมการใส่เลนส์สัมผัสในนักศึกษาแพทย์และแพทย์ประจำบ้าน คณะแพทยศาสตร์วชิรพยาบาล

ฉันทกา สุปิยพันธุ์ พ.บ., ว.ว. จักษุวิทยา สาขากระจกตาและการแก้ไขสายตาผิดปกติ^{1*}

ปัญชรช ปรีชาหาญ พ.บ.¹

¹ภาควิชาจักษุวิทยา คณะแพทยศาสตร์วชิรพยาบาล มหาวิทยาลัยนวมินทราธิราช กรุงเทพมหานคร ประเทศไทย

* ผู้ติดต่อ, อีเมล: chantaka@nmu.ac.th

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บทคัดย่อ

วัตถุประสงค์: สำรวจความรู้และพฤติกรรมการใส่เลนส์สัมผัสของนักศึกษาแพทย์และแพทย์ประจำบ้าน คณะแพทยศาสตร์วชิรพยาบาล

วิธีดำเนินการวิจัย: วิธีศึกษาแบบตัดขวางด้วยแบบสอบถามกับกลุ่มอาสาสมัครนักศึกษาแพทย์และแพทย์ประจำบ้าน ในคณะแพทยศาสตร์วชิรพยาบาลที่สวมใส่เลนส์สัมผัส ภายในช่วงเวลา 1 ปีผลลัพธ์ จากกลุ่มอาสาสมัครทั้งหมด 660 ราย (นักศึกษาแพทย์ 480 รายและแพทย์ประจำบ้าน 180 ราย) พบว่ามีจำนวนนักศึกษาแพทย์ร้อยละ 24 และ แพทย์ประจำบ้านร้อยละ 17 ที่ใส่เลนส์สัมผัสภายในระยะเวลา 1 ปีจากวันที่ตอบแบบสอบถาม เพศหญิงใส่เลนส์สัมผัสร้อยละ 79.3 ในกลุ่มนักศึกษาแพทย์และร้อยละ 80.6 ในกลุ่มแพทย์ประจำบ้าน อายุเฉลี่ยของผู้สวมใส่เลนส์สัมผัสคือ 21.4 ปีในกลุ่มนักศึกษาแพทย์และ 27.8 ปีในกลุ่มแพทย์ประจำบ้าน วัตถุประสงค์หลักในการสวมใส่เลนส์สัมผัสคือแก้ไขภาวะสายตาสั้นร้อยละ 67.3 โดยประมาณร้อยละ 60 ของอาสาสมัคร จากทั้งสองกลุ่มใส่เลนส์สัมผัสแบบรายเดือน และรองมาใส่เลนส์สัมผัสแบบรายวันร้อยละ 43.5 พฤติกรรมที่ไม่เหมาะสม 6 ประการในการสวมใส่และดูแลเลนส์สัมผัสคือ นอนหลับระหว่างใส่เลนส์สัมผัสพบร้อยละ 22.6 ว่ายน้ำในขณะที่สวมใส่เลนส์สัมผัสพบร้อยละ 26.5 เติมน้ำยาแช่เลนส์สัมผัสใหม่ลงบนน้ำยาเก่าร้อยละ 20.0 ไม่ทำความสะอาดตลับเลนส์สัมผัสทุกวันร้อยละ 57.7 เปลี่ยนเลนส์สัมผัสช้ากว่าระยะเวลาที่กำหนดร้อยละ 18.4 และไม่ถูกล้างเลนส์สัมผัสร้อยละ 33.7 โดยร้อยละ 70 ในกลุ่มนักศึกษาแพทย์และร้อยละ 48.4 ในกลุ่มแพทย์ประจำบ้านถูกจำแนกประเภทเป็นผู้ที่มีพฤติกรรมการดูแลเลนส์สัมผัสดี จำนวนของผู้ที่ถูกจำแนกว่ามีพฤติกรรมการดูแลเลนส์สัมผัสดีพบในกลุ่มนักศึกษาแพทย์มากกว่ากลุ่มแพทย์ประจำบ้าน ($p=0.013$) อย่างไรก็ตามอาสาสมัครทั้ง 2 กลุ่มส่วนใหญ่ถูกจำแนกประเภทเป็นผู้ที่มีความรู้ดี ($p=0.297$) และในกลุ่มอาสาสมัครทั้งหมดทางคณะผู้วิจัยพบความแตกต่างอย่างมีนัยยะสำคัญทางสถิติระหว่างพฤติกรรมการดูแลเลนส์สัมผัสและความรู้ ($p=0.001$)

