Contact lens usage and health literacy among Turkish adults

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ABSTRACT

Objective: To evaluate the usage of contact lenses and health literacy among ophthalmology clinic outpatients..

Patients and Methods: This cross-sectional study was conducted on outpatients of an ophthalmology clinic between July and September 2019. The data were collected using a questionnaire that consisted of questions about sociodemographic characteristics, contact lens-related behaviors, the European Health Literacy Scale (HLS-EU) Short-Form, and the Ocular Surface Disease Index. Contact lens-related behavior was evaluated through 15 questions. P < 0.05 was accepted as statistically significant.

Results: In the study group 402 (54.8%) of the participants were males. The ages of the patients ranged between 18 and 75 years, with a mean (SD) of 39.20 (15.0) years. It was found that 28.4% (n = 208) of the study group participants were contact lens wearers. The health literacy level was higher in the contact lens wearers. A positive correlation was found between the scores of the HLS-EU and the answers to the contact lens-related behavior questions.

Conclusion: In this study, we found that the health literacy levels of the contact lens wearers were higher than those of the non-contact lens wearers. As the health literacy of the patients increased, the behaviors towards the correct use of contact lenses improved. It is recommended that more detailed studies be carried out in the field of health literacy with contact lens use.

Keywords: Contact lenses, Dry eye syndrome, Eye diseases, Health literacy

1. INTRODUCTION

Contact lenses are medical devices that began to be produced in the late 19th century. The main purpose for the contact lens production was to correct refractive errors. Nowadays, they are used for cosmetic and therapeutic purposes, as well as the correction of refractive errors [1, 2].

The use of contact lenses has become widespread all over the world. It is estimated that about 140 million people wore them worldwide in 2010 [3]. In the United States, it is thought that contact lens use has risen to 45 million [4]. However, the number of contact lens users is not clear in Turkey. It was reported that the number of people who do not use any devices to correct their sight, such as glasses or contact lens, is decreasing progressively; in 2016, 35.6% of individuals aged 15 years and over wore glasses or contact lenses [5].

Contact lenses are known to be very safe and effective when used properly. However, contact lens use causes many complications, such as microbic keratitis. Inadequate contact lens hygiene and failure to follow the instructions for contact lens use have been reported as the main causes of keratitis in contact lens wearers. On the other hand, the risk of other eye problems, such as dry eye syndrome, increases in contact lens users. These infectious complications, like superior limbic keratoconjunctivitis, may cause serious health problems, including vision loss. Contact lens-related complications were reported to occur at a rate of around 5% and loss of vision is 0.6 per 10,000 users. It is estimated that contact lens-related health problems cost 175 million dollars annually in the USA [6–10].

Healthy contact lens use and regular ophthalmologist check-ups are the most effective ways to prevent contact lens-related health

problems. In addition to preventive methods, early treatment also plays a significant role in dealing with complications. With this in mind, a new concept, namely health literacy, is a leading factor that affects the health behaviors of individuals and their compliance to health advice. Health literacy covers accessing, understanding, appraising, and applying health-related information within healthcare. It is thought that having competent health literacy knowledge is an important issue in assisting contact lens users in avoiding complications [2, 11–14]. However, studies evaluating the use of contact lenses and health literacy in Turkey are limited.

The aim of this study was to evaluate the usage of contact lenses and health literacy among the Eskisehir Osmangazi University Hospital Ophthalmology Clinic outpatients.

2. PATIENTS and METHODS

This cross-sectional study was conducted on the outpatients of an ophthalmology clinic between July and September 2019.

The study was conducted in accordance with the regulations of the Eskisehir Osmangazi University Hospital Directorate and ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Eskisehir Osmangazi University with prothocol no: 25.06.2019/15. Written informed consent was obtained from all of the participants in the study.

In this study, the sample size was estimated as at least 384 participants (with a contact lens use prevalence of 50%, a 5% margin of error at a 95% confidence level). The study group consisted of 733 patients.

The data of the study was collected via a questionnaire form. The questionnaire form consisted of questions regarding sociodemographic characteristics, contact lens-related behaviors, the European Health Literacy-Q16 (HLS-EU-Q16) Scale and the Ocular Surface Disease Index (OSDI) [2,12,13,15,16]. The questionnaire forms were filled by the researchers in the waiting room of the clinic during face-to-face interviews with the participants. This process took about 20–25 min.

A 15-item questionnaire was applied to the patients about how they used their contact lenses. They were asked to answer yes or no to each question. Each correct behavior was evaluated as 1 point and a wrong behavior was evaluated as 0 points. A total of 0–15 points could be obtained from the questionnaire. As the score obtained from the questionnaire increases, the behaviors change positively.

