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Knowledge, Attitude, and Practice of Contact Lenses Among Female College Students in the College of Health Sciences in Kuwait

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Abstract: *Nowadays, contact lenses are significantly improved and are a source for effective rehabilitation of vision, cosmetic enhancement, especially among college students. The purpose of this study is to evaluate the knowledge, attitude, and practice among female college students in the college of health sciences in Kuwait regarding contact lens usage. A self-administered questionnaire was distributed to 100 female college students. Questions included demographic profile, knowledge and practice of lens related complications and attitude of students towards wearing and maintaining cleanliness of contact lenses. Most students were at the age of < 20 years' old*

Keywords : Contact lenses, attitude, knowledge, statement. College, students,

Introduction

Contact lenses are one of the imperative methods for rectifying vision; it is not only used for optical correction and refractive errors[1], but also for upgrading cosmetic appearance and therapeutic reasons[2]. It is very popular among the younger generation especially in schools, colleges, and universities[3]. Contact lens popularity increased since it became cheaper, obtainable, enormous choices and suitable compared with previous days[4]. In one of the studies, it was reported that a high utilization of contact lenses used by female university students was for cosmetic purposes[5], thus, changing the appearance of their eyes by wearing colored contact lenes. [23] Most students keep wearing contact lenses even when having ocular problems and are ignorant about the issues that result from wearing these contact lenses especially for cosmetic reasons[6], thus, it has been proven that some colored contact lenses are related to microbial keratitis, which is considered the most feared complication. In addition, the mishandling of contact lenses, the improper maintenance and noncompliance to the practitioners' instructions in the use of lenses and care products[7] can lead to different infections and complications such as, corneal abrasion, corneal edema, corneal ulcer[8,9–11], dry eye, giant papillary conjunctivitis,

neovascularization and keratitis [12]. A study was conducted on contact lens compliance in south India, on a group of young university student that are lens users, it was noticed that the poorest level of compliance was in the care of lens accessories such as contact lens cases and solution[13].

Purchasing contact lenses from the internet, online[14], or beauty salons or non-ophthalmic stores without the consultation of the ophthalmologist can cause serious complications and side effects varying from itchiness of the eye, redness of the eye to sever keratitis[15], for example, it was found that purchasing over the internet and other higher socio-economic status to be associated with microbial keratitis[16]. Ocular problems due to wearing contact lenses can be averted by gaining knowledge in using the accurate practice of contact lenses and in promoting ocular health education, nevertheless, the awareness to new strategies by the contact lens users is also an important issue, and can alter the wearers behavior, and reduce their problems[17]. The younger generation compliance to contact lenses are found to be less than the older generation[18,19,20]. A study noted a high prevalence of contact lens use by female university students[21], the cosmetic advantages and the aesthetic aspect of contact lenses were the most reasons for purchasing contact lenses by these young students[22]. The purpose of the current study is to evaluate the knowledge, attitude, and practice among female college students in Kuwait regarding contact lens usage.

METHOD

A self-administered questionnaire was distributed among 100 female college students the "college of health sciences" at the Public Authority for Applied Education and Training (PAAET) in Kuwait. After having the ethical approval. Students were briefed about the objectives, goals, and nature of the study. The students were assured that their data would be anonymous.

Questions included demographic profile, knowledge and practice of lens related complications and attitude of students towards wearing and maintaining cleanliness of contact lenses. Once they completed answering the questionnaire that took 10 minutes to complete. Data were entered and analyzed using SPSS V. (26).

RESULTS

Statistical Analysis

The purpose of this study is to evaluate the knowledge, attitude, and practice among female college students in the college of health sciences in Kuwait regarding contact lens usage. Data were entered and analyzed using SPSS V. (26). Chi-squared tests for goodness of fit and association between two variables were used to show the significance of the results.

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Table 1: Demographic characteristics of the respondents (N=166)

Characteristic		n	Percent
Age	17 - 20 years	68	41.0%
	21 to 25 years	87	52.4%
	26 years and above	11	6.6%
Academic Year	First	32	19.3%
	Second	76	45.8%
	Third	42	25.3%
	Fourth	16	9.6%
CGPA	Less than 2 points'	20	12.0%
	2.00 - 2.67 points	34	20.5%
	2.67 - 3.33 points	63	38.0%
	Above 3.33 points	49	29.5%
Nationality	Kuwaiti	40	24.1%
	Non- Kuwaiti	126	75.9%

As presented above, age distribution showed that majority of the students who participated in the study were between 21 and 25 years of age ($p < 0.05$). Regarding the academic year, up to 76 (45.8%) of the students were in second year of their academic journey in College of Health Sciences ($p < 0.05$), followed by 25.3% (n=42) were in the third year.
In addition, slightly less than two fifths of the students (38%, n=63) scored between 2.67 - 3.33 points in CGPA, followed by 49 (29.5%) has excellent academic performance, since they scored above 3.33 points. Nationality ration was in favor of non –Kuwaiti students; since they represented the majority (75.9%, n=126).