สรุปการวิจัย: อาสาสมัครส่วนใหญ่จากทั้ง 2 กลุ่มเป็นผู้ที่มีความรู้ดี อย่างไรก็ตามกลุ่มนักศึกษาแพทย์มีพฤติกรรมการดูแลเลนส์สัมผัสได้ดีกว่ากลุ่มแพทย์ประจำบ้าน

คำสำคัญ: เลนส์, นักศึกษาแพทย์, แพทย์ประจำบ้าน, พฤติกรรม, ความรู้

Introduction

Contact lens is an ocular medical device used by over 150 million people worldwide¹ The prevalence of contact lens user was increasing from 125 million people in 2014², and 40.9 million in 2015 to 45 million in 2019 in the United states³⁻⁴ which considered as the largest contact lens prescribing country in the world⁵. Contact lens can be worn for refractive error correction which offers many advantages over glasses such as better peripheral vision and convenience, particularly who participate in sports. For cosmetic reason, persons who wish to improve self-perception without glasses frame or even change the eye color can use cosmetic colored or big eye contact lens for these purposes. Special corneal conditions such as irregular cornea⁶, keratoconus and high anisometropia⁷ also need contact lens for therapeutic reason. Despite many researches show contact lens is safe even in young population⁸⁻¹⁰, the complications from CL wearer consisting of dryness, conjunctivitis and microbial keratitis, were reported¹¹⁻¹³. These unwanted events mostly caused by poor behavior of contact lens wear and care¹⁴. Healthcare professional especial medical students and medical residents are the chief of health care personnel in hospital to educate and to be the role model of their patients. However, many publications reported unsatisfied knowledge and non-compliance of contact lens wear and care in Medical student and healthcare worker¹⁵⁻¹⁷. The purpose of this study was to determine behavior and knowledge in contact lens wear and care in medical students and residents in Vajira hospital.

Methods

The study was a cross-sectional study that conducted during November 2018 to January 2019. The participants consisted of first to sixth year medical students and residencies (Department of Medicine, Surgery, Pediatric, Obstetrics and Gynecology, Emergency Medicine, Otolaryngology,

Ophthalmology, Orthopedic and Family medicine) Faculty of Medicine, Vajira hospital, Navamindradhiraj University, Bangkok, who had used contact lens once for any period of time in recent 1 year. Based on the questionnaire from Leeamornsiri S et al.¹⁷, and additional questions were modified on the basis of the contact lens care guidelines of the American Academy of Ophthalmology¹⁸. The paper-based questionnaire composed of 3 parts. The first part of questionnaire included sex, gender, age, purpose for using contact lens, type of contact lens, replacing schedule of lens, duration of wearing lens, daily hours using lens, and purchasing place. The second part of questionnaire included participant's behavior during wearing, hygiene of caring contact lens and complication management from their lens. The last part of questionnaire queried the general knowledge of lens wear and care including complication from lens worn. This study protocol was approved by the research committee of Navamindradhiraj University, and was carried out in accordance with the Declaration of Helsinki. Group comparisons were performed with Fisher's exact test using two-sided analysis.

Results

Demographic data of participants and characteristic of contact lens (table 1)

The interviewer-administered questionnaire was conducted among 480 medical students and 180 medical residents, only 116 (24.2%) and 31 (17.2%) wore contact lens within recent 1 year, and the average age is 21.4 (± 1.9) and 27.8 (± 1.1) years, respectively. Women were the majority accounting for 92 (79.3%) of contact lens used medical students and 25 (80.6%) of contact lens used medical residents. The main reason of wearing contact lens was visual correction (68.1%) in medical students group and 64.5% in medical resident group, following by both cosmetic and visual correction reason. Nearly 90% in both groups wore soft contact lens which mostly monthly renewable

lens 66 (56.9%) in medical student group and 18 (58%) in resident group following by daily disposable lens 49 (42.2%) and 15 (48.8%) in medical student group and medical resident group, respectively. The optical shop was the place that most of participants in both groups purchasing contact lens (96.5% and 87%) following by eye clinic (2.6% and 9.7%) and online internet (1.7% and 6.5%). Approximately one-third of resident groups and one-fifth of medical student group have ever worn big eye or cosmetic contact lens. Participant demographic data and type of contact lens used were not statistic difference between both groups.

