

# Questioning the Awareness of Partially Edentulous Patients About Dental Implants and Implant Supported Dental Prostheses

Elifnur Güzelce Sultanoğlu<sup>1</sup>, Bedirhan Dökülmez<sup>2</sup>, Meryem Hürbağ<sup>3</sup>

<sup>1</sup>Department of Prosthodontics, University of Health Sciences Türkiye, Hamidiye Faculty of Dental Medicine, İstanbul, Türkiye

<sup>2</sup>Department of Prosthetic Dentistry, University of Health Sciences Türkiye, Hamidiye Faculty of Dental Medicine, İstanbul, Türkiye

<sup>3</sup>Department of Prosthodontics, Cyprus International University, Nicosia, North Cyprus

## Abstract

**BACKGROUND/AIMS:** To measure and evaluate the level of awareness of a specific patient population with partial edentulism about dental implants, implant-supported prostheses, and the general treatment processes related to these.

**MATERIALS AND METHODS:** A total of 130 patients were included in the present study. Patients with local or systemic conditions considered as contraindications, those with a history of previous implant surgery, and illiterate patients were excluded. Prior to their participation, the patients were given informed consent forms and these were read to them before signing. Written survey forms consisting of 13 questions were given to the patients, and they were instructed to read the questions carefully the questions and mark the options with which they aligned most closely. Statistical correlation between age and the total scores and sub-dimensions of the scale were evaluated using Spearman's rho test, while statistical comparisons according to gender and education were evaluated using the Mann-Whitney U and Kruskal-Wallis tests.

**RESULTS:** It was found that 58.9% of the patients who participated had awareness about dental implants. Only 39.6% had received information about dental implants from their dentists or doctors, and 63.6% indicated that dental-implant treatment is more costly than alternative options. There is no statistically significant correlation between age and the total scores and sub-dimensions of the scale ( $p>0.05$ ).

**CONCLUSION:** Individuals with higher levels of education tend to exhibit greater awareness and more positive attitudes towards dental implant treatments. The high cost of implant treatment stands out as the most significant disadvantage of this approach.

**Keywords:** Dental implant, implant supported dental prosthesis, oral health

## INTRODUCTION

Tooth loss is a pervasive condition that has a significantly negative effect on an individual's quality of life by affecting their ability to eat, speak, and smile with confidence. It not only hampers functionality but also diminishes personal aesthetics and social aspects. Tooth loss not only affects oral health and functionality but also has profound psychological and social consequences. Individuals with missing teeth often experience reduced self-esteem, social withdrawal, and

impaired quality of life due to aesthetic concerns and difficulties in communication.<sup>1</sup> Edentulism still ranks among the top 100 global health issues.<sup>2</sup> With advancements in health care, however, there has been a decrease in the prevalence and incidence of tooth loss.<sup>3</sup> Tooth loss can be attributed to various factors, including systemic and oral diseases, aging, socioeconomic disparities and limited access to health care services.<sup>3,4</sup>

**To cite this article:** Güzelce Sultanoğlu E, Dökülmez B, Hürbağ M. Questioning the awareness of partially edentulous patients about dental implants and implant supported dental prostheses. Cyprus J Med Sci. 2025;10(1):62-69

**ORCID IDs of the authors:** E.G.S. 0000-0003-2163-5219; B.D. 0000-0001-9973-7624; M.H. 0000-0002-4117-4184.



**Corresponding author:** Elifnur Güzelce Sultanoğlu

**E-mail:** eguzelce@hotmail.com

**ORCID ID:** orcid.org/0000-0003-2163-5219

**Received:** 08.06.2024

**Accepted:** 28.02.2025

**Publication Date:** 14.03.2025



Copyright© 2025 The Author. Published by Galenos Publishing House on behalf of Cyprus Turkish Medical Association.

This is an open access article under the Creative Commons AttributionNonCommercial 4.0 International (CC BY-NC 4.0) License.

According to research conducted by the Turkish Dental Association, tooth loss rates in Türkiye exhibit variations across different age groups and regions. The findings from a 2018 study revealed an alarming overall edentulism rate of 69.3% in the country; notably, this study observed a slightly higher edentulism rate of 71.7% among women, whereas men have a 66.8% rate.<sup>5</sup>

When strategizing the rehabilitation of missing teeth in patients, several factors come into play, including the location and extent of tooth loss, bone condition in the affected area, occlusal relationships with the opposing jaw, and the overall systemic health of the patient.<sup>2</sup> A notable approach for restoration is the utilization of “bridge veneers”, which involves preparing and reducing the adjacent teeth to serve as abutments and subsequently veneering them. For the success of bridge veneers, it is essential that healthy periodontal conditions exist in the abutment teeth to ensure they can effectively withstand occlusal forces. A comprehensive consideration of these factors contributes to a well-informed, sophisticated treatment plan for patients with missing teeth. Bridge veneers are not an ideal treatment option, as it is necessary to damage healthy teeth during the construction phases and is not recommended for the treatment of edentulous spaces with a single terminal tooth.<sup>6</sup>

