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THE RELATIONSHIP BETWEEN THE LEVEL OF KNOWLEDGE OF CONTACT LENS WEAR WITH THE INCIDENCE OF EYE IRRITATION IN UMI MEDICAL FACULTY STUDENTS

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Abstract

Contact lens wear is increasing every year, a large part of which is to help those with nearsightedness or myopia. There are 140 million people in the world who use contact lenses and two-thirds of them are women. Objective: to determine the characteristics (age and gender) of students who wear contact lenses with the Faculty of Medicine UMI class of 2022-2023. To determine the description of knowledge (uses, types of fluids, and usage patterns) of contact lens wear with the incidence of eye irritation in students / female students of the Faculty of Medicine UMI class 2022-2023. To determine the frequency of eye irritation in students / (i) Faculty of Medicine UMI class of 2022-2023. To determine whether there is a relationship between the level of knowledge of contact lens use and the incidence of eye irritation in students / (i) Faculty of Medicine UMI class 2022-2023. As well as to find out the purpose of wearing contact lenses, types of contact lenses and how to wear contact lenses on students (i) Faculty of Medicine UMI class 2022-2023. Methods: The research design used in this study was descriptive analytic research with a cross-sectional design. Results: The majority of respondents were 20 years old, from the class of 2022, and female. Of the 110 respondents, the majority (74.5%) had sufficient knowledge and did not experience eye irritation, while only 10.0% with less knowledge experienced irritation. Respondents with good knowledge (8.2%) all did not experience irritation. The knowledge level of contact lens use was mostly in the moderate category, and most respondents did not experience eye irritation. Statistical tests showed a negative correlation (-0.582, sig. = 0.000) between the level of knowledge and the incidence of eye infections, where the higher the knowledge, the lower the incidence of eye infections. The majority of respondents used contact lenses as a visual aid, with a duration of wear of more than one year, a type of contact lens that can be used repeatedly, and a daily duration of wear of more than 6 hours.Conclusion: The majority of respondents had a moderate level of knowledge about contact lens use and did not experience eye irritation. There was a significant negative relationship between the level of knowledge and the incidence of eye infections, where the higher the knowledge, the lower the risk of infection. Respondents generally used contact lenses as a visual aid with a long duration of wear.

Keywords: Level of Knowledge, Contact Lenses, Eye Irritation

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Introduction

A contact lens is a curved shell made of glass or plastic, attached directly to the eyeball or cornea to correct refractive errors. The shape of a contact lens was first illustrated by Leonardo Da Vinci in 1508. And in 1827 J.F.W.1 Herschell described contact lenses as sterile glass capsules filled with jelly with a refractive surface on the back and can be used for irregular corneal cases. The birth year of contact lenses was 1888 when Adolf Eugene Fick (Germany) who was an eye specialist in Zurich, made the first clinical study on contact lenses followed by Kalt and Muller with the use of contact lenses in keratoconus aiming to register the cornea.[2]

Contact lenses are used by more than 140 million users worldwide[3]. Contact lens users are mostly female and relatively young[4]. Based on the , there are two types of contact lenses, namely *Soft Contact Lens (SCL)* and *Rigid Gas Permeable (RGP) Contact Lens*.[5] SCL is made of *silicone hydrogel* which provides more oxygen to the cornea and is easy to use.[6] *RGP* is made of *large-polymer plastics* which can allow the passage of oxygen.[7] However, this type of lens needs several weeks to adjust.[8]

Contact lens wear has two patterns depending on the oxygen content of each type of contact lens as well as the material, moisture content, design and thickness, namely a daily wear pattern and an indefinite wear pattern.[9] It is important for the eyes to rest without lenses for at least one night after each scheduled removal.[10]

The use of contact lenses must be accompanied by the supervision of an ophthalmologist and must have compliance with good care.[11] After removing or if you are going to put on contact lenses, you should immediately rinse with NaCl 0.9%. Store contact lenses in a storage box that has been filled with 2/3 of the disinfection liquid.[12] However, there are still many people who use contact lenses without knowledge of how to care for them, resulting in various irritations.[13] People prefer to use contact lenses rather than glasses because contact lenses move with the movement of the eyeball which allows you to see normally and has no frame so that the field of view is not disturbed.[14] Contact lenses also do not dew like glasses and do not hinder your activities. In addition, contact lenses can also improve the user's appearance.[15]