Figure 1: Age

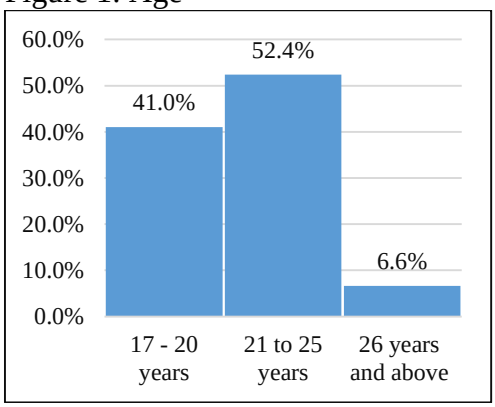

Figure 2: Academic Year

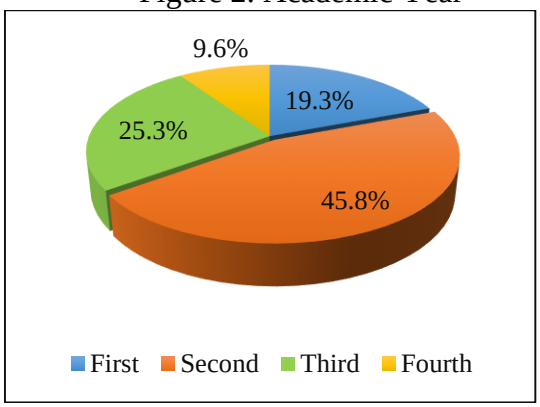

Figure 3: CGPA

Figure 4: Nationality

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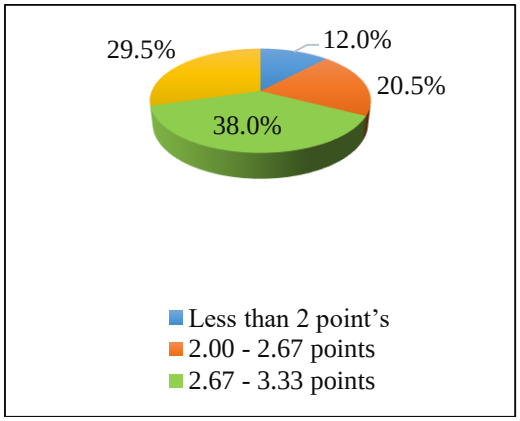

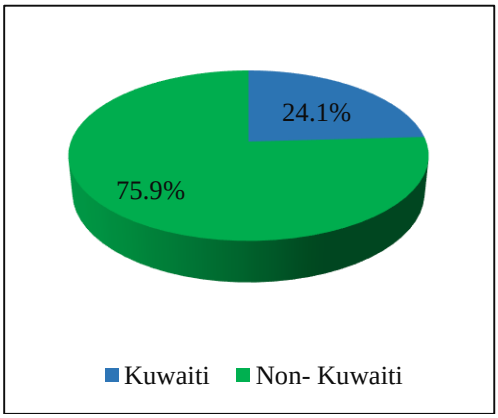

Practice of Contact Lenses among female college students:

Table 2: Responses of the students regarding their practice of Contact Lenses

Practice Statements		No	Sometimes	Yes	P value*
Do you wear contact lenses daily?	n	121	26	19	p < 0.01
	%	72.9%	15.7%	11.4%	
Do you live in a hot, dry and dusty environment?	n	79	12	75	p < 0.01
	%	47.6%	7.2%	45.2%	
Are you exposed to a smoking environment?	n	79	19	68	p < 0.01
	%	47.6%	11.4%	41.0%	
Did you ever suffer from an eye infection?	n	126	6	34	p < 0.01
	%	75.9%	3.6%	20.5%	
Did you wear contact lenses during the time of Corona Virus epidemic?	n	126	6	34	p < 0.01
	%	75.9%	3.6%	20.5%	
Did you ever have injury or surgery to your eyes?	n	122	0	44	p < 0.01
	%	73.5%	0.0%	26.5%	
Did you suffer from burning, itching or redness of your eyes?	n	73	8	85	p < 0.01
	%	44.0%	4.8%	51.2%	
Does your work require you to wear safety eye wear protection?	n	103	19	44	p < 0.01
	%	62.1%	11.4%	26.5%	
For far or near vision, do you wear eyeglasses?	n	105	6	55	p < 0.01
	%	63.3%	3.6%	33.1%	
Do you face difficulty in removing your contact lenses?	n	123	15	28	p < 0.01
	%	74.1%	9.0%	16.9%	
Do you clean your contact lenses after each wear?	n	50	14	102	p < 0.01
	%	30.2%	8.4%	61.4%	
Do you wash your hands before wearing the contact lenses?	n	62	6	98	p < 0.01
	%	37.3%	3.6%	59.1%	

