

## **Awareness towards dental implants as a treatment option for replacement of missing teeth: A Cross-sectional study**

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**Aim:** to ascertain the patients' comprehensive level awareness and attitude regarding the replacement of missing teeth with dental implants.

**Materials and Methods:** observational cross-sectional study, data was collected in both the private and public sectors of Benghazi city. A random sample size of 385 was used, with a confidence level of 95% and a margin of error of 5%. The data collection employed a standardized printed self-explanatory modified version of a questionnaire.

**Results:** The majority of participants were aged 30 and below, the percentage of males was (22.9%) while the females were (77.1%). The majority of participants held a Bachelor's degree (55.3%). The awareness of participants about various treatment options for the replacement of missing teeth was (84.7%).

**Conclusion:** dental implants were the preferred treatment option for replacing missing teeth. The participants showed high awareness and acceptance of dental implants. However, the cost of dental implants emerged as the primary reason for not selecting them as a treatment choice

**Keywords:** Dental implants, Missing teeth, Replacement options, Awareness

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## Introduction

Patients who are edentulous now have more treatment options because to osseointegrated implants. These days, implant-supported and implant-retained prostheses are frequently utilized in place of conventional complete dentures. Patients who are completely edentulous have traditionally received their rehabilitation through conventional dentures. While the majority of patients are happy with this course of therapy, many individuals had trouble adjusting to wearing dentures and expressed discontent.<sup>1</sup>

The face and smile play a crucial role in cultivating and preserving positive self-esteem. The face represents one's overall being, while the smile provides a glimpse into an individual's personality. In contemporary dentistry, there is a recognition of the patient's emotional and psychological connection to their dental concerns, oral healthcare, and particularly, aesthetics.<sup>2</sup>

Tooth loss is a prevalent problem that can be caused by dental caries, periodontal disease, face trauma, endodontic failure, or, in rare cases, iatrogenic factors.<sup>3</sup> Tooth loss can be a stressful and emotionally demanding experience, seen as an unforeseen occurrence that requires tremendous social as well as psychological adjustment.<sup>4</sup>

Patients who are completely edentulous have traditionally received their rehabilitation through conventional dentures. While the majority of patients are happy with this course of therapy, many individuals had trouble adjusting to wearing dentures and expressed discontent.

Depending on tooth loss's location, it can lead to aesthetic or functional impairment. This can manifest as difficulties in chewing, which may ultimately impact one's overall quality of life.<sup>2</sup>

Furthermore, it can negatively impact oral health by causing temporomandibular disorders (TMDs), resulting in the potential loss of nearby

teeth, misalignment of adjacent teeth, or excessive eruption of opposing teeth.<sup>2</sup> To restore missing teeth, a range of prosthodontic options are frequently employed, such as fixed or removable partial dentures and implant-supported prostheses. The acceptance of new dentures relies on the individual's attitude towards dentures and the demand for tooth replacement, which has long been the conventional approach for addressing missing teeth.<sup>2</sup>

A dental implant is a prosthetic device that is surgically integrated into the alveolar bone to provide support for the replacement of a single tooth, a fixed partial or complete denture, or a maxillofacial prosthesis. This treatment option is particularly well-suited for individuals who have excellent oral health.<sup>5</sup> Implants are now considered the optimal choice, as they offer an extended lifespan with fewer complications.<sup>2</sup>

Due to its remarkable long-term results in the rehabilitation of patients who are either partially or completely edentulous, dental implant treatment has attracted a lot of attention. Dental implants provide better denture retention, stability, functional efficacy, and an enhanced quality of life. Originally, they were used to treat edentulous patients.<sup>5</sup>

Moreover, researchers have focused on assessing patient satisfaction following oral rehabilitation using different dental prostheses. They have asserted that implant-supported restoration consistently delivers outstanding outcomes in terms of aesthetics, phonetics, and chewing efficiency.<sup>5</sup> The field of implantology has undergone significant changes in recent years as a result of technological advancements. These advancements, particularly in dental implants and surgical procedures such as immediate loading, have expanded the scope of patients who can benefit from dental implant procedures and broadened the array of treatment options available.<sup>6</sup> Studies carried out

reveals varying levels of awareness regarding dental implant treatment.<sup>4</sup>

### Materials and Methods

In this observational cross-sectional study, data was collected in both the private and public sectors of Benghazi city. A random sample size of 385 was used, with a confidence level of 95% and a margin of error of 5%. The data collection employed a standardized printed self-explanatory modified version of a questionnaire, which was adapted from a previous study conducted by Ali et al <sup>(9)</sup> in 2023. The questionnaire, consisted of eight questions written in both Arabic and English to ensure better understanding. It aimed to assess socio-demographic characteristics, the level of awareness regarding the use of dental implants as a treatment option, the source of knowledge, and the factors that influence the decision-making process. The questionnaire was distributed to participants after explaining the aim and nature of the study. A statistician analyzed the results, which were then presented in tables and graphs. The collected data were entered and analyzed using Statistical Package for Social Sciences (SPSS) software version 28. Inferential statistical analysis, such as the chi-square test for differences between variables, was employed, and the results were presented in the form of frequency tables and graphics.