Contact lens wear is increasing every year, a large part of which is to help those with nearsightedness or myopia. There are 140 million people in the world who wear contact lenses and two-thirds of them are women. According to data from the *American Optometric Association* (AOA) there are more than 30 million Americans who use contact lenses, ten percent of whom are aged< 18, fifteen percent are aged 18-24 years and 50 percent are aged 25-44 years.[16] Meanwhile, according to the British Contact Lens Association (BCLA) in 2013 there were 3.7 million people who used contact lenses in the UK. Contact lens wearers should know and comply with how to wear contact lenses according to established standards, for example according to the American Optometric Association (AOA). This should be noted because, when wearing 2/10,000 per year, for daily contact lenses there are 2.2-4.1/10,000 per year, and for long-term contact lenses there are 13.3 - 20.9/10,000 per year.[17]

Methods

This study used a descriptive analytic design with a cross-sectional approach to analyze the relationship between contact lens use and the incidence of eye infections in students of the Faculty of Medicine, Universitas Muslim Indonesia (UMI). The study was conducted at the Faculty of Medicine UMI, Makassar, during August-September 2023. The study population included active students of class 2022 and 2023, with a total sample of 110 people. Inclusion criteria involved active students who wore contact lenses 2-4 hours per day for 1-2 years with reusable contact lens types. Data were processed through editing, coding, entry, and cleaning stages, then analyzed univariately and

bivariately using the Chi-Square test or the alternative Kolmogorov-Smirnov test. A significant association was determined based on a p value of <0.05

Results

Univariate Analysis Results

Frequency Distribution of Respondents Based on Age

Table 1. Frequency Distribution of Respondents by Age

No.	Age	Frequency	Percentage (%)
1.	18 years old	13	11,8
2.	19 years old	43	39,1
3.	20 years	46	41,8
4.	21 years old	8	7,3
Total		110	100

Source: Primary Data, 2024

Based on Table 1, it is known that the majority of respondents were 20 years old as many as 46 respondents (41.8%), 19 years old as many as 43 respondents (39.1%), and 18 years old as many as 13 people with a percentage of (11.8%) and 21 years old as many as 8 respondents (7.3%).

Frequency Distribution of Respondents Based on Force

Table 2: Frequency Distribution of Respondents Based on Batch

No.	Force	Frequency	Percentage (%)
1.	2022	64	58,2
2.	2023	46	41,8
Total		110	100

Source: Primary Data, 2024

Based on Table 2, it is known that the majority of respondents came from the class of 2022 as many as 64 respondents (58.2%) and the class of 2023 as many as 46 respondents (41.8%).

Frequency Distribution of Respondents Based on Gender

Table 3. Frequency Distribution of Respondents Based on Gender

No.	Gender	Frequency	Percentage (%)
1.	Male	53	48,2
2.	Female	57	51,8
Total		110	100

Source: Primary Data, 2024

Based on Table 3, it is known that the majority of respondents have female gender as many 57 respondents (51.8%) and 53 respondents (48.2%).

Frequency Distribution of Respondents Based on Characteristics of Contact Lens Use

Table 4. Frequency distribution of respondents based on contact lens usage characteristics

No.	Characteristics of Contact Lens Use	Frequency	Percentage (%)
1	Purpose of using Contact Lenses		
1.	Vision aids	77	70,0
2.	Cosmetics	33	30,0
	Total	110	100
2	Length of Use		
1.	<1 year	39	35,5
2.	>1 year	71	64,5
	Total	110	100
3	Types of Contact Lenses		
1.	Single use	22	20,0
2.	Repeated use	88	80,0
	Total	110	100
4	Length of Contact Lens Wear in a Day		
1.	<6 hours	27	24,5
2.	>6 hours	83	75,5
	Total	110	100

Source: Primary Data, 2024

Based on Table 4 regarding the characteristics of contact lens use, it is known that from the purpose of using lenses, the majority of answered as a visual aid as many as 77 respondents (70.0%) and those who answered as cosmetics were 33 respondents (30.0%). Based on data on the length of use, the majority of respondents answered > 1 year as many as 71 respondents (64.5%) and < 1 year as many as 39 respondents (35.5%). Based on data on the type of contact lenses, the majority answered repeated use as many as 88 respondents (80.0%) and disposable as many as 22 respondents (20.0%). Based on data on the length of use in one day, the majority of respondents answered > 6 hours as many as 83 respondents (75.5%) and < 6 hours as many as 27 respondents (24.5%).