Do you nap or sleep wearing your lenses?	n	140	3	23	p < 0.01
	%	84.3%	1.8%	13.9%	
Do you like wearing colored lenses?	n	67	23	76	p < 0.01
	%	40.4%	13.8%	45.8%	
Do you use contact lens beyond expiry date?	n	136	7	23	p < 0.01
	%	81.9%	4.2%	13.9%	
Do you exchange in wearing contact lenses and eyeglasses?	n	123	10	33	p < 0.01
	%	74.1%	6.0%	19.9%	
Do you use water for cleaning your contact lenses	n	92	14	60	p < 0.01
	%	55.4%	8.4%	36.2%	

* Based on Chi-squared test for goodness of fit.

As Table 2 shows, majority of the students who participated in the study (72.9%, n=121) don't wear contact lenses daily (p value < 0.01). While 47.6% (n=79) of the students don't live in a hot, dry and dusty environment (p value < 0.01), there were 45.2% (n=75) that lived in a hot, dry and dusty environment. Regarding smoking, up to 47.6% (n=-79) of the students do not expose to a smoking environment (p value < 0.01), while 68 (41%) of them exposed to it.

In addition, slightly greater than three quarters of the students (75.9%, n=126) never suffer from an eye infection (p value < 0.01). Likewise, majority of the respondents (75.9%, n=126) did not wear contact lenses during the time of Corona Virus epidemic (p value < 0.01). On the other hand, slightly less than three quarters of the students (73.5%, n=22) never have injury or surgery to their eyes (p value < 0.01).

As presented in the above table, majority of the students (51.2%, n=85) suffered from burning, itching or redness of their eyes (p value < 0.01), while 44% (n=73) did not. Moreover, majority of the respondents (62.1%, n=103) their work doesn't require them to wear safety eye wear protection (p value < 0.01), while slightly greater than one-quarter of them (26.5%, n=44) responded positively. While closed to one third of the students (33.1%, n=55) wear eyeglasses for either far or near vision, majority of them (63.3%, n=105) don't do that (p value < 0.01).

In addition, 16.9% (n=28) of the students faced difficulty in removing their contact lenses, while majority of them (74.1%, n= 123) don't face such difficulty (p value < 0.01). Slightly greater than three fifths of the students (61.4%, n=102) clean their contact lenses after each wear (p value < 0.01), while 30.2% (n=50) don't do that. Majority of the students (59.1%, n=98) wash their hands before wearing the contact lenses (p value < 0.01), while (37.3%, n= 62) don't do that.

In the above table, most of the students (84.3%, n= 140) do not exchange in wearing contact lenses and eyeglasses (p value < 0.01). While up to 76 (45.8%) of the students like

wearing colored lenses (p value < 0.01), there were 40.4% (n= 67) don't like wearing colored lenses. Most of the students (81.9%, n=136) responded that they don't use water for cleaning your contact lenses (p value < 0.01).

Slightly less than three quarters of the respondents (74.1%, n=123) don't exchange in wearing contact lenses and eyeglasses (p value < 0.01), while 20% of them (n=33) doing that. There were 60 (36.2%) students use water for cleaning their contact lenses, while majority of them (55.4%, n=92) don't do that (p value < 0.01).

Table 3: Overall Practice of the students regarding Contact Lenses

Level of Practice	n	Percentage	P value*
Poor	47	28.3%	P < 0.01
Good	119	71.7%	
Total	**166**	**100%**	

In the Overall Practice of the students regarding Contact Lenses, most students (71.7%, n= 119) at College of Health Sciences reported good practice of contact lenses (p value < 0.01), while 28.3% (n=47) reported poor practice.

