An Evaluation of Factors Determining Patients' Choice of Dental Prosthesis in a Nigerian Tertiary Health Institution

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ABSTRACT

Objective: This study aimed at determining the factors that influence patients' decision-making process in the choice of teeth replacement.

Methods: This survey was conducted among 242 patients between 17 to 86 years, seeking dental prosthesis in a tertiary dental institution in Lagos, Nigeria. Data was collected using pre-tested interviewer-administered questionnaires designed to evaluate the factors determining patients' choice of dental prostheses. The resulting data were statistically tested using chi-square and Spearman's rank correlation coefficient with p-value ≤ 0.05 indicating significant level.

Results: Most recruited participants opted for Acrylic resin removable partial dentures (RPD). Amongst those who chose RPD, a significant number of participants 128(82.5%) did so, due to the cost of the prosthesis (p=0.001). Patients who opted for fixed replacement considered improved aesthetics 74(88.1%), chewing ability 79(94.1%) and comfort 75(89.2%). Fear of surgical procedure, made participants choose dentures and bridges.

Conclusion: Resin-based removable partial dentures were the most utilized options for teeth replacement in our Nigerian study population as these patients perceive them as cost-effective. Also, patients' choice of fixed prosthesis was often due to their perceived aesthetic and functional advantages.

Keywords: Dental prosthesis, factors, patients' choice, teeth replacement

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INTRODUCTION

Partial edentulism remains a crucial reason for dental visitation till date as a complete dentition plays an all important role in the maintenance of a positive self-image, and more individuals are becoming conscious of their facial appearance.[1-4] Tooth loss causes psycho-social and functional changes, which may disrupt an individual's daily activities resulting in the

need for tooth replacement and overall prosthetic rehabilitation.[5,6] The treatment options available for rehabilitating these patients are still centered on opting for removable partial dentures (RPD) which may be conventional or flexible partial dentures; fixed prosthetic options which includes fixed-fixed bridges, resin bonded bridges; and single dental implants or implant supported prosthesis.[7,8]

Previously, in the absence of peculiar treatment indications, choosing between these available replacement options depended principally on the dental practitioners as regards which treatment option is most suitable for their patients. Results obtained from a few studies conducted among experienced general dentists reported that patients had little influence on prescriptions of dental prosthetic therapy.[9,10] However, with the advent of patient-centered dental practice, patients are now assuming active roles in determining their actual treatment needs.[11] Dental health providers now duly inform their patients about different treatment options available which enables the patients make a decision based on the information provided while airing their views on aesthetic and functional expectations required of the definitive prosthesis.[12,13] Factors that have been proposed to determining patient's choice of dental prosthesis have included: mechanical, demographic and cultural factors. Respectively these factors determine the function, comfort and the aesthetic reasons for the prosthesis of choice.[7,13-15] However, generalizations of these factors cannot be made due to geographical and economic variations that may additionally confound prostheses selection. Considering the increasing influence of patients in dental decision making in our region, it is important to evidently determine the factors tilting prosthodontic patients towards their respective tooth rehabilitative procedures. Hence, this study aims to evaluate the key considerable factors that determine patients' choices when selecting a dental prosthesis, and we hypothesize that this will be in tandem with the economic situation of the region with cost-efficiency being the most implicated factor.

MATERIALS AND METHODS

This descriptive cross-sectional study was conducted among individuals seeking dental prosthetic rehabilitation at the outpatient clinics of the Prosthodontic and Conservative outpatient clinics of the Lagos University Teaching Hospital, Lagos Nigeria between June 2017 – October 2018. Participants were included in the study if they were partially edentulous and needed to replace the missing teeth with either resin-based removable or fixed dental prosthetic options. However, those who had special considerations that indicated the use of a specific treatment option were excluded from the study. Further excluded were completely edentulous patients or those unwilling to participate in the study. In our center, it is routine for the operator (dentists or dental undergraduate) to inform patient on their diagnosis and the different options available for management of edentulousness on a case-by-case basis. This includes information on the type of treatment, providing pictures and images or finished dental prosthesis to encourage familiarity and informing them on the cost implication of each treatment option.

