

EVALUATION OF KNOWLEDGE AND AWARENESS OF DENTISTS TOWARDS CEMENT -VERSUS SCREW-RETAINED IMPLANT-SUPPORTED PROSTHESIS IN SANA'A CITY, YEMEN

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ABSTRACT

Implant prostheses can be cement, screw-retained, or both. Implant retention system is typically chosen during treatment planning. The current study assessed the knowledge and awareness of dentists in Sana'a regarding factors affecting decision making between cement versus screw retained implant-supported prosthesis. A questionnaire was distributed to dentists (n = 903) in Sana'a city which showed that 64.4 % of participants they did not provide an implant and 59.7% of them because they were not specialists. 61.2 % of dentists provide a prosthesis for dental implants. There was a statistically significant difference between the dental specialist and GDP about their knowledge level $P= 0.03$. Dentists being specialists, providing implant treatment and prosthesis for dental implant likely have better knowledge level than others and the differences were found to be statistically significant OR = 3.50; $P=0.037$, 2.11; $P=0.02$, 1.83; $P=0.03$ respectively. The dentists who had ≥ 5 years of experience likely have better knowledge than the dentists with less than 5 years of expertise but considered non-significant (OR = 1.66, $P= 0.063$). There is a need to assess the theoretical and practical knowledge of dentists who practice implant in Yemen regularly and to increase their knowledge level regarding the implant-supported prosthesis.

KEYWORDS: Prosthesis, Cemented Restorations, Screw Restorations, Dental Implants & Knowledge

1. INTRODUCTION

There are many possible treatment options for partially edentulous patients, from those options; implant-supported prosthesis which has been documented that their success rate is comparable with tooth-supported fixed partial dentures or removable partial dentures¹⁻³.

Implant dentistry has revolutionized the modern dental practice due to increased numbers of dental practitioners are involved in the provision of implant restorations⁴. At the same time, there has been going on and spread in the number of courses submitted and targeted at dental practitioners, extending from one-day courses to degree level qualifications⁴. In addition, increasable availability of training opportunities and international educational events hosted by some dental implant manufacturers or implant-related societies have engaged many dental professionals from all over the world to practice implant dentistry⁵.

During the development period, implants had placed high setback rates, therefore, simplicity and recurrent removal of the prostheses was of substantial importance. Then the implant survival rates moved quickly from the 50% to the 90% range when both techniques and knowledge increased and advanced⁶.

It has been documented that the errors can be occur at any single step in the laboratory and clinical stages while producing implant restorations. During each stage the small errors can be accumulated, which will lead to misfit of the implant prosthesis⁷.

With sufficient treatment planning and the use of surgical guides, the location of implants must be in the best position to allow the prosthodontist or dentists to choose the suitable restorations, either cement-or screw retained prosthesis^{6, 8}.

The debate regarding the best type of implant restoration, the complications repeatedly encountered and treatment solutions that were offered are still argumentative among dental clinicians⁸. Therefore, the comprehensive knowledge about this subject should not be neglected without attention⁷.

An overview of various characteristics of cement- versus screw-retained implant-supported prostheses and how they may be affected by several factors have been reported in many published works⁸.

The choice between cement-retained restoration (CRR) and screw-retained restoration (SRR) is a critical decision and influenced by factors⁹ which probably affect the duration and clinical success of implants and implant prostheses. Examples of those factors are patient habits (smoking), financial implications, ease of maintenance, implant site, type of superstructure, oral hygiene maintenance, ease of fabrication, precision, retention provided by cement and abutment^{2, 10}, disrupt the normal occlusal contacts^{2, 6, 10}, accessibility^{2, 7}, complexity of components^{2, 6, 11, 12}, occlusal loads^{6, 9}, simplicity of the technique, security at the implant-abutment prosthetic interface¹³, and esthetic¹⁰⁻¹⁴.

In the mechano-chemically retained system, the porcelain of the crown is fired on the metal coping substructure (chemically bonded) and then the latter is screwed or snap fit directly onto the implant¹. So, the screws may be used to connect the abutments to the implants and the prostheses to the abutments⁶.