The HLS-EU was developed by the European Health Literacy Consortium within the framework of the European Health Literacy Project, between 2009 and 2012. The HLS-EU-Q16 was developed to include 16 selected questions by the HLS-EU. The validity and reliability of the HLS-EU-Q16 in Turkish was conducted by Emiral et al. The scale is a 5-point Likert-type and the answers for each question are scored between 0 and 4. The index score ranges between 0 and 50, and the health literacy level increases as the score obtained from the scale increases [15, 17].

The OSDI is a 12-item scale for the assessment of symptoms related to dry eye disease and their effect on vision. This scale

was developed by Walt et al. The validity and reliability of The OSDI in Turkish was conducted by Irkec et al in 2006 [16, 18]. Patients with a score of 13 or above are considered to have dry eye syndrome. The OSDI response structure contains five options that relate to the frequency of the effects of ocular surface disease.

Participants who both previously used or were currently using contact lenses were considered as contact lens users. The family income level was evaluated according to their own perceptions.

Statistical Analysis

The collected data were analyzed using SPSS Statistics for Windows 15.0 (SPSS Inc., Chicago, IL, USA). The normality of the data was analyzed using the Shapiro Wilk test. Chi square, Mann-Whitney U, and Spearman correlation were used for the analyses. $P < 0.05$ was accepted as statistically significant.

3. RESULTS

The study group consisted of 402 (54.8%) male, 331 (45.2%) female patients. The ages of patients ranged between 18-75, with mean (SD) 39.20 (15.0) years. In this study, the percentage of the contact lens users was 28.4% (n=208).

Distribution of study group among contact lens usage and sociodemographic characteristics are given in Table I.

Table I. *Distribution of study group among contact lens usage and sociodemografic characteristics*

Variables	Contact lens usage			Test statistics χ^2; p
	Not use n(%)*	users n(%)*	Total n(%)**	
Age group(year)				
£24	67 (49.2)	69 (50.8)	136 (18.5)	94.397; 0.001
25-44	224 (70.5)	119 (29.5)	343 (46.7)	
45-64	171 (94.9)	19 (5.1)	190 (25.9)	
³65	63 (98.4)	1 (1.6)	64 (8.9)	
Gender				
Male	311(77.4)	91 (22.6)	402(54.8)	56.309; 0.001
Female	214 (64.7)	117 (35.3)	331(45.2)	
Marital status				
Single	178 (59.5)	121 (40.5)	299 (40.8)	36.328; 0.001
Married	347 (80.0)	87 (20.0)	434 (59.2)	
Education level				
Primary school	63 (94.0)	4 (6.0)	67 (9.1)	55.875; 0.001
Secondary School	78 (89.7)	9 (10.3)	87 (11.8)	
High school	174 (76.0)	55 (24.0)	229 (40.7)	
University	210 (60.0)	140 (40.0)	350 (47.4)	
Income level				
Good	116(57.4)	86(42.6)	202(27.5)	27.750; 0.001
Moderate	368(76.8)	111(23.2)	479(65.3)	
Bad	41(78.8)	11(21.2)	52(7.0)	
Chronic eye disease story				
Yes	441(60.1)	203(39.9)	644(95.4)	25.816; 0.001
No	84(94.3)	5(5.7)	89(4.6)	
Total	525(71.6)	208(28.4)	733(100.0)	

*row percantage, ** column percantage

In this study, the most correctly answered behavior question was "I pay attention to the expiration date of contact lenses" at a rate of 90.9%, while the most incorrectly answered was "I clean contact lenses only when I use them" at a rate of 66.9%. The distribution of the answers to the contact lens-related behavioral questions by the contact lens users is given in the Table II. .

Table II. Distribution of the answers to the contact lens-related behavioral questions by the contact users

Contact Lens-Related Behavior Questions	No n (%)	Yes n (%)
1. I pay attention to the expiration date of my contact lenses	19 (9.1)	189 (90.9)
2. I continue to use contact lens solutions after the expiration date*	178 (85.5)	30 (14.5)
3. I clean my contact lenses with tap water*	149 (71.6)	59 (28.4)
4. I clean contact lenses only when I use them*	69 (33.1)	139 (66.9)
5. I always remove my contact lenses before going to sleep	41 (19.7)	167 (80.3)
6. I wash my hands before putting my contact lenses in	32 (15.3)	176 (84.7)
7. I use contact lenses when swimming*	140 (67.3)	68 (32.7)
8. I consult a doctor if there are side effects (flushing, burning, stinging etc.) from contact lens use	56 (26.9)	152 (73.1)
9. I wash my hands before removing my contact lenses	164 (78.8)	44 (21.2)
10. I always consult a doctor when using contact lenses	52 (25.0)	156 (75.0)
11. When I use contact lenses, I go to a doctor for regular check-ups	64 (30.7)	144 (69.3)
12. I remove my lenses before taking a shower	43 (20.6)	165 (79.4)
13. Once a week, I do not wear my contact lens	67 (32.2)	141 (67.8)
14. I have a spare bottle of contact lens solution and lens box	60 (28.8)	148 (71.2)
15. I use the same contact lens storage box until the lens solution runs out*	64 (30.7)	144 (69.3)

* Negative contact lens behaviors

The scores of the contact lens users obtained from the Contact Lens Behavior Questionnaire ranged from 2-15, with a mean score of 10.6 ± 2.6 (median: 11.0). The distribution of the scores obtained from the Contact Lens Use Behavior Questionnaire according to variables to be related to contact lens usage is given in Table III.

