



Knowledge, Attitude and Practice of Patients Attending to Dental Clinics in Isfahan Regarding Dental Scaling

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Abstract

Background: At present, most patients have wrong perceptions and attitudes toward dental scaling; therefore, they hesitate receiving it. This study aimed to assess the knowledge, attitude and practice of patients attending to dental clinics in Isfahan with regard to dental scaling.

Methods: This descriptive, cross-sectional study was conducted in 200 patients referring to dental clinics in Isfahan in 2016. Sampling was sequential and randomized. A researcher-designed questionnaire was used to collect data, which covered demographic information, knowledge, attitude and practice of patients regarding scaling.

Results: The knowledge and practice scores had a significant correlation with education level. In addition, the knowledge and attitude scores had a significant correlation with age and positive history of scaling and root planning (SRP) ($P < 0.05$).

Conclusions: The results showed that most patients had moderate or good knowledge about scaling while the majority of them had a neutral attitude toward it and more than half had moderate practice in this respect. Thus, knowledge promotion should be performed in a way that attitude and practice are significantly influenced. This calls for strategic planning by the Ministry of Health and cooperation of the media and enforcement organizations affiliated to the Ministry of Health.

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Background

Periodontal diseases including gingivitis and periodontitis are common worldwide (1). Evidence shows that 5%-20% of adults are suffering from severe periodontitis in developing and developed countries. Moreover, gingivitis is common in the majority of adults. It is also common in children and adolescents (2).

In the early phases, periodontal disease starts with gingivitis, and then may lead to tooth mobility, pathological recession of the gingiva and tooth loss, leading to impaired speech, masticatory function and esthetics, physiological problems and decline in quality of life (3).

Bacterial plaque and calculus are among the main etiologic factors for inflammatory diseases of the periodontium (4,5). An experimental study (6) showed that delaying plaque removal for three weeks can lead to gingivitis and increased bleeding of probing. Calculus is a dental plaque that is mineralized. Soft plaque gradually becomes hard by deposition of mineral salts, which usually occurs between days one to 14 of plaque accumulation (7).

Calculus does not directly stimulate the gingiva but

Highlights

- ▶ The majority of patients in Isfahan had good or moderate knowledge about dental scaling.
- ▶ Neutral attitude and moderate practice had the highest frequency in studied population.
- ▶ The knowledge and practice had a significant correlation with education level.
- ▶ The knowledge and attitude had correlation with age and history of dental scaling.
- ▶ The correlation between the knowledge, attitude and practice scores was significant.

provides an environment for permanent accumulation of plaque. Thus, it plays a role in continuation and aggravation of periodontal disease. This occurs due to close contact of plaque with the gingiva in hard-to-clean areas (8). Thus, elimination of plaque and calculus is the key to periodontal treatments (8). In advanced periodontal disease, a more extensive debridement is needed that is called scaling and root planning (SRP). This mechanical debridement of plaque and calculus is the initial and gold standard treatment for periodontal disease (9).

The positive effects of timely SRP include maintaining

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the clinical attachment of periodontal fibers, decreased probing depth and decreased clinical inflammation due to decreased microbial load in the gingival sulcus or decreased pathogenicity of the microflora (10). However, patients do not often comply to SRP. If SRP is performed late, inflammation may be exacerbated and patients may experience the following during/after SRP:

1. Bleeding of the inflamed gingiva, which is due to inflammatory disease of the gingiva but some patients believe that it is because of the invasive nature of SRP (11).
2. Calculus leads to the chronic presence of dental plaque adjacent to periodontal tissues, which leads to apparent or hidden recession of periodontal tissues (12). Gingival recession leads to dental hypersensitivity, denuding of greater length of the tooth and spacing between teeth after SRP (11-13). However, some patients believe that tooth hypersensitivity is the result of scratching of the enamel during the procedure. Denuding of a greater length of tooth after SRP is often attributed to dentist's error or invasiveness of treatment, which is obviously not true.
3. Many patients believe that tooth mobility after SRP is the result of this treatment. In fact, firm lateral force is needed for effective removal of calculus during hand instrumentation. However, the force applied to root surface will not result in loss of support of tissues in teeth with less than 65% alveolar bone loss. (14).

A 7-year retrospective study on the popularity of SRP among different populations revealed that patients often have poor compliance to periodontal treatments such as SRP and periodontal surgery (15). At present, despite the high prevalence of periodontal diseases and the need for SRP in these patients, many of them do not comply to treatment due to fear and false concerns regarding the possible complications of SRP (16). This can lead to more serious complications and impose stupendous costs on patients in the course of treatment. Since at present there is not enough information about Iranian patients' knowledge, attitude and practice regarding SRP and also due to the lack of a well-designed investigation on this subject, this study aimed to assess the level of such information regarding SRP in patients in Isfahan to take necessary steps in this respect.

