Babylon University

Collage of Dentistry

A patient preference about the treatment options for one or two missing teeth

Preparation by

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Abstract

Objective: To determine factors affecting the patients decision for selecting a particular treatment option for replacement of single or two missing tooth

Study Design: Descriptive analytical study**.**

Place and Duration: prosthodontics special and public clinic in AL-Hilla city, from November2023 to March2024.

Methodology: The participants were informed about anonymous, voluntary, and non-compulsory nature of the study and prior consent was taken before their participation in the study. The age range of the patients was (20-65) years, about (208) with males (85) and females (123), probability sample technique used for sampling

Results: Out of the total 208 patients mostly were from 20-65 years with 40.87% males and 59.13% were females. Majority of the participants preferred RPD (51.14%) as compared to FIXED (27.40%), dental implants (21.15%). Cost of treatment (37%) , Phobia(18.8%)and Damage to the adjacent(19.2%) were the most common factor affecting treatment option

Conclusion: The replacement of missing tooth is based on multiple factors amongst fixed partial denture, removable partial denture and dental implants, among which Cost of treatment , phobia and Damage to the adjacent are the most common influencing factors considered by the patient.

Keywords: Cost, Dental implants, Dental phobia, Fixed partial denture, Pain and suffer

Introduction

Tooth loss is a common dental problem that affects people of all ages. It can occur due to a variety of reasons (1) . The Gum disease, also known as periodontitis, is one of the leading causes of tooth loss. It is caused by the buildup of bacteria in the mouth that can lead to the destruction of the tissues that support the teeth. and Poor oral hygiene habits can cause tooth decay, leading to cavities that can ultimately cause tooth loss. Tooth decay can also be caused by a diet high in sugar and starches (2) . so Tooth loss can also result from trauma to the mouth, such as a sports

injury, fall, or car accident. also Genetic factors can also contribute to tooth loss. Some people are more susceptible to gum disease and tooth decay due to their genetic makeup (3) .

Consequences of Tooth Loss include Difficulty Chewing , Speech Impairment and Bone Loss Tooth loss can make it difficult to eat certain foods, which can impact a person's overall health and nutrition. As soon as Missing teeth can also affect a person's speech, causing a lisp or difficulty pronouncing certain words. Self-Esteem Issues, Tooth loss can also cause self-esteem issues and affect a person's confidence in social situations. also When a tooth is lost, the bone that supported the tooth begins to deteriorate, which can cause additional tooth loss and impact the overall structure of the jaw (4).

The prosthetic replacement of missing teeth is an important element of dental care. Patients with a single missing tooth can be treated with removable partial dentures, resin-bonded fixed partial dentures (RBFPDs), tooth-supported fixed partial dentures (FPDs), and implant-retained crowns (IRCs). A single tooth extraction with no tooth replacement is also an alternative treatment modality (5).

Although it is possible to replace a single tooth with removable prostheses or RBFPDs, they should be considered provisional instead of definitive restorations (6). Major disadvantages of RBFPDs are fracture and debonding (7) . FPDs and IRCs are the most commonly preferred definitive treatment options for a single missing tooth (8) . For many years, FPDs were considered to be the best treatment choice for replacing a single missing tooth (9,10) . The primary reasons for suggesting FPDs are its clinical ease and reduced treatment time and costs (11) . Nowadays, IRCs have become the most common treatment of choice in many clinical cases with a single missing tooth. Replacement of a single

tooth using an Osseo integrated implant is an accepted and satisfactory treatment. IRCs have definite advantages including esthetics and function with long-term predictability. They are an ideal treatment for replacing a single tooth in many situations (12) . IRCs exhibited the highest survival rates among treatment modalities. In addition, the adjacent teeth have the highest survival rate and the lowest complication rate, which is a considerable advantage. Although there are many advantages of implants, time-consuming protocols and economic aspects may affect the decision to replace a single tooth with an IRC (13).