The scores obtained from the OSDI Dry Eye Scale ranged from 0 to 43, the mean score was 14.78±8.7 (median: 14.0). The number of participants with dry eye disease was 429 (58.5%). Contact lens usage was found to have no significant effect on the frequency of dry eye syndrome(X^2=0.503; p=0.478).

The scores obtained from the HLS-EU-Q16 ranged between 0-50 and the mean score was 35.9±10.1 (median: 36.5). The distribution of scores obtained from OSDI Dry Eye Scale and HLS-EU-Q16 are shown in Table IV.

Table III. The distribution of the scores obtained from the Contact Lens Use Behavior Questionnaire according to variables to be related to contact lens usage

| Variables	n (%)	Median (Min-Max)	Test Statistic z/KW; p
Purpose of contact lens usage			
Correction of refractive errors*	114 (54.8)	11.0 (6.0-15.0)	
Aesthetic reasons *	79 (38.0)	10.0 (2.0-15.0)	**9.955; 0.007**
Other	15 (7.2)	10.0 (5.0-15.0)	
Efficient factor to contact lens usage			
Willingly	125 (60.1)	10 (2.0-15.0)	
Doctor's advice *	66 (31.7)	11.5 (5.0-15.0)	**23.959; 0.001**
Friend recommendation	10 (4.8)	7.5 (4.0-10.0)	
Other	7 (3.4)	9.0 (5.0-12.0)	
Contact lens provided place			
Optical store	120 (57.7)	10.0 (2.0-15.0)	
Pharmacy	74 (35.6)	11.0 (4.0-15.0)	4.332;0.228
Internet	13 (6.3)	13.0 (7.0-13.0)	
Other (beauty saloons etc.)	2 (0.5)	10.5 (10.0-11.0)	
Duration of contact lens use a day			
<8 hour	20 (9.6)	11.0 (8.0-15.0)	
8-16 hour	172 (82.6)	11.0 (2.0-15.0)	2.196;0.334
>16 hour	16 (7.8)	9.5 (6.0-14.0)	
Frequency of sleeping with contact lens			
Always	16 (7.7)	10.0 (5.0-13.0)	
Often	24 (11.5)	9.0 (8.0-14.0)	7.514;0.057
Rarely	103 (49.5)	11.0 (2.0-15.0)	
Never	65 (31.3)	11.0 (5.0-15.0)	
Washing contact lens with water			
Yes	67 (32.2)	10.0 (5.0-15.0)	
No	141 (67.8)	11.0 (2.0-15.0)	**2.252;0.024**
Experience of health problems related to contact lens usage			
Yes	68 (32.7)	10.0 (5.0-15.0)	
No	140 (67.3)	11.0 (2.0-15.0)	0.862;0.389
Level of information about contact lens usage			
Insufficient	17 (8.2)	10.0 (4.0-13.0)	
Sufficient	191 (91.8)	11.0 (2.0-15.0)	**2.479;0.013**
Total	208 (100.0)	11.0 (2.0-15.0)	

* pairwise x2 analysis, p <0.05

Table IV. The distribution of scores obtained from OSDI Dry Eye Scale and HLS-EU-Q16

Contact Lens Usage	n (%)	OSDI Dry Eye Scale Median (min-max)	HLS-EU-Q16 Median (min-max)
No	525 (71.6)	15.0 (0.0-43.0)	35.4 (0.0-50.0)
Yes	208 (28.3)	14.0 (0.0-42.0)	**38.5 (8.3-50.0)**
Total	733 (100.0)	14.0 (0.0-43.0)	36.5 (0.0-50.0)
Test Statistic (z; p)		1.394; 0.163	**3.305; 0.001**

In this study, there was a positive relationship between the scores obtained from the Contact Lens Related Behavior Questions and HLS-EU-Q16 (r=0.159, p=0.022).

