

## A cross sectional study on knowledge and attitude level of patients demanding implants in Isfahan, Iran, 2016

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### Original Article

#### Abstract

**BACKGROUND AND AIM:** Information gathered from patients about dental implants is often incomplete and scattered. The aim of the present study was to measure the level of this information and the attitudes of patients seeking dental implants.

**METHODS:** In the present cross-sectional descriptive-analytic study, 248 people were employed. To discover the level of knowledge and attitudes in dental implants a questionnaire was distributed amongst the participants. Data were collected from people seeking implants in dental colleges and implant dental clinics in Isfahan, Iran. Analyses of the patients' answers in the questionnaire was carried out using SPSS software with t-test, Spearman's rho correlation coefficient, and one-way analysis of variance (ANOVA) test ( $\alpha = 0.05$ ).

**RESULTS:** The mean score of knowledge was  $5.3 \pm 2.1$  (from maximum 12). The average of attitude questions in Likert scale reached to  $25.84 \pm 3.38$  (from maximum 35), and in questions with numerical linear scale it was  $21.44 \pm 5.38$  (from maximum 25). The source of information on dental implants for most of the patients was their dentists. The level of knowledge increased with higher level of education and also with better economic status. The attitude of patients about this method of tooth replacement was also more positive amongst ones with better economic situation.

**CONCLUSION:** The results of the present study demonstrated that the knowledge of patients about dental implants is moderate, and there is a positive attitude toward this treatment method.

**KEYWORDS:** Attitude; Dental Implants; Knowledge

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Common oral conditions have a paramount impact on the quality of life of an individual. Missing one or more natural tooth often leads to discomfort and disability, as many of diary functions such as speaking, mastication, and sensation take place through mouth and teeth. Dental prosthesis is used when these functions and the individual's beauty are compromised due to tooth missing. However, many of patients adapt to these

devices difficultly, and some other never get used to it. This problem can be related to different factors such as anatomical, psychological, and denture related issues.<sup>1-3</sup>

The aim of modern dentistry is to restore function as well as aesthetic and normal health to partially or totally edentulous patients. Implant dentistry is a promising tooth replacement method which covers all these objectives.<sup>4-7</sup> Moreover, it is proved that implant-supported prosthesis has excess

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advantages of bone maintenance and satisfying aesthetic needs compared to conventional denture treatments.<sup>8,9</sup> On the other hand, although the implant has some disadvantages such as high cost, an additional surgery in treatment stages, probability of failure, and the time consuming duration of treatment,<sup>10</sup> such facts have not negatively affected the patients' tendency toward implant; to the extent that many reports have shown that patients accept implant therapy as an approved treatment strategy. In a study by Grogono et al., it was reported that 88% of cases declared an improved self-confidence after implant placement, 98% announced a better feeling of health in their mouth, 89% agreed to undergo another more implant treatment, and 90%-94% of patients with previous implant therapy showed a positive attitude toward this method.<sup>11</sup>

In Al-Hamdan and Meshrif investigation, conducted on Saudi people in 2007, the level of patients' satisfaction of beauty needs was reported up to 71%, and 78% satisfaction was recorded about the function of dental implants.<sup>12</sup> The rate of knowledge and attitude of 120 American patients demanding dental implants was investigated by Zimmer et al.<sup>13</sup> The results of this study showed a high level of patients' knowledge and a positive attitude toward this treatment method. They also demonstrated that people believe prosthesis supported by implants satisfy more beauty needs than removable conventional dentures. The mass media was the principle source of individual information. In contrast to these results, in a study conducted in India in 2013, only 33% of 440 participants had knowledge of dental implants, whilst 70% of the implant applicants reported a positive attitude toward this treatment.<sup>16</sup>

In 1992, Kent reported that treatment costs, phobia of surgery, and the long term course of implant therapy are the major factors which prevent attendance for this treatment.<sup>14</sup> Satpathy et al. showed that high

cost is reported as the major implant disadvantage in 58% of patients, while in 43% the stressful process of implant surgery was declared as the main disadvantage.<sup>15</sup>

In an investigation which was undertaken in Tabriz, Iran, in 2012, knowledge and attitude of patients toward implant was evaluated as moderate, and dentists were the principle source of patients' information.<sup>17</sup> Although tooth replacement with implant is considered as a pleasant experience for most patients, the available data about treatment stages and its success rate is often incomplete and scattered; and at the same time the information reflected by media are often not based on scientific evidence.<sup>11</sup> This problem is more prominent in developing countries which have compromised trainings from education custodians about patients' awareness and knowledge.<sup>18</sup>

It is important for dentists to know the level of their patients' knowledge about dental implants. Awareness of patients' perceptions toward dental implants can help dentists for evaluating patients' expectations.<sup>19</sup> In addition, awareness of people about dental implants would limit negative attitude caused by inadequate or false information. The studies of this model on dental implants are scarce in our country, Iran; therefore, we decided to investigate the level of patients' knowledge and their attitude in regard to dental implants as a choice of tooth replacement therapy.