Sample size for the study was determined using the formula: $n = Z^2pq/ d^2$. The standard normal variate at 5% type I error (Z) and precision value (d) were set at 1.96 and 0.05 respectively. Expected population proportion (p) was 0.82 according to a previous study by Shrirao et al.[13] A total of 250 participants (giving due consideration to a 10% non-response rate), and subjects that met the inclusion criteria were recruited consecutively as they presented to our health facility until the sample size was attained.

Data was collected from each participant using pretested, interviewer-administered questionnaires which comprised both open and closed-ended questions. The study questionnaire was initially drafted by one author (JA) in English with face validity and qualitative content validity assessment provided by authors (OAO and DCU) to ensure that the scope of the study aims was duly represented. Lay experts were also involved to ensure ease of administration and comprehension of survey items. Cronbach's alpha for construct validity and internal consistency for similar items ranged from 0.81 – 0.94. Each questionnaire comprised 25 items which was divided into three distinct sections: sociodemographic information (8 items); reasons for dental visitation (3 items); and prosthodontic history, prosthesis of choice and reasons for choice of prosthesis (14 items). Collection items in the questionnaire were limited to general predetermined factors that guide patients' choice of dental treatment and tailored to their applications in the prosthodontic patient management.[9-15] Interviews were conducted by two dentists who were calibrated prior to study commencement at the time of questionnaire pretesting. The interviewers were in

no way involved in the management of the study participants and only performed data collection following routine consultations.

Data collected was analyzed using IBM SPSS version 22 (IBM Corp, Armonk, NY, USA). Frequency distribution tables of operational variables were generated. Mean and Standard deviation were calculated where appropriate for continuous variables and Shapiro-Wilk's test was used to determine normality of these distributions. Pearson's Chi-Square test was employed to determine the significance of associations between categorical variables. Statistical significance of outcomes was evaluated at 95% confidence interval and the level of significance was set at $p < 0.05$. Ethics approval was obtained from the Research and Ethics Committee of the Lagos University Teaching Hospital with reference number: ADM/DSCST/HREC/APP/1870. In addition, written informed consent forms were duly signed by study participants before administration of data collection materials. The study was conducted in full accordance with ethical principles including the World Medical Association Declaration of Helsinki (version 2008).

RESULTS

A total of 242 participants were included in the study. There were 140(57.9%) males and 102(42.1%) females. The age range was 17 to 86 years with mean range of 45.3 ± 18.07 years. One hundred and six participants (43.8%) were within ages 18 to 39 years (young adults), while 93(38.4%) and 40(16.5%) participants were middle aged and elderly participants respectively. A third of the participants had secondary education 95(39.3%) and another third had tertiary education 83(34.3%) (Table 1). More participants 105(43.4%) received a monthly income within the range of N10,000 - N100,000 ($27.59-$275.86) while less than a third 63(26.0%) earned above N100,000 ($275.86) but less than N250,000 ($689.66). The frequency distribution of other socio-demographic characteristics of respondents are on Table 1.

Gender did not affect the choice of tooth replacement (Table 1). Majority of respondents that chose removable partial dentures 60(38.7%) and conventional bridges 26 (48.1%) were educated up to the 'secondary' level while most subjects that opted for dental implants had tertiary level of education or above. More respondents who were artisans chose removable partial dentures 81 (52.3%) or conventional bridges 25 (46.3%) while professional workers accounted for most respondents that opted for dental implants 14 (66.7%) (p=0.001). Seventy-four respondents (47.7%) who chose removable partial dentures earned between ₦10,000 – ₦ 100,000 ($27.59-$275.86) while more subjects that chose dental implants 13 (43.3%) earned between ₦250,000 – ₦500,000 ($689.66-$1,379.31) monthly (p=0.001) (Table 1).