Moreover, the availability of the implant systems at present day show a different prosthetic solution for cemented and screw-retained single-tooth prostheses, but very little scientific information is affordable, comparing the pros and cons of both types of prostheses in similar conditions. Additionally, there is a lack scientific evidence that one type of restoration is better than the other⁷. Therefore, realizing the features and concepts that control the choice between screw- and cement-retained prosthesis will help the dental clinicians in Sana'a city to select the typical restorations for each clinical condition while promoting definitive aesthetic results. Furthermore, it is necessary to increase dental professionals' scope of knowledge to provide excellent care to patients by achieving better implant placement and simplifies the restoration of the implant prosthesis while promoting pleased outcomes.

The main aim of this study is to evaluate the knowledge and awareness of dentists in Sana'a city regarding factors affecting decision making between cement versus screw-retained implant-supported prosthesis.

2. MATERIALS AND METHODS

2.1. Study Design

This study was a descriptive cross-sectional study. Dentists in Sana'a city were surveyed to assess their knowledge and awareness towards cement versus screw-retained implant-supported prosthesis by filling a self-administrated questionnaire.

2.2. Inclusion Criteria

Dentists in Sana'a city who are graduated from local and international universities were included in the current study.

2.3. Exclusion Criteria

Non-qualified dental practitioners were excluded in the present study.

2.4. Sample Size Determination

The present study sample size was 229 which was calculated using OpenEpi® software after knowing the number of manpower in the dentistry field and the private dental clinics' number in 2014 at Sana'a city through statistics made by the ministry of public health, population of Yemen, considering $P=0.05$, power 80%, and anticipated proportion = 50%.

2.5. Sampling Method

Simple random sampling technique was used utilizing software and a computer.

2.6. Data Collection

A structured questionnaire written in both English and Arabic languages were used as an instrument for data collection and the participants were assured that all replies will be anonymous and the information provided will be kept confidential.

2.7. Questionnaire

A self-administered questionnaire involved three sections. Section one six questions, section two three questions, while section three ten questions. The total items were nineteen questions.

The first part of the definitive questionnaire requested background information. The second section included three questions about whether the dentists in Sana'a city provide implant treatment for their patients or not and what are the reasons behind avoidance providing such treatment by dentists and finally asking them if they perform fixed prosthesis for the dental implant or not. The last section of the questionnaire was ten multiple-choice questions enquired about implant restorations' (CRR or SRR) advantages and disadvantages.

2.8. Statistical Analysis

Data obtained from completed questionnaires were manipulated using Statistical Package for Social Sciences (SPSS) windows version 21, and then descriptive statistics and analysis of the collected data were performed considering the level of statistical significance $\alpha < 0.05$ at confidence interval level 95%.

3. RESULTS

The overall response rate was 88.5 % with the total number who filled the questionnaires was 800. The demographic characteristics and sample distribution of the respondents are shown in Table 1, which indicated that there was a nearly comparable percentage of males to females (50.4 %, 49.6 % respectively).

The majority of the respondents (61.2 %) were working part-time and most of them (81.1%) were graduated from local university. The years of experience for the most of participants, (48.0%) were less than 5 years. As well, most of the dentist's qualifications were the bachelor (84,9 %). (38.9%) of specialists in the present study were surgeons, while others were either prosthodontists or were from different specialties (19.4, 4 1.7 % respectively) Table 1.

Table 1: Descriptive Statistics for the Study Samples Characteristics

Independent Variable		N	%
Gender	Male	403	50.4%
	Female	397	49.6%
Working time	Full time	303	38.8%
	Part time	477	61.2%
University of graduation	Local	606	81.1%
	Regional /international	141	18.9%
Years of experience	Less than 5 years	377	48.0%
	5-10 years	206	26.2%
	More than 10 years	202	25.7%
Qualification	Bachelor	669	84.9%
	Master	89	11.3%
	Doctorate	30	3.8%
Specialty	Prosthodontist	21	19.4%
	Surgeon	42	38.9%
	Others	45	41.7%

More than half of participants (64.4 %) stated that they did not provide implant treatment for their patients (59.7%) of them because they are not specialists. On the other hand, (61.2 %) of dentists reported that they provide a fixed prosthesis for dental implants (Table 2).

