

A Survey of Differences in Attitudes toward Dental Implants between Sexes in Japan

Yukawa Ken, Tachikawa Noriko, Kasugai Shohei

Oral Implantology and Regenerative Dental Medicine, Department of Masticatory Function Rehabilitation, Tokyo Medical and Dental University, Japan

Abstract

This study used a questionnaire to assess the differences in responses toward dental implants between sexes and identify all the information that should be provided to patients prior to dental implant treatment. A total of 4,512 questionnaires were distributed among patients visiting the Tokyo Medical and Dental University Hospital for oral implants between January 2012 and December 2014. Of these, 2,972 questionnaires (66% of total questionnaires) were considered suitable for analysis. The study included 856 male and 2,116 female patients. With regard to reason of opting for dental implant treatment, males selected the “chewing ability” and females selected the “feeling of disgust associated with dentures.” The main concerns associated with the therapy among females were “post-surgical complications” and “pain after surgery.” There were differences pertaining to the purpose of the therapy between males and females. The results of this study suggest that it is essential to provide accurate and sufficient information to patients when collecting informed consent prior to treatment.

Key Words: Dental implant, Clinical analysis, Questionnaire, Patient education, Informed consent

Introduction

Dental implant treatment has become popular in Japan, with the number of patients opting for this treatment increasing from 1995 to 2012 [1]. Fixed and removable dentures exhibit higher survival rates [2] and less invasive. In comparison these treatments, dental implant treatment provide greater stability to dentures, thus improving the quality of life (QOL) of patients [3]. In Japan, 16.6% of dental clinics are equipped with facilities for dental implant treatment, reflecting the increasing popularity of this method [4].

According to the guidelines for dental implant treatment provided by the Ministry of Health, Welfare and Labour, informed consent is crucial prior to the commencement of surgery to avoid future predicaments between the doctor and patient [5]. It also provides evidence of the increased survival rates and decreased complications associated with this surgical technique [6]. Although a great deal of information regarding implants is readily accessible to patients, not all of it is accurate, and there is a difference in the knowledge between a doctor and patient. A previous survey reported that the main reason for selecting dental implant treatment was the preservation of adjacent teeth, and the main concerns associated with this treatment was post-surgical complications [7]. Moreover, patients exhibited insufficient knowledge regarding the pain associated with this surgical technique, peri-implantitis, correct measures for implant care, and systemic illnesses associated with dental implants, suggesting the need for better patient education.

Because it is essential for doctors to monitor the QOL of patients post-surgery, patients should be encouraged to avoid changing hospitals during treatment. Twenty percent of all new patients reporting to our clinic in 2012 had already undergone a dental implant treatment at another clinic. The reasons for changing doctors included closed hospitals and clinics, relocation of the patients, and insufficient education provided regarding implant care.

Some studies reported the knowledge of dental implant, and indicated that the disadvantage of dental implant treatment

was high costs (*Table 1*) [8-11]. In our previous study, the result of “Main concerns associated with dental implant” was post-surgical complications [7]. The male: female ratio of patients visiting our clinic is 1:2, making it possible for us to analyze the differences in responses between the sexes. Therefore, this study aimed to assess differences pertaining to the knowledge on dental implants between males and females in an attempt to improve patient education provided prior to collection of the informed consent.

Materials and Methods

This survey was commissioned by the Oral Implantology and Regenerative Dental Medicine group, Department of Masticatory Function Rehabilitation, Tokyo Medical and Dental University, and survey was conducted in accordance with the guidelines provided by the ethics committee of the Tokyo Medical and Dental University (accepted December 05, 2011; No. 733).

This study included all new patients visiting the Tokyo Medical and Dental University Hospital for dental implant treatment between January 2012 and December 2014. The study participants completed questionnaires addressing sex, age, dental implant treatment history, main reasons for opting for dental implants, main concerns regarding dental implants, knowledge on dental implants (pain post-surgery, peri-implantitis, maintenance, and systemic illness associated with dental implant), knowledge regarding smoking being a risk factor for periodontal disease and peri-implantitis, and survival life of the request to implant (*Table 2*), and the data collected based on the responses was analyzed.

The responses to each question were compared between patients with and without implant treatment history using the chi-square test. All statistical analyses were performed using PASW Statistics version 18.0.0 (SPSS Inc. SPSS Japan), and the level of significance was set at $p < 0.05$.

Results

Patient characteristics

The questionnaire was distributed to a total of 4,512 patients,

Table 1. Comparison between some reports about “Main concerns associated with dental implant”.