When Breine et al.<sup>7</sup> introduced the concept of osseointegration to the scientific world in 1964, the use of dental implants had become an alternative treatment option for missing teeth. After years of extensive research and empirical evidence, it can be confidently stated that dental implants offer the most ideal treatment option; this is primarily due to the remarkable ability thereof to enhance the retention, stability, and functional effectiveness of prosthetic restorations.<sup>8,9</sup> Dental implants have emerged as a transformative solution, addressing both the functional and aesthetic deficits caused by tooth loss. By restoring a natural appearance and improving oral functionality, implants play a crucial role in enhancing patients’ self-confidence, social interactions, and overall well-being.<sup>10</sup>

Studies comparing bridge veneers and implant-supported veneers in patients with partial edentulism show that implant-supported veneers provide a higher survival rate and functional ease-of-use than bridge veneers.<sup>9,11</sup>

While dental implants are considered an optimal treatment option for edentulous spaces, conventional bridge prostheses are used more commonly in current practices. The predominant factors contributing to the preference for conventional bridge prosthesis over implants include patients’ lack of sufficient awareness about implants and implant-supported prostheses, as well as cost-related issues.<sup>12</sup> Studies examining the awareness and preferences of specific populations regarding implants have reported that a significant proportion of elderly patients claim to possess awareness about dental implants; it is worth noting, however, that this information is often inaccurate, resulting in dental implants not being perceived as the ideal treatment option within this population.<sup>13,14</sup> Moreover, some studies have stated that patients prefer minimally invasive procedures, rather than surgical interventions.<sup>13,14</sup>

Although there are several studies<sup>11-14</sup> in the literature in which patients’ awareness about implant treatments was investigated, no study has been found with a similar patient population and survey questions. The aim of this study is to evaluate the awareness levels about dental implants and implant-supported prostheses of partially edentulous patients who

applied to University of Health Science Faculty of Dentistry, Department of Prosthodontics due to edentulousness.

## MATERIALS AND METHODS

This study was conducted with the approval of the University of Health Sciences Türkiye, Hamidiye Scientific Research Ethics Committee (approval number: 2/4, date: 27.01.2023). A total of 130 patients were included in the present study. Patients with local or systemic conditions regarding contraindication, those with a history of previous implant surgery and/or illiterate patients were excluded. The exclusion was primarily due to the reliance on a written survey format, which required participants to read and understand the questionnaire independently.<sup>15</sup> This exclusion may impact the generalizability of our findings, particularly in regions with lower literacy rates.<sup>16</sup> As a preliminary step, informed consent forms were presented to the eligible patients who would be enrolled in this study, and they were provided with an explanation of the study before we obtained their signatures. Written questionnaires comprised of 13 questions were distributed to the patients, who were instructed to carefully read the questions and select the response option that best reflected their views. The 13 questions in the questionnaire were divided into four groups. Responses ranged from 1 (no awareness) to 5 (high awareness). The question grouping was as follows (Table 1):

**Group 1:** General level of awareness about implant therapy.

**Group 2:** Information resource on dental implants.

**Group 3:** Advantages of dental implants.

**Group 4:** Disadvantages of dental implants.

The inclusion criteria for this study required that each patient applying to University of Health Sciences Türkiye, Faculty of Dentistry, Department of Prosthodontics due to edentulism be considered. Exclusions from the study included individuals with complete edentulism (i.e., total tooth loss) and those who were only missing their third molars (i.e., their wisdom teeth) with no other tooth loss.

## Statistical Analysis

Instead of using power analysis to determine the sample size in our study, we followed a method based on the proposal to determine sample size as several times, preferably 10 times or more, the number of variables, and included 130 participants for 13 questions.<sup>17</sup> The Cronbach’s alpha coefficient was used to determine internal consistency (Cronbach’s alpha=0.798). The split-half reliability method was used to evaluate between-class consistency, and the Spearman-Brown correlation coefficient was calculated (Spearman-Brown coefficient  $r=0.722$ ).

## Survey Validity

An exploratory factor analysis was conducted to assess the validity of the survey. Prior to performing the factor analysis, several preliminary tests were conducted. The Kaiser-Meyer-Olkin (KMO) criterion was examined for sample adequacy. The KMO index compares observed correlations and partial correlations. In this study, the KMO criterion was calculated to be 0.740, which indicated that the sample size was suitable for factor analysis.