Prosthesis for replacing a single missing tooth is determined by various factors, such as; age, gender, socio economic status, individual patient's condition (medical or psychological), location of the tooth in the arch, quality of ridge and alveolar bone, empirical evidence of outcomes of treatment, experience and expertise of clinicians and patient's preference (14,15). In many cases if more than one treatment option is possible, the definitive replacement depends on patient's decision/financial status or influenced by the patient's gender, age, public awareness and patient's knowledge. Therefore, it is mandatory to understand the patient's needs and demands to determine the kind of treatment that ensures the patient's satisfaction with the dental service. In many cases the cost of the treatment is considered as a major determinant and ahead of oral health status and patient preference. Pain and dental phobia are considered as important factors as well and they might affect the patient decision not to receive treatment at all (16,17) . Usually, the bias of the dentist plays a role rather than objective assessment of the treatment modalities. Treatment decisions should be made in close consultation with the patients and their expectations should be addressed if they reflect reality (18).

In clinical decision making, dentists routinely choose between alternative treatments such as crown vs. amalgam/composite buildup; root canal treatment vs. extraction; fixed bridge vs. removable partial denture; and periodontal treatment vs. extraction. A number of clinical and patient factors can influence the dentist's choice of treatment in these situations. However, little is known about their relative importance. To address this issue, a list of clinical (e.g., periodontal status and caries rate) and patient (e.g., cost and patient preference) factors possibly influencing the choice of treatment was developed for each pair of services (19). Other factors like the dentists, their particular skills, their accessibility to the public and the economic realities of the community in which they practise can affect the decision in choosing the treatment in addition to the attitudes of people towards different forms of treatment. These attitudes are influenced by such matters as education, personal finance, and cultural background (20).

This study examined patient preference and factors that would affect the treatment decision to replace a single or two missing tooth. As far as we know this is the only study that addressed the factors influencing the patient’s preference about the treatment option for one or two missing teeth in Iraq. On another hand, it can be considered a database for us in Iraq.

Methodology:

Study participant

Two hundreds healthy participant included in the study 100 were male and 100 were female their age were between 13-45 years old probability sample technique used for sampling process. Informed consent were obtained from each one before participating in the study. The questionnaire was explained to the patients by the investigators on a one-

to-one interview the filled questionnaire was collected on the same day. The study have inclusion and exclusion criteria, the inclusion criteria was any edentulous patient with one or two missing teeth ,have no other diseases ,within age group between 13-45 years old who attend prosthodontic clinic at Babylon university collage of dentistry and who agree to participate in the research.

Exclusion criteria was any of them who is unhealthy ,above or below the age limit in the study ,those who have more than two missing teeth, and those who were unwilling to participate. Study conducted between November 2023 and January 2024

Setting

The data collection process carried out at the prosthodontic clinic at Babylon University, collage of dentistry after granted permission from the ethical committee of the collage to start the study

Study questionnaire

The research tool used for study purpose contain 10 items, composed of two parts. Part one include the demographical data which involve the name, gender, educational level, age, and the monthly income .Part two include medical information to assess the edentulism include items about type of arch ,Kennedy classification, number of missing teeth , type of replacement ,and finally the reason for no need for replacement when tooth/teeth is lost.

Data analysis

The collected data were analyzed using a statistical package for social sciences, SPSS (IBM Corporation, SPSS Inc., Chicago, USA, Version 21, software package). The descriptive statistics with frequency and

percentage were used to find out the preference of patient in treatment option for one or two missing teeth.

Results:

In this descriptive analytical study 208 patients participated. 81 (38.94%) were males and 127 (61.06%) females. the participants 142 (68.27%) belonged to (<=40) years of age, 40(19.23%) for age (40-50) years,26(12.5%) for age (>=50) years. Additionally, 102 (49.04%) were Advance,96(46.15) primary and 10 (4081%) , uneducated, monthly income for the participants, 92(44.23%) for (without monthly income) ,48(23.08%)for (100000-500000)ID,55(26.44%)for (500000- 1000000) ID and 13(6.25%) for (>1000000)ID . The replacement, RPD were chosen by 106 (50.96%) participants, FXED by 58 (27.88%), Dental Implants by 44 (21.15%) .