## Methods

This cross-sectional descriptive-analytic study was conducted in Isfahan, Iran, from November 2015 to February 2016. All the procedures were conducted in accordance with ethics committee (393718) of Isfahan University of Medical Sciences.

A number of 248 patients who referred to dental clinics across the Isfahan City for implant purposes and also to the dental departments of Isfahan universities of medical sciences were employed to fill the questionnaires. The criteria for entrance of

patients to the project were cases seeking implant that previously had not undergone this treatment. Patients who had not been consistent with the process of the investigation were excluded from the study. The questionnaires were randomly distributed amongst patients of the study who were referred to implant section of dentistry school and implant offices in the city. Adequate explanation was told to each case before filling the questionnaire. In addition, a close supervision was taken while patients were answering the questions. This process of data gathering took 5 months from October to March 2016.

The questionnaire constituted of three sections divided upon previous studies;<sup>8,10,12,13,15,16,18</sup> first beginning with demographic questions including age, sex, economic status (by asking the amount of income rating questions as low, average, good, and excellent), and level of education; followed by the second part with the knowledge evaluating questions. In this section content related validity and face validity became approved. To achieve this goal, a group comprising of three specialists of periodontics was assigned to approve the content validity of questions related to knowledge. Furthermore, a weight was assigned to each question (1 = high coordination, 2 = moderate coordination, 3 = low or unspecified coordination) in order to detect accordance of each question to the goal of asking that part. Moreover, specialists were asked to propose any suggestion or concept to each question or the whole process of the project. After this step, all questions scored 2 or 3 were omitted or modified upon periodontics' opinion. Then questions were approved once again by specialists. In this way, the validity of the knowledge questionnaire was approved. Finally, 12 questions were assigned in this section. The third and last section was related to attitude questions with two subcategories: questions with Likert scale (7 questions), and questions with linear numerical scale

(5 questions). Questionnaires of other studies were used in designing the questions of this section. Otherwise, a group of specialists were asked to present their comments on objectives such as what the patients' reasons for implant treatment are, the level of their consent of this treatment, and factors which play a significant role on this satisfaction. Upon specialists' opinions, the sentences of attitude section of the questionnaire were written, and at last these questions were again reviewed by specialist to approve its validity. It is noteworthy to state that in making the attitude questions all principles of writing attitude questionnaires were observed; for example, the time of questions was present and there was not any induction in questions.

*The mode of rating and scoring of knowledge questions:* in the knowledge evaluating section, each question scored 1 if the patient's response was right. Thus, the range of the total score of this section was between 0 and 12. At the end, the mean score of knowledge for each patient was calculated, and then the classification of these results was done in a way that mean scores from 0 to 4 were classified as poor, from 4.1 to 8 as moderate, and the means amongst 8.1 to 12 were categorized as high.

Guttman coefficient was calculated as 0.7, which showed the validity of our questionnaire.

The third section of questionnaire was related to attitude evaluating questions. Similar to the previous part, in designing the questions of this section, computerized analyses and the specialists' comments on their perception of questions were used to validate the questions.

The reliability of questions was then examined by three specialists in periodontics. Finally, the questions of the attitude section were prepared in two sections: group with Likert scale (7 questions), and batch on a linear numerical scale (5 questions).

*The mode of rating and scoring of the attitude questions:* In questions with Likert scale, the attitude was determined as

positive, negative, and neutral. Since the number of questions in this section was 7, and each question had 5 choices, the mean score range of negative attitude was 7 to 16.3, neutral attitude between 16.4 and 25.6, and positive attitude was ranged of 25.7 to 35.

