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Implant-supported prostheses versus conventional permanent and removable dentures

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Accepted 03 March 2014**Keywords:**prosthetic replacements,
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demographic factors.**ABSTRACT**

Social, economic and technological progress results in an increasing range of treatment and rehabilitation methods for patients with partial or complete edentulism. The role of the dentist is to inform the patient about the full range of available missing teeth treatment options leading to complete rehabilitation of the masticatory organ in agreement with the patient's aesthetic and functional expectations. The aim of the paper was to identify the type of prostheses used by patients before opting for implant-supported teeth replacements, according to the patients' age, sex, marital status, place of residence and education. The study covered 464 patients, women and men, aged 20-74, treated with dental implants. The patients answered questions in an anonymous questionnaire. The influence of the prosthetic replacement type according to age and marital status was highly statistically significant, whereas it was statistically significant according to sex, place of residence and education. The female respondents who previously used tissue-borne complete or partial dentures opted for implant treatment more frequently. The respondents younger than 40 and between 40-60 years of age who did not previously use any prosthetic replacements opted for implant treatment more frequently. The respondents who did not use any prosthetic replacements decided to undergo implant treatment most frequently, regardless of their marital status, education and place of residence. The patients opted for implant treatment to improve their quality of life, despite the high cost of such therapy.

INTRODUCTION

Recent achievements in the field of medicine and dentistry have significantly changed attitudes to the problem of permanent teeth loss in patients at any age. Social, economic and technological progress results in an increasing range of treatment and rehabilitation methods for patients with partial or complete edentulism [7].

The needs of the Polish population in the area of conservative and prosthetic treatment are high to a large degree unsatisfied. The studies conducted in 2003 showed that over 50% of adults aged 35-44 and 30% of those aged 67-74 had untreated missing teeth. The average number of teeth in the oral cavity found in different age groups was, respectively: 35-44 years – 24.24 teeth; 45-64 years – 19.09 teeth; 65-74 years – 12.50 teeth; and over 74 years – 9.41 teeth [14]. The

data provided by the programme "Oral Cavity Health Monitoring" indicate that in 2009 the percentage of edentulous Poles at the age 65-74 reached 43.9% of the population, and the masticatory function was preserved only in 43.9% of this age group. In 2002, however, this proportion was 69.4%, which points to a deteriorating dentition status [10]. The cited results confirm the fact that the challenge for dentists is enormous.

The role of the dentist is to inform the patient about the full range of available missing teeth treatment options leading to complete rehabilitation of the masticatory organ in agreement with the patient's aesthetic and functional expectations [3].

AIM

The aim of the paper was to identify the type of prostheses used by patients before opting for implant-supported teeth replacements, according to the patients' age, sex, marital status, place of residence and education.

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MATERIAL AND METHODS

The study covered 464 patients, women and men, aged 20-74, treated with prosthetic implants at the Non-Public Healthcare Centre "Dental" in Tomaszów Mazowiecki, Poland. The patients anonymously answered the questions concerning their sex, age, marital status, place of residence, education, and previously used prosthetic replacements.

The respondents were divided into groups according to their age: younger than 40 years (n=157), 40-60 years (n=241), and over 60 years (n=66); and according to their place of residence (village, small town – population 20,000-50,000, large city – population 100,000-500,000).

Correlations between the variables were analyzed using χ^2 independence test. Statistical analysis was performed with Statistica 6.0 (StatSoft, Inc., Tulsa, Oklahoma, USA).

RESULTS

The study showed that 48.7% of the respondents (226 patients) who opted for implant-based prosthetic replacements had not used any prosthetic treatment: the percentage of such patients was 50% of the men, and 47.37% of the women. The decision to have implant treatment was much more frequently taken by women who had used complete or partial tissue-borne dentures; in the case of men, such a decision was taken more frequently by the permanent replacement users (Table 1).

The respondents aged under 40 and between 40 and 60 years who did not use prosthetic replacements opted for implant treatment much more frequently than other patients, while those over 60 made this decision if they previously used partial tissue-borne dentures (Table 2).