Bartlett’s test was employed as a statistical tool to determine the adequacy of a correlation matrix for multivariate normal distribution, specifically evaluating whether the correlation matrix exhibited a diagonal consisting of ones and off-diagonal elements of zeros for multivariate normality assumptions. In this study, the Bartlett’s test yielded a pvalue of <0.001 at a significance level of 0.05, which confirmed that the population correlation matrix was not an identity matrix; this suggested that a factor analysis could be conducted. The diagonal values of the anti-image correlation matrix range from 0.503-0.857, which indicate that the sample size is appropriate for factor analysis.

A principal component analysis was used to determine the structure of the factors. The percentages of explained total variances are presented in Table 2. In this study, four factors account for 65.7% of the total variance. According to the exploratory factor analysis, the survey consists of 4 subscales. Since the difference in factor loadings for questions 1 and 6 was less than 0.10, the questions were removed from the survey. Factor 1 includes questions 4, 5, 7, and 8. Factor 2 includes questions 11, 12, and 13. Factor 3 includes questions 2 and 3. Factor 4 includes questions 9 and 10.

**Validity/Confirmatory Factor Analysis**

A confirmatory factor analysis (CFA) is a specific approach within the broader framework of structural equation modeling, which is widely recognized as a distinct research method. In the CFA model, observed variables (i.e., scale items) are represented by rectangles, latent variables (i.e., sub-dimensions) are ovals, and the letter *e* denotes the error or

unexplained variance. Maximum-likelihood estimation (MLE) assumed a normal distribution for the item scores. Fit indices-including  $\chi^2$ , GFI, CFI, IFI, and RMSEA-were utilized to evaluate the model fit (Figure 1).

**Model Output**

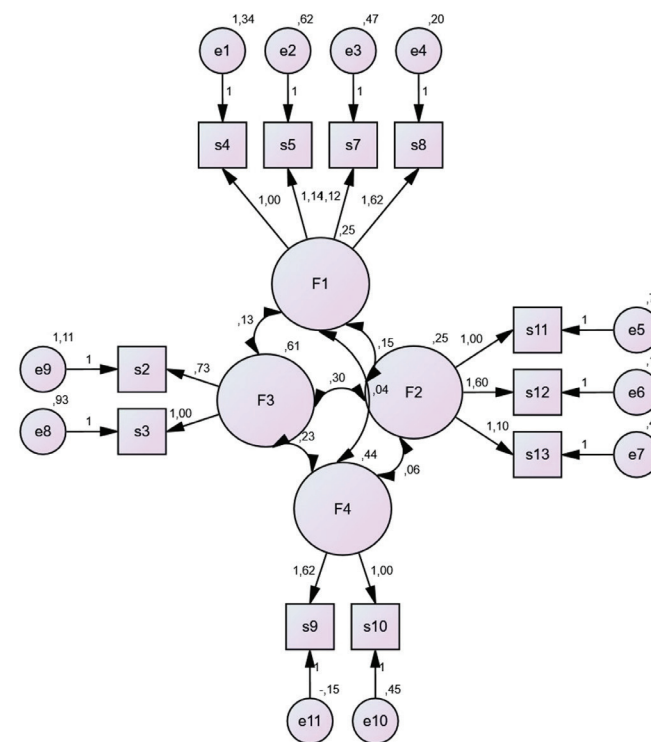
The output of the model that was estimated using the MLE method was as follows; notably, the model was found to be statistically significant ( $p<0.05$ ) (Table 3).

**Statistical Comparison of Survey Results**

In this study, Spearman’s rho correlation analysis was used to analyze the relationship between two continuous variables that do not conform to a normal distribution. The comparison of two independent and non-normally distributed variables was made with the Mann-Whitney U test. The comparison of continuous variables belonging to more than two groups that do not conform to normal distribution was conducted using the Kruskal-Wallis test. Spearman’s rho correlation analysis was used to analyze the relationship between two continuous variables that do not conform to a normal distribution. The statistical significance level was determined as 0.05.