### Results

In this cross-sectional questionnaire-based survey, 385 participants completed the questionnaire. The majority of participants were aged 30 and below, the percentage of males was (22.9%) while the females were (77.1%). The majority of participants held a Bachelor's degree (55.3%). The awareness of participants about various treatment options for the replacement of missing teeth was (84.7%). In addition (92.7%) had heard about dental implants as an option for the replacement of missing teeth, their source of information was mainly from a

dentist (42.6%), followed by the internet and advertisements respectively (36.6%), (6.5%). On the other hand, for the participants who did not choose dental implants as a treatment option, the high cost was the main reason (13.5%).

Furthermore, the findings of our investigation underscored the necessity of furnishing patients with more precise details regarding the length, expenses, and benefits of dental implants in comparison to other traditional treatment alternatives.

**Table 1: Demographic data of the participants**

Variables	Class	N	%
Gender	Male	88	22.9%
	Female	297	77.1%
Educational	High school	79	20.5%
	Bachelor	213	55.3%
	Master or Ph.D.	25	6.5%
	other	68	17.7%
Age	<=30	197	51.2%
	>30	188	48.8%

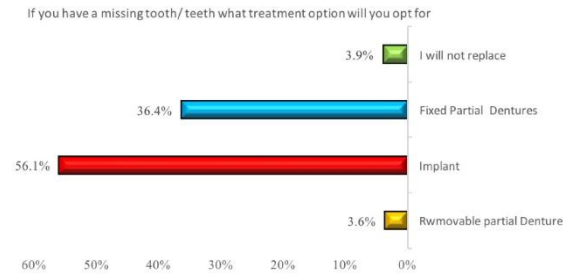
The awareness of removable and fixed appliances as a choice for tooth replacement was high at 326 (84.7%). As well as dental implants which showed a great percentage of awareness 357 (92%), on the other hand only 28 (7.3%) were fully unaware of dental implants. (Table 2)

**Table 2: Awareness toward the various treatment options and dental implants**

Variables	yes N(%)	No N(%)
Are you aware that various treatment options are available for the replacement of missing teeth like removable appliance, fixed appliance, and Dental Implants	326(84.7)	59(15.3)
Have you ever heard about dental implants	357(92.7)	28(7.3)

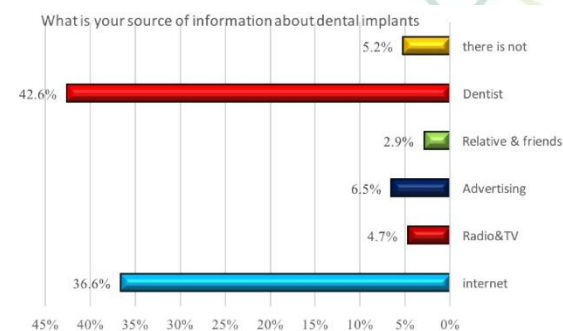
The treatment option that the participants selected most frequently was dental implants with the percentage of

(56.1%), followed by Fixed partial dentures (36.4%) and Removable partial dentures being the least selected (3.6%), only around (3.9%) participants chose to have no replacement at all (3.9%). (Fig.1)



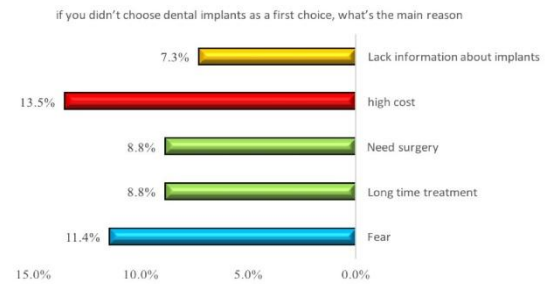
**Fig 1: if you have a missing tooth/teeth what treatment option will you opt for?**

The majority of participants (42.6%) obtained their information on dental implants from their dentists, followed by the internet (36.6%) and advertisements (6.5%), respectively. (Fig.2)



**Fig 2: what is your source of information about dental implants?**

Regarding the participants who did not select dental implants as a treatment option for their missing tooth, High cost was the major limiting factor (13.5%) followed by fear (11.4%), the need for surgery and long treatment time had an equal percentage of (8.8%), the least percentage of individuals determined a lack of information as a limiting factor (7.3%). (Fig.3)



**Fig 3: if you did not choose dental implants as a first choice, what's the main reason?**

**Table 3: summarizes the data of all three figures above.**

Variables	Class	N	%
If you have a missing tooth/teeth what treatment option will you opt for	Removable partial Denture	14	3.6%
	Implant	216	56.1%
	Fixed Partial Dentures	140	36.4%
	I will not replace	15	3.9%
What is your source of information about dental implants	Internet	141	36.6%
	Radio &TV	18	4.7%
	Advertising	25	6.5%
	Relative & friends	11	2.9%
	Dentist	164	42.6%
	there is not	20	5.2%
if you didn't choose dental implants as a first choice, what's the main reason	Fear	44	11.4%
	Long time treatment	34	8.8%
	Need surgery	34	8.8%
	high cost	52	13.5%
	Lack of information about implants	28	7.3%

A significant correlation was observed between the awareness of dental implants and the age of the participants ( $p < 0.05$ ). However, no significant correlation was found between awareness and gender or educational levels.