Table 1. Frequency of dental implant treatment according to sex and prosthetic replacement type used before the treatment

Sex	Prosthetic replacement					Total
	Complete denture	Tissue-borne partial denture	Removable partial denture	Permanent replacement(s)	No replacement	
Men	11	25	37	45	118	236
	4.66%	10.59%	15.68%	19.07%	50.00%	100%
Women	21	33	20	46	108	228
	9.21%	14.47%	8.77%	20.18%	47.37%	100%
Total	32	58	57	91	226	464

Test function value $\chi^2=9.617$, p=0.047

Table 2. Frequency of dental implant treatment according to age and prosthetic replacement type used before the treatment

Age	Prosthetic replacement					Total
	Complete denture	Tissue-borne partial denture	Removable partial denture	Permanent replacement(s)	No replacement	
Younger than 40	3	13	6	21	114	157
	1.91%	8.28%	3.82%	13.38%	72.61%	100%
Between 40 and 60	18	24	34	60	105	241
	7.47%	9.96%	14.11%	24.90%	43.57%	100%
Older than 60	11	21	17	10	7	66
	16.67%	31.82%	25.76%	15.15%	10.61%	100%
Total	32	58	57	91	226	464

Test function value $\chi^2=102.567$, p<0.001

Both single and married patients who did not use prosthetic replacements, as well as single previously married patients who used partial tissue-borne dentures, permanent dentures or had untreated missing teeth opted for implant treatment more often than other respondents (Table 3).

Table 3. Frequency of dental implant treatment according to marital status and prosthetic replacement type used before the treatment

Marital status	Prosthetic replacement					Total
	Complete denture	Tissue-borne partial denture	Removable partial denture	Permanent replacement(s)	No replacement	
Unmarried	0	2	12	4	54	72
	0.00%	2.78%	16.67%	5.56%	75.00%	100%
Married	26	41	41	70	154	332
	7.83%	12.35%	12.35%	21.08%	46.39%	100%
Divorced/widow (widower)	6	15	4	17	18	60
	10.00%	25.00%	6.67%	28.33%	30.00%	100%
Total	32	58	57	91	226	464

Test function value $\chi^2=50.954$, p<0.001

The decision to have implant treatment was most frequently taken by the respondents who did not use prosthetic replacements, regardless of the place of residence; however, the majority of them were city residents. The patients from villages who used permanent replacements or partial tissue-borne dentures opted for implant treatment more often than other village residents. The patients who lived in small towns who used removable partial dentures or complete dentures decided to undergo implant treatment more frequently than others (Table 4).

Table 4. Frequency of dental implant treatment according to place of residence and prosthetic replacement type used before the treatment

Place of residence	Prosthetic replacement					Total
	Complete denture	Tissue-borne partial denture	Removable partial denture	Permanent replacement(s)	No replacement	
Village	7	19	4	27	53	110
	6.36%	17.27%	3.64%	24.55%	48.18%	100%
Small town	21	31	37	37	105	231
	9.09%	13.42%	16.02%	16.02%	45.45%	100%
City	4	8	16	27	68	123
	3.25%	6.50%	13.01%	21.95%	55.28%	100%
Total	32	58	57	91	226	464

Test function value $\chi^2=23.926$, p=0.002

Table 5. Frequency of dental implant treatment according to education and the prosthetic replacement type used before the treatment

Education	Prosthetic replacement					Total
	Complete denture	Tissue-borne partial denture	Removable partial denture	Permanent replacement(s)	No replacement	
Vocational	7	6	2	5	14	34
	20.59%	17.65%	5.88%	14.71%	41.18%	100%
Secondary	15	11	15	25	66	132
	11.36%	8.33%	11.36%	18.94%	50.00%	100%
University	10	41	40	61	146	298
	3.36%	13.76%	13.42%	20.47%	48.99%	100%
Total	32	58	57	91	226	464

Test function value $\chi^2=23.956$, p=0.002

The respondents who did not use prosthetic replacements opted for implant treatment regardless of their education. The patients with vocational education who used permanent dentures decided to have implant treatment more frequently, while among the patients with secondary and university education, such a decision was taken by those using permanent replacements (Table 5).