Frequency Distribution of Knowledge Level of Contact Lens Wearing

Table 5. Frequency Distribution of Knowledge Level of Wearing Contact Lenses

No.	Usage Knowledge Level Contact Lenses	Frequency	Percentage (%)
1.	Less	14	12,7
2.	Simply	87	79,1
3.	Good	9	8,2
	Total	110	100

Source: Primary Data, 2024

Based on Table 5, it is known that the majority of respondents have a level of knowledge of contact lens wear in the moderate category as many as 87 respondents (79.1%), 14 respondents (12.7%) in the poor category and 9 respondents (8.2%) in the good category.

Frequency Distribution of Eye Infection Variables

Table 6. Frequency distribution of eye infection variables

No.	Eye Infections	Frequency	Percentage (%)
1.	No irritation	94	85.5
2.	Irritation	16	14.5
Total		110	100

Source: Primary Data, 2024

Based on Table 6, it is known that the majority of respondents did not experience irritation as many as 94 respondents (85.5%) and experienced irritation as many as 16 respondents (14.5%).

Bivariate Analysis Results

Table 7. Cross Tabulation of the Relationship between Knowledge Level of Contact Lens Contact Lenses with the Incidence of Eye Infections in Students / (i Faculty of Medicine UMI Batch 2022-2023.

Knowledge Level	Eye Infections				Total		Correlation Coefficient	Asymp. Sig. (2 sided) (□)
	No Irritation		Irritation					
	N	%	N	%	N	%		
Less	3	2,7	11	10,0	14	12,7	-0,582	0.000
Simply	82	74,5	5	4,5	87	79,1		
Good	9	8.2	0	0	9	8,2		
Total	94	85,5	16	4,82	110	54,1		

Source: Primary Data, 2024

Table 7 shows that out of 110 respondents, it is known that there are 11 respondents (10.0%) with a lack of knowledge who have irritation, 3 respondents (2.7%) with a lack of knowledge and no irritation. Of the 82 respondents (74.5%) had a sufficient level of knowledge and did not experience irritation, and there were 5 respondents (4.5%) who had a sufficient level of knowledge but experienced irritation. From the results of the statistical test results obtained a correlation coefficient of -0.582 with a sig value. = 0.000, which means Pvalue <0.05, this study shows that there is a relationship between the level of knowledge of contact lens use and the incidence of eye infections in students / (i) Faculty of Medicine UMI class 2022-2023. The results of the correlation coefficient are negative, indicating that the increase in the level of knowledge of contact lens wearers, the less the incidence of eye infections.

Discussion

Knowledge level of contact lens wear

Based on the results of the frequency distribution, it is known that the majority of respondents have a level of knowledge of contact lens wear in the moderate category as many as 87 respondents (79.1%), 14 respondents (12.7%) in the poor category and 9 respondents (8.2%) in the good category. According to Mubarak in Ibrahim, et al, knowledge is influenced by the following factors, namely education, occupation, age, interest, experience and culture.[44] In this study, it is known that the respondents were medical students of class 2022 and 2023. According to Mubarak's theory, it is known that it is undeniable that the higher a person's education, the easier it is for them to receive information, and ultimately the more knowledge they have. This is one of the reasons that the majority

of respondents' knowledge is in the moderate category because students also have access to knowledge about health, either taught by the university or obtained by students through books or social media.[45]

In addition to education, knowledge is also influenced by the age of the respondent. Based on the results of the frequency distribution, it is known that the majority of respondents aged 21 years were only 8 respondents (7.3%), aged 20 years were 46 respondents (41.8%), aged 19 years were 43 respondents (39.1%), and aged 18 were 13 respondents (11.8%). Age is an important factor, because age can affect a person's experience in dealing with health problems or diseases and decision making. A person's maturity level will be more mature in thinking and working. This also affects person's cognition. A person's age also affects a person's ability to catch and think. The older the age, the more developed the power of capture and mindset, so that the knowledge gained is better. The age of the majority of respondents in this study, aged 20 years, is an age that is quite mature in thinking. This is one of the factors causing the respondents'level of knowledge in the category.[46]

Incidence of Eye Irritation

Based on the results of the frequency distribution, it is known that the majority of respondents did not experience irritation as many as 94 respondents (85.5%) and experienced irritation as many as 16 respondents (14.5%). The use of contact lenses can have a negative impact that must be watched out for, especially if you do not comply with the rules of use. Problems or negative impacts that often occur in contact lens use depend on several factors, such as understanding, compliance, and lens use procedures. Good contact lens use behavior will reduce the risk of complications due to contact lens use, which can be seen from knowledge, attitudes, and lens care actions.[47]

