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ASSESSING THE ORAL HEALTH LITERACY, ORAL HEALTH RELATED QUALITY OF LIFE AND ORAL HEALTH STATUS IN ADULT PATIENTS

YETİŞKİN HASTALARDA AĞIZ SAĞLIĞI OKURYAZARLIĞI, AĞIZ SAĞLIĞI İLE İLGİLİ YAŞAM KALİTESİ VE AĞIZ SAĞLIĞI DURUMUNUN DEĞERLENDİRİLMESİ

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ABSTRACT
Aim: Oral health literacy (OHL) is an important term that used to determine the individuals skills to make appropriate oral health decisions, to process and understand basic oral health information. OHL is considered as a part of oral health. This study aimed to evaluate the association between OHL, Oral Health Related Quality of Life (OHRQoL) and decayed (D), missing (M) and filled (F) teeth scores (DMFT).
Materials and Methods: This study was conducted on Turkish speaking, 300 voluntary individuals between the ages 18-30 that were applied to Kırıkkale University Faculty of Dentistry without any cognitive impairment, visual and hearing problem. Patients' socio-demographic information and DMFT scores were recorded. Then OHL level was detected using a word recognition test. After that OHRQoL score was determined using a special survey. Data were analyzed SPSS 16.0 programme with using Pearson correlation analysis, one-way ANOVA and Scheffe tests.
Results: Male individuals had more missing teeth than female individuals (p=0.041). OHL was significantly high at higher educational level individuals (p<0.001). In terms of OHL levels, DT, MT, FT, DMFT and OHRQoL scores did not show significant differences (p>0.05). OHL level of the individuals' did not associated with DT, MT, FT, DMFT and OHRQoL scores (p>0.05). Besides these findings, there is no association was found between DMFT and OHRQoL scores (p>0.05). Age factor showed a positive correlation between MT (p=0.001, r=0.197).
Conclusion: The education level of the individuals has an impact on OHL levels. The association between OHL, DMFT and OHRQoL scores did not confirmed clearly.
Key Words: DMFT, Oral Epidemiology, Oral Health Literacy, Quality of Life, TREALD-30.

ÖZ
Amaç: Ağız sağlığı okuryazarlığı (OHL), kişilerin uygun ağız sağlığı kararlarını verme, temel ağız sağlığı bilgilerini işleme ve anlama becerilerini belirlemek için kullanılan önemli bir terimdir. OHL, ağız sağlığının bir parçası olarak kabul edilir. Bu çalışma, OHL, Ağız Sağlığına Bağlı Yaşam Kalitesi (OHRQoL) ile çürümüş (D), eksik (M) ve doldurulmuş (F) toplam diş skorları (DMFT) arasındaki ilişki değerlendirmeyi amaçladı.
Gereç ve Yöntem: Bu çalışma, Kırıkkale Üniversitesi Diş Hekimliği Fakültesi'ne başvuran, 18-30 yaşları arasında, bilişsel bozukluk, görme ve işitme problemi olmayan 300 gönüllü kişi üzerinde gerçekleştirildi. Hastaların sosyo-demografik bilgileri ve DMFT skorları kaydedildi. Hastaların OHL seviyeleri özel bir kelime tanıma testi kullanılarak, OHRQoL skorları ise özel bir anket kullanılarak belirlendi. Veriler SPSS 16.0 programında Pearson korelasyon analizi, tek yönlü ANOVA ve Scheffe testleri kullanılarak analiz edildi.
Bulgular: Erkek bireylerde eksik diş sayısı kadınlardan daha fazla bulundu (p=0,41). OHL, yüksek eğitim düzeyindeki bireylerde anlamlı derecede yüksekti (p<0,001). OHL düzeyleri açısından DT, MT, FT, DMFT ve OHRQoL skorları anlamlı farklılık göstermedi (p>0,05). Bireylerin OHL düzeyi DT, MT, FT, DMFT ve OHRQoL skorlarıyla ilişkili bulunmadı (p>0,05). Bu bulguların yanı sıra DMFT ile OHRQoL skorları arasında ilişki bulunmadı (p>0.05). Yaş faktörü MT ile pozitif korelasyon gösterdi (p = 0.001, r = 0.197).
Sonuç: Bireylerin eğitim düzeyinin OHL düzeyleri üzerinde etkisi vardır. OHL, DMFT ve OHRQoL skorları arasındaki ilişki net olarak teyit edilmemiştir.
Anahtar Kelimeler: DMFT, Oral Epidemiyoloji, Ağız Sağlığı Okuryazarlığı, Yaşam Kalitesi, TREALD-30.