	Variance percentage	Cumulative %
<b>Factor 1</b>	20,942	20,942
<b>Factor 2</b>	15,280	36,222
<b>Factor 3</b>	14,985	51,207
<b>Factor 4</b>	14,540	65,747

Table 1. List of questions asked to participants and the evaluated groups	
Questions	Evaluated group
1- How familiar are you with “dental implants,” which are one of the treatment options for edentulous areas?	1
2- Did you acquire most of your information about dental implants through the internet/social media?	2
3- Did you acquire most of your information about dental implants through your circle of friends?	2
4- Did you acquire most of your information about dental implants through your dentist?	2
5- One of the advantages of dental implant treatment is that it allows achieving more aesthetic results.	3
6- One of the advantages of dental implant treatment is that it does not require damaging the existing teeth.	1, 3
7- One of the advantages of dental implant treatment is it reduces bone loss in the edentulous area.	1, 3
8- One of the advantages of dental implant treatment is that it provides a more permanent solution.	3
9- One of the disadvantages of dental implant treatment is that it may be aesthetically less satisfying.	4
10- One of the disadvantages of dental implant treatment is that it has a lengthy process.	1, 4
11- Another disadvantage of dental implant treatment is that it is costlier.	1, 4
12- One of the disadvantages of dental implant treatment is the need for surgical intervention.	1, 4
13- One of the disadvantages of dental implant treatment is the potential complications that may occur afterward.	4



**Figure 1.** Modified CFA model according to EFA. CFA: Confirmatory factor analysis, EFA: Exploratory factor analysis

## RESULTS

The survey included 52 male participants (40%) and 77 female participants (59%), who ranged from 19-96 years of age with a median age of 50 years. The age distribution of the participants was as follows: 18% were younger than 30, 45% were 30-50 years of age, and 37% were older than 50. Among the participants, 65% had completed their primary education, 23% had completed their secondary education (i.e., middle school), 8% had completed high school, and 3% had attained a university degree (Table 4).

There is no statistically significant correlation between age and participants' awareness when analyzing the total scores and sub-dimensions of the scale (Spearman's rho  $p>0.05$ ) (Table 5). There is a statistically significant difference in the distribution of the 4<sup>th</sup> dimension between participants' dental implant treatment awareness according to gender (Mann-Whitney U  $p<0.05$ ) (Table 6). The mean is higher for men. There is no statistically significant difference according to education (Kruskal-Wallis  $p>0.05$ ) (Table 7).

The survey revealed that 58.9% of respondents reported being aware of dental implants. However, subsequent analysis of their responses to other survey questions indicated that these patients did not have a sufficient level of accurate understanding. Furthermore, 39.6% of the participants indicated that they received information about dental implants from their dentist or doctor. 63.6% mentioned that dental-

	Chi-square	Degrees of freedom	p
Model	71,821	38	0.001

		Average	Median (minimum-maximum)
Age		50.73±12.67	50 (19-96)
		n	%
Gender	Male	52	40.3
	Female	77	59.7
Education	Primary education	84	65.1
	Middle school	30	23.3
	High school	11	8.5
	University	4	3.1

		Age
F1	r	-0.101
	p	0.253
F2	r	0.113
	p	0.200
F3	r	-0.096
	p	0.279
F4	r	0.030
	p	0.734
Total	r	-0.045
	p	0.612

implant treatment was costlier than alternative options. 10.1% believed that dental implants were a treatment option that reduced bone loss. 53.5% did not consider dental implants to be a permanent treatment option (Table 8).

## DISCUSSION

The objective of this study was to examine the awareness and attitudes of patients toward dental-implant treatment. Specifically, the research focused on a sample of partially edentulous patients who had not undergone dental-implant rehabilitation in the past. By exploring the participants' understanding and perspectives, this study aimed to gain insights into patient-awareness levels and attitudes regarding dental implants within this specific population. In addition to evaluating the participants' awareness, we also investigated their perceptions of the dental-implant treatment; this involved gathering information about the overall impact of dental implants on oral health and quality of life, the sources from which the participants acquired information about implants, and any concerns or misconceptions they had. Through an analysis of the collected data, researchers can gain valuable insights into the level of patient awareness regarding dental-implant treatment. These findings can be utilized to enhance patient education programs, develop targeted informational materials, and improve communication between dentists and patients.

The study was conducted in a region with a low level of education in Istanbul.<sup>18</sup> Consistent with this finding, 65% of the participants in our study were primary-school graduates, 23% had completed middle school, 8% had completed high school, and 3% were university graduates. Although we did not find a significant statistical relationship between dental implant awareness and education in our study ( $p>0.05$ ), when we evaluated the awareness level, we observed that 60% of the study participants had no awareness. This is consistent with the studies conducted by Barot et al.<sup>19</sup> and Gayathri<sup>20</sup> on populations with low socioeconomic levels. Notably, however, these findings contradict a study conducted by Tepper et al.<sup>21</sup>, in which 72% of the patients reported having awareness about implants. In our opinion, the socioeconomic level of the sample participating in our survey may be the primary reason for this discrepancy.