Participant’s behavior of contact lens wear and care (table 2)

In medical student group, 31 of 116 participants (26.7%) wore lens longer than recommended replacing schedule compared with 11 of 31 (35.5%) in resident group. Sixty-eight of 116 (59.1%) medical students and 21 of 31 (67.7%) in medical residents wore contact lens more than 1 year. Approximately 70% in both groups wore lens more than 8 hours per day. Only 1 of 116 participants (0.9%) in medical student group shared their lens with others which was no statistically significant compared to 2 of 32 (6.5%) in medical resident group. Approximately 23.2% of medical student group and 38.7% of medical resident group swam while wearing lens.

One-fifth of medical student groups and one-third of residency group had experience slept while wearing lens overnight, which was no statistical significance between groups.

Most of participants, 101 of 116 (87.1%) in medical student group and 24 of 31 (77.4%) in medical resident group, always washed their hands before handling lens. Interestingly, 26 of 67

participants (38.8%) in medical student group and 2 of 16 participants (12.5%) in residency group did not rub and rinse lens before wearing the lens, which was statistic significantly different between both groups. Minority of both groups, 7.5% and 6.2% in medical student group and medical resident group had ever rinsed their lens with tap water. The majority of participants in medical student group (84.6%) and medical resident group (66.7%) always changed lens storage solution daily only 3.1% and 6.7% replaced the solution by topping off respectively. Almost half of participants in medical student group and approximately a quarter of participants in medical resident group always cleaned lens case daily. In medical student group, 7 of 65 participants (10.8%) replaced lens case more than every 3 months. On the other hand, all of participants in medical resident group replaced lens case within 3 months.

Participant’s knowledge of contact lens wear, care and complications (table 3)

We developed questionnaire in close end question, which did not relate with their behavior, queried knowledge of good compliance for contact lens wear and care, and complications. In the knowledge part of contact lens care, more than 80% in both groups answered correctly as shown in Table 3. Approximately 60% in both groups knew that the lens care solution was not allowed to transfer into smaller travel-size containers. All of participants in both groups knew that the lens should not be rinsed with tap water. The majority in both groups knew that the complications from contact lens included dry eye, contact lens related allergic conjunctivitis, corneal abrasion and microbial keratitis.

Table 1:

Characteristic of participant between medical student group and resident group

	Medical students (N=116) (%)	Residencies (N=31) (%)	p-value
Number of lens wearer/ total number	116/480 (24.2)	31/180 (17.2)	0.059
Mean Age (SD)(year)	21.4 ± 1.9 (18-30)	27.8 ± 1.1 (25-30)	<0.001
Gender			>0.999
Male	24/116 (20.7)	6/31 (19.4)	
Female	92/116 (79.3)	25/31 (80.6)	
Reason of wearing contact lens			0.345
Vision correction	79/116 (68.1)	20/31 (64.5)	
Cosmetic	2/116 (1.7)	2/31 (6.5)	
Both	35/116 (30.2)	9/31 (29)	
How long had been a contact lens wearer			0.047
<1 month	16/115 (13.9)	4/30 (13.3)	
1-6 months	14/115 (59.4)	3/30 (10.0)	
6-12 months	17/115 (14.8)	2/30 (6.7)	
1-5 years	43/115 (37.4)	6/30 (20.0)	
≥ 5 years	25/115 (21.7)	15/30 (50.0)	
Type of contact lens			>0.999
Soft CL	104/116 (89.6)	28/31 (90.3)	
RGP	1/116 (0.9)	0	
Unknown	11/116 (9.5)	3/31 (9.7)	
Replacing schedule			
Daily disposable	49/116 (42.2)	15/31 (48.8)	0.548
Two-weekly renewable	9/116 (7.8)	1/31 (3.2)	0.461
Monthly renewable	66/116 (56.9)	18/31 (58)	>0.999
Place to buy CL (participants can choose more than one choice)			
Eye clinic/ Hospital	3/116 (2.6)	3/31 (9.7)	0.108
Optical shop	112/116 (96.5)	27/31 (87)	0.061
Market	1/116 (0.08)	0	>0.999
Internet	2/116 (1.7)	2/31 (6.5)	0.196
Have the participants ever worn color or big eye CL			
5-7 day/week	5/115 (4.3)	2/31 (6.5)	0.220
3-4 day/week	3/115 (2.6)	2/31 (6.5)	
1-2 day/week	15/115 (13.0)	7/31 (22.6)	
Never worn cosmetic CL	92/115 (80.0)	20/31 (64.5)	

