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Dental implant treatment from the patient's perspective: a descriptive, survey-based cohort study

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ABSTRACT

Aims: The aim of this study was to assess the participants' general knowledge and awareness about dental implants.

Methods: 550 voluntary participants over 18 years of age with or without missing teeth were applied to our clinic in 2024. The questionnaire was designed as multiple-choice.

Results: 550 volunteers, 282 females (51.19%) and 268 males (48.81%), participated in the study. 428 participants reported having missing teeth, while 120 participants reported having no missing teeth. Most participants (84.9%) thought missing teeth should be treated, while 14.2% thought missing teeth should not be treated. While 23.1% of the participants thought they had sufficient information about dental implants, 70.9% knew dental implants were a treatment alternative for missing teeth. While 41.6% of the participants stated that they obtained their current knowledge about dental implants from dentists, the rate of obtaining information from friends and relatives was 26.7%. 53.3% of the participants stated they feared dental implant treatment. Participants noted that the most positive factor affecting their decision to have dental implant treatment was better chewing, with 26.6%. Participants noted that the biggest challenge in choosing dental implant treatment was the high cost, 44%. 60% of the participants said oral, dental, and maxillofacial surgeons were the most qualified for dental implant treatment.

Conclusion: The study's results show that the level of awareness about dental implant treatment has increased but is still insufficient. Therefore, dentists should inform patients more about dental implant treatment to increase awareness further.

Keywords: Awareness, knowledge, dental implants, dental implantation, information source

INTRODUCTION

Artificial devices placed in tissues to restore a missing area in the human body or to heal a damaged organ are called implants.[1] The aim of modern dentistry is to restore the patient to his normal function, aesthetics, speech, and health. Dental implants, which allow us to achieve these goals ideally, are now used in the prosthetic treatment of completely or partially edentulous patients.[2] Numerous studies on the long-term successful outcomes of oral rehabilitation with dental implants have led to the widespread acceptance and popularity of dental implants in dentistry in recent years.[3,4] High patient satisfaction with dental implant treatment has been reported in the literature.[5-7] However, many patients still do not prefer this form of treatment. This is mainly because patients are less aware of dental implants.[8] In the literature, many surveys have been conducted to evaluate awareness about dental implant treatment.[9-12] Al-Johany et al.[9] conducted a survey study on dental patients in Riyadh and showed an acceptable level of awareness about dental implants. According to a study conducted in Dharwad, most patients were aware of dental implants as a treatment modality.[10]

There are also studies conducted in our country. Still, patients' knowledge level about dental implant treatments and their awareness of this treatment varies according to region, socioeconomic status, and years.[13-18] Yerliyurt et al.[13] showed that patients had insufficient knowledge about dental implants according to their study conducted in the same city as ours. Özkan Şen et al.[15] stated that patients had limited awareness about dental implant treatment in Konya. Memiş et al.[18] showed that patients had insufficient knowledge about dental implants, and awareness of patients was not high in the Western Black Sea Region of Turkey.

This study aims to evaluate the awareness and knowledge of patients living in Tokat about dental implants, which are used as a treatment method in rehabilitating lost/missing teeth, considering the data of 2024.

METHODS

The study was approved by the Non-interventional Clinical Researches Ethics Committee of Tokat Gaziosmanpaşa University (Date: 21.12.2023, Decision No: 23-KAEK-318). The surveys were conducted on patients who applied to Tokat

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Gaziosmanpaşa University, Faculty of Dentistry, Oral and Maxillofacial Surgery clinic in 2024. Our study was carried out in accordance with the Declaration of Helsinki. Individuals who have not received implant treatment before, have/do not have missing teeth, can read and write, can understand, and who volunteered for the study were included in the study. Individuals who refused to participate in the study, received dental implant treatment, and had no ability to read, write, and understand were excluded from the study. It was administered to adult and volunteer patients to participate in the study. Power analysis was performed using G*power Version 3.1.9.6 software. Power analysis was performed based on the educational level of the individuals and their answers to the question, "Are dental implants a treatment alternative for missing teeth?". According to the results of the chi-square test power analysis with 95% confidence (1-α), 95% test power (1-β), and w=0.202 effect size, it was concluded that research should be conducted on 512 cases. It was applied to 550 participants, considering possible losses. The questionnaire consists of 24 questions. The questionnaire includes questions that evaluate the demographic information of the volunteers, their knowledge, opinions and awareness about dental implants.

