

Knowledge and Perception about Dental Implants among Undergraduate Dental Students and Interns in UAE

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Abstract

Practicing implant dentistry procedures is progressively strolling from specialists to the general dental practitioner. The increasing demand for the dental implant treatment requires a higher level of knowledge from clinical years' dental students and interns. This study aimed to assess the knowledge and perception about implant dentistry among these students.

A descriptive cross-sectional study was conducted where participants from the College of Dentistry, Gulf Medical University and Ajman University were requested to complete a validated questionnaire. Data was collected from clinical years' students (4th, 5th years) and interns. A total of (n=219) responses were coded and statistical analysis was done by SPSS 20. Statistical significance was set as $p < 0.05$.

Most of the 4th and 5th year students showed an average level of knowledge about implant dentistry. While the majority of the interns showed a good level. There was no statistically significant difference in the knowledge between the students at both universities regarding implant dentistry.

Knowledge and perception about dental implants in dentistry among clinical years' dental students and interns vary at different academic levels, but not as expected. A lot of 5th year students and interns gave unsatisfactory answers despite their clinical experience compared to 4th year students.

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Introduction

Dental implant is an artificial replacement for a missing tooth¹. It can be used to replace a single tooth, multiple missing teeth or completely edentulous jaw^{1,2}. It has two main stages, which are surgical and prosthodontic. For centuries, partial dentures, complete dentures and fixed bridges were the go-to methods to replace a missing teeth. But these methods are used to replace the crown of the tooth only but not the root, which is now possible by using implants³. In the last decades, oral rehabilitation and replacement of missing teeth using dental

implants has been considered as a gold standard in clinical practice due to its advantages if compared with the other methods⁴.

In 1965, Brånemark was the first dentist to document and place dental implants in his patients' mouth and maintained 4 dental implants that lasted for 40 years⁵. From that time on, with technological advancements, specialized dentists, availability of facilities and more informed patients, dental implants have become a routine procedure to replace missing teeth. This therapy has been identified as an effective and predictable treatment option. Regardless of its predictability, the success of implant treatment could be negatively affected by some risk factors which might lead to implant loss or biological implant complications such as peri-implant mucositis and peri-implantitis^{2,4,6-8}.

The health of peri-implant tissue is very important aspect to judge implant success. In the

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last decades, many studies and trials were done to show the link between periodontal disease and implant success rate⁸. Due to the direct link between periodontal disease and implant success, a new periodontal classification guideline was introduced in 2018 that included a new and separate category regarding peri-implant diseases and conditions⁹. More patients are seeking information and asking about teeth replacements by implant as the awareness is increasing among the general public¹⁰⁻¹⁴.

Practicing implant dentistry procedures is progressively strolling from specialists to general dental practitioner in the practice setting¹⁵. The increasing demand for dental implants by patients to replace their missing teeth, requires a higher level of knowledge of clinical years' dental students and interns considering their daily interactions with patients. Appropriate knowledge of these students and interns will help them to communicate effectively with patients addressing all aspects of treatment and maintenance regarding dental implants, guide and advice patients to undergo implant treatment whenever appropriate^{16,17}. Hence, the aim of this study was to evaluate the knowledge and perception among clinical years' dental students and interns.

Materials and methods

This study was a descriptive cross-sectional study which was conducted at College of Dentistry, Gulf Medical University and College of Dentistry, Ajman University, Ajman, UAE. The study population included dental students (n=500) studying in clinical years (4th, 5th years) and dental interns of Gulf Medical University and Ajman University. Considering this was a population study and not a sample study all the students in these two universities who consented for the study were included. This study was approved by the IRB of Gulf Medical University. The anonymity and privacy of the participants was maintained, and the collected data was kept confidential.

The study was conducted over 12 months, from Oct 2020 to Sep 2021.

A questionnaire was developed and composed of three parts. The first part included the demographic data of the participants. The second part aimed to assess the knowledge and awareness of the participants regarding dental implants. The third part aimed to assess the

knowledge and awareness of the participants regarding the relationship and effect of periodontal health/disease on dental implant. The questionnaire was reviewed by a panel of experts in periodontology and implantology. This process verified the content validity of the questionnaire. The participants had to sign an informed consent form before participating in the study. This form was later separated from the completed survey to ensure confidentiality.