Table 2:

Participant’s behavior related to hygiene of contact lens wear and handling of contact lens care solution and the lens cases among medical students and residencies

* exclude daily wear contact lens	Medical students group (%)	Residencies group (%)	p-value
Have you ever slept while wearing CL?			0.235
5-7 day/week	2/115 (1.7)	-	
3-4 day/week	1/115 (0.9)	1/31 (3.2)	
1-2 day/week	20/115 (17.4)	9/31 (29.0)	
Never slept while wearing CL	92/115 (80.0)	21/31 (67.7)	
Sharing contact lens			0.113
5-7 day/week	-	-	
3-4 day/week	1/116 (0.9)	1/31 (3.2)	
1-2 day/week	-	1/31 (3.2)	
Never share CL with other people	115/116 (99.1)	29/31 (93.5)	
Swimming while wearing CL			0.089
5-7 day/week	-	-	
3-4 day/week	4/116 (3.4)	-	
1-2 day/week	23/116 (19.8)	12/31 (38.7)	
Never share CL with other people	89/116 (76.7)	19/31 (61.3)	
Have you ever used tap water for rising lens? *			0.536
5-7 day/week	1/66 (1.5)	-	
3-4 day/week	1/66 (1.5)	1/16 (6.2)	
1-2 day/week	3/66 (4.5)	-	
Never use tap water for rinsing lens	61/66 (92.5)	15/16 (93.8)	
Do you always change lens storage solution daily? *			0.243
Everyday	55/65 (84.6)	10/15 (66.7)	
Every 2-3 days	6/65 (9.2)	3/15 (20.0)	
Every 4-7 days	1/65 (1.5)	-	
Once a week	3/65 (4.6)	2/15 (13.3)	
Topping off lens solution *			0.241
Everyday	2/65 (3.1)	1/15 (6.7)	
Always (>80%)	-	-	
Sometime (<80%)	9/65 (13.8)	4/15 (26.7)	
Never topping off lens solution	54/65 (83.1)	10/15 (66.7)	

Table 2:

Participant's behavior related to hygiene of contact lens wear and handling of contact lens care solution and the lens cases among medical students and residencies (continued)

* exclude daily wear contact lens	Medical students group (%)	Residencies group (%)	p-value
Replacing lens cases *			0.313
Monthly	23/65 (35.4)	8/15 (53.3)	
≤ 3 months	35/65 (53.8)	7/15 (46.7)	
> 3 months	7/65 (10.8)	-	
Do you always cleaned lens case?*			0.094
Everyday	29/63 (46.0)	4/15 (26.7)	
Every 2-3 days	13/63 (20.6)	3/15 (20.0)	
Every 4-7 days	2/63 (3.2)	3/15 (20.0)	
Weekly	16/63 (25.4)	3/15 (20.0)	
> 1 week	3/63 (4.8)	2/15 (13.3)	
Have you always washed hand before handling lens?			0.407
Every time	101/116 (87.1)	24/31 (77.4)	
Always (>80%)	11/116 (9.5)	6/31 (10.4)	
Sometime (<80%)	3/116 (2.6)	1/31 (3.2)	
Do not washed hand before handling lens	1/116 (0.9)	-	
Rub and rinse lens before wearing lens *			0.035
Every time	24/67 (35.8)	9/16 (56.2)	
Always (>80%)	9/67 (13.4)	5/16 (31.2)	
Sometime (<80%)	8/67 (11.9)	-	
Do not rub and rinse lens before wearing lens	26/67 (38.8)	2/16 (12.5)	
Delayed replace lens schedule			0.800
Yes	22/115 (19.1)	5/31 (16.1)	
No	93/115 (80.9)	26/31 (83.9)	