Statistical Analysis

Descriptive analyses were performed to give information about the general characteristics of the study groups. IBM SPSS V22 (IBM company, V22.0, Chicago, IL, USA) software was used for statistical analysis. Data on categorical variables are given as n (%). The significance test of difference and One-Way analysis of variance was used. Crosstabs and chi-square tests were used to assess whether there was a relationship between qualitative variables.

RESULTS

A total of 550 volunteers, 282 women (51.19%) and 268 men (48.81%) participated in the study. The demographic data of the volunteers are shown in Table 1.

Table 1. Demographic data of the participants

Demographic data		
	n	**%**
Gender		
Female	282	51.19
Male	268	48.81
Age		
30 and younger	175	31.75
31-36	83	15.14
37-42	75	13.69
43-49	88	16.06
50 and older	129	23.36
Education status		
Primary school	139	25.36
Secondary school	74	13.5
High school	137	25
University	169	30.48
Master	28	5.11
Doctorate	3	0.55
Income level		
10000 and less	176	31.73
10000-20000	175	32.28
20000-30000	71	13.17
30000 above	128	22.82
Marital status		
Married	381	69.45
Single	169	30.55

n: Number, %: Percent

While 428 participants stated that they had missing teeth, 120 stated that they did not. 27.3% of those with missing teeth were 50 or older, 24.5% were 30 and younger, and 48.2% were between 30 and 50. There is a statistically significant difference between age and the presence of missing teeth. While 94.2% of primary school graduates had missing teeth, it was observed that this rate decreased as the level of education increased. It was observed that only 30.4% of those with missing teeth were at university or higher education level. It was determined that 75.9% of those with missing teeth were married, and 24.1% were single. While the majority of the participants (84.9%) think that missing teeth should be treated, 14.2% think it is unnecessary to treat missing teeth. As age increases, the proportion of those who think missing teeth should be treated increases. When the question of whether you think missing teeth should be treated according to age groups was evaluated, there was a statistically significant difference between the groups. There is a significant difference between the participants under the age of 30 and those over the age of 50 who think that missing teeth should be treated ($p<0.001$) (Table 2).

While the rate of those who want to have dental implant treatment if deemed necessary is 60.5%, it is seen that 17.1% do not wish to have it done, and 20.9% are undecided. 38.3% of those who wish to have dental implants are university graduates. While 48.4% of those who do not wish to have dental implant treatment have an income level of 10.000 Turkish Liras or less, 73.9% of those who wish to have it have an income of 10.000 Turkish Liras or more.

53.3% of the participants stated they feared dental implant treatment. 62% of those who are afraid are women. When the answers to the question "Are you afraid of dental implant treatment?" were analyzed according to gender, a statistically significant difference was found between males and females ($p<0.001$) (Table 3). Most who are not afraid (53.6%) are university graduates.

While 23.1% of the participants thought that they had sufficient knowledge about dental implants, 70.9% of the participants knew that dental implants were a treatment alternative in the treatment of missing teeth. 57.5% of those who thought they had sufficient knowledge about dental implants were male, and 42.5% were female. It was observed that 40.9% and 36.2% of those who thought they had sufficient knowledge about dental implants and that dental implants were treatment alternatives for missing teeth were university