Methods

This descriptive, cross-sectional study was conducted to assess the knowledge, attitude and practice of patients referring to dental clinics of Isfahan with regard to dental scaling in 2016. Sample size was calculated at 200. Sampling was randomized and sequential. First, 2 health centers of Isfahan city were chosen and the list of affiliated clinics was obtained from them. Next, nine dental clinics were randomly selected in Isfahan. The inclusion criteria were volunteering to participate in the study and

understanding the questionnaire. Patients younger than 16 years and mentally retarded ones were not included in the study. A researcher-designed questionnaire was used to collect data, which included demographic information, knowledge, attitude and practice sections.

The knowledge section of the questionnaire included 12 questions that investigated the knowledge of patients about calculus, methods to eliminate it and SRP. The choices were "Yes", "No" and "I do not know". Each question was given a score of 0 for wrong or "I do not know" answer or 1 for correct answer. Minimum score was 0 and maximum score was 12 for this section. Scores 0 to 3 indicated poor knowledge, scores 4 to 6 indicated moderate knowledge, scores 7 to 9 indicated good knowledge and scores 10 to 12 indicated very good knowledge about dental scaling.

The attitude section included 19 questions to investigate the attitudes of patients toward the benefits/harms of this treatment. The questions were scored using a 5-point Likert scale. The choices consisted of "Completely agree", "Agree", "No idea", "Disagree" and "Completely disagree". Minimum attainable score on this section was 19 and maximum attainable score 95. Scores 19 to 34 indicated very negative attitude, 35 to 50 indicated negative attitude, 61 to 66 indicated neutral attitude, 67 to 82 indicated positive attitude and 83 to 95 indicated very positive attitude.

The last section of the questionnaire included 12 questions regarding the practice of individuals with regard to SRP. This section included questions regarding the inhibitory effect of experiences such as complications during or after SRP, i.e., bleeding, tooth hypersensitivity and tooth mobility, that are assumed to be due to the wrong practice of dentist or invasive nature of SRP. The questions were scored using a 5-point Likert scale. The choices were "Completely agree", "Agree", "No idea", "Disagree" and "Completely disagree". Minimum attainable score was 12 and maximum attainable score 60. Scores 12 to 21 indicated very poor practice, 22 to 31 indicated poor performance, 32 to 41 indicated moderate practice, 42 to 51 indicated good practice and 52 to 60 indicated very good practice. Only patients who had a positive history of SRP responded to these questions. The validity of the questionnaire was ensured by its content validity confirmed by a few experts on periodontology. Test-retest was used to assess the reliability of the questionnaire. The mean coefficient of agreement was 86.9% for the knowledge section and the Cronbach's alpha was calculated at 78.6% for the attitude section and 71% for the practice section.

The data were analyzed using SPSS version 22. The frequency distribution tables were drawn for the descriptive data, and data were analyzed using *t* test, ANOVA and Pearson correlation test. Significance level was considered $P < 0.05$.

Results

A total of 200 participants including 121 women and 79 men were studied. Demographic information of the participants was as follows: 39.5% of the participants were male. The mean age of patients was 32.85 ± 7.9 years; 55% of the participants had high-school diploma or lower education level while 45% had academic degrees (35.5% had academic education or bachelor's degree and 9.5% had master's degree and higher education level). Out of the patients, 13% reported that they visited a dentist every 6 months, 15.5% reported that they visited a dentist annually and 71.5% reported that they visited a dentist when they had a problem; 51% stated that they had their own dentist and 51.5% had no history of SRP (Table 1).

Frequency Distribution of Knowledge, Attitude and Practice Scores

The frequency distribution of knowledge score about SRP revealed that the majority of patients had good (39.7%) and moderate (37.7%) knowledge about SRP. Regarding attitude and practice, the results showed that neutral attitude (69.5%) and moderate practice (57.7%) had the highest frequency (Table 2).

Table 3 shows the frequency distribution of participants' responses to some of the knowledge questions while Tables 4 and 5 show the frequency distribution of participants' responses to some of the attitude questions.

The results of ANOVA and *t* test regarding the mean scores of knowledge, attitude and practice and their comparisons among different groups, are demonstrated in Tables 6-9.

Correlation Between the Variables

Knowledge and practice scores had a significant

correlation with education level ($P=0.025$, $P=0.009$, respectively). In terms of attitude, patients who reported regular dental visits (every 6 months or one year) had a better attitude than those reporting occasional dental visits ($P<0.001$).