The gender based distribution of treatment options are presented in Table-1, the frequency of RPD, FIXED and IMPLANT; opted by male was n=48 (23.08%), n=25(12.02%), n=8(3.85 while in female n=58 (27.88%) , n=33 (15.87%) , n=36(17.31. Hence no a significant difference (p- value = 0.14).

Table-1 :Gender based distribution of prosthetic treatment options

Type of prosthesis	Gender		Total n	p- value
	Male n(%)	Female n(%)		
RPD	48(23.08%)	58(27.88%)	106(50.96)	0.14
FIXED	25(12.02%)	33(15.8%)	58(27.88%)	
IMPLAND	8(3.85%)	36(17.13%)	44(21.15%)	
Total	81(38.94%)	127(61.06%)		

The analysis of treatment options and age as depicted in Table -2, when comparison between age(<=40) and (40-50) years a significant difference (p- value= 0.007),age(<=40) and(>=50)years a significant difference (p- value= 0.005),age (>=50) and(40-50) no a significant difference (p- value= 0.085). The majority 106 participants chosen RPD while FIXED by (58) and IMPLANT(44).

Table -2 comparison of age and treatment option

Type of prosthesis	Age			Total	P -value	
	<= 40 years n (%)	40-50 years n(%)	>= 50 years n(%)			
RPD	57(27.40%)	28(13.46%)	21(10.10%)	106(50.96%)	(<=40)y &(40-50)y	0.007
FIXED	47(22.60%)	8(3.85%)	3(1.44%|)	58(27.88%)	(<=40)y&(<=50)y	0.005
IMPLAND	38(18.27%)	4(1.92%)	2(.096%)	44(21.15)	(>=50)y&(40-50)y	0.085
Total	142(68.27%)	40(19.23)	26(12.50%)			

Similarly, when education level was compared with treatment options such as RPD,FIXED and IMPLAND: The frequency in uneducated was n=5(2.4%), n=3(1.44%), n=2(0.96%) , the Primary education n=61(29.33%), n=27(12.98%), n=8(3.85%) while in Advance n=40(19.23%), n=28(13.46%),n= 34(16.35%) . Hence, non a significant difference (p- value = 0.19) between uneducated and primary education , a significant difference (p- value = 0.009) between uneducated and Advance was seen subsequently as mentioned in Table-3

Table -3 Education level and treatment option consideration

Type of prosthesis	Education level			Total	p- value	
	Non n (%)	Primary n(%)	Advance n (%)			
RPD	5(2.40%)	61(29.33%)	40(19.23%)	106(50.96%)	Non &	0.19

					primary	
FIXED	3(1.44%)	27(13.98%)	28(13.46%)	58(27.88%)	Non & Advance	0.009
IMPLAND	2(0.96%)	8(3.85%)	34(16.35%)S	44(21.15%)		
Total	10(4.81%)	96(46.15%)	102(49.04%)			

Monthly income was compared with treatment options such as RPD,FIXED and IMPLAND: The frequency in without monthly income was n=47(22.60%), n=25(12.02%), n=20(9.62%) , monthly income from (100000-500000)ID n=27(12.98%), n=13(6.25%), n=8(3.85%) , monthly income from (500000-1000000) ID was n= 32(15.38%|), n= 14(6.72%), n=9(4.33%),while monthly income (>=1000000) was n=0(0%), n=6(2.88%),n= 7(3.37%) . Hence, non a significant difference (p- value = 0.13) between (without monthly income & >=1000000) ID , a significant difference (p- value = 0.030) between (without monthly income &100000-500000)ID , a significant difference (p- value = 0.01) between (without monthly income &500000-1000000)ID. was seen subsequently as mentioned in Table-3