Table 3:

General knowledge of contact lens wear and care among medical students and residencies evaluated by using 10 closed- questions. Do you agree or disagree in following situations

	Medical student group		Residency group		p-value
	Agree	Disagree	Agree	Disagree	
Wearing contact lens while sleeping don't lead to get eye infection	12/116	104/116	2/31	29/31	0.735
Contact lens can be shared to others	1/116	115/116	2/31	29/31	0.113
Prolong using lens longer than replacing schedule was allowed	12/116	104/116	2/31	29/31	0.735
Using tap water rinsed contact lens was allowed due to chloride can kill the microbe on lens surface	0	116/116	0	31/31	-
Contact lens can wear while swimming	18/116	98/116	9/31	22/31	0.115
Should change storage solution daily to remove the microbe	106/116	10/116	25/31	6/31	0.106
We don't have to change lens storage every 3 months because the case does not relate with the growth of microbe	18/116	98/116	6/31	25/31	0.592
We can Topping off lens solution without replacing lens solution	3/116	112/116	2/31	29/31	0.607
Normal saline and/or artificial tears can be used instead of multipurpose solution for cleaning contact lens	25/116	89/116	12/31	19/31	0.109
Do not transfer contact lens solution into smaller travel-size containers	70/116	46/116	20/31	11/31	0.836

Comparison between behavior and knowledge (Figure 1, 2)

Following the information in table 2, the number of correct answers were counted and the participants were divided into 3 groups according to the following criteria. Good behavior participants were defined if the score was equal or greater than 8. The fair behavior was defined if the score was 6-7. The participants who had score less than 6 were defined as poor behavior group. Seventy-three percent of medical students and 48.4% of residents were good behavior, while 5.2 % of medical student

group and 3.2% of residency group were poor behavior. There was statistically significant difference in behavior among both groups. (p=0.013)

The knowledge of lens care and wear including contact lens complication were divided in 3 groups by using criteria as follows, the good knowledge was defined if the participants had score equal or greater than 8, the poor knowledge was defined if the score is less than 6. The participants with the score of 6-7 were identified as fair knowledge. More than three-quarter of both medical student and residency group were defined in good knowledge.

The minority of both groups (1.7 % of medical students and 3.2% of residents) were poor knowledge. There was no statistically significant difference in terms of the knowledge among both

groups (p=0.297). In all participants, our study found statistic significant difference between knowledge and behavior (p=0.001).