	Author	Al-Johany S et al.	Saha A et al.	Suprakash B et al.	Yukawa et al.	Kohli S et al.
	Place	Saudi Arabia	India	India	Japan	Malaysia
	Year	2010	2013	2013	2014	2015
	Subject number	379	483	440	1159	1013
Main concerns or disadvantage associated with dental implant	Post-surgical complications or Need surgery (%)	46.7	10.3	11.3	27	37.9
	Lifetime desired dental implant (%)	-	-	15.6	23	-
	Treatment cost (%)	70.1	35.2	27.8	22	80.2
	Fear or Pain after surgery (%)	41.4	21.7	18.4	13	-
	Doubts regarding chewing ability with implants (%)	-	-	-	5	-
	Esthetics (%)	-	-	-	2	-
	Lack information about implant (%)	24.3	-	-	-	33.9
	Long time treatment	38.8	14.3	-	-	41.2
	Others (%)	-	18.5	26.9	8	-
		People may select more than one option, so percentages may add up to more than 100%				

of which 3,659 questionnaires were collected (collection rate, 81%) and 2,972 patients responded (response rate, 66%). The mean age of the patients was 53.7 years. The number of patients with implant treatment history was 2,115 (66%) and without implant treatment history was 857 (34%).

Main reason for opting for dental implant treatment

Approximately 70% of patients in each group responded to this question with “preservation of adjacent teeth,” “feeling of disgust associated with removable dentures,” and “recommended by others”. A significantly higher number of males responded with “unsatisfactory chewing ability because of removable dentures” and “preferred chewing with dental implants,” while more females responded with “feeling of disgust associated with removable dentures” and “recommended by others” (Table 2).

Main concerns regarding dental implants

More than 70% males as well as females responded to this question with “post-surgical complications,” “survival life of the request to implant,” and “high treatment cost”. Females exhibited a significantly higher tendency to respond with “post-surgical complications” and “pain associated with surgery” (Table 2).

Knowledge regarding dental implant treatment

For all questions excluded “Maintenance” of female, almost patients were replied “I do not know.” Females responded significantly more frequently with “I know it well,” whereas males responded with “I do not know” or “I know it more or less” (Table 2).

Knowledge of effects of smoking on periodontal health and dental implants

Majority of patients in both groups replied to this question with “definitely yes,” and there were no significant differences between the groups. Males showed a tendency to reply to this question with “probably yes,” whereas females responded with “probably no,” and significant differences were observed with regard to the same answer between the two groups (Table 2).

Survival life of the request to implant

Majority of patients in both groups replied with “25 years.” A

significantly higher number of males replied with “10 years,” whereas females replied with “20 years” (Table 2).

Discussion

Dental implant treatments are becoming increasingly popular in Japan because of the super-aging society wanting to improve their QOL [3]. The main requirements of dental implants include function, esthetics, and maintainability. However, because it is often difficult to achieve both function and esthetics, the patient’s chief requirement should be taken into consideration to ensure satisfaction [12].

Peršić et al. [12] suggested that although patients with removable dentures were satisfied with their treatment, those with dental implants reported better QOL because it provided additional stability for the prosthetic structure. In the current study, both groups reported dissatisfaction with dentures. Males tended to opt for dental implant treatment to ensure additional stability, whereas females chose the same to avoid using removable dentures. These results suggest that there is a need to prioritize function in males so as to improve their QOL.

Because this treatment option involves surgical invasion, it is often associated with various complications such as injury to the inferior alveolar nerve, mandibular fracture during implant placement, and aberrant dental implant in the sinus [13]. Some studies reported the disadvantage of dental implant treatment was high costs (Table 1) [8-11], and fear to surgery and post-surgical complication were high secondly. The results of this study suggest that females fear surgical treatment to a greater extent than males. Moreover, doctors and patients may exhibit differences in their perceptions of pain. Therefore, it is important to inform patients, particularly females, regarding the pain associated with surgery prior to commencing treatment.

Renver et al. [14] reported that periodontal disease, smoking, surplus cement, and insufficient maintenance were crucial risk factors for peri-implantitis. Unlike natural teeth,

Table 2. Patients' characteristic and responded.