Data Analysis

Total of (n=219) responses were coded, entered in Microsoft Excel and statistical analysis was done by SPSS 20. Results were cross tabulated to examine the independency between variables. A p-value of less than 0.05 was considered significant in all statistical analysis.

Results

A total of 219 students participated in the research. The participants' ages ranged between 20 and 29 years. The majority of the participants, 161 out of 219 (73.5%), were females. Among the participants, 83 (37.9%) were fourth-year students, while 58 (26.5%) of the students were in the fifth year and 78 participants (35.6%) were interns.

A self-assessment of knowledge regarding implant dentistry was conducted. Most of the participants, 98 (44.7%), rated themselves as having a moderate/adequate knowledge, while 57(26%) of them rated themselves as good. Similarly, 57(26%) rated themselves poor and only 7(3.2%) rated themselves "excellent". Twelve questions were included in the knowledge domain; of the 12, 6(50%) of the questions were correctly answered by more than 50% of the participants. One of the questions was about dental implants' material; the majority of the participants, 179 (81.7%), gave the correct answer "Titanium", while 24 (11%) of them chose stainless steel; however, 9 (4.1%) reported ceramic and the rest 7 (3.2%) said porcelain. Regarding the longevity of dental implants, most of the participants, 109 (49.8%) reported that dental implants last for more than ten years; in comparison, 73 (33.3%) said that it might last for a lifetime. The question asked about the advantages of the dental implant in comparison to the conventional ways of tooth replacement. The majority of the respondents, 139 (63.5%) reported that dental implants have better

longevity, 51 (23.3%) of them said that the dental implants are more conservative, 24 (11%) reported that dental implants have an aesthetic advantage and better looks and 5 (2.3%) were not sure and unaware about the correct answer. Concerning the factor to achieve successful implant treatment, most of the respondents 100 (45.7%) reported that case selection and patient compliance are the major factors associated with the successful implant treatment, followed by 93 (43%) of them said that the surgical techniques and the operator experience are the factors behind implant success. 129 (58.9%) reported that dental implant requires additional oral hygiene maintenance and care by the patient, whereas 74 (33.8%) reported that oral care for a dental implant is similar to that of natural teeth, no additional care is needed and around 16(7.3%) of the participants were not aware of it. Most of the participants, 218 (99.5%) were aware that there is a link between periodontal health and the success of dental implant treatment. 131 (59.8%) of the participants reported that they usually examine the soft tissue around the implant. A few 8 (3.7%) said they do not check the tissue around the implant surface and around 80 (36.5%) of them reported that they had not seen a patient with an implant yet.

Question about the probe used to examine the soft tissue around the implant, 72 (32.9%) chose the plastic probe, whereas 48 (21.9%) reported that the WHO probe is the one that is used to examine the periodontal tissue around the implant. Around 44(20.1%) of the participants said that Williams probe is used to examine the periodontal tissues and 55 (25.1%) of the respondents were not aware of the probe used to examine periodontal tissues around implants. 169 (77.9%) reported that plastic ultrasonic tip is used while scaling around the dental implant, whereas 48 (22.1%) reported that metal ultrasonic tip is used. One more question was asked about the dental implant mobility test. It was reported by 111(50.7%) of the participants that they measured implant mobility by Periotest. At the same time, 62 (28.3%) of the participants reported that they use two metal instruments to measure the implant mobility and only 46 (21%) of the respondents use fingers to measure the implant mobility.

Participants were asked about the factors affecting dental implants in the maxilla; 99 (45.2%) reported that Pneumatization might

affect dental implants in the maxilla. While 59 (26.9%) chose the size of the buccal pad of fat. Retromolar area width was reported by 50 (22.8%) and gender of the patient was reported by 11(5%) of the participants, respectively. The next question was about managing loose dental implants; of the total participants, 111(50.7%) reported that loose dental implants should be managed by preparing the site and replacing it again. Whereas 74(33.8%) of them said that loose dental implants should be managed by discarding them and placing a new one, around 74(33.8%) of the respondents reported that loose dental implants should be managed by adding more titanium oxide later and replacing it again. The dental implant osseointegration question was asked; among the participants, 125(57.1%) reported that dental implant osseointegration is known as Ankylosis. Some of the participants, 54(24.7%) said that dental implant osseointegration is called Concrecence. In contrast, 40(18.3%) reported that dental implant osseointegration is known as hypercementosis.