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INTRODUCTION

Oral health literacy (OHL) is an important term that used to determine the individuals skills to make proper decisions about oral health and understand basic oral health information.[1] However, health literacy is an idea developed in the field of health and positive correlations were found between low health literacy skills and poor health outcomes.[2] It has been shown that health literacy functions as a mediator between socio-economic factors, such as folk and education, and health outcomes, which in part explain health differences. OHL is considered as an important determinant that contributes to differences in oral health.[1,3] The level of health literacy of individuals is a product of complex skills and interaction in the individual, the health system, and the cultural and social context.[2,4]

Literacy is defined as "Ability to read and write" or "to be educated". The health literacy term was firstly used in a paper published in the year 1974. It was about the educational system, the effects of health education on the health care system, mass communication and health education as social policy.[5] Various instruments which are usually divided two types into word recognition tests and comprehension tests, have been developed in order to determine a person's level of health literacy.[6] Word recognition tests are simple and provide to determine the level of literacy of the individuals quickly and easily. However the word recognition tests do not measure reading comprehension or interpretation.

REALD-30 is a simple recognition test that consists of 30 words and measures the individual's ability to read these words correctly. It has been translated and validated in Indian[7], Chinese[8], Spanish[9], Arabic[10], Portuguese[11]. TREALD-30 is the Turkish version of the Rapid Estimate of Adult Literacy (REALD) questionnaire translated and validated by Peker et al. in 2017 as a valid and reliable tool for assessing oral health literacy in adult patients. This measurement can be used to identify patients who cannot communicate properly with dentists and practicing oral care instructions because of difficulty recognizing basic oral health words.[4]

Tooth decay; is one of the most common chronic diseases affecting oral health worldwide with its multifactorial etiology. Tooth decay and associated early tooth loss, also affects the individual's oral health as well as general health, causing large expenditures in the country's economy [12]. The DMFT index was created to determine the total number of teeth (T) that are decayed (D), missing because of caries (M) and filled (F) for an individual. The DMFT index shows the caries experience of an individual.[13]

Oral health is a default standard for oral tissues that contributes to physical, psychological, and social well-being, enabling individuals to participate in selected social roles and to socialize without discomfort. The Oral Health Related Quality of Life (OHRQoL) is the individual's perception of how oral health affects its own quality of life and general health. It has been proven that oral health has a profound effect on the appearance of impressiveness, breathing, comfort, sleep, social life and quality of life. Factors affecting quality of life and OHRQoL can be expressed as personal characteristics, psychological status, socio-demographic factors, factors affecting the lifestyle and judgments of the social and social environment. [14] The Oral Health Impact Profile-14 survey (OHIP-14) has been widely used to measure OHRQoL. It is a specific measurement that determines the effects of oral health problems on people's quality of life. The OHIP-14 TR was translated and validated into Turkish by Balci et al. in 2017.[15]

The aim of this study was to evaluate the association between OHL, OHRQoL and DMFT scores at 300 adults with dental problems. Besides, the effect of gender, educational status and dental examination frequency on these parameters were also investigated. The null hypotheses are as follow: 1. There is no association between OHL, DMFT and OHRQoL, 2. There is no association between OHL and socio-demographic factors.

MATERIALS AND METHODS

This study was carried out in the Restorative Dentistry Department of the Kırıkkale University Faculty of Dentistry. Ethical approval for the study was obtained from Kırıkkale University Clinical Research Ethics Committee. (Decision no: 22/02). The participants were selected from the patients who have visual-tactile and radiologic examination by the Oral Diagnosis and Radiology Clinic and directed to the Restorative Dentistry Clinic for tooth filling. Within the scope of the study, 300 participants were selected that aged 18-30 years old, who could speak and read Turkish without obvious signs of cognitive impairment, visual or hearing problems, who were not under the

influence of drug or alcohol intoxication were included. After all individuals were informed about the study, informed consent form were signed by them. Data were collected from 300 patients within 6 months.

The examination of participants and application of questionnaires were carried out by one researcher. The questionnaires were implemented in a face to face interview. Firstly, each participant's socio-demographic variables status was recorded. Then oral and radiological examination were done and DMFT scores were recorded.