Table 2: Distribution of the Study Participants According to their Response Regarding Implantation Practice

Item	Questionnaires	Response	N	%
1	Provide dental implant treatment	Yes	283	35.60%
		No	513	64.40%
2	Reason for not providing dental implant treatment	Not specialist	292	59.70%
		Haven't taken courses	106	21.70%
		Other	91	18.60%
3	Provide fixed prosthesis for dental implant	Yes	462	61.20%
		No	293	38.80%

The study participants just showed incorrect responses regarding questions number 5, 9, and 10 with the percentages of these responses were (46.9, 32.5, 35.8 % respectively) (Table 3).

Table 3: Responses of the Study Participants Towards the Study Questionnaire

Item	Questionnaires	Response	N	%
1	Best esthetic appearance	Cement retained prosthesis	356	44.7%
		Screw retained prosthesis	179	22.5%
		Both are same	140	17.6%
		Don't know	121	15.2%
2	Lowest cost	Cement retained prosthesis	465	58.4%
		Screw retained prosthesis	137	17.2%
		Both are same	36	4.5%
		Don't know	158	19.8%
3	Easier fabrication prosthesis	Cement retained prosthesis	462	58.0%
		Screw retained prosthesis	129	16.2%
		Both are same	55	6.9%
		Don't know	150	18.8%
4	Requires higher experience	Cement retained prosthesis	111	13.9%
		Screw retained prosthesis	474	59.5%
		Both are same	102	12.8%
		Don't know	109	13.7%
5	Easier removed prosthesis	Cement retained prosthesis	373	46.9%
		Screw retained prosthesis	275	34.5%
		Both are same	47	5.9%
		Don't know	101	12.7%
6	Providing best passivity	Cement retained prosthesis	281	35.3%
		Screw retained prosthesis	218	27.4%
		Both are same	97	12.2%
		Don't know	199	25.0%
7	Best fracture resistance prosthesis	Cement retained prosthesis	278	34.9%
		Screw retained prosthesis	246	30.9%
		Both are same	94	11.8%
		Don't know	178	22.4%
8	Achieving optimum occlusal contact	Cement retained prosthesis	256	32.2%
		Screw retained prosthesis	129	16.2%
		Both are same	253	31.8%
		Don't know	158	19.8%
9	Prosthesis with Limited interocclusal distance	Cement retained prosthesis	258	32.5%
		Screw retained prosthesis	203	25.5%
		Both are same	102	12.8%
		Don't know	232	29.2%
10	Best prosthesis with malposed implant	Cement retained prosthesis	254	32.0%
		Screw retained prosthesis	190	23.9%
		Both are same	66	8.3%
		Don't know	284	35.8%

About 8% of respondents in the current study had a low level of knowledge and most of the participants (65.8 %) had a moderate level of knowledge while the rest (26.6 %) had a high level of knowledge (Table 4).

Table 4: Level of Knowledge and Awareness of Dentists towards Cement-vs. Screw Retained Implant-Supported Prosthesis in Sana'a City

	Frequency	Percent
(Low)	60	7.6
(Moderate)	522	65.8
(High)	211	26.6
Total	793	100.0

Analysis of the present survey revealed that there was a statistically significant difference between dental specialists and general dental practitioners about their level of knowledge ($P= 0.03$) (Table 5).

Table 5: Association between the Level of Knowledge of Participants and their Qualifications

		Level of knowledge		P-value	
		Fair	Good Knowledge		
Qualification Relation	Bachelor	Frequency	495	169	.031
		%	74.5%	25.5%	
	Specialist	Frequency	76	41	
		%	65.0%	35.0%	
Total		Frequency	571	210	
		%	73.1%	26.9%	

The logistic regression analysis (Table 6) in the present study has shown that the dentists being specialists, providing implant treatment, and providing fixed prosthesis for dental implant likely have better knowledge and awareness level than others and the differences were found to be statistically significant (OR = 3.50; $P=0.037$, 2.11; $P=0.02$, 1.83; $P=0.03$ respectively).