Association

Among the participants, most of the participants were from GMU, which accounts for 69.7% of females and 30.3% of males. Whereas from AU, 79.3% were females and 20.7% were males. There was no statistically significant association between gender and settings as the participants were distributed equally. Regarding the nationality and university settings, among GMU participants, the majority were Arab participants, which accounts for 55% and the remaining 45% were non-Arab participants. Similarly, AU participants, majority 86.9%, were Arab participants and 13.1% were non-Arab participants. The association between nationality and settings was statistically significant ($P<0.001$).

Association between knowledge on implant dentistry and settings observed that only 'factors' showed statistical significance ($P<0.05$). 53.5% of participants from AU reported that case selection and patient compliance are essential, whereas only 42.9% from GMU reported the same. Statistically significant association observed in questions on "Which probe is preferred to examine periodontal tissue around implant?" and "Probe". From AU, 43.7% believed that plastic probe is better, whereas the participants from GMU consider almost all the same except WHO probe. Some variables with

an expected cell value of less than five were not included in the table. (Table-1)

We divided the participants according to the university they belong to and their clinical year to assess their overall knowledge. We divided the participant's knowledge into four groups. Those who answered <25% correctly as poor, 25-50% as average, 50-75% as good and >75% as excellent. Among 4th year students, there are no participants with excellent knowledge in both settings, but the knowledge is increasing as the year of study progresses. The details are given in table 2.

Discussion

The increasing demand for replacing missing teeth with dental implants requires a higher level of efficiency and knowledge from clinical years' dental students and interns. Therefore, it is important to assess their knowledge about the direct link of periodontal disease and dental implants.

Various levels of awareness among dental students and interns regarding dental implant have been discussed in many studies worldwide which raised valid concerns about the insufficient education and training in dental implants at the undergraduate level¹⁸⁻²¹. Up to our best knowledge, this study might be the first study in the UAE to assess the dental curriculum concerning implant dentistry at two of the most prestigious universities in the field of dentistry in the UAE.

In a recent study published in 2021 in Saudi Arabia dental students, researchers found that the level of knowledge regarding dental implants varied among institutions in the Kingdom. Moreover, the researchers pointed out the need to re-evaluate and standardize dental implant curricula²². The present study shows that there was a predominance of females (73.4%) participating in this study but there was no significant association between gender and settings of the participants. They were distributed more or less equal. This is similar to the many other surveys on the same topic²³⁻²⁵. 44.7% of the total participants in his study evaluated themselves to be moderately well informed about dental implants.

When asked about the most important factor for implant success, most of the participants 45.7% agreed on case selection.

Other studies conducted in Sweden and KSA obtained similar results^{26,27}. Similarly, evidence shows that case selection is the most important factor for implant success²⁶⁻²⁸.

A majority of all the participants 63.5% thought that longevity is the main advantage of using dental implants while only 23.3% chose it as conservative method for replacing teeth. However, literature shows that dental implants are considered to be a more conservative way to replace the natural tooth²⁹⁻³⁰. When asked about dental implant and oral hygiene, 58.9% of the respondents said that dental implants required more care than natural teeth. This was similar to a study carried out on 2018, where it was reported that majority of the participants agreed on that dental implant requires additional care from both patients and dentist²⁴.

In our study, new and more detailed questions were asked about dental implants and periodontics, when compared to most of the previous studies. Questions regarding the most appropriate type of periodontal probe and ultrasonic tip to be used around implant surface, how to measure and evaluate implant mobility, how to manage loose implants, what is the factor that affect dental implant treatment plan in maxilla and finally the other term of dental implant osseointegration were asked. This questionnaire had both detailed and basic questions which helped to understand and accurately assess the level of knowledge with regards to implant dentistry. When asked about the most appropriate probe to examine the tissue around implant, only 32.9% of the total gave the correct answer which is a plastic probe. Such a response demonstrates a lack of and inadequate understanding of basic information because inappropriate probing around implant with metal probe might lead to interruption of osseointegration. The majority of the participants agreed that ankylosis is the other name of dental implant osseointegration 57.1%. This was in contrast to the literature that called dental implant osseointegration concrescence³¹. Based on our survey, the results show that the majority of 4th and 5th year students (55.4%, 48.3%) respectively showed an average level of knowledge regarding dental implants as they gave 4-6 correct answers out of 12.