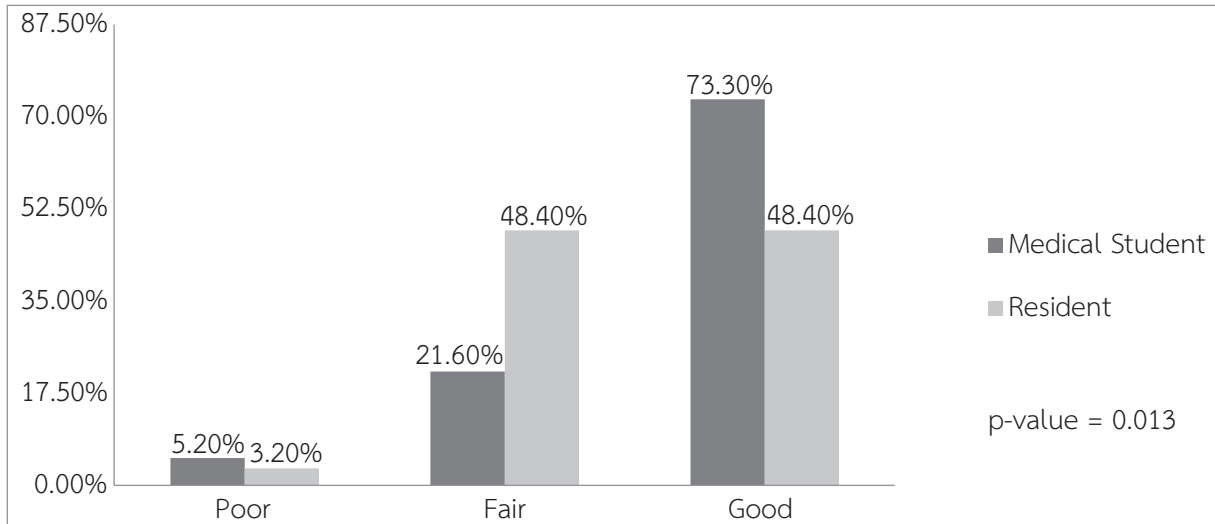


Figure 1: Comparison of behavior in contact lens wear and care between medical student and resident

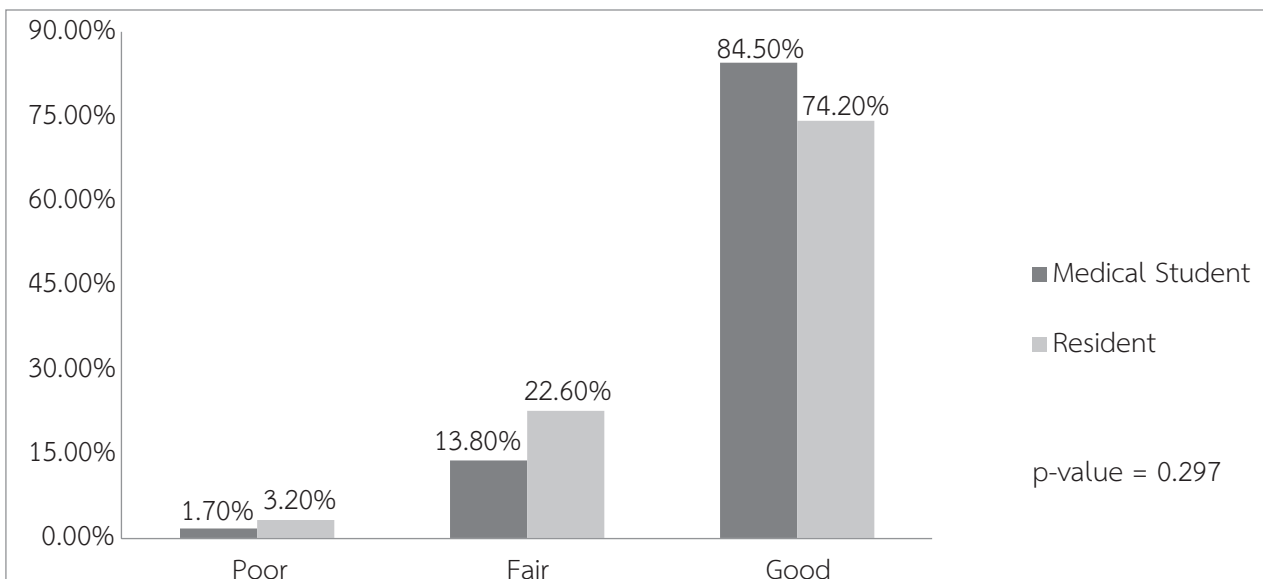


Figure 2: Comparison of knowledge in contact lens wear and care between medical student and resident