Regarding association between demographic characteristics and level of practice, no association found between practice of contact lenses and each of Age, Academic Year, and CGPA (p value > 0.05), while nationality statistically showed association with practice of contact lenses ($\chi^2 = 5.23$, DF=1, p <0.05). Non-Kuwaiti students tend to have good practice of contact lenses higher than Kuwaiti students (76.2% vs 57.5%).

Knowledge about Contact Lenses among female college students:

Table 4: Responses of the students regarding their knowledge of Contact Lenses

Knowledge Statements		No	To some extent	Yes	P value*
Do you know about over-wear syndrome?	n	131	2	33	P < 0.01
	%	78.9%	1.2%	19.9%	
Do you know about side effects caused by some contact lenses?	n	93	4	69	P < 0.01
	%	56.0%	2.4%	41.6%	
Do you know about the duration of lens cleaning solution?	n	87	4	75	P < 0.01
	%	52.4%	2.4%	45.2%	
Do you know some infections caused by contact lenses?	n	71	6	89	P < 0.01
	%	42.8%	3.6%	53.6%	
Do you know wearing contact lenses when having infection of the eye, can cause loss of vision?	n	85	5	76	P < 0.01
	%	51.2%	3.0%	45.8%	

As Table 4 shows, majority of the students who participated in the study (78.9%, n=131) don't know about over-wear syndrome (p value < 0.01). While 56% (n=93) of the students don't know about side effects caused by some contact lenses (p value < 0.01), there were 69 (41.6%) know about it. Slightly greater than a half of the students (52.2%, n=81) don't know about the duration of lens cleaning solution (p value < 0.01), while 45.4% (n=81) know about it. Up to 89 (53.6%) of the students know some infections caused by contact lenses (p value < 0.01), while slightly greater than two fifths suffered from lack of knowledge about the infections caused by contact lenses. Slightly greater than a half of the students (51.2%, n=85) don't know that wearing contact lenses when having infection of the eye can cause loss of vision (p value < 0.01), while 76 (45.8%) know that.

Table 5: Overall Knowledge of the students regarding Contact Lenses

Knowledge	**n**	**Percentage**	**P value***
Poor Knowledge	100	60.2%	P < 0.01
Good Knowledge	66	39.8%	
Total	**166**	**100%**	

The total scores of knowledges regarding contact lenses based on the median of the scores. She found that the median was 6. Each student scored below median reported poor knowledge, while the others reported good knowledge. As presented in the above table, majority of the students (60.2%, n=100) at College of Health Sciences reported poor knowledge of contact lenses (p value < 0.01), while 66 (39.8%) have good knowledge.
On the other hand, no association found between knowledge about contact lenses and each of Age, CGPA, and Nationality (p value > 0.05), while level of study (Academic year) showed statistical association with knowledge about contact lenses ($\chi^2 = 7.99$, DF=3, p <0.05). Noticeable percentage of students (75%) at the top level of the study (fourth year) showed poor knowledge about contact lenses.

Figure 5: Overall knowledge of the students regarding Contact Lenses by Study level

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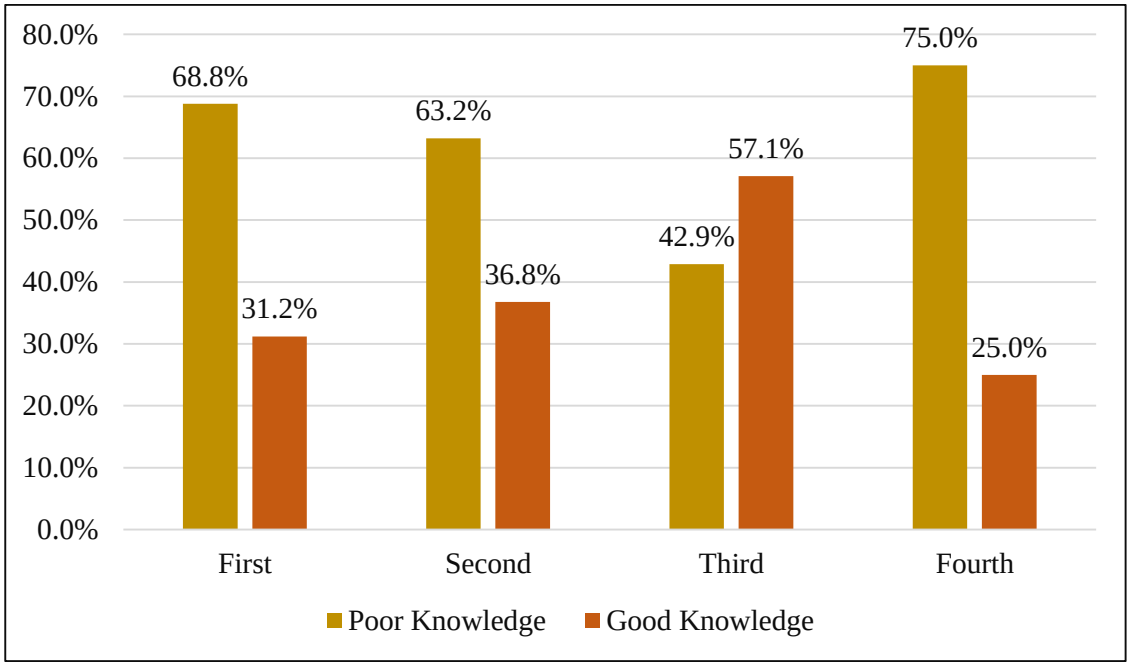