**Table 4: Correlation between the awareness regarding dental implants and the demographic characteristics of the Participants.**

Variables	Class	Have you ever heard about dental implants			
		Yes	No		
		N(%)	N(%)		
Age	<=30	188 (52.7)	9 (32.1)	4.375	0.036
	>30	169 (47.3)	19 (67.9)		
Gender	male	81 (22.7)	7 (25)	0.079	0.779
	female	276 (77.3)	21 (75)		
Education	High school	74 (20.7)	5 (17.9)	4.557	0.207
	Bachelor	201 (56.3)	12 (42.9)		
	Master or Ph.D.	23 (6.4)	2 (7.1)		
	other	59 (16.5)	9 (32.1)		

## Discussion

Recently, a rise in the popularity of dental implants made it become a preferred option by many. This significant change in the dental field can be attributed to several factors, including oral surgeons with high expertise and extensive clinical training, as well as the advancements in implant technology, which have resulted in a high success rate of dental implants and patient satisfaction. This presented study aimed to assess the awareness and knowledge towards dental implants as an option in replacing missing teeth, the participants were selected in Benghazi city, Libya.

The awareness regarding various prosthodontic replacement options was 84.7%. However, the awareness level specifically for dental implants was significantly higher at 92.7%, surpassing results from several other countries. For instance, studies by Mgbeokwerre et al. (2011) in Enugu, Nigeria <sup>7</sup> and Berge (2000) in Norway <sup>8</sup> reported that only 9.7% and 70.1% of the population, respectively, had heard of dental implants. A recent study by Mishra et al. (2023) in India <sup>9</sup> reported a lower awareness level of 36.86%, which can be attributed to lower educational levels in the population compared to this study.

When participants were asked about their preferred treatment option in the case of a missing tooth or teeth, the results showed that 56.1% of the respondents selected dental implants as their first treatment option, followed by fixed appliances 36.4%, with only a small percentage opting for removable appliances 3.6% or choosing not to replace at all 3.9%. Almost identical results were reported in a study conducted in Saudi Arabia in 2023 by Ali et al.<sup>10</sup> 56.5% of participants preferred dental implants, while around 30%, 2.6%, and 3.9% favored fixed appliances, removable appliances, and no replacement, respectively. From my perspective, participants likely chose dental implants as their first choice due to their desire for a permanent solution and the long-term benefits they offer, such as high stability, enhanced esthetics, functionality, and high success rates.

According to the findings of this current study, dentists were found to be the main source of information regarding dental implants at 42.6% followed by the internet at 36.6%. These results align with several other studies, dentists being the prime source of obtaining information, with figures such as 74% in Austria 2010 by Pommer et al.<sup>11</sup>, 41.9% in Nepal 2020 as reported by Gurgain et al.<sup>12</sup>, and 59% in Switzerland 2023 according to Al-Haj Husain et al.<sup>13</sup>. Conversely, a study in Saudi Arabia 2024 by Al-Nasser et al.<sup>14</sup> found that media was the main source for 60.2% of participants. This collective evidence highlights the significant roles dentists, internet, and social media play in informing individuals about dental implants in modern society.

The participants stated that the primary limiting factor in undergoing dental implant procedures is the high cost, followed by the fear of surgery. This finding aligns with a 2024 survey by Al Nasser in Saudi Arabia <sup>14</sup>, which reported similar concerns. Additionally, other surveys have identified financial cost as the main barrier to dental implants, including

Al Johany et al. 2010 study in Saudi Arabia<sup>15</sup>., Kazadi et al. 2018 study in Congo<sup>16</sup>.and Amin's 2024 study in Iraq<sup>17</sup>. The consistent identification of cost as a significant barrier across different regions highlights the need for more affordable dental options. Addressing this issue could improve access to dental implants, thereby enhancing overall oral health and quality of life for patients.

### Limitations

The data were collected may not be representative of the entire population as a larger sample size and in different regions would signify the results. , the validity of the answers obtained was challenging to control. Moreover, it is uncertain whether respondents' claims about their responses reflect their definite conduct, as is the shortcoming with survey studies.

### Conclusion

In conclusion, this study revealed that dental implants were the preferred treatment option for replacing missing teeth. The participants showed high awareness and acceptance of dental implants. However, the cost of dental implants emerged as the primary reason for not selecting them as a treatment choice. To address this barrier, it is crucial to provide patients with comprehensive and accurate information about the advantages, duration, and cost of dental implants compared to other available options. By enhancing patient education, individuals can make informed decisions regarding their dental treatment and potentially overcome cost-related concerns associated with dental implants.

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### Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Declarations

The authors declare that they have no conflicts of interest

### Ethics approval and consent to participate

Ethics approval was obtained from the Ethics Committee of the Libyan International Medical University. All participants verbally consent to participate in this study.

### Competing Interests

The authors have no competing interests that could influence the outcome of this research.

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