However, 50% of the interns demonstrate a moderate level of knowledge, as they gave 7-9 correct answers out of 12. These results reflect

the level of knowledge of clinical years' students and interns. It is noteworthy to mention that the implant dentistry course is introduced in the 5th year only in GMU and AU despite their different curriculums.

A survey of American dental schools was published in 2005 to evaluate the curricula used in undergraduate implant dentistry courses. About 70% of the dental schools in the US offered implant courses in the third year and 88% of the schools allow the clinical year students to restore implant cases clinically. The most popular type of implant restoration in these schools was single-tooth implant restoration³².

Another survey was published in 2005 of the European dental schools to determine and evaluate the curriculum, it concludes that implant dentistry programs varied from school to school. In 2008 a recommendation was released to consider implant dentistry as an integral part of the undergraduates' curriculum³³. In Australia; a workshop on implant dentistry University Education released a consensus document recommending basic competencies necessary for graduating dental general practitioners³⁴. All-India surveys on the same subject concluded that there is a need to revise the undergraduate dental curriculum²⁹.

Knowledge and perception about implant in dentistry among clinical years' dental students and interns in our study vary at a different academic level, but not as expected. A lot of 5th-year students and interns gave unsatisfactory answers despite their clinical experience compared to 4th year students. (Figure 1)

Conclusion

This study concluded that there is no significant difference in the level of knowledge between 4th, 5th clinical years' students and interns. Therefore, this investigation suggests a need to review dental implant curricula in the dental undergraduate program among the institutions and to evaluate teaching materials and methods to incorporate the principle information and skills related to implant dentistry.

Limitations

- Sample size was small as only two institutes were included in this study due to the Covid 19 pandemic restrictions during this period.
- Convenient sampling method was used to select the participants, and this may affect

the generalization of the study result to the entire population.

While surveys have numerous advantages, they can also be a source of dishonesty. Respondents may not be completely truthful in their responses. This can happen for a variety of reasons, including social desirability bias and the desire to preserve personal information. When using questionnaires, some questions may be skipped or left unanswered.

Recommendation

This investigation suggests a need to review dental implant curricula in the dental undergraduate program among the institutions and to evaluate teaching materials and methods to incorporate the principle information and skills related to implant dentistry as early as possible within the curriculum. As well as to develop a sufficient and well-structured implant dentistry content and clinical training based on evidence science in order to keep pace with the future dentistry.

Declaration of Interest

The authors report no conflict of interest.

Variables	Group	University				P
		AU		GMU		
		No.	%	No.	%	
Self-assessment of the level of implant dentistry	Excellent	5	5.7	2	1.5	NS
	Good	24	27.6	33	25.0	
	Fair	34	39.1	64	48.5	
	Poor	24	27.6	33	25.0	
Dental implants materials made from	Poreline	--	--	7	5.3	NS
	Stainless steel	8	9.2	16	12.1	
	Titanium	74	85.1	105	79.5	
	Ceramic	5	5.7	4	3.0	
Implants material last for	>10 years	45	51.7	64	48.5	NS
	5-10 years	10	11.5	18	13.6	
	I don't know	7	8.0	5	3.8	
	Life long	25	28.7	45	34.1	
Duration	5-10	10	12.2	18	14.1	NS
	more than 10	45	54.9	64	50.0	
	lifetime	27	32.9	46	35.9	
Advantage	Aesthetic, better look	5	5.8	19	14.8	NS
	More conservative	19	22.1	32	25.0	
	Longevity	62	72.1	77	60.2	
Factors	surgical technique and operator experience	38	44.2	55	43.7	<0.05
	implant type and material	2	2.3	17	13.5	
	case selection and patient compliance	46	53.5	54	42.9	
Dental implant requires additional oral hygiene maintenance and care by the patient	I don't know	4	4.6	12	9.1	NS
	No, cleaned like natural teeth	31	35.6	43	32.6	
	Yes, need more than natural teeth	--	--	1	0.8	
	Yes, need more than natural teeth	52	59.8	76	57.6	
Oral hygiene	No, cleaned like natural teeth	31	35.6	43	32.6	NS
	Yes, need more care than natural teeth	52	59.8	77	58.3	
	I don't know	4	4.6	12	9.1	
Which probe is preferred to examine periodontal tissue around the implant?	I don't know	18	20.7	37	28.0	<0.001
	Plastic probe	38	43.7	34	25.8	
	WHO probe	24	27.6	24	18.2	
	Williams probe	7	8.0	37	28.0	
Which ultrasonic tip is suitable for an implant?	Metal	16	18.4	34	25.8	NS
	Plastic	71	81.6	98	74.2	

Table1: Association between knowledge on implant dentistry Vs. Settings.