Table 2. Comparison of age groups according to the survey

		Age groups					
		30 and younger	31-36	37-42	43-49	50 and older	p
Do you think missing teeth should be treated? (n=540)	Yes	136 (78.2)[a]	66 (80.5)[a]	64 (85.3)[a,b]	77 (88.5)[a,b]	123 (96.1)[b]	<0.001
	No	38 (21.8)[a]	16 (19.5)[a]	10 (13.3)[a,b]	8 (9.2)[b]	5 (3.9)[b]	
Would you like to have dental implant treatment if it is deemed necessary? (n=547)	Yes	112 (64.4)	54 (65.1)	48 (64)	46 (52.3)	72 (56.7)	p=0.058
	No	21 (12.1)	10 (12)	11 (14.7)	20 (22.7)	31 (24.4)	
	Undecided	41 (23.6)	18 (21.7)	14 (18.7)	19 (21.6)	23 (18.1)	
Do you think you have enough information about dental implants? (n=544)	Yes	50 (29.1)[a]	22 (26.5)[a,b]	15 (20)[a,b]	21 (24.1)[a,b]	18 (14.1)[b]	p=0.048
	No	122 (70.9)[a]	61 (73.5)[a,b]	60 (80)[a,b]	65 (74.7)[a,b]	110 (85.9)[b]	
Do you know that dental implants are a treatment alternative for missing teeth? (n=538)	Yes	136 (78.2)	58 (69.9)	52 (69.3)	58 (65.9)	85 (66.4)	p=0.72
	No	36 (20.7)	24 (28.9)	21 (28)	27 (30.7)	41 (32)	
What are the limitations in choosing dental implants? (n=534)	High cost	69 (40.8)	42 (50.6)	30 (41.1)	34 (40.5)	67 (53.2)	p=0.384
	Less information	44 (26)	14 (16.9)	16 (21.9)	21 (25)	18 (14.3)	
	Surgery	31 (18.3)	15 (18.1)	13 (17.8)	12 (14.3)	15 (11.9)	
	Long treatment time	24 (14.2)	12 (14.5)	14 (19.2)	17 (20.2)	26 (20.6)	
How long do you think a dental implant will last? (n=535)	5	35 (20.5)	9 (10.8)	11 (15.1)	19 (22.6)	19 (15.3)	p=0.207
	10	52 (30.4)	26 (31.3)	22 (30.1)	25 (29.8)	32 (25.8)	
	20	39 (22.8)	15 (18.1)	16 (21.9)	15 (17.9)	19 (15.3)	
	Lifetime	45 (26.3)	33 (39.8)	24 (32.9)	25 (29.8)	54 (43.5)	
Do you think dental implants need special care and hygiene? (n=544)	Like natural teeth	50 (28.7)[a]	26 (32.1)[a]	27 (36)[a]	22 (25.3)[a]	38 (29.9)[a]	p=.001
	More than natural teeth	109 (62.6)[a,b]	51 (63)[a,b]	39 (52)[a,b]	58 (66.7)[b]	59 (46.5)[a]	
	Less than natural teeth	15 (8.6)[a]	4 (4.9)[a]	9 (12)[a,b]	7 (8)[a]	30 (23.6)[b]	

p<0.05 indicates significance among groups. p value from X^2 test. Data in parentheses represent percentages. The same letters represent similarity and different letters represent difference

Table 3. Comparison of gender groups according to the survey

		Sex		p
		Female	Male	
Do you have any missing tooth (s)? (n=547)	Yes	215 (76.8)	211 (79)	p=0.528
	No	65 (23.2)	56 (21)	
Would you like to have dental implant treatment if it is deemed necessary? n=539)	Yes	156 (55.7)	175 (65.8)	p=0.119
	No	54 (19.3)	40 (15)	
	Undecided	67 (23.9)	47 (17.7)	
Do you know that dental implants are a treatment alternative for missing teeth? (n=537)	Yes	196 (70)	193 (72.3)	p=0.063
	No	83 (29.6)	65 (24.3)	
What are the limitations in choosing a dental implant? (n=534)	High cost	117 (42.5)	123 (47.3)	p=0.418
	Less information	58 (21.1)	56 (21.5)	
	Surgery	51 (18.5)	35 (13.5)	
	Long treatment time	49 (17.8)	45 (17.3)	
Do you think dental implants need special care and hygiene? (n=543)	Like natural teeth	76 (27.4)	88 (33.1)	p=0.259
	More than natural teeth	170 (61.4)	145 (54.5)	
	Less than natural teeth	31 (11.2)	33 (12.4)	
Are you afraid of the dental implant treatment procedure? (n=535)	Yes	176 (63.8)[a]	108 (41.4)[a]	<0.001
	No	100 (36.2)[b]	151 (57.9)[b]	
What is the most important factor when deciding to have dental implants? (n=522)	Cost	103 (38.3)[a]	134 (52.1)[a]	p=0.006

p<0.05 indicates significance among groups. p value from X^2 test. Data in parentheses represent percentages. The same letters represent similarity and different letters represent difference

graduates. When the answers to the question "Do you think you have enough information about dental implants?" were examined according to age groups, it was seen that there was a significant difference between individuals under the age of 30 and over the age of 50 (p=0.048) (Table 2).

Participants stated that the most positive factor affecting their decision to have dental implant treatment was better chewing, with 26.6%. This is followed by the absence of the need to wear traditional prostheses with 21.1%. The aesthetic expectation was the 3rd most positive factor, with 19.5%.

Participants stated that the greatest difficulty they faced in choosing dental implant treatment was the high cost, 44%. When the answer to the question "What factors influence you in deciding on dental implant treatment?" was analyzed according to gender, a statistically significant difference was found between males and females (p=0.006) (Table 3). While 69.9% of the participants noted that everyone with missing teeth should have access to dental implant treatment, 30.1% stated that only rich people should have access to dental implant treatment. While 34.1% of the participants thought implant treatment was affordable, 65.9% stated it was expensive.