From the total participants, 155 (64.1%) selected removable partial dentures as the prosthetic option for teeth replacement, followed by conventional bridges 54 (22.3%) and dental implants 30 (12.4%), only 3 (1.2%) subjects chose resin bonded bridges. The presence of one or more missing teeth was the most common reason for dental visits among the participants 81(33.5%), followed by tooth pain 74(30.6%). Other reasons for dental presentation of participants also included caries 25(10.3%). Swollen gums, fractured and mobile teeth each accounted for 14(5.8%) respectively, while routine checks 13(5.4%) and treatment review 7(2.9%) were other reasons for dental visits. When asked about the motivation of visit, most of the participants 183(75.6%) chose to visit the dental facility on their own volition, while 35(14.5%) and 20(8.3%) were motivated by family and friends respectively while 3 (1.2%) and 1 (0.4%) were motivated by colleagues and dentists respectively before deciding to present at the dental facility.

Prosthodontic history of respondents

About half of the participants 130(53.7%) became partially edentulous following dental extractions consequent to tooth decay, followed by tooth avulsion which accounted for the aetiology of tooth loss in 48(19.8%) participants. Among the total participants, 155(64.1%) selected removable partial dentures as the prosthetic option for teeth replacement, followed by conventional bridges 54(22.3%) and dental implants 30(12.4%). Only 3(1.2%) subjects were rehabilitated with resin bonded bridges, all of whom were 18 years old or less. One hundred and twenty-three (50.8%) participants had previously replaced one or more missing teeth before presentation. Amongst these 123 participants, 107(87.0%) had used removable partial dentures, while a total of 16(13%) were made up of participants who had used conventional/resin-bonded bridges and dental implants previously. Adequate information on the options for tooth replacement was provided by dental practitioners to 188(77.7%) participants, and they acknowledged that they had enough information on removable dentures, conventional bridges and dental implants

(Table 2). Cross-tabulation of the choice of previous and current dental prostheses revealed that 86 participants (69.9%) who previously had removable dentures opted for the same prosthesis a second time while 18 (14.6%) and 3 (2.4%) participants opted for conventional bridges and dental implants respectively. Furthermore, 5 participants (4.1%) who previously had conventional bridges opted for dental implants while only one subject (0.8%) opted for a removable partial denture instead (Table 3). Three subjects (2.4%) who previously had dental implants opted for it a second time while all subjects that had resin bonded bridges (2.4%) chose dental implant replacement therapy following consultation (p=0.001).

Table 1: Sociodemographic information and its effect on choice of dental prosthesis (n=242)

Characteristics	Frequency (%)	Removable partial denture (%)	Conventional bridge (%)	Resin Bonded bridge (%)	Implant/Implant Supported prosthesis (%)	P-value
Age (years)						0.001[a]
<18years	3(1.2)	2(1.3)	-	1(33.3)	-	
18 – 39 years	106(43.8)	48(31.0)	39(72.2)	2(66.7)	17(56.7)	
40 – 64 years	93(38.4)	66(42.6)	14(25.9)		13(43.3)	
>64 years	40(16.5)	39(25.2)	1(1.9)			
Sex						0.215[b]
Female	102(42.1)	69(44.5)	24(44.4)		9(30.0)	
Male	140(57.9)	86(55.5)	30(55.6)	3(100.0)	21(70.0)	
Education						0.001[a]
None	13(5.4)	13(8.4)				
Primary	27(11.2)	26(16.8)	1(1.9)			
Secondary	95(39.3)	60(38.7)	26(48.1)	3(100.0)	6(20.0)	
Tertiary	83(34.3)	43(27.7)	23(42.6)		17(56.7)	
Postgraduate	24(9.9)	13(8.4)	4(7.4)		7(23.3)	
Occupation						0.001[a]
Unemployed	39(16.1)	27(17.4)	4(7.4)	3(100.0)	5(16.7)	
Artisans	115(47.5)	81(52.3)	25(46.3)		9(30.0)	
Professional	62(25.6)	32(20.7)	16(29.6)		14(46.7)	
Others	26(10.7)	15(9.7)	9(16.7)		2(6.7)	
Monthly income (Naira)						0.001[a]
<10,000	24(9.9)	20(12.9)	2(3.7)		2(6.7)	
10000 – 100000	105(43.4)	74(47.7)	23(42.6)	3(100.0)	5(16.7)	
100001 – 250000	63(26.0)	41(26.5)	15(27.8)		7(23.3)	
250001 – 500000	44(18.2)	18(11.6)	13(24.1)		13(43.3)	
>500000	6(2.5)	2(1.3)	1(1.9)		3(10.0)	