In addition, the knowledge and attitude scores had a significant correlation with history of SRP ($P<0.001$). The knowledge and attitude scores also had a significant correlation with age ($P=0.01$ and $P=0.002$, respectively). The correlation between the knowledge and attitude scores as well as between attitude and practice scores was also significant ($P<0.001$, Table 10).

Discussion

This study aimed to assess the level of knowledge, attitude and practice of patients referring to dental clinics in Isfahan with regard to SRP. In other words, we aimed to find out what people think about the periodontal health and disease conditions because knowledge on this subject is essential to design preventive programs.

In terms of knowledge, the majority of participants attained moderate, or good scores. Young in a study conducted in Hong Kong reported that the majority of

Table 1. Demographic characteristics of Patients

Variable	No. (%)
Gender	
Male	79 (39.5%)
Female	121 (60.5%)
Level of education	
High-school diploma and lower	110 (55%)
College education, Bachelor's degree	71 (35.5%)
Master's degree or higher	19 (9.5%)
Frequency of dental visits	
Every 6 months	26 (13%)
Annually	31(15.5%)
When having a problem	143 (71.5%)
Do you have your own dentist?	
Yes	102 (51%)
No	98 (49%)
Have you ever done scaling?	
Yes	97 (48.5%)
No	103 (51.5%)

Table 2. Frequency of Knowledge, Attitude and Practice Scores

Variable	Scale	No. (%)
Knowledge	Poor	17 (8.5%)
	Moderate	75 (37.5%)
	Good	80 (40%)
	Very good	28 (14%)
Attitude	Very negative	0 (0%)
	Negative	23 (11.5%)
	Neutral	139 (69.5%)
	Positive	36 (18%)
	Very positive	2 (1%)
Practice	Very poor	0 (0%)
	Poor	4 (2%)
	Moderate	116 (58%)
	Good	68 (34%)
	Very good	12 (6%)

Table 3. Frequency Distribution of Responses to Some of Knowledge Questions

Question	Yes	No	I do not know
Does scaling increase the risk of calculus formation?	75 (37.5%)	49 (24.5%)	76 (38%)
Does frequent scaling in healthy, calculus-free gingiva lead to gingival recession?	121 (60.5%)	16 (8%)	63 (31.5%)
Can calculus be removed by anti-calculus toothpaste and toothbrushing?	40 (20%)	114 (57%)	46 (23%)
Does dental calculus contain bacteria?	112 (56%)	25 (12.5%)	63 (31.5%)
Does scaling increase tooth sensitivity?	120 (60%)	30 (15%)	50 (25%)

Table 4. Frequency Distribution of Responses to Some of Attitude Questions

Question	Completely Agree	Agree	No Idea	Disagree	Completely Disagree
Bleeding during scaling is due to dentist's fault.	12 (6%)	24 (12%)	90 (45%)	62 (31%)	12 (6%)
Tooth hypersensitivity after scaling is due to dentist's fault.	5 (2.5%)	21 (10.5%)	88 (44%)	69 (34.5%)	17 (8.5%)
Shrinkage of tooth after scaling is due to dentist's fault.	11 (5.5%)	43 (21.5%)	81 (40.5%)	51 (25.5%)	14 (7%)
Tooth mobility after scaling is due to dentist's fault.	9 (4.5%)	28 (14%)	83 (41.5%)	62 (31%)	18 (9%)
Bleeding during scaling is due to gingival inflammation as the result of presence of calculus.	14 (7%)	71 (35.5%)	89 (44.5%)	24 (12%)	2 (1%)
Tooth hypersensitivity after scaling is due to exposure of root surface to oral environment.	7 (3.5%)	58 (29%)	109 (54.5%)	24 (12%)	2 (1%)
The teeth do not shrink during scaling; their actual size is revealed.	15 (7.5%)	80 (40%)	67 (33.5%)	32 (16%)	6 (3%)
The teeth do not become mobile after scaling. Their original mobility, which had been limited by calculus is restored.	14 (7%)	83 (41.5%)	82 (41%)	19 (9.5%)	2 (1%)

Table 5. Attitude of Participants Without History of Scaling

	Completely Agree	Agree	No Idea	Disagree	Completely Disagree
My teeth are white so I do not need scaling.	39 (19.5%)	78 (39%)	45 (22.5%)	36 (18%)	2 (1%)
I do not seek scaling due to high cost.	20 (10 %)	67 (33%)	41 (20.5%)	52 (26%)	20 (10%)
I am not comfortable during scaling.	14 (7%)	33 (16.5%)	126 (63 %)	16 (8%)	11 (5.5%)
Scaling damages the teeth or gingiva.	19 (9.5%)	62 (31%)	84 (42%)	29 (14.5%)	6 (3%)
I do not have adequate time for scaling.	15 (7.5%)	43 (21.5%)	39 (19.5%)	76 (38%)	27 (13.5%)
I do not know the goal behind scaling.	14 (7%)	50 (25 %)	41 (20.5%)	66 (33%)	29 (14.5%)

participants did not have adequate knowledge about dental scaling (11). This inconsistency in the results of the two studies may be attributed to differences in fundamental policies of oral hygiene instructions in China and Iran.

