

# Level of health awareness and the development of dental caries in adults

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## Abstract

**Objective:** The study aimed to assess the relationship between health knowledge, demographic determinants, and dental caries intensity in adults.

**Materials and methods:** The study involved 100 patients aged 19 to 64 years. A structured questionnaire assessed sociodemographic factors and oral health knowledge. The DMFT+t index evaluates the incidence of dental caries in them.

**Results:** The Intensity of dental caries was high in participants with low oral health literacy ( $9.37 \pm 3.17$ ), followed by those with a satisfactory level of health knowledge ( $6.25 \pm 2.53$ ) and participants with a high level of health knowledge ( $4.73 \pm 1.22$ ). Participants' age and gender were not significantly associated with health knowledge, in contrast to education ( $Rho= 0.818$ ,  $p<0.001$ ) and employment ( $Rho=-0.476<0.01$ ), where a significant correlation was found.

**Conclusion:** A significant association between health knowledge with DMFT score was found in participants.

**Keywords:** Oral health literacy, parents, DMFT, children, demographic determinants.

## Introduction

Dental hygiene is essential to the oral cavity's health and the individual's general well-being. It has emerged as a separate research area in dentistry (1, 2). In the last decade, many researchers have turned their attention to studying the relationship between oral health and health literacy, which has led to the introduction of the term Oral Health Literacy (OHL)(1).

The Institute of Medicine's Committee on Oral Health and the American Association of Dental Hygienists conducted a study involving health promotion experts, epidemiologists, physicians, nurses, dentists, and dental hygienists, showing that people's literacy is an aspect that needs to be addressed. Measured to assess the potential disease risk to general or oral health (3).

The American Dental Association states that people with a low level of OHL represent an obstacle to the effective treatment, diagnosis, and prevention of oral diseases and implements an effective strategy to improve oral health literacy in the population (3).

Several researchers have noted that it is essential to improve it to reduce oral health problems (1, 4, 5, 6 ). The study aimed to assess the relationship between health knowledge, demographic determinants, and dental caries intensity in adults aged 19 to 64.

## Materials and Methods

Fifty-nine women and 41 men participated in the study after signing informed consent.

A structured questionnaire was used to assess sociodemographic factors and health knowledge.

The prevalence of dental caries was assessed using the DMFT index of Klein, Palmer & Knutson (1938), following the ethical standards for medical research on humans laid down in the Declaration of Helsinki, Finland (1964) of the World Medical Association.

In diagnosing and recording the condition of the hard dental structures, the WHO criteria - WHO Basic Methods of Health Examination, Geneva, 1997 and infection control standards were followed.

SPSS version 16 statistical software (SPSS, Inc., Chicago, IL, USA) was used for data analysis. Statistical analysis was done using Spearman's descriptive and correlation analysis.

Spearman's correlation coefficient (Rho) values range from -1.00 to +1.00. A correlation value of +1.00 indicates a perfect positive correlation, while a value of -1.00 represents a perfect negative correlation and a value of 0.

## Results

Fifty-nine women and 41 men aged 19 to 64 participated in our study.

Table 1 presents the results, reflecting the participants' demographic characteristics.

Table 1. Demographic characteristics of the participants

<b>Gender</b>	
Women	59% (59)
Man	41% (41)
<b>Place of residence</b>	
Urban	82% (82)
Rural	18% (18)
<b>Education</b>	
Secondary education	11% (11)
Bachelor degree	31% (31)
Master degree	58% (58)
<b>Employment</b>	
Employed	94% (94)
Unemployed	6% (6)
<b>Socio-Economic Status (SES)</b>	
Low SES	2% (2)
Average SES	80% (80)
High SES	18% (18)
<b>Age</b>	
19-34	36% (36)
35-44	42% (42)
45-64	22% (22)

The results show that participants with higher and semi-higher education predominate, with a small number having secondary education. Many live in the city, and very few are residents of villages. Regarding gender distribution, more than half of the study participants were women.