a=statistically significant

Factors determining respondents' choice of prosthesis

The choice of dental prostheses was assessed based on six broad factors: cost, fear of advanced surgical procedures, time taken before delivery of prosthesis, aesthetics, chewing ability and comfort. Participants were asked to give reasons for their choice of prostheses. A significant number of participants 128(82.5%) preferred removable partial dentures (RPDs) because of its cheaper cost (p=0.001), others chose conventional bridges 20(37.0%), resin bonded bridges 1(33.3%) or dental implants 3(10.0%) while considering the cost of these dental prostheses (Table 4). The participants 55(22.7%) who opted for removable partial dentures 32(20.7%) or conventional bridges 23(42.6%) cited the fear of surgical procedures as a reason for them choosing these treatment options. None of the patients who decided to undergo dental implant therapy had reservations on the surgical procedures involved, these finding was statistically significant (p=0.001) (Table 4). There was no significant influence of the time taken before delivering the dental prosthesis on participants' decisions; albeit, 36(23.2%) and

17(31.5%) study participants who opted for partial dentures and conventional bridges respectively considered the time taken before obtaining their prostheses as important to making their selection.

A significant number of participants (p=0.001) who chose resin bonded bridges 3(100.0%), implants 27(90.0%) or conventional bridges 44(81.5%) considered them as the most aesthetic treatment options available to them, while about a third of participants 61(39.4%) who chose RPDs did so because of their aesthetic expectations (Table 4).

Improved chewing ability was a significant factor (p=0.001) in selecting fixed prosthetic resin bonded bridges 3(100%), conventional bridge 49 (90.7%) and dental implants 27(90.0%), while 79(51.0%) considered their ability to chew better with partial dentures as an important reason for its selection.

Participants who opted for conventional bridge 46 (85.2%), resin bonded bridge 3(100%) and dental implant 25 (83.3%) were significant (p=0.002) and did so because of the 'comfort' associated with its use, while a lower number of respondents chose RPDs for this reason. (Table 4). All participants who opted for resin bonded bridges were influenced by the dental practitioner; 20 (66.7%) participants who selected dental implants were also influenced by the dental practitioner. However, a significant number of participants (p=0.001) that opted for removable partial dentures 139 (89.7%) had little or no contributions from the dentist (Table 4).

Participants 66 (42.6%) who chose removable partial dentures were middle age, while young adults were observed to have chosen conventional bridges 39 (72.2%), resin bonded bridges 2 (66.7%) and dental implants 17 (56.7%) (p=0.001).

Table 2: Prosthodontic History and Treatment Information

Variables	Frequency (n)	Percent (%)
Cause of partial edentulism		
Tooth Avulsion	48	19.8
Dental extraction	130	53.7
Periodontitis	25	10.3
Multiple aetiology	39	16.1
History of previous teeth replacement		
Yes	123	50.8
No	119	49.2
Selected/chosen teeth replacement option		
Removable partial denture	155	64.1
Conventional bridge	54	22.3
Resin bonded bridge	3	1.2
Dental Implant/Implant retained prosthesis	30	12.4
Adequate information by dentist on teeth replacement options		
Provided	188	77.7
Not provided	54	22.3
Participants provided with chair-side information on replacement options (n=188) (multiple answers)		
Removable partial denture	179	95.2
Conventional bridge	132	70.2
Resin bonded bridge	42	22.3
Dental Implant/Implant retained prosthesis	158	84.0
Source of information on tooth replacement		
Dentist	176	93.6
Dental Student	12	6.4

Table 3: Previous versus current selected prostheses used among participants having prosthodontic tooth replacement