		Male		Female	
		Number (%)		Number (%)	
History of dental implant treatment	History of treatment	645 (75)		1604 (76)	
	No history of treatment	211 (25)		512 (24)	
Main reason for selecting dental implant	Preservation of adjacent teeth	239 (28)		450 (21)	
	Disgust associated with removable dentures	37 (4)	*2	142 (7)	*1
	Recommended by others	182 (21)	*2	718 (34)	*1
	Unsatisfactory chewing ability with removable dentures	168 (20)	*1	327 (15)	*2
	Improved chewing ability with dental implants	131 (15)	*1	226 (11)	*2
	Aesthetics	23 (3)		52 (2)	
	Others	98 (11)		146 (7)	
	Main concerns associated with dental implant	Post-surgical complications	188 (22)	*2	417 (20)
Lifetime desired dental implant		207 (24)		449 (21)	
Treatment cost		245 (29)		617 (29)	
Pain after surgery		63 (7)	*2	249 (12)	*1
Doubts regarding chewing ability with implants		29 (3)		115 (5)	
Esthetics		29 (3)		46 (2)	
Others		115 (13)		157 (7)	
Pain post-surgery	I know it well	140 (16)	*2	551 (26)	*1
	I know it more or less	344 (40)	*1	720 (34)	*2
	I do not know	381 (45)	*1	851(40)	*2
Peri-implantitis	I know it well	186 (22)	*2	576(38)	*1
	I know it more or less	219 (26)		563 (27)	
	I do not know	461 (54)	*1	1045 (49)	*2
Maintenance	I know it well	219 (26)	*2	795 (38)	*1
	I know it more or less	293 (34)	*1	635 (30)	*2
	I do not know	354 (41)	*1	698 (33)	*2
Systemic illness associated with dental implant	I know it well	191 (22)	*2	720 (34)	*1
	I know it more or less	242 (28)		629 (30)	
	I do not know	433 (51)	*1	770 (36)	*2
Knowledge of smoking as a risk factor for periodontal disease	Definitely yes	519 (60)		1263(60)	
	Probably yes	205 (24)		569 (26)	
	Probably no	116 (13)		223 (10)	
	Definitely no	28 (3)		69 (3)	
Knowledge of smoking as a risk factor for peri-implantitis	Definitely yes	402 (47)	*1	194 (9)	*2
	Probably yes	261 (30)		625 (29)	
	Probably no	173 (20)	*2	1232 (59)	*1
	Definitely no	32 (3)		75 (3)	
Survival life of the request to implant	3 years	5 (1)		10 (1)	
	5 years	33 (4)		33 (2)	
	10 years	182 (21)	*1	345 (16)	*2
	15 years	153 (18)		315 (15)	
	20 years	210 (25)	*2	703 (33)	*1
	>25 years	292 (34)		726 (34)	

*1: There was a significantly higher trend among the male and female patients ($P < 0.05$).

*2: There was a significantly lower trend between the female and male patients ($P < 0.05$).

dental implants do not move over time because they undergo osseointegration [2]. Peri-implantitis is usually observed after 5 years in 28%–56% of patients undergoing implant treatment [15]. Therefore, maintenance of dental implants is essential for the preservation of good health. In this study, males reported insufficient knowledge of peri-implantitis and appropriate implant care. Therefore, information regarding measures for maintaining implants and the importance of good oral hygiene must be emphasized to patients, particularly males, before, during, and after treatment.

Smoking is a risk factor for periodontal disease [16] and plays a crucial role in dental implant treatment because it adversely affects early osseointegration [17,18]. The results

of this study suggest that although patients are aware of the association between smoking and periodontal disease, females in particular fail to recognize the influence of smoking on dental implants. According to the Ministry of Health, Labour and Welfare, the rate of smoking is higher among males (30.3%) than females (9.8%) [19]. The rate of smoking is directly linked to the knowledge of its association with peri-implantitis. However, smoking cessation is difficult to achieve because it involves nicotine addiction and social pressures [20]. Therefore, to improve QOL and decrease the incidences of systemic illness, health care workers should focus on providing adequate information to patients for aiding smoking cessation.

In this study, “> 25 years” was the most common reply in both groups. Turkyilmaz et al. [21] reported a survival period of 30 years for mandibular fixed dental implants, whereas Jemt et al. [22] reported early loss of dental implant associated with surgery. Dental implant treatment is affected by various factors such as the operator’s skills, characteristic differences between patients, and dental implant systems used. Unpredicted dental implant loss may occasionally occur. Therefore, it is essential to emphasize the risk of early

and late implant loss to patients when collecting informed consent prior to treatment.

Conclusion

In this study, males showed a tendency to opt for dental implant treatment for additional stability and exhibited insufficient knowledge of proper implant care and peri-implantitis. Conversely, females usually opted for this treatment to avoid using removable dentures and they had a lot of anxious about surgery.