After that, the Turkish Oral Health Impact Profile-14 (OHIP-14 TR) questionnaire that consisting of 14 questions was performed. The OHIP-14 questions were asked the individual's with the following expression: Have you because of problems with your mouth, teeth or dentures?" Likert scale used to determine the degree of the problem and responses were recorded (0= never, 1= hardly ever, 2= occasionally, 3= fairly often, 4= very often). Total score of the each participant's responses generated the individual OHIP-14 score. Higher OHRQoL score indicates a greater intensity of the problem that is a decrease in life quality.

Finally, OHL score of each participant's was detected using the TREALD-30 instrument that was previously validated (Cronbach's alpha = 0.91). TREALD-30 is a word recognition test includes 30 dental-related words arranged in order of increasing difficulty. The 30 words were read aloud by participants to the researcher. One point was given for each correctly pronounced word and a total score between 0 (lowest literacy) to 30 (highest literacy) was detected for each participant. The REALD-30 score was categorized as ≤21 is low, 22 to 25 is moderate, or ≥26 is high according to previous studies[16,17].

Data were analyzed at SPSS 16.0 programme using One-way ANOVA test to compare more than two independent groups. Independent t-test was used to compare pairwise groups. Scheffe test was used as a complementary post-hoc analysis to specify the differences between the groups after the ANOVA test. Pearson correlation analysis was applied to the continuous variables of the study.

RESULTS

Totally 300 individuals participated in the study, of which 162 were women (54%) and 138 were men (46%). The mean age of the individuals' were 23.113 ± 3.795. Beside age, the mean DT, MT, FT, DMFT, OHL and OHRQoL scores were showed in Table 1.

Table 1. The minimum, maximum and mean scores of age, DT, MT, FT, DMFT, OHL and OHRQoL.

	n	***Mean***	***Min.***	***Max.***
Age	300	23.110±3.796	18.00	30.00
DT	300	2.330±2.194	0.00	12.00
MT	300	0.660±1.105	0.00	6.00
FT	300	3.900±3.625	0.00	18.00
DMFT	300	6.890±4.210	0.00	26.00
OHL	300	21.503±3.536	10.00	30.00
OHRQoL	300	9.570±8.157	0.00	36.00

According to gender, it was revealed that male individuals had more missing teeth than female individuals (p=0.41). The other parameters did not show significant differences between two genders (p>0.05).

According to self-reported dental examination frequency of the individuals' FT scores showed statistically significant differences (p=0.006). Besides, OHL levels showed significant differences according to dental examination frequency. It was found that dental examination interval is longer as the OHL level decreases (p=0.018).

According to the educational status of the participants; MT scores showed significantly higher scores at "High school or lower" education level individuals. Besides, OHL scores showed significantly higher scores at "University or higher" educational level individuals (p<0.001). Average parameters of the individuals' according to gender, self-reported dental examination frequency and educational status were shown at Table 2.

According to the OHL scores; 147 (49%) of the participants were categorized as low literacy, 117 (39%) as moderate literacy and 36 (12%) as high literacy levels. The mean score was 18.598 ± 2.128 for the low OHL group, 23.367 ± 1.178 for the moderate OHL group, and 27.305 ± 1.283 for the high OHL group. In terms of OHL levels, DT, MT, FT, DMFT and OHRQoL scores did not show significant differences (p>0.05). These findings were shown at Table 3.

OHL level did not associated with DT, MT, FT, DMFT and OHRQoL scores of the individuals' (p>0.05). Besides these findings, there is no association was found between DMFT and OHRQoL

Table 2. The mean scores of the Individuals by gender, self-reported dental examination frequency and educational status. (*<0.05)