According to our survey findings, a significant majority (75%) of patients who were indicated for implant-supported restorative treatment reported that their primary source of information regarding dental-

	Male	Female	p
	Mean ± SD Med. (min.-max.)	Mean ± SD Med. (min.-max.)	
F1	3.61±0.7 3.5 (1.75-5)	3.39±0.77 3.5 (1-5)	0.175
F2	3.64±0.66 3.67 (2-5)	3.66±0.77 3.67 (1-5)	0.624
F3	2.89±1.08 3 (1-5)	2.97±0.93 3 (1-5)	0.582
F4	3.02±0.87 3 (1-5)	2.65±0.92 2.5 (1-5)	0.024
Total	3.29±0.59 3.14 (1.69-4.75)	3.17±0.56 3.19 (1-4.44)	0.488

Min: Minimum, Max: Maximum, SD: Standart deviation.

**Table 7. Comparisons according to education**

	Primary-school	Middle school	High school	University	
	Mean $\pm$ SD Med. (min.-max.)	Mean $\pm$ SD Med. (min.-max.)	Mean $\pm$ SD Med. (min.-max.)	Mean $\pm$ SD Med. (min.-max.)	P
F1	3.43 $\pm$ 0.79 3.5 (1-5)	3.54 $\pm$ 0.73 3.5 (2-5)	3.64 $\pm$ 0.45 3.5 (3-4.5)	3.38 $\pm$ 0.32 3.38 (3-3.75)	0.857
F2	3.61 $\pm$ 0.81 3.67 (1-5)	3.74 $\pm$ 0.56 3.67 (2.67-5)	3.58 $\pm$ 0.5 3.67 (3-4.33)	4 $\pm$ 0.47 4.17 (3.33-4.33)	0.528
F3	2.88 $\pm$ 1.04 3 (1-5)	3.02 $\pm$ 0.97 3 (1-4.5)	3.18 $\pm$ 0.78 3 (2-5)	3 $\pm$ 0 3 (3-3)	0.839
F4	2.85 $\pm$ 0.92 3 (1-5)	2.53 $\pm$ 0.93 2.75 (1-4)	3.27 $\pm$ 0.68 3 (2-4)	2.5 $\pm$ 0.58 2.5 (2-3)	0.116
Total	3.19 $\pm$ 0.66 3.13 (1-4.75)	3.21 $\pm$ 0.34 3.14 (2.31-3.98)	3.42 $\pm$ 0.39 3.54 (2.75-4.19)	3.22 $\pm$ 0.15 3.18 (3.08-3.44)	0.278

Min: Minimum, Max: Maximum, SD: Standart deviation.

**Table 8. List of questions asked to participants and percentage of given answers**

Questions	Answers	n	%
1- How familiar are you with “dental implants,” which are one of the treatment options for edentulous areas?	1	44	34.1%
	2	32	24.8%
	3	23	17.8%
	4	24	18.6%
	5	6	4.7%
2- Did you acquire most of your information about dental implants through the internet/social media?	1	20	15.5%
	2	39	30.2%
	3	28	21.7%
	4	32	24.8%
	5	10	7.8%
3- Did you acquire most of your information about dental implants through your circle of friends?	1	15	11.6%
	2	32	24.8%
	3	26	20.2%
	4	39	30.2%
	5	17	13.2%
4- Did you acquire most of your information about dental implants through your dentist?	1	30	23.3%
	2	21	16.3%
	3	28	21.7%
	4	37	18.7%
	5	13	10.1%
5- One of the advantages of dental implant treatment is that it allows for achieving more aesthetic results.	1	6	4.7%
	2	7	5.4%
	3	54	41.9%
	4	42	32.6%
	5	20	15.5%
6- One of the advantages of dental implant treatment is that it does not require damaging the existing teeth.	1	5	3.9%
	2	6	4.7%
	3	56	43.4%
	4	42	32.6%
	5	20	15.5%

**Table 8. Continued**

Questions	Answers	n	%
7- One of the advantages of dental implant treatment is that it serves as a treatment option that reduces bone loss in the edentulous area.	1	2	1.6%
	2	11	8.5%
	3	74	57.4%
	4	23	17.8%
	5	19	14.7%
8- One of the advantages of dental implant treatment is that it provides a more permanent solution.	1	4	3.1%
	2	7	5.4%
	3	36	27.9%
	4	59	45.7%
	5	23	17.8%
9- One of the disadvantages of dental implant treatment is that it may be aesthetically less satisfying.	1	10	7.8%
	2	41	31.8%
	3	54	41.9%
	4	14	10.9%
	5	10	7.8%
10- One of the disadvantages of dental implant treatment is that it has a lengthy treatment process.	1	8	6.2%
	2	40	31.0%
	3	58	45.0%
	4	15	11.6%
	5	8	6.2%
11- Another disadvantage of dental implant treatment is that it is more costly.	1	45	34.9%
	2	37	28.7%
	3	37	28.7%
	4	7	5.4%
	5	3	2.3%
12- One of the disadvantages of dental implant treatment is the need for surgical intervention.	1	2	1.6%
	2	7	5.4%
	3	38	29.5%
	4	56	43.4%
	5	26	20.2%
13- One of the disadvantages of dental implant treatment is the potential complications that may occur after the treatment.	1	2	1.6%
	2	10	7.8%
	3	70	54.3%
	4	31	24.0%
	5	16	12.4%