Table 6: Responses regarding the properties of Contact Lenses (n=166)

Question	Category	n	Percentage	P value
Purpose of you wearing contact lenses	Refractive error	24	14.5%	P < 0.01
	Cosmetic	60	36.1%	
	Both	82	49.4%	
Frequency of wearing contact lenses	Daily	24	14.5%	P < 0.01
	Occasionally	142	85.5%	
Self -experience in wearing contact lenses	1-2 years	84	50.6%	P < 0.01
	3-7 years	54	32.5%	
	> 7 years	28	16.9%	
Number of daily hours wearing contact lenses	2-4 hours	67	40.4%	P < 0.01
	5-7 hours	58	34.9%	
	8-10 hours	26	15.7%	
	> 10 hours	15	9.0%	
Age of contact lenses	1-2 months	71	42.8%	P < 0.01
	3-6 months	55	33.1%	
	7-10 months	19	11.4%	
	> 10 months	21	12.7%	

Type of contact lenses used	Oxygen permeable	23	13.9%	P < 0.01
	Disposable	16	9.6%	
	Colored	48	28.9%	
	Of Temporary use	54	32.5%	
	Soft	25	15.1%	
Time of contact lenses solution expire	After 3 months	44	26.5%	P < 0.01
	After 6 months	39	23.5%	
	After 12 months	24	14.5%	
	I don't know	59	35.5%	
Source of purchasing contact lenses	From the intent	67	40.4%	P < 0.01
	From the pharmacy	34	20.5%	
	From the beauty salon	12	7.2%	
	From the hospital	53	31.9%	

As Table 6 shows, closed to a half of the students (49.4%, n= 82) indicated that the purpose of wearing contact lenses is either for refractive error or for cosmetic (p value < 0.01), while 36.1% (n=60) of them wear contact lenses for cosmetic purpose only. Most of the students (85.5%, n= 142) occasionally wear contact lenses (p value < 0.01). Slightly greater than a half of the students (50.6%, n=84) had between 1 to 2 years of Self - experience in wearing contact lenses (p value < 0.01), followed by 54 (32.5%) had between 3 to 7 years.

In addition, up to two fifths of the students (40.4%, n=67) wear contact lenses for between 2 to 4 hours daily (p value < 0.01), followed by 58 (34.9%) wear it for between 5 to 7 hours daily. Slightly more than two fifths of the students (42.8%, n= 71) their contact lenses had between 1 to 2 months of age (p value < 0.01), followed by 55 (33.1%) their contact lenses had between 3 to 6 months of age.

In a question in the survey labeled "What type of contact lenses do you wear?" closed to one third of the students (32.5%, n=48) reported that they wear temporary (i.e., Daily, weekly, and monthly use) contact lenses (p value < 0.01), followed by 48 (28.9%) wear colored contact lenses. Regarding the expiration of the solution of contact lenses, majority of the students (35.5%, n=59) showed lack in knowledge about this issue (p value < 0.01), followed by 44 (26.5%) stated that their contact lenses will expire after 3 months. Finally, majority of the students (40.4%, n=67) purchased contact lenses from the internet (p value < 0.01), followed by 53 (31.9%) purchased them from the hospital.