The distribution of the scores obtained from the Contact Lens Related Behavior Questions and HLS-EU-Q16 is given in Figure I.
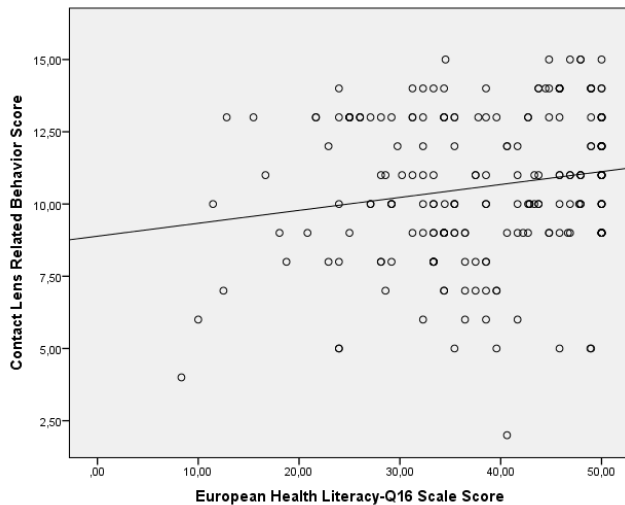
Figure 1. *The distribution of the scores obtained from the Contact Lens Related Behavior Questions and European Health Literacy-Q16 Scale Score*

4. DISCUSSION

This study explored a fairly new field, which evaluated contact lens usage and health literacy among Turkish adults. It was found that there was a positive correlation between health literacy and healthy contact lens usage habits. With this in mind, health literacy is an important factor in proper contact lens usage as well as other healthy lifestyle behaviors.

In the literature review, the percentage of contact lens usage was very wide. In this study, 28.4% of the participants used contact lenses. Generally, studies conducted in developing countries have indicated a high prevalence of contact lens use [10, 19, 20]. A study conducted in Ghana reported that only 3.3% of participants had previously used contact lenses [21]. On the other hand, Aziz et al. and Dinc et al. reported that the percentage of contact lens usage was 38.0% and 34.2% in Malaysia and Turkey, respectively [11, 22]. These different findings may have been the result of differences in the attitudes of the societies towards wearing contact lenses and barriers to accessing contact lens.

Contact lens usage could be affected by many socioeconomical factors. Some studies have reported that gender, age, and economic and educational status are associated with contact lens usage [10, 23]. In the current results, female gender, younger age, and higher economic and educational status were associated with being more likely to use contact lenses. A report from the United States noted that increasing age, male gender, and lower income and educational status were reversely associated with contact lens usage [23]. Ocansey et al., reported that contact lenses were mostly used by younger people [24]. These findings could be related with the use of contact lenses for esthetic and sportive purposes.

Contact lens usage increases the risk of some health problems, such as keratitis and dry eye syndrome. It is already known that extended wear and poor hand hygiene are more important risk factors for contact lens-related microbial keratitis. Failure to properly use contact lenses may be a leading cause of the development of a bacterial biofilm layer. Moreover, extended contact lens usage increases susceptibility to infections due to hypoxic stress [25]. In this study, only 21.2% of the contact lens users washed their hands before handling their contact lenses. Berenson et al., reported that poor hygienic practices were common among contact lens users, and almost half (37%) did not wash their hands before handling their lenses [26]. Furthermore, other recent studies from Germany and the United Kingdom noted that 77.1% and 72.2% of participants always washed their hands before inserting their contact lenses, respectively [27]. The use of proper hygiene behavior among contact lens users, especially hand washing, must be improved.

Another common disease in contact lens wearers is dry eye syndrome. Symptoms of this include sensitivity to light, eye grittiness, and blurred vision [28]. The mechanism of symptoms seems complex. Tear hiperosmolarity and decreased protective effects of the musin layer can cause dry eye symptoms among contact lens users [29]. Contact lens usage was found to have no significant effect on the frequency of dry eye syndrome. A study noted that contact lens users were 5 times more likely than others to report dry eye symptoms [30]. Dry eye syndrome is a symptom-based disease [31]. It can be considered as the cause of different results.

It is known that low health literacy is a problem in the provision of effective health care and has a key role in delaying the uptake of health care [32, 33]. An increase in health literacy will improve health-seeking behaviors, including eye conditions [33]. In this study, the health literacy level of the contact lens users was higher than in the other participants. No studies could be found in the literature that directly addressed or measured health literacy among contact lens users in Turkey. Harrison et al. reported that health literacy is an important factor in gaining more control of an individual's visual health and ophthalmologic diseases could have a negative impact on health literacy [32].

In conclusion, contact lens usage was quite common in the study group. The usage was more frequent in the young and female patients. Only one in five patients reported that they washed their hands before removing their contact lenses. The health literacy level was higher in the contact lens wearers. A positive correlation was found between the scores of the health literacy scale and the answers to the contact lens-related behavior questions. Ophthalmologic diseases could have a negative impact on health literacy. Further studies on contact lens use and health literacy are needed.

Compliance with Ethical Standards

Ethical Approval: The study was approved by the Non-Interventional Clinical Research Ethics Committee of Eskisehir Osmangazi University. Informed consent was obtained from all patients prior to examination.

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