Table 6: Association between the Dentists' Demographic Data and Their Level of Knowledge and Awareness Towards the Cement-vs. Screw Retained Implant-Supported Prosthesis in Sana'a City

Independent Variable		OR	P-value
Gender	Male (Ref.)	0.91	0.74
	Female		
Working time	Full time (Ref.)	0.75	0.33
	Part time		
Graduation university	Local University (Ref.)	0.86	0.68
	Regional / International University		
Years of experience	Less than 5 years (Ref.)	1.66	0.063
	More than or equal 5 years		
Qualification	Bachelor (Ref.)	3.5	0.037
	Master / Doctorate		
Specialty	Prosthodontist (Ref.)	0	0.99
	Others		
Provide implant treatment	Yes	2.11	0.02
	No (Ref.)		
Provide prosthesis for implant	Yes	1.83	0.03
	No (Ref.)		

Furthermore, the dentists who had more than or equal 5 years of clinical experience likely have superior knowledge and awareness than the dentists with less than 5 years of clinical expertise but it was not significant (OR = 1.66, $P= 0.063$).

3.1. Discussion

This is the first study of its kind provides published information regarding practicing dental implants and using screw versus cement-retained implant supported prosthesis in Yemen.

In the current study, the direct question regarding the confidence in providing dental implant treatment was avoided to eliminate the Dunning–Kruger effect that is considered as a cognitive bias wherein the unskilled people mistakenly assess their ability to be much higher than is accurate¹⁵.

Most of the participants (64.4%) in the current study avoided providing implant treatment during their dental clinical practice, among them, 59.7% reported that the reason for that they are not specialists (Table2). Which is in agreement with another published study in which the majority of participants believed the qualifications were necessary before advertising their implant skills⁴. Whereas this finding disagreed another study in which the majority of their respondents addressed that the implant treatment can be provided in general practice with appropriate training¹⁵.

Some of the participants (21.7%) in the present study reported the reason for not practicing implant treatment in their clinics is that they haven't taken courses in implantation yet. While Tejal et al reported there was a higher percentage (80%) of interns admitted their inability to perform implant procedure independently due to lack of professional training¹⁷.

Abbas et al. stated that the general practitioners' and specialists' awareness were much lower than the ideal in relation to dental implants because 67.7% of the subjects had not participated in any sort of implant courses and they found that the differences were statistically significant (p -value < 0.001) among dentists participated and those not participated in such courses¹⁸.

However, the adverse role of several short implant courses that seek to train dental clinicians in the placement of dental implants has been documented¹⁹, which does not instill confidence among them¹⁵.

The possible main factor preventing the dentists in present study from practicing implantation is that the dental implant procedures are neglected in the undergraduate curriculum of the dental students, which is in agreement with Angeles et al. who stated that 78.8% of the graduates believed that they had not received sufficient teaching/training in implant dentistry and 100% believed that their knowledge was insufficient¹⁶.

Surprisingly, seven out of ten answers in relation to ideal properties regarding cement and screw-retained restoration(CSRR) of the implant supported prosthesis have responded correctly by most of the dentists in our study.

The most of participants in the present survey considered CRR to be aesthetically better (44.7%), lower cost (58.4%), easier to fabricate (58%), provides the best passivity and best fracture resistance (35.3,34.9% respectively), and achieves optimum occlusal contact (32.2%) than SRR. In addition, they considered SRR requires higher level of experience than CRR (59.5%), which agreed with a survey published by Vohra and Habib regarding the following properties; esthetic, easier to fabricate, expertise required and passivity⁹, which is in a coincide too with a study done by Fahim Vohra et al. who mentioned that the respondents showed a clear preference of CRR regarding aesthetics (71.4%), passive fit (55.3%), ease of fabrication (57.3%) and fracture resistance (40%). Furthermore, their respondents considered SRR requires higher technical expertise (42.6%)²⁰, that appears to be in line with the established standards in implant dentistry⁹.

However, Vohra and Habib stating that most of SP (50.8%) considered both SRR and CRR to be equally cost-effective, while 59.7% of GDP considered SRR to be more economical.

Majority of Vohra's and Habib's respondents mentioned that the SRR is easier to be retrievable than CRR⁹, this is in agreement with another published survey in which most of the participants (72%) considered SRR is easier retrievability than CRR²⁰, which disagreed the respondents' opinion in current study where most of them (46.9%) have chosen CRR for easily retrievability which was inappropriate answer.