Table 7.1: Frequencies and percentages of Attitudes towards Contact Lenses (n=166)

Attitudes Statements		**NE**	**RA**	**SO**	**MO**	**AL**
	n	15	22	41	49	39

Do you think that the media has an impact in changing your mind to wear contact lenses?	%	9.0%	13.3 %	24.7%	29.5 %	23.5 %
Do you think wearing contact lenses for cosmetic purpose can affect your eyes?	n	11	19	54	52	30
	%	6.6%	11.4 %	32.6%	31.3 %	18.1 %
Do you think friends can change your opinion wearing contact lenses?	n	27	27	50	44	18
	%	16.3 %	16.3 %	30.1%	26.5 %	10.8 %
Do you think wearing contact lenses carelessly can lead to blindness?	n	9	17	34	48	58
	%	5.4%	10.2 %	20.5%	28.9 %	34.9 %
Do you think wearing contact lenses can beautify your appearance?	n	8	16	41	39	62
	%	4.8%	9.6%	24.7%	23.5 %	37.3 %
Do you think wearing contact lenses is an important issue?	n	48	21	41	31	25
	%	28.9 %	12.7 %	24.7%	18.7 %	15.0 %
Do you think frequent cleaning of contact lenses is essential?	n	7	7	19	20	113
	%	4.2%	4.2%	11.4%	12.0 %	68.2 %
Do you think changing lens solution frequently is important?	n	4	7	23	18	114
	%	2.4%	4.2%	13.9%	10.8 %	68.7 %
Do you think frequent cleaning of contact lens case is important?	n	3	7	19	22	115
	%	1.8%	4.2%	11.4%	13.3 %	69.3 %
Do you think wearing contact lenses on sensitive eyes is acceptable	n	66	16	33	21	30
	%	39.8 %	9.6%	19.9%	12.7 %	18.0 %

NE=Never RA=Rarely SO=Sometimes MO=Mostly AL=Always

In tables 7.1 and 7.2, the statement “Do you think frequent cleaning of contact lens case is important?” came first with a high importance among the attitudes dimension of the students (Mean= 4.44, SD = ±0.98), most of the students (82.5%, n=127) ordinarily think that cleaning of contact lens case is important (p-value < 0.01).

The statement “Do you think changing lens solution frequently is important?” came second in the attitudes dimension with a high importance (Mean= 4.39, SD = ±1.03), most of the students (79.5%, n=132) substantially think that changing lens solution frequently is important (p-value < 0.01).

The statement "Do you think frequent cleaning of contact lenses is essential?" came third in the attitudes dimension with a high importance (Mean =4.36, SD = ±1.11), most of the students (80.2%, n=133) typically think that frequent cleaning of contact lenses is essential (p-value < 0.01).

Table 7.2: Descriptive statistics of Attitudes towards Contact Lenses (n=166)

Attitudes Statements	Mean	Std. Dev.	Rank
Do you think that the media has an impact in changing your mind to wear contact lenses?	3.45	1.24	6
Do you think wearing contact lenses for cosmetic purpose can affect your eyes?	3.43	1.11	7
Do you think friends can change your opinion wearing contact lenses?	3.00	1.23	8
Do you think wearing contact lenses carelessly can lead to blindness?	3.77	1.20	5
Do you think wearing contact lenses can beautify your appearance?	3.79	1.20	4
Do you think wearing contact lenses is an important issue?	2.78	1.43	9
Do you think frequent cleaning of contact lenses is essential?	4.36	1.11	3
Do you think changing lens solution frequently is important?	4.39	1.03	2
Do you think frequent cleaning of contact lens case is important?	4.44	0.98	1
Do you think wearing contact lenses on sensitive eyes is acceptable?	2.60	1.55	10

Std. Dev.= Standard Deviation

The statement "Do you think wearing contact lenses can beautify your appearance?" came fourth in the attitudes dimension with a high importance (Mean = of 3.79, SD = ±1.20), majority of the students (61%, n=101) ordinarily think wearing contact lenses can beautify their appearance (p-value < 0.01).

The statement "Do you think wearing contact lenses carelessly can lead to blindness?" came fifth in the attitudes dimension with a high importance (Mean= 3.77, SD = ±1.20), majority of the students (63.8%, n=106) commonly think that wearing contact lenses carelessly can lead to blindness (p-value < 0.01).

The statement "Do you think that the media has an impact in changing your mind to wear contact lenses?" came sixths in the attitudes dimension with a moderate importance to some extent (Mean= 3.45, SD = ±1.24), majority of the students (53%, n=88) generally

think that the media has an impact in changing their mind to wear contact lenses (p-value < 0.01).

The statement "Do you think wearing contact lenses for cosmetic purpose can affect your eyes?" came sixths in the attitudes dimension with a moderate importance to some extent (Mean= 3.43, SD = ±1.11), slightly less than a half of the students (49.4%, n=82) generally think that wearing contact lenses for cosmetic purpose can affect their eyes (p-value < 0.01).