implant treatments was their dentist. Consistently, our results revealed that dentists were the most prominent source of information, followed by friends and relatives, the Internet, magazines, television, and general physicians, when ranked in order of importance. These findings align with the findings of Pommer et al.<sup>22</sup>, who similarly highlighted dentists as the primary source of information for patients regarding dental implants and other dental treatments, accounting for 74% of cases. This is also in line with a study conducted by Yao et al.<sup>23</sup>, the aim of which was to explore patients' awareness levels, perceptions, and expectations regarding implant treatment; they concluded that dentists were the most frequently consulted source of information. The results of numerous similar studies investigating the sources of information about dental implants also support and reinforce these findings.<sup>24-27</sup>

The study by Berge<sup>28</sup> in Norway found that individuals aged 45 and older, with a higher level of education, had better awareness of dental implants, which aligns with the findings of Choudhary et al.<sup>29</sup> in India. However, there are also surveys suggesting an inverse relationship between the level of awareness about dental implants and the age of the individual.<sup>17,27</sup> In this study, although individuals aged 50 and over gave more accurate answers about dental implant treatment than other age groups, no statistically significant relationship was found between age and awareness of the participants ( $p > 0.05$ ).

According to the analysis of the questions on the reliability of dental implants, only 18% of the participants evaluated implants as being more reliable than natural teeth; this indicates that the majority believed natural teeth are more reliable than implants. When considering treatment options for missing teeth, the longevity of the treatment is an important factor.<sup>6</sup> According to the analysis of the data obtained from our study, 96.93% of the patients stated that implant treatment was not a lifelong permanent treatment option. In contrast to our findings, in a survey study conducted by Insua et al.<sup>30</sup>, 70.4% of the participants stated that implants are a lifelong treatment; conversely, a 2021 survey conducted by Küçük et al.<sup>31</sup> concluded that only 20% of the participants believed that dental implants represent a lifelong permanent treatment. The significant discrepancy in these findings may be attributed to variations in the evaluated populations across different geographical regions and with differing levels of education.

The high cost of an implant-supported prosthesis is a primary factor contributing to negative perceptions of implant treatment.<sup>14,22,32,33</sup> In a study conducted by Satpathy et al.<sup>32</sup>, among patients who were aware of implant treatment and had indications for dental implants, 58.79% opted for alternative treatments due to the high cost. Similarly, in a research study by Sinha et al.<sup>33</sup>, 76% of participants expressed that implant treatment is expensive. Consistent with these findings, the current study also revealed that 86% of participants consider implant treatment to be costly. Studies focusing on populations with a lower socioeconomic status have reported that participants prefer conventional fixed and removable partial treatments over implant treatments due to the high cost associated with implants.<sup>17,18</sup> To address the cost barrier to implant adoption, public health initiatives and financial assistance programs should be considered. These programs can offer subsidized dental treatments

or financial support to individuals from lower-income backgrounds.<sup>34</sup> Additionally, promoting cost-effective alternatives, such as simplified implant systems or preventive care programs, can help make dental implants more accessible.<sup>35</sup>

In the subsequent phase of the present study, an evaluation was conducted on patient information concerning the surgical procedure and potential complications associated with dental-implant treatment. Approximately 60% of the participants expressed their readiness for dental-implant surgery. Notably, individuals with higher levels of education displayed greater acceptance of surgical procedures. In line with similar previous studies, these collected data indicated a positive correlation between age and awareness levels regarding complications and potential failures.<sup>27,36</sup>

A study conducted by Atagün and Kalyoncuoğlu<sup>27</sup> in a different region of Türkiye reported that 95.5% of elderly participants were familiar with implant treatment, but only 21.5% possessed accurate awareness thereof. Dentists should also strive to enhance motivation and education among patients before beginning treatment.<sup>13,31</sup>

### Study Limitations

It is important to note that the study has some limitations. Firstly, it only represents a certain segment of the population. Secondly, the survey focused solely on evaluating the patients' awareness without investigating their treatment preferences or the reasons behind their choices. Finally, the survey questions were selected from a pool of suitable questions obtained by reviewing previous studies and were optimized for the study.