Based on the results of the frequency distribution in this study on the characteristics of contact lens use, it is known that from the purpose of using lenses, the majority of respondents answered as a visual aid as many as 77 respondents (70.0%) and those who answered as cosmetics were 33 respondents (30.0%). Corrective lenses are designed to correct refractive errors in the eye and other eye abnormalities, so that they will improve vision like glasses. that can be corrected by using contact lenses are myopia, hypermetropia, astigmatism and presbyopia. Cosmetic contact lenses are designed for cosmetic purposes by changing the color and appearance of the eyes. This type of lens actually also serves to improve vision. But sometimes the design and color of this type of contact lens can make the view blurry or unclear. Non-corrective contact lenses for cosmetic purposes are also often called decorative contact lenses or plano cosmetic. Although used for cosmetic purposes, the material of these contact lenses must still be considered as well as other conventional contact lenses because cosmetic contact lenses usually allow less oxygen to enter the eye than corrective contact lenses. This can certainly disturb and cause damage to the eye.[48]

Based on data on length of use, the majority of respondents answered >1 year as many as 71 respondents (64.5%) and <1 year as many as 39 respondents (35.5%). The use of overnight contact lenses has been carried out for several years. Both the prevalence and severity of complications, especially microbial keratitis, increase when contact lenses are used on an extended basis that exceeds one or more sleep cycles. The FDA limits the use of extended hydrogel lenses to a maximum of 6 nights, while some silicone hydrogels and contact lenses with high Dk are approved for use for up to 1 consecutive month. However, some studies have found that even with contact lenses with very high oxygen permeability, extended use can lead to a risk of corneal infection.[49]

Based on data on the type of contact lenses, the majority answered repeated use as many as 88 respondents (80.0%) and single use as many as 22 respondents (20.0%). The impact of using contact lenses that are not in accordance with procedures results in the onset of symptoms eyes such as eye irritation so that the eyes turn red, the presence of foreign objects around the cornea such as fine dust,

so that the eyes experience stinging and itching around the eyes and can cause damage to the eye cornea and surrounding areas.[50]

Based on the data on the length of use in one day, it is known that the majority of respondents answered > 6 hours as many as 83 respondents (75.5%) and < 6 hours as many as 27 respondents (24.5%). Daily use means that contact lenses should not be worn for more than 24 hours a day without removing. Contact lenses must be removed every night. Furthermore, contact lenses must be washed and soaked in a solution for lens care for several hours, then they can be worn again.[52]

The most common negative effects of contact lens wear are corneal neovascularization, keratitis, giant papillary conjunctivitis, dry eye, and corneal staining. In these diseases, the symptom of red eye is obtained. Red eye is a complaint or symptom that often appears. This complaint is caused by the color of the eyeball changing from white to red. Red eye can occur due to three problems such as mechanical trauma, chemical trauma, and infection or inflammation. In a study at Syiah Kuala University, out of 193 respondents who used contact lenses, 126 of them experienced red eyes (65%).[53]

Relationship between Knowledge Level of Contact Lens Use and the Incidence of Eye Infections in Students / (i) Faculty of Medicine UMI class 2022-2023

The results of the cross tabulation show that out of 110 respondents, it is known that there are 11 respondents (10%) with a lack of knowledge and experience irritation, where 3 respondents (2.7%) have a lack of knowledge but do not experience irritation, In respondents who have a lack of knowledge and have experienced eye irritation while wearing contact lenses, this is due to the respondents' ignorance in cleaning and caring for contact lenses, so that complications such as eye irritation arise due to the use of dirty contact lenses or the accumulation of microorganisms on the surface of the contact lenses worn. The results of this study are supported by Vitaloka's research (2021) on the relationship between knowledge level and contact lens care with the incidence of eye infections. This study explains that the statistical test results obtained P Value = 0.0005 (P Value 0.0005 < α 0.05), it can be concluded that there is a significant relationship between the level of knowledge of contact lens care and the incidence of eye infections. From the results of the analysis, the OR value = 5.304 was also obtained, which means that respondents with a poor level of knowledge are at risk 5.3 times to experience eye infections compared to respondents with a good level of knowledge.

The results of the cross tabulation further show that 82 respondents (74.5%) have a sufficient level of knowledge and do not experience irritation, and there are 5 respondents (4.5%) who have a sufficient level of knowledge but experience irritation. According to Notoatmodjo, knowledge is the result of a person's sensing of objects. This knowledge has six levels, namely; *know (know)*, understand (*comprehension*), application (*application*), analysis (*analysis*), synthesis (*synthesis*), and evaluation (*evaluation*). Students' knowledge about wearing contact lenses is obtained from several sources, including their own experience in wearing contact lenses, other people, electronic and print media, or doctors. By having sufficient knowledge, it is one of the reasons that students are prevented from the incidence of eye infections due to contact lens wear.