In the questions with linear numerical scale, due to the fact that the number of questions was 5 and each question had 5 choices, the level of significance was categorized as low if the range of mean score was between 5-11.6, intermediate if between 11.6 and 18.32 (the patient had not a specific idea on this topic), and high if the mean was in the range of 18.33-25. To calculate the reliability of questions in the attitude section, computation of Cronbach's alpha coefficient in 10% of the sample volume was used, which achieved to 0.7. Then data were analyzed using t-test (to compare means of knowledge and attitude in relation to gender, living in city or village, placement of implant in dental school or clinic), Spearman's correlation coefficient (to compare means of knowledge and attitude due to economic status and evaluating the relationship between mean of knowledge and mean of attitude), and one-way analysis of variance (ANOVA) (to compare means of knowledge and attitude in different age groups and educational level) with application of SPSS software (version 17, SPSS Inc., Chicago, IL, USA).

## Results

The present research was conducted on

248 patients (94 men, 154 women). The mean age of participants was  $47.7 \pm 14.0$  among the men and  $39.38 \pm 12.24$  among the women. The mean score of knowledge was calculated as  $5.3 \pm 2.1$ , on the total scale. Table 1 shows the frequency distribution of responses in the knowledge evaluating section.

In response to the question of implant site in the mouth, 64.1% said that it is intra-osseous and 24.6% thought that it would be intra gingival. In regard to the hygienic implant care 65.5% believed that implants require more care than natural teeth, 36.3% said that equal care is needed for implant and natural teeth, and 0.8% believed that natural teeth required more care. Of the individuals participating in this description study 5.7% believed in success rate of less than 50% for implant therapy, 22.7% agreed with a success rate between 50.0%-75.0%, 40.1% said it is between 75%-90%, and 31.6% stated a success rate of more than 90% for implant treatment. The mean score of attitude in questions with Likert scale was  $25.84 \pm 3.38$  (positive attitude), and mean score with linear numerical scale was calculated to be  $21.44 \pm 5.38$ .

Tables 2 and 3 show the frequency distribution in Likert scale and the linear numerical scale, respectively. Amongst all tooth replacement strategies suggested to patients in the questionnaire, 77.2% chose implant therapy. 73.2% believed that the benefits of implant therapy are more acceptable than its side effects such as pain and swelling.

**Table 1.** Frequency distribution of responses of implant seekers to knowledge questions

Knowledge components	Correct [n (%)]	Incorrect [n (%)]	Average weighted score
Implant application for each physical body status	90 (36.3)	158 (63.7)	0.36
Knowledge of the proper age for implant insertion	70 (28.2)	178 (71.8)	0.28
Implant placement immediately after tooth extraction	75 (30.2)	173 (69.8)	0.30
The site of implant insertion in the mouth	159 (64.1)	89 (35.9)	0.64
Hygiene care of implant	90 (36.3)	158 (63.7)	0.36
The possibility of damage of natural tooth adjacent to implant	70 (28.2)	178 (71.8)	0.28
The terms of implant use	219 (88.3)	29 (11.7)	0.88
Implant material	113 (45.6)	135 (54.4)	0.45
Parts of the tooth which is replaced by implant	60 (24.2)	188 (75.8)	0.24
Implant usage in a diabetic patient	167 (67.3)	81 (32.7)	0.67
Success rate for dental implants	78 (31.5)	170 (68.5)	0.31
Checkup cycles needed after implant insertion	120 (48.4)	128 (51.6)	0.48

**Table 2.** Frequency distribution of responses of implant seekers to attitude questions (with Likert scale)

Attitude components	Totally agree [n (%)]	Agree [n (%)]	No idea [n (%)]	Disagree [n (%)]	Totally disagree [n (%)]
Implant fulfill my expectations	70 (28.2)	134 (54.0)	42 (16.9)	2 (0.8)	0 (0)
Anterior tooth replacement must be done with implant	108 (43.7)	96 (38.9)	37 (15.0)	6 (2.4)	0 (0)
Posterior tooth replacement must be done with implant	53 (21.5)	25 (50.6)	57 (23.1)	11 (4.5)	1 (0.4)
Tendency to treatment compared with other methods	81 (32.9)	109 (44.3)	38 (15.4)	16 (6.5)	2 (0.8)
Implant treatment side effects is acceptable	55 (22.4)	125 (50.8)	52 (21.1)	13 (5.3)	1 (0.4)
Implant treatment cost is affordable	12 (4.8)	64 (25.8)	62 (25.0)	82 (33.1)	28 (11.3)
Implant treatment success rate is identical in the elderly and young	11 (4.5)	47 (19.0)	113 (45.7)	70 (28.3)	6 (2.4)

The cost effectiveness of implant was reported as acceptable for 30.6% of cases, and 44.4% believed this therapy is not affordable. From individuals, 82.2% stated that implant therapy is successful and has met their expectations.