### CONCLUSION

In conclusion, younger participants with higher education levels tend to have better awareness of dental-implant treatment, and have a more positive attitude toward rehabilitating toothless spaces with dental implants. The most important disadvantage of an implant treatment is the high cost thereof. Considering that dentists are the most important source of information, they should take more responsibility to raise public awareness. Further studies are needed to evaluate this topic in greater depth.

### MAIN POINTS

- Partially edentulous patients possess a limited awareness of dental implant treatments.
- There is no significant relationship between dental implant treatment awareness and the age of the individual.
- One of the most significant reasons why patients decline implant treatment may be that they perceive the treatments to be expensive due to illness.

### ETHICS

**Ethics Committee Approval:** This study was conducted with the approval of the University of Health Sciences Türkiye, Hamidiye Scientific Research Ethics Committee (approval number: 2/4, date: 27.01.2023).

**Informed Consent:** Informed consent forms were presented to the eligible patients who would participate in this study.

## Footnotes

## Acknowledgement

I would like to express my gratitude to Büşra Keleş and Berk Yüzbaşıoğlu for their valuable contributions in conducting this study.

## Authorship Contributions

Surgical and Medical Practices: E.G.S., Concept: E.G.S., Design: E.G.S., Data Collection and/or Processing: B.D., Analysis and/or Interpretation: B.D., Literature Search: M.H., Writing: M.H.