	Current Prosthesis selected			
Previous Prosthesis used	Removable partial denture	Conventional bridge (%)	Implant/Implant Supported prosthesis (%)	P-value
Removable partial dentures	86(69.9)	18(14.6)	3(2.4)	0.001[a]
Conventional bridge	1(0.8)	1(0.8)	5(4.1)	
Resin-bonded bridges	0(0.0)	0(0.0)	3(2.4)	
Dental implants	2(1.6)	1(0.8)	3(2.4)	

[a] Statistically Significant association; Pearson's Chi-Square; p<0.05

Table 4: Assessment of factors determining choice of dental prosthesis

Variables	Removable partial denture (%) N=155	Conventional bridge (%) N=54	Resin Bonded bridge (%) N=3	Dental Implant/ Implant Supported prosthesis (%) N=30	P-value
Reason for choice of prosthesis					
Cost	128 (82.5)	20 (37.0)	1 (33.3)	3 (10.0)	0.001[a]
Fear of Surgical/Advanced procedures	32 (20.7)	23 (42.6)	0 (0.0)	0 (0.0)	0.001[a]
Time consideration	36 (23.2)	17 (31.5)	0 (0.0)	2 (6.7)	0.053[b]
Aesthetics	61 (39.4)	44 (81.5)	3 (100.0)	27 (90.0)	0.001[a]
Chewing ability	79 (51.0)	49 (90.7)	3 (100.0)	27 (90.0)	0.001[a]
Comfort	95 (61.3)	46 (85.2)	3 (100.0)	25 (83.3)	0.002[a]
Influence of treatment provider on choice of prosthesis					
Yes	16 (10.3)	30 (55.6)	3 (100.0)	20 (66.7)	
No	139 (89.7)	24 (44.4)	-	10 (33.3)	.001[a]

[a] Statistically Significant association; Pearson's Chi-Square; p<0.05
[b] No statistically significant association; Pearson's Chi-Square; p>0.05

DISCUSSION

The importance of dental prostheses cannot be over-emphasized as they are responsible for rehabilitating facial aesthetics and oral function in edentulism. When practitioners provide necessary information on different treatment modalities, patients are able to make decisions based on the details received. This present study aimed to determine the most crucial aspects considered by patients before opting for a particular dental prosthesis from a list of predetermined factors, which include cost, fear of surgical procedures, time frame to deliver prosthesis, aesthetics, chewing ability and comfort.

Most of the individuals in the study visited the dental clinic for missing teeth replacement and majority presented on their own accord without motivation from friends, family or colleagues. The most commonly selected dental prosthesis by participants after adequate information had been provided was the removable partial denture (64.1%). This observation corroborates what another study reported about RPD being the most common tooth replacement within the region.[16] The conventional fixed bridges (22.3%) were the next most common teeth replacement option chosen by the patients; albeit this choice is low, and agrees with the report by Ogunrinde et al.[15] on the poor utilization of fixed prostheses in Nigeria.

This study observed that most patients who chose removable partial dentures for teeth replacement, did so because it was cheaper than other treatment modalities. This observation may be attributed to the

monthly income of patients and to a lesser extent their occupation. Most patients that opted for removable dentures earned less than the naira equivalent of $275 monthly, it would be almost impossible to afford a three-unit conventional porcelain fused-to-metal bridge or a single dental implant estimated at $413 and $826 respectively. This finding corroborates the observation of Shrirao et al.[13] in a cross-sectional survey carried out in Maharashtra, India where 71.1% of the study patients declined treatment plans involving teeth replacement with expensive proposed fixed restorative options for cheaper removable options due to their inability to afford the expensive option. Furthermore, our finding is also consistent with a comparative study among Jordanians, utilizing different dental prosthetic options, which reported low socioeconomic status as an "indication" for opting for the removable treatment option.[6] The similarity in reasons at the three centers may be linked to closeness in the socioeconomic status distribution of Indians, Jordanians and Nigerians.