The mean number of knowledge and attitude was compared on the basis of the individual's sex with t-test analyses. The mean number of knowledge was  $5.26 \pm 2.02$  for men and  $5.33 \pm 2.15$  for women ( $P = 0.84$ ). Furthermore, the average score of attitude with numerical linear scale was  $21.50 \pm 5.51$  in men and  $21.60 \pm 5.31$  in women ( $P = 0.53$ ).

Tables 4 and 5 show mean scores of knowledge and attitude between different educational levels and P values obtained by two by two comparisons of different educational levels in evaluating subjects' knowledge, respectively.

It was showed that there was a poor relationship between knowledge and economic status ( $P = 0.026$ ,  $r = 0.046$ ), and knowledge with attitude in Likert scale ( $P = 0.001$ ,  $r = 0.243$ ). In contrast, the relationship between economic status and attitude in numeric-linear scale was not

significant ( $P = 0.481$ ,  $r = 0.046$ ). It was also showed that there were significant differences between amounts of knowledge and attitude ( $P = 0.010$ ,  $r = 0.166$  and  $P = 0.018$ ,  $r = 0.151$ ; with Likert and linear numerical scales, respectively).

There was a significant difference between knowledge scores of patients presented to city implant clinics and dental school clinic ( $P = 0.007$ ), with more knowledge in participants of city clinics. On the other hand, there was no significant difference between attitude scores of patients in these two different places ( $P > 0.050$ ). The source of information about dental implants was reported as: 46.9% dentists, 30.6% friends and relatives, 3.7% magazines, 10.2% TV and radio, 4.1% web sites, and 4.5% named other sources.

## Discussion

The present study gives information on knowledge and attitude of patients demanding dental implants. In this study, the mean score of knowledge in total was  $5.3 \pm 2.1$ , which shows a moderate level of knowledge about dental implants in people of Isfahan City.

**Table 3.** Frequency distribution of responses of implant seekers to attitude questions with numerical linear scale

Attitude components	Incredibly important [n (%)]	Important [n (%)]	No idea [n (%)]	Not important [n (%)]	Super trivial [n (%)]
Aesthetic of implant	169 (69.0)	31 (12.7)	26 (10.6)	4 (1.6)	14 (5.7)
Mastication comfort ability with implant	172 (70.2)	40 (16.3)	25 (10.2)	5 (2.0)	3 (1.2)
Implant costs	131 (53.7)	49 (20.1)	41 (16.8)	12 (4.9)	10 (4.1)
Number of sessions needed for this treatment	85 (34.8)	59 (24.2)	65 (26.6)	18 (7.4)	17 (7.0)
Bone resorption prevention with implant	145 (59.2)	51 (20.8)	33 (13.5)	9 (3.7)	7 (2.9)

**Table 4.** Mean of amount of knowledge and attitude according to educational level

Educational level	Knowledge	Attitude (Likert scale)	Attitude (numerical linear scale)
Below diploma	4.96 ± 2.15	25.76 ± 3.72	20.69 ± 3.64
Diploma (mean ± SD)	5.22 ± 2.16	25.64 ± 3.46	22.04 ± 7.88
Bachelor (mean ± SD)	5.43 ± 1.90	25.97 ± 3.21	21.49 ± 3.26
MSc-PhD (mean ± SD)	7.08 ± 2.06	26.54 ± 2.69	20.41 ± 2.46
P	0.013	0.826	0.455

SD: Standard deviation

**Table 5.** Comparison of the amount of P-values "two by two" in evaluation of knowledge according to different educational level

	Below diploma	Diploma	Bachelor	MSc-PhD
Below diploma	-	0.460	0.170	< 0.001
Diploma	-	-	0.490	0.004
Bachelor	-	-	-	0.010
MSc-PhD	-	-	-	-

Likewise, in a study conducted in Tabriz, Iran, the rate of knowledge was reported as moderate.<sup>16</sup> On the other hand, this level was low in a similar study conducted by Ozcakir Tomruk et al. in the Turkish population.<sup>20</sup> In Satpathy et al. investigation in India, 15.91% had knowledge about the implant method which was significantly low.<sup>15</sup>