Participants were asked what material the dental implant was made of. While 54.5% stated that they had no idea, the rate of those who stated that the dental implant was made of titanium was 22.7% (Table 4).

Table 4. Distribution of participants' answers to the question of what material dental implants are made of

What material dental implants are made of?		
	n	%
Titanium	128	23.06
Zirconium	47	8.67
Platin	25	4.61
Porcelain	48	8.31
No idea	302	55.35

n: Number, %: Percent

While 41.6% of the participants stated that they obtained their current knowledge about dental implants from dentists, the rate of obtaining information from friends and relatives was 26.7% (Table 5). 33.1% of the participants stated that the duration of use of dental implants is lifelong. While the number of people who think that dental implants require more care than natural teeth is 57.5%, 36% of those who think this way are university graduates, and 34.5% are under the age of 30. 30% of respondents think dental implants should be cleaned like natural teeth. When the answers given to the question of how dental implants should be cared for were examined according to age groups, it was seen that there was a significant difference between the groups (p<0.001) (Table 2).

While 43.2% of the participants did not know the difference between traditional prostheses and dental implant treatment, 39.9% stated that implant treatment was better than traditional prostheses. While 25.5% of those who do not know the difference between traditional prostheses and dental implant

Table 5. Distribution of respondents' answers to the question "How did you learn about dental implants?"

Where did you learn about dental implants?		
	n	%
Print media (newspapers, magazines, etc.)	48	8.58
Audiovisual media (radio, TV)	45	8.03
Internet	81	14.78
Dentists	229	41.79
Friends/relatives	147	26.82

n: Number, %: Percent

treatment are primary school graduates, 41.9% of those who state that dental implant treatment is better are university graduates.

60% of the participants stated that oral, dental, and maxillofacial surgeons are the most qualified for dental implant treatment. While 58.7% of the participants say that the shape of the dental implant is in the form of a screw, 29.5% state that they do not know the shape of the implant. 36.3% of those who say that the shape of the implant is in the form of screws are university graduates. The rate of those who say dental implants are placed in the jawbone in the oral cavity is 52%.

DISCUSSION

This study aimed to evaluate the awareness of patients who applied to our clinic about dental implants. Most patients have limited information about dental implant applications and their success. This problem is more pronounced in developing countries with insufficient education and awareness. A limited number of people in developing countries prefer dental implants, and many factors influence the choice of dental implant treatment as a treatment method in these countries.[19,20] Society's awareness and evaluations about oral implants are also affected by demographic variables such as age, gender, socioeconomic status, place of residence, and the sources from which people obtain information.[21] In this study, in line with the literature, it was determined that awareness about dental implant treatment was not related to education level.[15,18]

Dental implants are often used in the treatment of missing teeth. In the study conducted by Choudhary et al.[23] in India, 23.24% of the participants saw dental implants as a treatment alternative for missing teeth; In the study of Tomruk et al.[22], which was conducted in our country 10 years ago, it was reported that 43.5% of the participants saw dental implants as a treatment alternative for missing teeth. In this study, 60.5% of the participants stated that dental implants were a treatment alternative for missing teeth. The increase in this rate in previous years shows that the awareness of dental implant patients has increased even more.

Today, obtaining information about a subject that is parallel to technological developments has become very easy. In the studies of Memiş et al.[18] and Al-Johany et al.[9], the most common source of information about dental implant treatment was their friends and relatives. In our study, the

majority of the participants stated that they obtained their knowledge about dental implants from dentists, similar to the studies reported in the literature[9,13,15,18,22,24] and 26.7% stated that they obtained it from their friends and relatives. The rate of information obtained from the Internet ranked third among the participants. These results show that dentists and their relatives are an important information source for patients with a positive view of dental implant treatment. If specialist dentists provide patient information via the Internet, it may be possible to reach more people.

One of the limiting factors for patients in dental implant treatment is surgical treatment. 53.3% of the participants stated they feared dental implant treatment. 62% of those who were afraid were women. Most of those who were not afraid (53.6%) were university graduates. In the study of Al-Johany et al.[25], 41.4% of the participants reported that they were afraid of surgery. As the authors report, when patients hear the word surgery, they think they are going to have major surgery. If dental implant surgical steps are explained to patients in detail and attention is paid to the language of communication, patients' fear may decrease.[26]

Routine dental treatments in Turkey are covered by health insurance. Since health insurance does not cover implant treatments, it is one of the most costly treatments. Participants stated that the biggest difficulty they faced in choosing dental implant treatment was the high cost with a rate of 44%, which was in line with the results of previous studies.[9,14,15,22,27] In this study, it has been shown that dental implant treatments are not economical for most patients. Dental implant prices should be more accessible so patients can access dental implant treatments more easily. For this reason, it will be beneficial to develop further university-industry cooperation for the purpose of dental implant production.