The relative share of working participants is large - 94% and the remaining 6% are unemployed. Those with medium socio-economic status predominate, and the rest are of high and low socio-economic quality.

Table 2. Level of health knowledge and intensity of dental caries

Indicators	DMFT			p Value
	Free from caries	Affected by caries	±SD	
<b>Level of health literacy</b>				
Low	0	15	9,37 ± 3,16	<0,05
Satisfactory	17	21	6,25 ± 2,53	
High	8	39	4,72 ± 1,22	
<b>Education</b>				
Secondary education	2	9	11,2 ± 4,16	<0,05
Bachelor degree	5	26	7,69 ± 3,47	
Master degree	21	37	5,61 ± 2,59	

\* Statistical reliability  $p < 0,05$ .

Table 2 presents the results reflecting the intensity of dental caries in the participants included in the study depending on the level of their health knowledge.

The intensity of dental caries in participants with a low level of health knowledge was high ( $9.37 \pm 3.16$ ), followed by those with a satisfactory level of oral health knowledge ( $6.25 \pm 2.53$ ) and a high level of health knowledge ( $5.72 \pm 1.22$ ).

The caries experience of the participants with their education also showed statistical significance ( $p < 0.05$ ). The mean DMFT score was high in participants with secondary education ( $11.2 \pm 4.16$ ), followed by those with secondary ( $7.69 \pm 3.47$ ) and tertiary education ( $5.61 \pm 2.59$ ).

**Table 3. Distribution of DMFT by age and sex in adults aged 19 to 64 years.**

Indicators	Free from caries	Affected by caries	D	M	F	DMFT Mean $\pm$ SD	p Value
<b>Age</b>							
19-34 г.	5	30	$2,49 \pm 1,05$	$0,19 \pm 0,27$	$2,08 \pm 1,10$	$4,75 \pm 2,39$	<0,05
35-44 г.	3	44	$3,31 \pm 2,00$	$0,15 \pm 0,35$	$2,16 \pm 1,03$	$5,47 \pm 3,31$	
45-64 г.	7	11	$3,95 \pm 3,23$	$0,28 \pm 0,41$	$4,76 \pm 1,15$	$7,49 \pm 4,22$	
Total	15	85	$3,48 \pm 2,40$	$0,18 \pm 0,21$	$4,17 \pm 2,24$	$7,82 \pm 2,15$	
<b>Gender</b>							
Man	2	39	$5,26 \pm 2,45$	$0,22 \pm 0,36$	$2,69 \pm 2,02$	$7,18 \pm 4,74$	<0,05
Women	13	46	$4,02 \pm 1,28$	$0,54 \pm 0,29$	$2,37 \pm 2,26$	$5,98 \pm 3,83$	
Total	15	85	$4,61 \pm 2,32$	$0,35 \pm 0,18$	$2,34 \pm 1,87$	$7,29 \pm 3,25$	

Statistical reliability  $p < 0,05$ .

The results in Table 3 show the mean DMFT score of the participants included in the study depending on their age and gender. Statistical reliability ( $p < 0.05$ ) was established for the indicators of age and gender of the participants of different age groups about the intensity of dental caries represented by the DMFT index. Mean DMFT scores were higher in males ( $7.18 \pm 4.74$ ) than in females ( $5.98 \pm 3.83$ ).

**Table 4. Correlation between demographic indicators and DMFT**

№	Indicators	1	2	3	4	5	6	7
1	DMFT	1.000						
2	Health knowledge	$-0,537$ $<0,001$	1.000					
3	Age	0,073	$-0,032$	1.000				
4	Gender	$-0,066$	$-0,123$	$-0,161$ $<0,05$	1.000			
5	Education	$-0,654$ $<0,001$	0,818 $<0,001$	0,006	$-0,181$ $<0,001$	0,196 $<0,001$	1.000	
6	Employment	0,425 $<0,001$	$-0,476$ 0,01	$-0,023$	0,252 $<0,001$	$-0,132$ $<0,05$	$-0,633$ $<0,01$	1.00 0

Statistical reliability  $p < 0,01$  and  $< 0,05$ .