In the Zimmer et al. study, the percent of knowledge was 77.0%,<sup>13</sup> which was similar to the Pommer et al. study in Australia which was reported as 79.0%.<sup>21</sup> Furthermore, in the Berge study in Norway, 70.0% had knowledge about the intra oral site of implant, 64.1% of patients responded that implant is placed intra-osseous, and 24.6% said that it is intra-gingival. 65.5% of patients believed in more hygiene care for implants than natural teeth, 36.3% stated equal hygiene need, and 0.8% stated lower need to care for implants than natural teeth.<sup>22</sup>

In the present study, the mean number of attitude in questions with the Likert scale and the numeric-linear index was  $25.8 \pm 3.3$  and  $21.4 \pm 5.3$ , respectively; which shows that generally the patients' attitude about dental implants is positive. This result is in consistency with the Zimmer et al. results.<sup>13</sup> Furthermore, in the Grogono et al. investigation, 90%-97% of patients with knowledge of implants had positive attitudes toward it.<sup>11</sup> Similarly, in the Berge study, 60%

of patients had positive attitude toward implants;<sup>22</sup> interestingly enough, this attitude was mostly reported by patients who had already employed to this kind of treatment.

In our study, although there was not any significant difference in means of knowledge and attitude (with Likert scale) between different age groups, but there was significant difference when considering mean of attitude (with linear numerical scale) ( $P < 0.05$ ). Esthetic, ease of function, prevention of bone loss, cost, and follow up sections needed for implant placement for subjects in the range of 30-50 years old were more important than those under 30 years old.

In the Pragati and Mayank study, the most important factor which inhibited implant treatment was the cost of treatment.<sup>18</sup> Satpathy et al. also stated that 58% of patients believed that the high cost of implant is the major disadvantage.<sup>15</sup> In the Ozcakir Tomruk et al. investigation, 60.3% of patients reported high cost of implant as the major disadvantage, 34.7% the need to undertake surgery procedures, and 32.1% the long period of treatment.<sup>20</sup> In the present study, 44.4% of patients reported that this method of treatment was not affordable and it could be an inhibitory factor in implant application. Therefore, this problem should be taken into consideration in policy-makings, i.e. having part of such costs paid by insurance companies.

In the present study, there was a significant difference between mean scores of knowledge between patients of the dentistry department and ones referring to dental clinics in the city; the latter had more knowledge ( $P = 0.007$ ). This discrepancy can be explained by better economic status and higher educational level of patients referred

to city implant clinics than the ones referring to dental school clinics. Improvement of economic status leads to a trend to costly and modern dental treatments. The present study also demonstrated that people with higher educational levels have better information on dental implants. Increasing in the level of education can result in more referring to therapeutic centers, more communication with doctors, and also doing more scientific searches, and finally more trusting the clinicians. Additionally, patients with better economic status had more information. There was also a direct and poor relationship between economic status and attitude in the Likert scale ( $P < 0.001$ ,  $r = 0.243$ ).

In an assessment by Berge in Norway, media was introduced as the source of patients' information on dental implants.<sup>22</sup> In spite of the fact that in media (such as magazines, TV or radio) there is a significant focus on problems and failures of implant, the general attitude of people about dental implants was positive; this can be due to the fact that individuals mostly gather their information from multiple sources. In contrast, Rustemeyer and Bremerich documented that the main source of information about dental implants for German people was dentists and the lowest score belonged to web services.<sup>23</sup> In the present study, also it was found that dentists were the most important source of patients' information, followed by friends, and the very least important source was network information. This can be explained by the age range of the studied population in this study (47 for men and 39 for women). It is thought that usage of internet in this range of age in our country is limited; and therefore, most of

the patients' data is provided by clinicians and peer groups.

In the present investigation, there was a significant relationship between mean scores of knowledge and questions of attitude evaluation with both Likert and linear numerical scales. This shows that with increase in the level of knowledge about dental implants, the attitude would become more positive toward it.

Hence, by gathering the results of this study in general, it can be concluded that in our country, if dentists improve the evidence-based knowledge of their patients, there is hope that the community attitude toward this method of treatment would be more positive and realistic.

### Conclusion

The results of the present study showed that the knowledge of patients about dental implant was moderate, and there was a positive attitude toward this method. The level of knowledge regarding dental implanting was in direct relationship with educational degree and economic status, and was higher in patients referred to city clinics than the ones referred to the dental school clinics. In addition, the more the knowledge of patients, the better their attitude toward dental implants. The source of implant information was mostly from the patients' dentist.

### Conflict of Interests

Authors have no conflict of interest.

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