Table -4 comparison of monthly income and treatment option

Type of prosthesis	Monthly income * 1000 ID				p- value	
	0 n(%)	100-500 n(%)	500-1000 n(%)	>=1000 n(%)		
RPD	47(22.60%)	27(12.98%)	32(15.38%)	0 (0%)	(0&100-500)ID	0.030
FIXED	25(12.02%)	13(6.25%)	14(6.73%)	6(2.88%)	(0& 500-1000) ID	0.01
IMPLAND	20(9.62%)	8(3.85%)	9(4.33%)	7(3.37%)	(0 &>=1000) ID	0.13
Total	92(44.23%)	48(23.08%)	55(26.55%)	13(6.25%)		

Moreover, cost or expense 92(44 %) was the most common reason of treatment option while phobia 40(19.2%), damage to the adjacent & NO. visit 20(9.6), Do not know about treatment 19(9.1%), duration 17(8.2%) , other 13(6.3%) participants as described in Table-5

Table -5 Factors affecting treatment options in relation to prosthesis type

Reason for not need of replacement when teeth is lost	PRD	FIXED	implant	Total n(%)
Cost n(%)	51(25%)	21(10%)	20(10%)	92(44%)
Do not know about treatment	10(4.8%)	7(3.4%)	2(1%)	19(9.1%)
Pain / discomfort	2(1%)	1(0.5%)	1(0.5%)	4(1.9%)
Duration	9(4.3%)	8(3.8%)	0	17(8.2%)
Phobia	17(8.2%)	18(8.7)	5(2.4%)	40(19.2%)
Damage to the adjacent and NO. visit	8(3.8%)	1(0.5%)	11(5.3%)	20(9.6%)
Unhealthy	1(05%)	2(1%)	0	3(1.4%)
Other	8(3.8%)	0	5(2%)	13(6.3%)

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Discussion

As in this study, patients were evaluated for three different types of prosthesis against different influencing factors namely cost, pain and suffer, duration, number of visits, compromised abutments and phobias.

In our study, a significant difference suggesting that gender can be one of the patient factors affecting the decision for the selection of a particular treatment option. As females are more inclined towards their facial

esthetics whereas males do not give importance to their appearance much, for them comfort and functionality are prime concerns. Our results were also in agreement with Al-Quran et al (٢٣). Ahmed et al (٢٤) also concluded that esthetic rather than functional factors determine an individual's subjective need for the replacement of missing teeth

On the other hand, the analysis of treatment options and age the comparison revealed significant difference and this agree with Al-Quran et al (٢٣) (in this study analysis of treatment option and age revealed that all Groups prefer RPD more than Fixed and implant because the RPD is low cost. While when compare group I and group III in fixed treatment choice we found significant differences and this may be old age prefer RPD because is easy and less pain.

In addition to this, the level of education also played a role in choosing a treatment modality. In our study, a significant difference was found between education levels about treatment modality chosen which is in accordance with Al-Quran et al (23) who also found significant differences between levels of education with treatment modality chosen the role of education could affect the patient's awareness regarding the options and importance of tooth replacement.

Group I economic preferred the RPD treatment when compared with fixed and implant. The difference between group II and group III who seek for replacement of missing teeth with different treatments despite its non-significant the findings clearly showed that individuals with greater financial resources had better access to dental care. Result was similar to study done by, Shah et al (25) Shah et al (26), Marcus et al (27) and Mack et al (28).

When patients were asked about factors affecting their choice of treatment modality overall, cost or expense of the treatment was the most common deciding factor for choosing a particular treatment option, which is in accordance with the research carried out by Samuel et al (29), Shetty et al (30), Nayana et al(31) and Mohapatra et al (32) where of the participants cited high costs as the most determining factor for a

particular choice of prosthesis. Cost is the most affecting factor in treatment choice for missing teeth because dental procedures are typically expensive, requiring numerous visits, specialist involvement, and advanced technology use. Furthermore, treatments for missing teeth, such as dental implants or bridges, often involve complexly designed medical devices, which increase the overall expenses. This financial burden can deter individuals from choosing certain treatments, hence arranging treatments with lower costs. Consequently, despite the potential benefits of more expensive procedures, cost tends to be the predominant factor affecting patients' decision-making regarding dental treatment for missing teeth.