This study also showed that there were respondents with sufficient knowledge, but still experienced infectious events indicated by eye irritation. This may be because they only know the knowledge or procedures for wearing contact lenses and the indications for their use, but in reality they do not do what they know.[54]

The results of the last cross tabulation were 15 respondents (7.5%), it was known that all of them had a good level of knowledge and none of them experienced eye irritation. Respondents in this study who have good knowledge and do not experience eye irritation mean that the better the level of knowledge of contact lens wearers, the less the risk of eye irritation. This is because students who

have good knowledge about wearing contact lenses will be careful when wearing contact lenses, so as to reduce the risk of eye irritation or eye infection.

The results of this study are supported by Inayatullah's research, which shows that as many as 6 respondents (35.3%) have good knowledge of contact lens use and there are red eye events, 11 respondents (64.7%) have good knowledge of contact lens use and there are no red eye events, 15 respondents (75%) have poor knowledge of contact lens use and there are red eye events, and 5 respondents (25%) have poor knowledge of contact lens use and there are no red eye events. From these results*, a p-value* of 0.036 was obtained so that it can be concluded that there is a relationship between knowledge of contact lens use and the incidence of red eye.[55]

From the results of statistical tests obtained a correlation coefficient of -0.582 with a sig value. = 0.000, which means Pvalue <0.05, so this study shows that there is a relationship between the level of knowledge of contact lens use and the incidence of eye infections in students / (i) Faculty of Medicine UMI class 2022-2023. The results of the correlation coefficient are negative, indicating that the increase in the level of knowledge of contact lens wearers, the less the incidence of eye infections.

Knowledge is a very important indicator for contact lens wearers, so that negative impacts and side effects that may occur can be avoided. The higher the level of knowledge of contact lens wearers, less the incidence of eye irritation. Students who know the importance of knowledge related to contact lenses can reduce the risk of eye irritation or other eye health problems that come from ignorance of how to wear and care for contact lenses. Students' knowledge about wearing contact lenses can be obtained from several sources, such as their own experience, the experience of others, electronic or print media, and doctors.

The results of this study are in accordance with Hayati's research on the relationship between the level of knowledge of contact lens wearers and the incidence of eye irritation in students of the Malikussaleh University Medical Study Program. The results showed that contact lens wearers with good knowledge amounted to 48 people (72.7%), sufficient knowledge 13 people (19.7%) and less knowledge 5 people (7.6%) with the incidence of eye irritation as many as 29 people (43.9%) and not eye irritation as many as 37 people (56.1%). The conclusion of this study is that there is a significant relationship between the level of knowledge of contact lens wearers and the incidence of eye irritation in Malikussaleh University Medical Study Program students (p-value 0.046).

Conclusion

Based on the results and discussion of this study, it can be concluded that the results of the frequency distribution show that the majority of respondents are 20 years old, come from the class of 2022 and the majority have female gender. The cross tabulation results showed that out of 110 respondents, there were 11 respondents (10.0%) with a lack of knowledge experiencing irritation, where 3 respondents (2.7%) had a lack of knowledge and did not experience irritation. There were 82 respondents (74.5%) who had a sufficient level of knowledge and did not experience irritation, and there were 5 respondents (4.5%) who had a sufficient level of knowledge but experienced irritation. Of the 9 respondents (8.2%), it is known that all of them have a good level of knowledge and none of them experience eye irritation. The results of the frequency distribution of knowledge levels showed that the majority of respondents had a level of knowledge of contact lens wear in the sufficient category and the majority of eye infections did not experience irritation. From the results of the statistical test results obtained a correlation coefficient of -0.582 with a sig value. = 0.000, which means that there is a relationship between the level of knowledge of contact lens use and the incidence of eye infections in students / (i) Faculty of Medicine UMI class 2022-2023. The result of the correlation coefficient is negative, indicating that the increase in the level of knowledge of contact lens wearers, the less the incidence of eye infections. The results of the frequency distribution of the

characteristics of contact lens use, it is known that from the purpose of using lenses, the majority of respondents answered as a visual aid with a length of use, the majority answered> 1 year. Based on data on the type of contact lenses, the majority answered repeated use with the length of use in one day, it is known that the majority of respondents answered> 6 hours.

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