In our survey, respondents were asked where dental implants were placed, and 52% said that dental implants were placed in the jawbone in the oral cavity. These results are similar to previous studies conducted by Pommer et al.[27] and in our country.[14,22] For patient information, there is a need for a more detailed explanation about where dental implants are located in the mouth.

While the number of people who think that dental implants require more care than natural teeth is 57.5%, 36% of those who think this way are university graduates, and 34.5% are under the age of 30. 30% of respondents think dental implants should be cleaned like natural teeth. Tepper et al.[28] and Alanazi et al.[29] reported that their study concluded that dental implants require more care than natural teeth compared to most patients, which aligns with our study.

The duration of use of dental implants is one of the important parameters for patients. In our study, 33.1% of the participants stated that the duration of use of dental implants is lifelong. In the study conducted by Özcan Küçük et al.[14], 20% of the participants thought that the dental implant would last more than 20 years, while 2% stated that they had no idea. In the study conducted by Tepper et al.[28], approximately half of the patients stated the implant life as 1-20 years. In the study conducted by Alanazi et al.[29], approximately 18% of the participants reported that the life of dental implants was longer than 25 years. In comparison, approximately 37% reported that it was between 10-15 years.[29] Over time, we can see that patients have more information about dental implants.

Participants were asked what material the dental implant was made of. While 54.5% stated that they had no idea, the rate of those who stated that the dental implant was made of titanium was 22.7%. In the study conducted by Memiş et al.[18], more than half of the participants reported that they did not know what material the dental implant was made of. In the study conducted by Deeb et al.[30] in the United States, most participants reported that they did not know what material the dental implant was made of. While 58.7% of the participants said that the shape of the dental implant was in the form of a screw, 29.5% said that they did not know the shape of the implant. 36.3% of those who said that the shape of the implant was in the form of screws were university graduates. There is no data on the shape of the implant in the studies conducted in the literature. According to the results, it is thought that when informing about the dental implant, it should be emphasized what material it is made of and the shape of the implant.

In our country, non-specialists and specialist dentists can apply dental implant treatments. Most participants stated that oral and maxillofacial surgeons are the most qualified staff in dental implant placement, similar to previous studies.[18,30] It can be said that patients act consciously in this regard.

According to the data in our study, 43.2% of the participants did not know the difference between traditional prostheses and implant treatments. In comparison, 39.9% stated implant treatment was better than traditional prostheses. Participants cited better chewing as the most positive factor in the decision to have dental implants, followed by the absence of the need to wear dentures. The aesthetic expectation was the third positive factor. In the study conducted by Ho et al. with 1172 people in Japan, they reported that the most common reason for having dental implants was not using removable dentures and an increase in chewing.[12] In other studies, in line with our study, participants found implant treatment more acceptable and aesthetic than traditional prostheses.[9,22,24]

Limitations

This study has some limitations. Since the participants live in the same city, the general population will not capture the results. The region where the study was conducted may affect the results because demographic factors like education level, economic factors, and people's awareness in each region in Turkey are different. If the sample size in the subgroup of demographic data is selected like each other and researchers from different regions of the country come together and conduct joint studies, the study results may be less affected by demographic data and regions. Since there were only multiple-choice questions, the participants' personal opinions could not be examined in depth. We would like to state that the questionnaire used in the study is a questionnaire whose validity and reliability have not been demonstrated before.

CONCLUSION

According to the results of our study, the participants had a level of knowledge and awareness about dental implants. Still, information about the implant material, shape, where it was placed, and surgery should be done in more detail. Participants want to have dental implants in case of missing teeth, but they have difficulty accessing this treatment due to reasons such as economic difficulties and fear of surgery. Implants are frequently preferred today to restore function and aesthetics in the mouth and are now included in dentistry as a classic form of treatment. For this reason, for everyone to benefit from this treatment, we dentists should explain it to our patients in detail and eliminate their fears and concerns. Health policies need to be further developed to address treatment costs. Nationwide studies are needed to cover the general population and examine patient opinions.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was approved by the Non-interventional Clinical Researches Ethics Committee of Tokat Gaziosmanpaşa University (Date: 21.12.2023, Decision No: 23-KAEK-318).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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