DISCUSSION

Our study shows that among the female respondents, the decision to have implant treatment was taken most frequently by the patients who had previously used tissue-borne partial or complete dentures. As it is known, tissue-borne partial dentures have undesirable effects, cause chronic gingivitis, exposure of dental necks, and damage both to the soft tissues and bones [12]. In addition, improper stabilization of a tissue-borne denture in the oral cavity may result in speech and eating problems, anxiety about a possible “falling out” of the prosthesis, leading to aversion to wear such replacements and, to some extent, to a psychosocial handicap [1,5,11].

Among the male respondents, the patients who used permanent replacements opted for implant treatment most frequently. A permanent prosthetic replacement, if it is correctly designed and executed at both clinical and laboratory stage, may be successfully used by the patient. However, the fabrication of such replacements may also lead to complications that result from the necessity to considerably cut abutment teeth, causing injury to their pulp and also possibly damaging the periodontium during cutting [8]. The fabricated crown must eventually adhere precisely to the abutment tooth at the correct distance from the periodontium. Otherwise, the gums and surrounding tissues are continually irritated, which leads to inflammation and atrophic changes. The exposure of the crown edge causes considerable aesthetic problems [9].

The use of prosthetic of conventional, either removable or permanent, does not entirely satisfy the patients. It does not fully reproduce the masticatory function and the required aesthetics. For these reasons, the patients choose the replacements based on prosthetic implant, which enables an effective restoration of the masticatory function and aesthetics even in difficult anatomical conditions [13]. It also does not require the preparation of the patient's own teeth [7, 8].

As the study results show, the type of previously used prosthetic replacements affected the decision to undergo implant treatment. The respondents below 60 years opted for such treatment significantly more frequently if they had not previously used any prosthetic replacements to restore functionality of the masticatory organ and increase their psychological comfort. The patients who used tissue-borne partial dentures opted for implant treatment more frequently at the age of over 60 years, which may have resulted from their need to replace their prostheses with new ones that would be more durable and comfortable. Intraosseous implants may be used as abutments for permanent replacements, but also to stabilize removable prostheses [6]. According to Knychalska-Karwan, an interest in the improvement of one's

appearance and of mouth functionality may be observed to increase steadily also among elderly patients [4].

According to the results obtained in our study, the decision to undergo dental implantation was most frequently taken by both unmarried and married patients who had not previously used any replacement, as well as by single-previously married respondents who had used tissue-borne dentures, permanent dentures, or no prosthetic replacement. Also, the respondents who did not use any replacements opted for intraosseous implants more frequently than others, regardless of the place of residence. Similarly, the decision to undergo implant treatment was taken more frequently by the patients who had not used any prosthetic replacement and did not depend on their education. Among the remaining respondents, the majority of the patients with vocational education used removable dentures before implantation, while among the patients with secondary and university education the majority used permanent replacements. This may be related to a greater self-confidence of people with complete dentition in human contacts. Missing teeth replacement improves psychological and physical welfare of patients [2]. Replacing missing teeth, it is extremely important to adopt treatment and rehabilitation procedures that correspond to the patient's expectations [11].

The treatment of partially or completely edentulous patients enables, on the one hand, the restoration of masticatory organ function, which improves their physical condition. On the other hand, it significantly improves the patient's psychological welfare. Teeth loss often causes a decrease in self-esteem, an aversion to contacts with other people, lack of self-confidence and stress. Replacing missing teeth in the way that guarantees the greatest possible satisfaction of the patient enables her or him to engage in normal family life and professional activities [2,11].

Permanent replacements based on implanted abutments do not require preparation by cutting the patient's own teeth. Intraosseous implants used to stabilize removable prostheses guarantee their best possible stability in the oral cavity. They also enable the use of permanent replacements in the case of shortened dental arches. The use of implants makes it possible to improve aesthetics, masticatory organ functionality and the quality of speech. This enables the patients' unlimited functioning in society, improves their self-esteem and satisfaction with life [11,15].

CONCLUSIONS

1. The female respondents who previously used tissue-borne complete or partial dentures opted for implant treatment more frequently.
2. The respondents younger than 40 and between 40-60 years of age who did not previously used any prosthetic replacements opted for implant treatment more frequently.
3. The respondents who did not use any prosthetic replacements decided to undergo implant treatment most frequently, regardless of their marital status, education and place of residence.
4. The patients opted for implant treatment to improve their quality of life, despite the high cost of such therapy.

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