Moreover, in our study damage to the adjacent abutments the was accounted as the second most important factor followed by phobia of dental treatment do not know about treatment, duration and the number of visits. These findings corroborated with other studies including Kvale et al (33), Similarly, Shrirao ND et al (34) reported fear of dental treatment as the second most common deciding factor in their study.

The damage to the adjacent teeth and phobia were most affected factors reported secondly in close percentage. Phobia significantly affects the treatment options of missing teeth because it can hinder a patient’s willingness and ability to seek and continue necessary dental treatments. Dental phobia, characterized by intense fear or anxiety related to dental procedures, may lead to avoidance behavior, delaying crucial visits to the dentist. This can exacerbate a patient’s oral health condition, making teeth replacement options more complex and invasive. Furthermore, phobia can influence a patient's choice of treatment. Some may choose for less effective or temporary solutions to avoid certain procedures they perceive as frightening. Therefore, fear and anxiety can lead to significant

consequences, making phobia a crucial variable to consider when devising a treatment plan for patients with missing teeth. These findings corroborated with the study of Kvale et al (33), who found that 40% of the adult population has been reported to be afraid of dental treatment. Similarly, Shrirao ND et al (34) reported fear of dental treatment as the second most common deciding factor (17.1%) in their study.

Unknowing treatment option and duration of treatment were closely reported in close percentage. Dental illiteracy can significantly impact the treatment options available for missing teeth. When individuals lack knowledge about the varying treatment methods such as dental implants, Fixed, or RPD and their respective benefits and drawbacks, they may lean towards simpler and cheaper options which may not be the most effective ones for their dental situation. This could lead to further complications or dissatisfaction with the results. Moreover, they might not adhere to post-treatment preventive measures due to lack of awareness. Therefore, dental literacy is crucial for all patients to make informed decisions about their dental care and to ensure optimal resolution of their dental issues.

Tepper et al(35)who reported that 15% complained the time for healing and prosthodontics management was too long. In other investigations conducted by Satpathy et al(36)mentioned that 26% of participant reported duration as an affecting factor of their choice.

Pain and discomfort alongside with health problems reasons were barely reported in very few percentages. The presence of pain and discomfort significantly influences an individual's treatment choice concerning missing teeth. Patients typically desire a treatment that offers relief from pain and discomfort while also addressing the issue of missing teeth. More invasive procedures, such as dental implants, might be overlooked

due to fear of pain during and after the procedure. On the other hand, non-invasive procedures like dentures, which are often associated with less pain, might be preferred. The potential for discomfort may also push some patients to choose for temporary solutions, like partial dentures or bridges, rather than permanent ones. Therefore, the patient's perception of pain and discomfort can greatly impact their decision-making concerning missing teeth treatment. As study reported by Al Quran et al (23) 53.9% participants reported pain and discomfort while 18.9% reported phobia as a major concern for not selecting removable dentures this prosthesis which is also supported by other from Shetty et al (30)' who reported 42.4% subjects with discomfort and pain and Satpathy et al (36) reported 71.24 % participants experiencing pain while wearing single tooth replacing removable dentures.

Conclusion:

With the limitations of this study, including a relatively small sample size and Single-Center Study, the following was concluded:

The replacement of missing one or two teeth, is based on multiple factors, where was the cost is the most common influencing factor considered by the patient, and the most dominant choice among patients was RPD treatment option. In general, age, monthly income and patient's education had no significant association with choice of treatment. Additionally, gender did affect the choice of treatment options.

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