The statement "Do you think friends can change your opinion wearing contact lenses?" came eighth in the attitudes dimension with a moderate importance (Mean= 3.00, SD = ±1.23), slightly less than two fifths of the students (37.3%, n=62) commonly think that friends can change their opinion regarding wearing contact lenses (p-value < 0.05).

The statement "Do you think wearing contact lenses is an important issue?" came pre to last in the attitudes dimension with a moderate importance (Mean= 2.78, SD = ±1.43), slightly greater than two fifths of the students (41.6%, n=69) generally think that wearing contact lenses is not an important issue (p-value < 0.01).

The statement "Do you think wearing contact lenses on sensitive eyes is acceptable?" came last in the attitudes dimension with a moderate importance (Mean= 2.60, SD = ±1.55), slightly less than a half of the students (49.4%, n=82) generally don't think that wearing contact lenses on sensitive eyes is acceptable (p-value < 0.01).

Factor analysis

In this study, Explanatory Factor Analysis (EFA) ran separately for the items of the attitudes towards contact lenses among the students of college of health sciences in Kuwait. The statements were examined using EFA to characterize the factors formulating the attitudes of the students and studying their contribution on students' attitudes towards contact lenses.

Kaiser –Meyer-Olkin Measure of sampling adequacy (KMO) is 0.684, therefore, this value considered statistically good according to Kaiser's classifications. Consequently, this result reinforces our confidence that the size of the sample for this study is adequate for carrying out Factor Analysis.
However, during eigenvalue's examination, four factors were extracted whose eigenvalue was greater than 1. The value of the accumulated variance is 66.2%, which means that these three factors explain 66.2% of change occurring in the attitudes towards contact lenses among the surveyed students (see table 8 below).

Table 8: Rotated Component Matrix for attitudes items

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Statements	Factors (Spectrums) of Attitudes			
	Cleaning contact lenses	Wearing for appearance	Effect of contact lenses	Acceptability Changing Opinions
Do you think frequent cleaning of contact lenses is essential?	0.840			
Do you think frequent cleaning of contact lens case is important?	0.837			
Do you think changing lens solution frequently is important?	0.702			
Do you think wearing contact lenses is an important issue?		0.790		
Do you think wearing contact lenses can beautify your appearance?		0.628		
Do you think wearing contact lenses on sensitive eyes is acceptable?		0.520		
Do you think wearing contact lenses carelessly can lead to blindness?			0.807	
Do you think wearing contact lenses for cosmetic purpose can affect your eyes?			0.755	
Do you think friends can change your opinion wearing contact lenses?				0.858
Do you think that the media has an impact in changing your mind to wear contact lenses?				0.506

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

As presented in table 8 above, four factors described the attitudes towards contact lenses among the surveyed students. These four factors were: cleaning contact lenses, wearing for appearance, Effect of contact lenses, and Acceptability Changing Opinions. Each of these four factors contributed to overall variance in the attitudes towards contact lenses among the surveyed students by 22.2%, 15.7%, 14.3%, and 13.9% of the variance respectively.

Table 9: Descriptive statistics for the Factors (Spectrums) of Attitudes

Factors	Mean	Std. Dev.	Level of Importance
Acceptability of Changing Opinions	3.22	1.00	Moderate
Effect of contact lenses	3.60	0.95	High
Wearing contact lenses for cosmetics	3.10	0.96	Moderate
Cleaning contact lenses	4.40	0.87	High

Std. Dev.= Standard Deviation.

As Table 9 shows, cleaning contact lenses came at the top priorities of the students when dealing with contact lenses (Mean= 4.40, SD = ± 0.87), then Effect of contact lenses on their eyes with a high importance (Mean= 3.60, SD = ± 0.95), while Acceptability of Changing Opinions came with a moderate importance (Mean= 3.22, SD = ± 1.00), and Wearing contact lenses for appearance (cosmetic tool) came last in the attitudes of the students with a moderate importance (Mean= 3.10, SD = ± 0.96).