		n	*Decayed Teeth*	*Missing Teeth*	*Filled Teeth*	*DMFT*	*OHL score*	*OHRQoL*
Gender	*Female*	162	2.200 ± 2.184	**0.540 ± 1.104[a]**	3.960 ± 3.666	6.700 ± 4.504	21.444 ± 3.487	8.990 ± 8.075
	Male	138	2.490 ± 2.202	**0.800 ± 1.093[b]**	3.830 ± 3.587	7.120 ± 3.840	21.572 ± 3.604	10.240 ± 8.231
	p value		p= 0.246	**p= 0.041***	p= 0.758	p= 0.399	p= 0.755	p= 0.188
Self-reported dental examination frequency	Less than 6 months	47	2.090 ± 2.339	0.490 ± 0.997	**4.320 ± 4.233[a b c]**	6.890 ± 4.824	**22.489 ± 3.470[ab]**	8.620 ± 7.300
	6 months - 1 year	96	2.090 ± 2.108	0.780 ± 1.258	**4.750 ± 3.509[a b]**	7.620 ± 4.161	**21.906 ± 3.694[a b c]**	10.180 ± 8.526
	Longer than 1 year	110	2.700 ± 2.321	0.600 ± 0.979	**3.500 ± 3.593[c d]**	6.780 ± 4.085	**21.182 ± 3.163[c d]**	9.900 ± 8.348
	Only dental problems	47	2.210 ± 1.829	0.740 ± 1.151	**2.700 ± 2.812[d]**	5.660 ± 3.732	**20.447 ± 3.827[d]**	8.490 ± 7.807
	p value		p= 0.175	p= 0.413	**p= 0.006***	p= 0.071	**p= 0.018***	p= 0.538
Educational status	High school or lower	106	2.550 ± 2.427	**0.930 ± 1.297[a]**	3.790 ± 3.512	7.270 ± 4.601	**19.962 ± 3.098[a]**	9.940 ± 7.424
	University or higher	194	2.220 ± 2.052	**0.520 ± 0.956[b]**	3.960 ± 3.692	6.690 ± 3.976	**22.345 ± 3.483[b]**	9.360 ± 8.542
	p value		p= 0.213	**p= 0.004***	p= 0.696	p= 0.269	**p= 0.000***	p= 0.555

Table 3. The mean scores of the individuals by OHL level.

OHL Level	*n*	*Decayed Teeth*	*Missing Teeth*	*Filled Teeth*	*DMFT*	*OHRQoL*
Low ≤ 21 (Mean 18.598 ± 2.128)	147	2.380 ± 2.153	0.780 ± 1.175	3.810 ± 3.702	6.950 ± 4.165	10.200 ± 8.378
≥ 22 Moderate ≤ 25 (Mean 23.367 ± 1.178)	117	2.180 ± 2.196	0.620 ± 1.007	3.800 ± 3.366	6.600 ± 4.212	8.570 ± 7.684
High ≥ 26 (Mean 27.305 ± 1.283)	36	2.640 ± 2.368	0.360 ± 1.073	4.610 ± 4.115	7.610 ± 4.403	10.220 ± 8.633
p value		p= 0.512	p= 0.109	p= 0.460	p= 0.440	p= 0.241

scores (p>0.05). The DMFT score showed positive correlation between DT (p=0.00, r=0.398), MT (p=0.00, r=0.363) and FT (p=0.00, r=0.811) scores as an expected result. While age showed a negative correlation between DT (p=0.007, r= -0.156), it also showed a positive correlation between MT (p=0.001, r=0.197). The Pearson correlation analyzes of these parameters were shown at Table 4.

Table 4. The correlation results between the investigated parameters (*<0.05)

		Age	*DT*	*MT*	*FT*	*DMFT*	*OHL*	*OHRQoL*
Age	r	1.000						
	p	0.000						
DT	r	**-0.156**	1.000					
	p	**0.007***	0.000					
MT	r	**0.197**	0.012	1.000				
	p	**0.001***	0.837	0.000				
FT	r	0.105	**-0.147**	0.110	1.000			
	p	0.068	**0.011***	0.056	0.000			
DMFT	r	0.060	**0.398**	**0.363**	**0.811**	1.000		
	p	0.300	**0.000***	**0.000***	**0.000***	0.000		
OHL	r	-0.082	0.047	-0.087	0.036	0.033	1.000	
	p	0.158	0.414	0.135	0.539	0.566	0.000	
OHRQoL	r	0.060	-0.018	-0.036	0.027	0.006	-0.049	1.000
	p	0.299	0.758	0.540	0.639	0.920	0.402	0.000

DISCUSSION

In this study, the association between OHL, OHRQoL and DMFT index was evaluated and no association was found between the factors. So, the first null hypothesis was accepted. In contrast to this study, Bado et al.[18] reported the association between OHL and OHRQoL at Brazilian adults. Besides this, Divaris et al. investigated that "low" OHL level individuals showed significantly more "Oral Health Related Quality of Life" impacts versus those with higher literacy. Divaris et al. also reported that the association between OHRQoL and OHL appears to be modified by race.[19] In a previous study Jamieson et al.[20] reported a significant inverse interaction between OHL and OHRQoL among American Indians but not among Indigenous Australians between 17-72 years-old. In our study, participants in different races were not evaluated and in contrast to findings of Divaris et al.[19] and Bado et al.[18] there was no significant association was found between OHL and OHRQoL.