References

1. Yukawa K, Tachikawa N, Munakata M, Shiota M, Kasugai S. A clinical investigation of new patients who had already received treatment with dental implants at other clinics in seventeen years. *Kokubyo Gakkai Zasshi*. 2014; 81: 1-8.
2. Brånemark PI, Hansson BO, Adell R, Breine U, Lindström J, et al. Osseo integrated implants in the treatment of the edentulous jaw. Experience from a 10-year period. *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery*. 1977; 16: 1-132.
3. Fang QG, Shi S, Zhang X, Li ZN, Liu FY, et al. Assessment of the quality of life of patients with oral cancer after pectoralis major myocutaneous flap reconstruction with a focus on speech. *Journal of Oral and Maxillofacial Surgery*. 2013; 71: e1-e5.
4. The national health and nutrition examination survey in 2011 (in Japanese). Ministry of Health, Labour and Welfare. Retrieved July 28, 2015.
5. The guide line for dental implant treatment in 2013 (in Japanese). Ministry of Health, Labour and Welfare. Retrieved July 28, 2015.
6. Q&A for dental implant treatment in 2014 (in Japanese). Ministry of Health, Labour and Welfare. Retrieved July 28, 2015.
7. Yukawa K, Tachikawa N, Munakata M, Shiota M, Kasugai S. Questionnaire survey of patients visited our dental implant clinic. *Journal of Japanese Society of Oral Implantology*. 2014; 27: 175-180.
8. Kohli S, Bhatia S, Kaur A, Rathakrishnan T. Patients awareness and attitude towards dental implants. *Indian Journal of Dentistry*. 2015; 6: 167-171.
9. Al-Johany S, Al Zoman HA, Al Juhaini M, Al Refeai M. Dental patients' awareness and knowledge in using dental implants as an option in replacing missing teeth: A survey in Riyadh, Saudi Arabia. *Saudi Dental Journal*. 2010; 22: 183-188.
10. Saha A, Dutta S, Vijaya V, Rajnikant N. Awareness among patients regarding Implants as a treatment option for replacement of missing teeth in Chattisgarh. *Journal of International Oral Health*. 2013; 5: 48-52.
11. Suprakash B, Ahammed AR, Thareja A, Kandaswamy R, Nilesh K, et al. Knowledge and attitude of patients toward dental implants as an option for replacement of missing teeth. *The Journal of Contemporary Dental Practice*. 2013; 14: 115-118.
12. Peršić S, Čelebić A. Influence of different prosthodontic rehabilitation options on oral health-related quality of life, orofacial esthetics and chewing function based on patient-reported outcomes. *Quality of Life Research*. 2015; 24: 919-926.
13. Pjetursson BE, Thoma D, Jung R, Zwahlen M, Zembic A. A systematic review of the survival and complication rates of implant-supported fixed dental prostheses (FDPs) after a mean observation period of at least 5 years. *Clinical Oral Implants Research*. 2012; 23: 22-38.
14. Renvert S, Quirynen M. Risk indicators for peri-implantitis. A narrative review. *Clinical Oral Implants Research*. 2015; 26: 15-44.
15. Costa FO, Takenaka-Martinez S, Cota LO, Ferreira SD, Silva GL, et al. Peri-implant disease in subjects with and without preventive maintenance: a 5-year follow-up. *Journal of Clinical Periodontology*. 2012; 39: 173-181.
16. Vellappally S, Fiala Z, Smejkalová J, Jacob V, Somanathan R. Smoking related systemic and oral diseases. *Acta Medica (Hradec Kralove)*. 2007; 50: 161-166.
17. Strietzel FP, Reichart PA, Kale A, Kulkarni M, Wegner B, et al. Smoking interferes with the prognosis of dental implant treatment: a systematic review and meta-analysis. *Journal of Clinical Periodontology*. 2007; 34: 523-544.
18. Bezerra Ferreira JD, Rodrigues JA, Piattelli A, Iezzi G, Gehrke SA, et al. The effect of cigarette smoking on early osseointegration of dental implants: a prospective controlled study. *Clinical Oral Implants Research*. (Epub ahead of print). 2015.
19. The newest tobacco information. Ministry of Health, Labour and Welfare. Retrieved July 28, 2015.
20. Yukawa K, Tachikawa N, Kasugai S. A survey of attitude about smoking, associated with periodontal disease and new patients hoping dental implants intended for new patients hoping dental implants. *Jpn Journal of Tobacco Control*. 2014; 9: 41-49.
21. Turkyilmaz I, Tözüm TF. 30-Year Outcomes of Dental Implants Supporting Mandibular Fixed Dental Prostheses: A Retrospective Review of 4 Cases. *Implant Dentistry*. 2015; 24: 620-624.
22. Jemt T, Olsson M, Renouard F, Stenport V, Friberg B. Early Implant Failures Related to Individual Surgeons: An Analysis Covering 11,074 Operations Performed during 28 Years. *Clinical Implant Dentistry and Related Research Journal*. (Epub ahead of print). 2015.