Concerning phobia for surgical procedures, none of the patients who opted for dental implant therapy expressed concerns on the fear of the procedures, while 22.7% of the patients adduced their choice of removable dentures and conventional bridges to their fear of implant surgery, as they perceived the former as safer treatment options. Annibali et al.[17] reported that most individuals who opted for dental implants were more satisfied with its aesthetic (82.8%) and functional (94.2%) outcome. Al-Quran et al.[8] further expanded on this, citing that aesthetic and functional expectations accounted for most reasons why subjects opted for fixed partial dentures or dental implants. These facts were corroborated by our study where most patients trusted fixed than removable prostheses in restoring or maintaining their aesthetics (81.5%) and chewing ability (90.7%); hence their reasons for opting for them.

Comfort is often regarded as one of the strong indicators for successful prosthetic rehabilitation. In this present study, it represented a crucial factor considered by most individuals regardless of their type of selected prosthesis. Patients opting for fixed replacement options considered 'comfort' more than those who chose removable partial dentures. This finding is also supported by several studies that attributed better comfort to the use of conventional bridges or dental implants.[15,18-22] Respondents of their own understanding provided reasons centered on 'better retention' and 'longevity of prosthesis use' as additional reasons for selecting their preferred options. The need for 'better retention' may be attributed to the higher distribution of young adults in this study as opposed to other age group, with younger individuals perceiving removable prostheses as an appliance for the elderly. This reason was also cited by Grzic et al.[23]

The influence of sociodemographic characteristics such as age, sex, education, occupation and income on the participant's choice of prosthesis was also assessed. Age significantly influenced prosthetics choice of the participants, as most of the individuals who were 18 to 39 years chose conventional/resin bonded bridges and dental implants while more subjects who were 40 to 64 years of age and the elderly subjects preferred removable partial dentures. This is in keeping with the report of Zitzmann et al.[24] identifying age as an important determinant of prosthesis choice.

However, our study is slightly at variance to a retrospective study in Nigeria[15] involving 1518 subjects where the use of fixed prosthetic options increased from young to middle age adults and only declined in elderly. Also, our study did not totally corroborate the recent reports of Elagra et al.[25] among Saudi Arabians where more middle age subjects in addition to young adults opted for fixed prosthetic options while more elderly subjects opted for removable partial dentures.[23] Our study found that gender did not significantly affect the choice of prosthesis, although this may be due to the higher number of male participants in this study which may have skewed this observation. There was significant association between education and occupation on prosthesis selection, as more participants with tertiary or post-tertiary level of education opted for dental implants in comparison with more individuals with secondary education who opted for conventional bridges and removable partial dentures. In addition, more individuals with professional jobs opted to undergo dental implant therapy while most self-employed individuals preferred removable partial dentures and conventional bridges.

CONCLUSION

Resin based removable dentures were most commonly selected dental prosthesis by patients for replacement of missing teeth in our Nigerian study population, and the cheaper cost of this option was the most important reason for its selection. Most subjects that selected conventional bridges or dental implants did so for their better aesthetics and masticatory functions. In addition, most individuals

made their choice considering the comfort offered with prosthesis use. Age influenced the decision-making of patients as younger individuals chose more fixed options while older patients selected more removable options. To obtain concrete evidence on patients' factors for prosthesis choice in general, large multicenter studies from different regions are now required.

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Nil.