Discussion

Vajira hospital locates in Bangkok, the capital city of Thailand, where the majority of contact lens users live in and the We found lots of complications from using contact lens such as conjunctivitis, contact lens related allergic conjunctivitis and microbial keratitis which continuously increased especially in contact lens user who had poor compliance and lens care hygiene. The knowledge and understanding of contact lens care, including awareness of complications especially in medical students and medical residents are very important for primary educating patients as a role of health care providers. In this study, the prevalence of contact lens wearer was 24.2% in medical student group and 17.2% in medical resident group which lesser than the previous study was varied from Ibrahim NK and Leeamornsiri S that reported 32.2-40.5%¹⁶⁻¹⁷. Our study defined who wore lens in recent 1 year as same as from Leeamornsiri S. study¹⁷ in Thailand. The difference of prevalence may be from time frame difference. Whereas the study from Ibrahim NK¹⁶ enrolled medical students who had ever worn contact lens once that cause higher prevalence than our study. Female contact lens user is the majority in this study (80%) which was similar to many previous studies¹⁶⁻¹⁷. Approximately 65% in both groups used contact lenses for visual correction following by both cosmetic and vision correction reason (30%). The reason of increasing of cosmetic and visual correction from the study in 2015¹⁷ due to the difference in study time frame and variety of available contact lens design in the market which can provide power in lens for visual correction and aesthetic color in the same time. Almost 90% of participants wore soft contact lens which are not difference from others¹⁶⁻¹⁷. Furthermore 42.2% in medical student group and 48.8% in residency group used daily disposable type lens increasing from 27.6%¹⁷ but difference from King Abdulaziz University, Saudi Arabia¹⁶ which reported yearly type

as the commonest type of contact lens used. We found the majority of participants purchased contact lens at optical shop, similarly to the study from Thammasart hospital in Thailand. On the other hand, previous study in Sydney reported that most of participants bought lenses from optometrist's prescription¹⁹. The difference of buying place depend on the law regulation in each country.

According to the behavioral factor, we found 6 improper contact lens compliance and care practices including sleeping with their lens, swimming with lens, topping off lens storage solution, not cleaning case daily, prolong using lens over replacement schedule and not rubbing and rinsing before handling lens. Twenty percent of medical student group and 32.3% in medical resident group slept while wearing contact lens compared to 9.6% in Thammasart University and 29.5%¹⁷ in King Abdulaziz University¹⁶. The difference from others study especially in medical resident group due to we included both nap and overnight slept in our study. Additionally, harder works and having night shifts in medical resident group might be the factor that made medical residents trended to easily slept before taking off their lens. However, the study from USA reported 50.2% of adult wearer slept overnight with their lens³. The difference type of lens, country and population may affect the behaviors of contact lens users. Our study found 23.3% in medical student group swam with their lens which coincide with the results from other studies^{16-17,20}. Wearing lens longer than recommended were found approximately one-third of participants in both groups which was the same prevalence as found in Thammasart study¹⁷. Only one-third in medical student group and a half in residency group rubbed and rinsed their lens everytime before putting on which had not been reported from previous studies. We also found that the lens care hygiene and compliance in CLs wearer in medical student group were significantly better than medical resident group. The possible reason was a lack of

time to follow lens wear and care instructions in medical resident group.

Regarding the knowledge questions, more than 80% in both groups had good knowledge (correct answers at least 8 of 10 questions). Approximately 40% in both groups answered incorrectly in 2 questions consisting of using normal saline or artificial tears instead of multipurpose solution for cleaning lens and transfer lens solution in smaller travel-size containers. However, the previous study reported the knowledge of contact lens wear and care among medical students in Saudi Arabia which was less than our study¹⁶. We suspected that they possibly do not know the difference action of normal saline and multi-purpose cleaning solution for cleaning contact lens. Some people think that normal saline can be used to clean contact lens and they do not emphasize using multipurpose solution to remove bacteria before using normal saline solution. We found most of participants in both groups had good knowledge but less proportion in good behavior of lens wear and care hygiene especially in medical resident group.

Limitations

This study included only medical students and residents from a single university hospital, which might not represent contact lens knowledge and behavior in general medical students and residents. We also did not include other healthcare professionals such as pharmacist, nurse and medical staffs in the survey. therefore, our results cannot infer to contact lens situation in that population.

Conclusion

The majority of participants in medical student and residency group have good knowledge contrast to their behaviors of contact lens care. This indicates that the contact lens educational strategy in Thailand nowadays is still ineffective enough to change the behavior of contact lens users. Even in the medical personnel, the poor behavior was high

especially in medical students. The awareness of contact lens complications causing form poor contact lens care in Thai society should be raised. Further study is needed to identify factors that affect in good contact lens behavior in order to reduce severe ocular complications from using contact lens. The limitation in this study is small number of participants that can not represent the knowledge and behavior of contact lens wear and care in whole medical profession in Bangkok, Thailand.

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