According to findings of this study no association was detected between DMFT index and

OHRQoL scores. In a cross-sectional study, Yamane-Takeuchi et al. reported a direct relationship between DMFT and OHRQoL. It was also reported at the same study that most of the participants were aged 18-19 to avoid the age-related effect.[21] In contrast to findings of the previous study, Lu et al. [22] reported that there was no association between oral health status and OHRQoL at 18 years-old Chinese adults. However, it was reported at Chinese preschool Children that OHRQoL was improved after dental treatment [23]. After a survey on medical and dental students between 18-25 years-old, Drachev et al.[24] reported that high DMFT scores found to be significant predictors of low OHRQoL. However, there was no relationship was found between DMFT and OHRQoL in the study conducted in Sweden.[25] These opposite findings in studies may be related with racial differences, selected age ranges, and personal characteristics of the individuals.

According to findings of this study no association was found between OHL and DMFT scores. Reshmi Haridas et al.[26] reported that high OHL scores were associated with low DMFT, DT and MT scores. According to findings of Reshmi Haridas et al, FT score was not associated with OHL level similar to findings of our study. Besides, it was reported by Geltman et al. [27] that OHL was not associated to DT score, but OHL and DMFT score were significantly associated. In a previous study, Batista et al. [28] reported that low OHL was significantly associated with untreated caries lesions (DT). In contrast to Batista et al., Baskarados [29] reported that there was no significant association between OHL level and DT and overall DMFT scores. Our study also showed similarity with Baskarados in terms of showing that there was no association between OHL and DMFT. At the same study low OHL level was associated with higher MT and FT scores significantly [29]. According to findings of our study, low OHL level individuals showed higher mean MT scores, but it was not found statistically significant. In our opinion, detailed cross-sectional studies and meta-analyses are needed to explain this complex relationship between OHL and DMFT.

According to findings of this study, OHL scores were not associated with the genders. Both male and female individuals were showed similar OHL scores. Besides this, OHL was associated with educational level and self-reported dental examination frequency. So, the second null hypothesis was partially rejected. OHL scores were not different between the genders and this finding was similar to that obtained in the previous studies [26, 30]. In present study nearly half of the participants had low OHL. Also, according to results of this study it was found that with low frequency of dental examination and education level participants were showed decreased OHL. These results were found similar with the previous studies in the literature [30-33].

It was observed in this study that OHL level was higher in individuals with more frequent dental examination. Parker and Jamieson [34] reported higher MT scores were found among individuals aged 38+ years who visit the dentist only because of a problem. Our findings were not similar with the findings of Parker and Jamieson, but the age range was between 18-30 years for our study that was different the study mentioned above. In a study investigating adolescents about dental caries and related factors, Pakpour et al. reported that high DMFT scores was associated with having no dental visit. They also reported that mean DT scores were higher at the patients who visit the dentist because of an acute problem [35]. Self-reported dental examination frequency was associated with the OHL levels.

Berkman et al.[36] reported that health literacy is lower among those who are financed by public institutions, who have lower levels of education. In a previous study, Baskarados [29] reported that OHL levels significantly associated with educational levels. According to findings of our study it was found that lower education levels caused lower OHL levels.

In Turkey, there were studies present about oral health status and socioeconomic factors,[37] dental caries and parents' educational level[38] or caries experience and oral health status [39] However, OHL [4] and OHRQoL [15] are relatively new topics and studies are needed on these areas.

Researchers have reported many different DMFT scores in similar studies [21, 2,24-26] This study may have reported high DMFT scores because participants were selected through applicant to Restorative Dentistry Department because of caries. It was also a high range of age of individuals were included to the study referring to some esteemed studies in the literatüre.[21,22] This study was also conducted at a faculty of dentistry and was not planned as a multi-central investigation. These are among the limitations of the study to evaluate more randomized and specific individuals in terms of the investigated parameters.

CONCLUSION

Within the limitations of this study, individuals with different education level and different dental examination frequency showed different OHL levels. Individuals in different OHL groups had similar DMFT and OHRQoL scores. The association between OHL, DMFT and OHRQoL scores did not confirmed clearly. Further studies are needed on OHL, OHRQoL and oral health status especially for the Turkish society.

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Conflict of Interest:
The authors declare that they have no conflict of interest.

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