**Conflict of Interest:** No conflict of interest was declared by the authors.

**Financial Disclosure:** The authors declared that this study had received no financial support.

## REFERENCES

- Kreider KE, Whyte DF. Psychosocial impact of tooth loss: a review of the literature. *J Prosthodont.* 2018; 27(4): 304-10.
- Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of severe tooth loss: a systematic review and meta-analysis. *J Dent Res.* 2014; 93(7 Suppl): 20-8.
- Marcenes W, Kassebaum NJ, Bernabé E, Flaxman A, Naghavi M, Lopez A, et al. Global burden of oral conditions in 1990-2010: a systematic analysis. *J Dent Res.* 2013; 92(7): 592-7.
- Silva Junior MF, Batista MJ, de Sousa M. Risk factors for tooth loss in adults: a population-based prospective cohort study. *PLoS One.* 2019; 14(7): 219240.
- T.C. Sağlık Bakanlığı Sağlık Hizmetleri Genel Müdürlüğü Ağız ve Diş Sağlığı Dairesi Başkanlığı Türkiye ağız diş sağlığı profili araştırma raporu - 2018. Available from: <https://dosyamerkez.saglik.gov.tr/Eklenti/42552/0/turkiye-agiz-ve-dis-sagligi-profil-arastirma-raporu.pdf>
- Alhammadi SH, Burnside G, Milosevic A. Clinical outcomes of single implant supported crowns versus 3-unit implant-supported fixed dental prostheses in Dubai Health Authority: a retrospective study. *BMC Oral Health.* 2021; 21(1): 171.
- Breine U, Johansson B, Roylance PJ, Roeckert H, Yoffey JM. Regeneration of bone marrow. A clinical and experimental study following removal of bone marrow by curettage. *Acta Anat (Basel).* 1964; 59: 1-46.
- Prabhu AG, Mundathaje M. Knowledge, attitude, and awareness of patients regarding dental implants: a cross-sectional study. *J Int Oral Health.* 2018; 10(6): 278.
- Walton TR. An up-to-15-year comparison of the survival and complication burden of three-unit tooth-supported fixed dental prostheses and implant-supported single crowns. *Int J Oral Maxillofac Implants.* 2015; 30(4): 851-61.
- Davenport C, Elley K, Salas C, Taylor-Weetman CL. The effectiveness of dental implants in improving the quality of life: a systematic review. *J Prosth Dent.* 2003; 89(4): 381-92.
- Pjetursson BE, Brägger U, Lang NP, Zwahlen M. Comparison of survival and complication rates of tooth-supported fixed dental prostheses (FDPs) and implant-supported FDPs and single crowns (SCs). *Clin Oral Implants Res.* 2007; 18(s3): 97-113.
- Davut U, ÖZYILMAZ ÖY. Evaluation of patients-awareness levels regarding implant and implant-supported prosthesis who were admitted to bezmialeml vakif university faculty of dentistry. *Bezmialeml Science.* 2022; 10(1): 96-103.
- Muller F, Salem K, Barbezat C, Herrmann FR, Schimmel M. Knowledge and attitude of elderly persons towards dental implants. *Gerodontology.* 2012; 29(2): 914-23.
- Brunello G, Gervasi M, Ricci S, Tomasi C, Bressan E. Patients' perceptions of implant therapy and maintenance: a questionnaire-based survey. *Clin Oral Implants Res.* 2020; 31(10): 917-27.
- Smith J, Johnson M, Brown T, et al. Assessing the role of literacy in survey data accuracy. *J Survey Res.* 2018;45(2):112-118.
- Brown R, Williams P, Taylor S, et al. The impact of literacy on survey participation: a global perspective. *Int J Public Health.* 2017; 62(5): 601-9.
- Tuna M, Bircan H, Yeşiltaş M. Etik liderlik ölçeği'nin geçerlilik ve güvenilirlik çalışması: Antalya örneği. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Derg.* 2012; 26(2): 143-155.
- Durmuş E. Ortaöğretim kurumlarında öğretmenlerin aile katılımıyla ilgili görüşlerinin incelenmesi: İstanbul-Sultanbeyli örneği: *Sosyal Bilimler Enstitüsü;* 2016.
- Barot K, Dave B, Patel J, Vaghasiya C, Brahmbhatt H. Awareness and attitude of patients regarding dental implants as a treatment modality, at Kalol Town, Gujarat. *Int J Recent Sc Res.* 2018; 7: 13-5.
- Gayathri MM. Knowledge and awareness among patients about dental implants. *J Pharm Sci Res.* 2016; 8(5): 351.
- Tepper G, Haas R, Mailath G, Teller C, Zechner W, Watzak G, et al. Representative marketing-oriented study on implants in the Austrian population. I: level of information, sources of information and need for patient information. *Clin Oral Implants Res.* 2003; 14: 621-33.
- Pommer B, Zechner W, Watzak G, Ulm C, Watzek G, Tepper G. Progress and trends in patients' mindset on dental implants. I: level of information, sources of information and need for patient information. *Clin Oral Implants Res.* 2011; 22(2): 223-9.
- Yao J, Li M, Tang H, Wang PL, Zhao YX, McGrath C, et al. What do patients expect from treatment with dental implants? Perceptions, expectations and misconceptions: a multicenter study. *Clin Oral Implants Res.* 2017; 28(3): 261-71.
- Saha A, Dutta S, Vijaya V, Rajnikant N. Awareness among patients regarding implants as a treatment option for replacement of missing teeth in Chattisgarh. *J Int Oral Health.* 2013; 5(5): 48-52.
- Simensen AN, Bøe OE, Berg E, Leknes KN. Patient knowledge and expectations prior to receiving implant-supported restorations. *Int J Oral Maxillofac Implants.* 2015; 30(1): 41-7.
- Suprakash B, Ahammed AY, Thareja A, Kandaswamy R, Kumar N, Bhondwe S. Knowledge and attitude of patients toward dental implants as an option for replacement of missing teeth. *J Contemp Dent Pract.* 2013; 14(1): 115-8.
- Atagün ÖS, Kalyoncuoğlu ÜT. Evaluation of elderly patients' knowledge and awareness of dental implant treatments applying to periodontology and prosthodontics departments. *Eur J Geriatr Gerontol.* 2023; 5(2): 132-8
- Berge T. Public awareness, information source and evaluation of oral implant treatment in Norway. *Clin Oral Implants Res.* 2000; 11: 401-8.
- Choudhary M, Khandhedia S, Dhaduk K, Sumit U, Naresh M, Dipesh P. Morbidity pattern and treatment seeking behaviour of geriatric population in Jamnagar city. *J Res Med Dent Sci.* 2013; 1(1): 12-6.
- Insua A, Monje A, Wang HL, Inglehart M. Patient-centered perspectives and understanding of peri-implantitis. *J Periodontol.* 2017; 88(11): 1153-62.
- Küçük AÖ, Keskinrüzgar A, Şimşek HO. Hastaların dental implantlara bakış açısının değerlendirilmesi. *Mersin Üniversitesi Sağlık Bilimleri Derg.* 2021; 14(2): 232-241.

32. Satpathy A, Porwal A, Bhattacharya A, Sahu PK. Patient awareness, acceptance and perceived cost of dental Implants as a treatment modality for replacement of missing teeth: a survey in Bhubaneswar and Cuttack. *Int J Public Health Dent.* 2011; 2(1): 1-7.
33. Sinha M, Agarwal M, Shah SS, et al. Constraints among patients while opting dental implant as a treatment option. *International Journal of Oral Care and Research.* 2019; 7(1): 8-11.
34. Smith J, et al. The role of public health initiatives in improving access to dental care. *J Public Health Policy.* 2019;40(3):229-40.
35. Johnson M, Lee T. Cost-effective solutions in dental implantology: Simplified implant systems. *J Dent Res.* 2020; 68(2): 142-50.
36. Hof M, Tepper G, Semo B, Arnhart C, Watzek G, Pommer B. Patients' perspectives on dental implant and bone graft surgery: questionnaire-based interview survey. *Clin Oral Implants Res.* 2014; 25(1): 42-5.