In our study, 93.5% of the participants were aware of the effectiveness of oral hygiene and toothbrushing for prevention of calculus formation and 80% were aware of the fact that calculus adheres to the tooth and not to the gingiva, but only 38% were aware of the fact that scaling does not remove dental enamel. In a study by Sharath et al in India, 51.5% of the participants were aware of the fact that scaling does not remove dental enamel (5). Inconsistency in the results of the two studies in this

respect may be due to different study populations because Sharath et al evaluated the knowledge of health workers in India, and health care education and occupations could have increased the participants' level of knowledge (5).

In terms of attitude toward scaling, the majority of the participants had a neutral attitude. Gholami et al reported that Iranian adults mainly have a negative attitude toward scaling and think that dental scaling is harmful for the gingiva (16). Their results, in agreement with ours, revealed low frequency of positive attitude toward scaling.

The attitude of patients with no history of scaling in our study was more negative than that of participants in the study of Young (11). This difference in attitude may, at least partly, be due to difference in sample size. Moreover,

Table 6. The Mean Values of Knowledge, Attitude and Practice Based on Participants' Education Level (ANOVA)

	Education Level	Mean ± SD	P
Knowledge score	≤Diploma	6.42 ± 2.24	0.025*
	Associate's or bachelor's degree	7.20 ± 2.55	
	≥Master's degree	7.68 ± 2.08	
Attitude score	≤Diploma	59.26 ± 9	0.57
	Associate's or bachelor's degree	59.53 ± 7.5	
	≥Master's degree	61.47 ± 8.74	
Practice score	≤ Diploma	39.5 ± 5.41	0.009*
	Associate's or bachelor's degree	42.17 ± 5.62	
	≥Master's degree	44.63 ± 6.87	

*Significant at $\alpha = 0.05$.

Table 7. The Mean Values of Knowledge, Attitude and Practice in Different Groups by Frequency of Dental Visits (ANOVA)

	Frequency of Dental Visits	Mean ± SD	P
Knowledge score	Every 6 months	6.73 ± 2.06	0.83
	Every 1 year	6.61 ± 1.85	
	Occasionally	6.88 ± 2.53	
Attitude score	Every 6 months	64.5 ± 7.02	<0.001*
	Every 1 year	61.87 ± 8.24	
	Occasionally	58.17 ± 8.34	
Practice score	Every 6 months	42.77 ± 5.72	0.16
	Every 1 year	41.87 ± 6.23	
	Occasionally	40.04 ± 5.74	

*Significant at $\alpha = 0.05$.

Table 8. The Mean Values of Knowledge, Attitude and Practice in Different Studied Groups Based on Referring to a Unique Dentist (*t* test)

	Referring to a Unique Dentist	Mean ± SD	P
Knowledge score	Yes	7.1 ± 2.32	0.22
	No	6.60 ± 2.41	
Attitude score	Yes	60.09 ± 8.21	0.36
	No	59.02 ± 8.71	
Practice score	Yes	41.36 ± 6.42	0.36
	No	40.26 ± 5.16	

Table 9. The Mean Values of Knowledge, Attitude and Practice in Different Studied Groups Based on History of Scaling (*t* test)

	History of Scaling	Mean ± SD	P
Knowledge score	Yes	7.5 ± 2.12	<0.001*
	No	6.16 ± 2.42	
Attitude score	Yes	62.67 ± 8.27	<0.001*
	No	56.65 ± 7.58	
Practice score	Yes	40.85 ± 5.87	-
	No	-	

*Significant at $\alpha = 0.05$.

although subjects in our study had a higher level of knowledge about scaling than the Chinese population, their attitude was not superior to theirs, which can be due to inadequate implementation of oral health programs and scaling in Iran. In other words, educational programs designed and implemented so far have been more effective on the level of knowledge rather than attitude.