Table 4 shows the correlation between oral knowledge and the demographic indicators of the participants included in the study. From the obtained results, a correlation dependence ( $Rho = -0.537$ ,  $p < 0.001$ ) was established between the health knowledge of the participants and the intensity of dental caries in them, represented by the DMFT index.

Regarding age and gender, no correlation was reported with health knowledge, but it was related to education ( $Rho = -0.181$ ,  $p < 0.001$ ) and employment ( $Rho = -0.476$ ,  $p < 0.01$ ).

## Discussion

Various studies show that a low level of health knowledge is associated with poorer oral health knowledge [9], and these patients do not regularly visit the dental office (2, 9). Limited health literacy can also lead to low quality of life related to oral health (2, 5).

Knowing the level of health knowledge can be helpful for policymakers in implementing interventions and strategies to promote oral health and reduce problems related to it (15).

Oral health literacy has become an essential factor of concern regarding oral health (16, 17, 18). Data from the available literature show a high risk of developing dental caries in individuals with a low level of health knowledge (1, 4, 19, 20, 21).

Several studies have found an inadequate level of OHL attributable to low education and low socio-economic status among study populations living in rural areas (23, 24, 25).

The results of our study show a higher relative proportion of low oral health literacy among participants who have primary education and those who are unemployed, indicating that education and employment are essential factors in good levels of health literacy. Knowledge. It has been suggested that individuals with low levels of health literacy should be included in oral health education programs and encouraged to improve their learning (25).

Raising health literacy through general and oral health promotion strategies should include mass media, television commercials, the Internet, brochures, handouts, and other motivational materials (24, 25).

Health literacy programs should include health counseling and education through motivational interviewing, preventive care, and clinical examinations. This would improve an individual's knowledge, habits, behavior, attitudes, and practices, improving their oral health status (26, 27).

Studies have shown that many factors, such as low OHL, heredity, improper oral health maintenance care, and unhealthy habits, are directly related to oral health status (14). Improving health knowledge is associated with the healthy behavior of the individual to protect his oral health and build correct health habits, attitudes, and knowledge, which in turn will impact a better oral health status (12).

The participants' health knowledge level showed a significant difference in their education. It is higher among those with a high education level than the other participants with secondary or tertiary education. This is consistent with Baskaradoss's (26) studies, where the level is significantly related to educational level, supported by other authors (24, 27, 28). A good educational background greatly influences health knowledge, as well-educated individuals can access oral healthcare materials(30). A lower educational level leads to inappropriate behavior and poor oral health outcomes (29). Our results showed no significant difference regarding the status of health knowledge of the participants and their age, which supports the results of the study done by other authors (29,30). The level of health knowledge was found to be higher among the younger participants compared to the older age group, which is also consistent with the results of our study. This may be due to exposure to numerous information resources and a higher ability to absorb and apply new modern information in practice, which is also confirmed by another study (27,28).

Participants with good socioeconomic status also have better access to sources of oral health information and promotion and easier access to dental health care providers, which improves their oral health literacy (27).

The results of our study revealed a significant difference between participants' gender and health knowledge, with women having a higher level of health knowledge than men. A similar result has been reported by other studies (9, 25).

Sociodemographic status and the level of health literacy are significant factors in increasing access to oral health care (22).

In our study, we also observed the influence of sociodemographic differences in the clinical status of oral health in participants of different social groups, which is confirmed by other studies conducted that show sociodemographic divergence in different parts of the world (12, 19, 22).

Health education on oral health issues should be aimed at the different age groups of society to have better health knowledge.

## Conclusions

Our study found high caries experience in the study participants. There was a significant link between their education, employment, and career experience. This requires the development of strategies to promote oral health, and participants with a low level of health knowledge must necessarily be included in various health programs in the public health sector, which will ultimately lead to a decrease in the prevalence of dental caries in them.

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