	Group	University			
		AU		GMU	
		No.	%	No.	%
4 th year	Poor	1	3.8	4	7.0
	Average	10	38.5	36	36.2
	Good	15	57.7	17	29.8
	Excellent	-	-	-	-
5 th year	Poor	-	-	3	7.3
	Average	7	41.2	21	51.2
	Good	9	52.9	16	39.0
	Excellent	1	5.9	1	2.4
Interns	Poor	6	13.6	2	5.9
	Average	16	36.4	10	29.4
	Good	19	43.2	20	58.8
	Excellent	3	6.8	2	5.9

Table 2. Level of knowledge of participants in both settings.

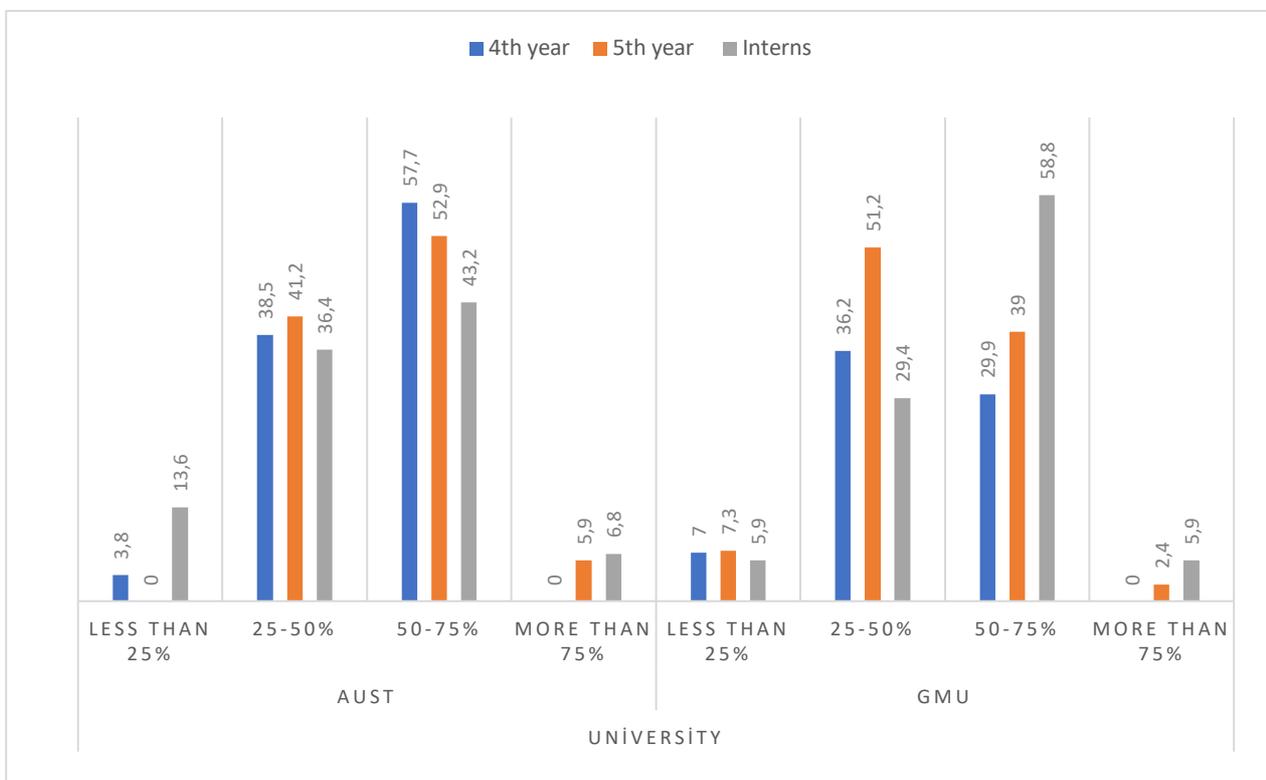


Figure 1: Knowledge of the participants at both universities about implant variables

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