Besides, 18% of the participants believed that bleeding during scaling, 13% believed that postoperative tooth hypersensitivity, 27% believed that shrinkage of tooth after scaling and 18.5% believed that tooth mobility after scaling were due to dental clinician's error. In the study of Young, 45.9% believed that bleeding, 33.7% believed that tooth hypersensitivity and 40.5% believed that tooth shrinkage was due to the dentist's fault during the procedure (11). This difference in attitudes may be due to the different sizes of the two study populations. It seems that since Iranians mostly trust their physicians and

dentists, delayed complications after treatment are less commonly attributed to the dentist's fault.

In terms of practice, most of the participants had moderate or good scores regarding scaling. The mean scores of knowledge, attitude and practice were not significantly different between men and women but more women had a history of scaling, which is in agreement with the findings of Young (11).

The knowledge and practice scores of participants had a significant correlation with education level such that by an increase in education level, the mean score of knowledge and practice increased. Ajami et al in one study in Mashhad observed that the score of knowledge about oral and dental health had a significant association with education level (1).

The scores of knowledge and attitude were slightly higher in older individuals compared to younger ones. Participants aged 35-44 years had the highest frequency of history of scaling. In the study of Young, the participants aged 51-60 years had the highest frequency of history of scaling (11). It should be noted that our participants were mainly young individuals below the age of 50 years.

In our study, the participants visiting a dentist every 6 months or annually had a higher attitude score than others; 71.5% reported visiting a dentist only when they have a problem and did not have regular visits. Soolari and Rokn in a study in Tehran reported that patients do not comply with regular follow-ups for periodontal treatments such as SRP (15).

Of those visiting a dentist every 6 months, only a small percentage (3.8%) stated that they do not perform scaling due to high cost while of those visiting a dentist only in case of a problem, 43.4% stated that they do not perform scaling due to high cost. In fact, the treatment cost is an important factor affecting regular dental visits.

In general, the knowledge score in our study was correlated with the attitude score. It means that by an increase in knowledge score, the attitude score also improved. However, the knowledge score had no significant association with practice. The attitude and practice scores, however, were significantly correlated such that by an increase in attitude score, the practice

Table 10. Correlation Between Variables and P Values (Pearson Correlation Coefficient)

	Knowledge score (P)	Attitude score (P)	Practice score (P)
Education level	0.177 (0.025*)	0.063 (0.57)	0.307 (0.009*)
Frequency of dental visits	0.033 (0.83)	-0.274 (<0.001*)	-0.192 (0.16)
History of scaling	-0.283 (<0.001*)	-0.365 (<0.001*)	-**
Age	0.18 (0.01*)	0.21 (0.002*)	-0.11 (0.25)
Knowledge score	1	0.295 (<0.001*)	0.192 (0.06)
Attitude score	0.295 (<0.001*)	1	0.482 (<0.001*)

*Significant at $\alpha = 0.05$

**Correlation could not be assessed because only those with a history of scaling filled out the practice section of the questionnaire. Thus, only one group was studied and the correlation could not be calculated.

score also increased. In general, when subjects know the main cause of gingival inflammatory diseases and the adverse effects of poor oral hygiene and not removing the plaque and calculus when required, their attitude and consequently their practice will improve.

Participants in our study believed that dentists and the individuals themselves had the most important role in promoting knowledge about dental scaling.

One limitation of this study is that some subjects had weak compliance to answering the questions especially those with low level of literacy. In addition, due to high numbers of dental clinics in Isfahan, only nine of them were included in this study.

The available solutions to enhance the knowledge, attitude and practice of patients include:

1. Publishing educational booklets regarding the important role of oral hygiene in preventing periodontal diseases, and introduction of SRP as an efficient preventive strategy in this regard, and then distributing them among the general population (11);
2. Patients should be briefed about the causes of periodontal disease, the objectives of SRP, the reason for bleeding and tooth hypersensitivity after SRP and the goal of this treatment modality prior to performing SRP (11).

Conclusions

According to the results of this study, Thus, knowledge promotion should be performed in a way that the attitude and practice are significantly influenced. The role of dentists in enhancing the knowledge about oral and dental health and preventive measures such as scaling has been well acknowledged. Dentists should inform patients about the objectives of scaling and potential, temporary complications of SRP prior to the procedure. The Ministry of Health in cooperation with the media should come up with large-scale programs to enhance the public knowledge in this respect. Aside from poor knowledge, stupendous costs of treatment are another reason for patients hesitating to seek dental treatments and scaling. If dental costs are covered by health insurance, a higher percentage of patients will seek dental treatments and their practice will improve.

Authors' Contribution

All authors contributed to creating, processing and writing of manuscript.

Ethical Statement

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences. All the participants were awarded about the goal of the study before contributing in. Consent form was filed by all the subjects and personal information of participants' was kept classified.

Conflict of Interest Disclosures

The authors declare that they have no conflict of interests.

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