Conflict of Interest
None declared

REFERENCES

1. Roessler DM. Complete denture success for patients and dentists. Int Dent J 2003; 53(5):340-345.
2. Ogbebor OG, Azodo CC. Reasons for seeking dental healthcare services in a Nigerian missionary hospital. Sahel Med J 2016; 19:38-43.
3. Wittneben JG, Wismeijer D, Bragger U, Joda T, Abou-Ayash S. Patient-reported outcome measures focusing on aesthetics of implant and tooth-supported fixed dental prostheses: A systematic review and meta-analysis. Clin Oral Implants Res 2018; 29(16):224-240.
4. Maklcmacher L. Total dental aesthetics. Dent Today 2013;32(11):134-137.
5. Omar R, Tashkandi E, Abduljabbar T, Abdullah MA, Akeel RF. Sentiments expressed in relation to tooth loss: a qualitative study among edentulous Saudis. Int J Prosthodont 2003; 16(5):515-520.
6. Fiske J, Davis DM, Frances C, Gelbier S. The emotional effects of tooth loss in edentulous people. Br Dent J 1998; 184:90-93.
7. Al-Quaran FA, Al-Ghalayini RF, Al-Zu'bi BN. Single tooth replacement: Factors affecting different prosthetic treatment modalities. BMC Oral Health 2011; 11:34-38.
8. Chau TN, Witter DJ, Kreulen CM, Creugers NH, Tu HH. Replacement of missing teeth in a southern region of Vietnam – a descriptive dental laboratory study. Int Dent J 2009; 59(4): 192-196.
9. Grembowski D, Milgrom P, Fiset L. Factors influencing dental decision making. J Pub Health 1988;48(3):159-167.
10. Leles CR, Freire MCM. A sociodental approach in prosthodontics treatment decision making. J Appl Oral Sci 2004; 12(2):127 -132.
11. Scambler S, Delgado M, Asimakopoulou. Defining patient-centred care in dentistry? A systematic review of the dental literature. Br Dent J 2016; 221(8):477-484.
12. Rich G, Goldstein B. New paradigms in prosthodontic treatment planning: A literature review. J Prosthet Dent 2002; 88:208-214.
13. Shrirao ND, Deshmukh SP, Pande NA, Radke UM. An evaluation of patient's decisions regarding dental prosthetic treatment. J Indian Prosthodont Soc 2016; 16:366-371.
14. Jung HY, Kim HG. Factors affecting patients' decision-making for dental prosthetic treatment. J Korean Acad Prosthodont 2008; 46: 610-619.
15. Ogunrinde TJ, Gbadebo SO, AO Sulaiman. Trend of Prosthetic rehabilitation of partially edentulous patients in a Nigerian Teaching Hospital. J West Afr Coll Surg 2015; 5(2):84-89.
16. Oremosu OA, Umesi DC, Savage OH. Pattern of tooth replacement and colour choice among patients in a Nigerian teaching hospital. Niger Quart J Hosp Med. 2014; 24(2):169-174.
17. Annibali S, Vestri RA, Pilotto A, La Monaca G, Di Carlo S, Cristalli MP. Patient satisfaction with oral implant rehabilitation: evaluation of responses to a questionnaire. Ann Stomatol (Roma) 2010; 1(3-4):2-8.
18. Singh RK. A survey based evaluation and assessment of satisfaction and countenance of patients wearing partial dentures. Int J Med Health Res. 2017; 3(8):34-37.
19. Yao J, Tang H, Gao XL, McGrath C, Mattheos N. Patients' expectations from dental implants: a systematic review of literature. Health Qual Life Outcomes 2014; 12:153. doi. 10.1186/s12955-014-0153-9
20. Dudley J. Implants for the ageing population. Aust Dent J 2015; 60(1):28-43.
21. McCrea SJJ. An analysis of patient perceptions and expectations to dental implants: Is there a significant effect on long-term satisfaction levels? Int J Dent. 2017. doi. 8230618.
22. Moghadam M, Dias R, Kuyinu E, Ferguson MB, Mucciolo T, Jahangiri L. Pre-doctoral fixed implant patient satisfaction and challenges of a clinical implant competency. J Dent Educ *2012; 76(4):437–442.*

23. Grzic R, Spalj S, Lajnert V, Glavicic S, Uhac I, et al. Factors influencing a patient's decision to choose the type of treatment to improve dental esthetics. Vojnosanit Pregl 2012; 69(11):978-985.
24. Zitzmann NU, Marinello CP, Zemp E, Kessler P, Ackermann-Liebrich U. Tooth loss, dental restorations and dental attendance in Switzerland. Schweiz Monatsschr Zahnmed 2001; 111:1288-1294.
25. Elagra MEI, Alhayek AIA, Al-Mutairi BFM, Aljohar NA, Aladwani RA. Changing trends of prosthetic rehabilitation of partially edentulous patients visiting a tertiary dental hospital. J Family Med Prim Care 2019; 8(6):1914-1918.