The present survey showed that 7.6% of dental practitioners in Sana'a city had a low knowledge level, 65.8% had moderate knowledge level and 26.6% had a high level of knowledge regarding this subject. Which indicates that the majority of dental professionals in Sana'a city have a basic knowledge of cement and screw-retained implant supported restorations, that probably they could attained their knowledge towards this type of treatment through their reading and by attendance of continuing dental education(CDE) or via workshops because the dentists knowledge is directly proportional to their history of participation in seminars and continuous education programs as was mentioned in a published survey that showed a significantly higher level of knowledge among those attended CDE compared to the others who didn't ($p=0.007$)²¹.

It would appear that in the future the implant treatments will mainly be performed in general dental clinics (87.4 %) rather than in specialized implantology clinics (7.3%) (according to the SEI White Paper)¹⁶.

So, comparing the knowledge and awareness level among general dental practitioners and dental specialists regarding cement versus screw-retained implant-supported prosthesis in Sana'a city was made in the current study. Our results exhibited that the percentage of dental specialists who had good knowledge was higher than the percentage of general dentists (35.0, 25.5% respectively).

Furthermore, the dental specialists likely have a superior level of knowledge regarding this subject than GDPs by 3.5 times and the difference was found to be statistically significant ($P=0.03$, $OR=3.5$), this is in the line with another published study in which the differences between general dental practitioners and dental specialists in terms of knowledge regarding to implant treatment planning were statistically significant²².

In this context, the education should be increased among GDPs regarding this aspect and they must be prepared to perform these basic duties as soon as they enter the professional practice by stimulation of their interest in self-learning. Hence, they may direct their interest in to correcting any deficiencies through a positive attitude to lifelong learning¹⁶.

Alireza et al. have reported that they found a significant difference in the level of knowledge between male and female dental practitioners, with a higher knowledge level in males compared to females ($P<0.05$)²¹, that is in agreement too, with a survey done by Raghavendra et al. who reported that males dental practitioners were better in knowledge about dental implants than females and the difference was statistically extremely significant ($P < 0.001$)²³.

However, the present study has shown that there was no statistically significant difference ($P = 0.74$) between males and females dental practitioners regarding their knowledge of this subject. This might because the females dental practitioners in Sana'a city were as active attendance of dental workshops and self-learning programs as males.

It is a possible that the dentist with more job experience has been able to acquire higher knowledge scores because of his/her active participation in continuous education programs²¹, that is in accordance with the current study in which the dental professionals with more than or equal 5 years of clinical experience likely have better knowledge by 1.6 times than dental professionals with less than 5 years of clinical experience in relation to implant prosthesis ($P = 0.06$, $OR=1.6$), which is in agreement with a survey done by Alireza et al. who revealed significant differences in the knowledge level of dental practitioners about dental implant treatment planning based on job experience²¹. Consequently, the knowledge level increased with an increase in job experience and this was noticed in the present study by that, the dental professionals who were provided implantation or fixed prosthesis for dental implant likely have better knowledge by 2 and 1.8 times respectively than the dental professionals who didn't and the differences were found to be statistically significant ($P= 0.02$,

On the other hand, others reported that the experience of the operator was not important for the success of the dental implants²³. Farther, another study reported that the dental practitioners' experiences some drawbacks in some aspects after graduating from the university despite their improvements in abilities and skills due to clinical experience²¹.

Thus, the theoretical and practical educational programs have an important role in promoting the dentist's knowledge and expertise to treat their patients.

4. CONCLUSIONS

Despite the lack of statistics in Yemen regarding this aspect, the evidence demonstrated that the dental implants demand is on the rise like to that in other countries¹⁶⁻¹⁸ and the majority of dental clinicians are familiar with this type of treatment and introduce it as a proper treatment modality^{16, 17}.

Therefore, promotion of knowledge and awareness of dental clinicians up to a level proportional to routine needs is one of the necessities of continuous education programs. In addition, it appears that there is a need to regular assessment of the theoretical and practical knowledge of dental professionals who practice implant dentistry in Yemen and to increase their knowledge and awareness level regarding the prosthetic part of implant treatment too. Furthermore, modification of dental curricula incorporating dental implantology for the undergraduate dental students will improve the future dentist's level of knowledge and practice.

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