Figure 6: Factors (Spectrums) characterized Attitudes of the surveyed students

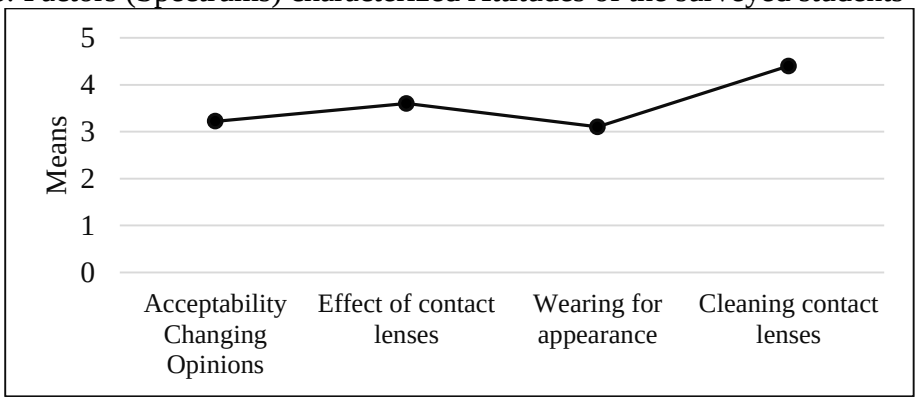

Table 10: Overall attitudes of the students regarding Contact Lenses

Attitudes	n	Percentage	P value*
Negative attitudes	98	59.0%	P < 0.01
Positive attitudes	68	41.0%	
Total	166	**100%**	

As presented in the above table, majority of the students (59.0%, n=98) at College of Health Sciences reported negative attitudes towards contact lenses (p value < 0.01), while 68 (41%) had positive attitudes.

On the other hand, no association found between attitudes of the students towards Contact Lenses and each of Age, CGPA, and Nationality, and level of study since (p value > 0.05). Students at college of Health Sciences were similar in their attitudes towards Contact Lenses.

Regarding the association between Knowledge and level of the attitudes, Chi-squared test indicated that there was a high significant association between them (χ^2= 6.60, DF=1, p < 0.01). Up to 67% (n=100) of the students who had poor knowledge gain negative attitudes towards Contact Lenses, while 53% (n=35) of those who had good knowledge gain positive attitudes towards Contact Lenses.

In addition, Logistic regression ran revealed that statistically knowledge has positive effect on the students' attitudes towards Contact Lenses ($\beta = 0.83,, OR =$

2.3; 95% $C.I.$: 1.21 − 4.30). Students with good knowledge of Contact Lenses were 2.3 time more likely tend to have positive attitudes towards Contact Lenses.

DISCUSSION

Knowledge improves and changes people's behavior towards contact lens use. Therefore, education and practice can improve community information about contact lens care and reduce contact lens-related problems among the wearers. The participated students at our college showed poor knowledge regarding contact lenses, nevertheless the non-Kuwaiti students showed a better practice of contact lenses than the Kuwaiti students. Most students wore contact lenses for both reasons refractive error and cosmetics for beautifying reasons. One study showed, many participants were using contact lens for cosmetic purposes while the remaining were using the lenses for refractive purposes. [24–25] It is necessary to change the sterile storage solution of the contact lenses, it is also important to be aware about the expiration date of the solution to reduce the possibility of contamination with pathogens[26]thus causing infection to the eyes when placing them on. It was noticed that the participated students had no idea of the expiration date of the solution.

One of the major risk factors is the inadequate hygiene in handling contact lenses and their accessories[27]**.** Hygiene plays an important role in reducing complications to the eyes; therefore, it is essential to wash hands before putting the lenses on. Most participants did not sleep with the contact lenses on, wearing the lenses while sleeping are more prone to infections of the eyes and other complications due to reduced oxygen level supply to the cornea when eyelid is closed and can cause corneal (anoxia). [28]

Frequent replacement of soft contact lenses can reduce infection of the eye as well as discomfort and other complications concerning the eyes. [29–30]
There are four factors that described the attitudes towards contact lenses among the surveyed students at our college. These four factors were: cleaning contact lenses, wearing for appearance, Effect of contact lenses, and Acceptability Changing Opinions. Each of these four factors contributed to overall variance in the attitudes towards contact lenses among the surveyed students by 22.2%, 15.7%, 14.3%, and 13.9% of the variance respectively. Many of these students had a negative attitude towards contact lens, while students with good knowledge of Contact Lenses showed a positive attitude and had 2 to 3 times more attitudes towards Contact Lenses.

CONCLUSION

Many students see contact lenses as regular items or as cosmetic tools not medical devices. These attitudes usually lead to bad habits.
Education regarding hygiene practice, proper guidance and behavioral modification are important factors that help improve compliance level of contact lens wearers thus it

changes the student's attitudes and behaviors towards contact lens use, nevertheless, it reduces and minimizes complications of the eyes.

Recommendation

Education, hygiene practice, and health knowledge are important issues for students to understand the health risks and complications of contact lenses improper use. We should promote and improve the compliance level of the students to reduce contamination of contact lenses and their accessories.

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Conflicts of interest

There are no conflicts of interest.

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