Study for Selection Criteria of Two Types Fixed Partial Dentures in Iraqi Population

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Abstract

Fixed prosthodontics is the area of prosthodontics focused on permanently attached (fixed) dental prostheses. The superb esthetic and biocompatible characteristic of ceramic and zirconia restorative materials make both the most pioneer materials for the construction of the fix prostheses by the dentist. Such dental restoration is called direct or indirect restorations according to their method of construction. They include crowns, bridges (fixed dentures), inlays, onlays, and veneers. Prosthodontist is a specialist dentist who have trained to select the proper types, material and design of the fixed prostheses. However, comprehensive information about the dental materials are available from the internet websites and social media, which improved the patient's knowlege and consequently they may share physician in their decision in selecting the tooth reconstruction materials. The current survey study concerned three factors that may affect patient's choice for the fix prostheses: (1) internet information, (2) doctor advice, (3) the cost. A total of 100 patients who attending the clinic of the Operative Dentistry in the last 16 months for aesthetic restorations were included in the survey. The samples included 72 female and 28 males of age ranged between 30 and 69 years. The survey based on the criteria for selection the type of fixed metal according to the following items,(1) internet and social media information's, (2) advice of doctor, and (3) the price. The results showed that 67 of patient's choose zircon while 33 of them choose porcelain fused to metal. Furthermore, the results revealed that the internet represented 36% of selection criteria chosen for this study, compared to 34% due to doctor advice and 30%. Due to cost of the treatment The P value were <0.001 significant. The primary reason for selecting zirconia over porcelain fused to metal was the doctor advice and the internet. Where the cost was the main reason in choosing Porcelain fused to metal,plus the sex, age, and marital status.

Keywords: *Zirconia, PFM, Prosthodontics, Indirect.*

Introduction

Due to its reliability, the porcelain fused to metal (PMF) was considered as gold standard fixed for partial dentures and crowns for the last 30 years. But the complete opacity of this metal requires a thick fuzzy layer, which create difficulties in imitative esthetics as inherent in a natural tooth. The main problem for all ceramic type restorations are their fracture probability due to the occlusal forces[1].But still, the use of full ceramic prosthesis is increasing in last decade's[2]. Ozer et al survey found that porcelain fused to zirconia crowns was identical to the PFM crowns in any type of coping system for molar or premolar teeth locations[3].

Generally the essential limitation of all ceramic material is their low mechanical stability[4]. The new Polycrystalline ceramics, Zirconia and aluminia, are mor stable when employd as frame material. zirconia is Yttria-stabilized tetragonal polycrystals (Y-TZP), which has high flexural strength with the transformation toughening feachers. These materials are providing

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both esthetic and good material property demanded for modern tooth restoration [3,5,6,7].

This zirconia material of a particuler advantages properties for dental applications including: high esthetics, excellent biocompatibility, low plaque accumulation, low thermal conductivity, and high strength make themdemanded from both dentist and dental tachnicions [8,9].

Since the most important requierment in dental prostheses is the accurate fiting to the abutment[10]. The progressin manufacturing (CAD/CAM) with the aide of the computer design improved the prosthetic devices techniques [8,11].

Internet and social media have bigeffect on person's dicision to in selection of the prosthesis, spacilly inhealth care as well as dental materials information. Evensome of this informations may be not correct[12],But the advantages of health informations leading to better health outcome[13].Although the social media has been widely used in Iraq, there has been limited information about their effect on people's decision to select the fixed prostheses.

This survey was done to analyze patient selection desicion for crown and fixed dentures between zirconia fused to metal or porcelain fused to metal, according to the intrnet informations, doctor advice, and the cost were the t-test was used to make the comparison.

Material and Method

A 100patients aged between25-69 years, attending outpatients the Department of Operative Dentistry for restorations, and the esthetic area were included. The number of females were 72, and of males 28. This survey based on the selection of fixed crown or bridge employing either ceramic fused to metal or zircon. The selection material criteria based on the advice of doctors, internet informations, or the price. The patients marital Status and employement, was also recorded.

Result

The total recorded informations for all subjects were presented in table 1. The result revealed that the mean age was 41.5 ± 11.7 years. The age group between 40 – 49 years showed the highest frequency (38%) while age group between 60 – 69 years showed the lowest frequency (10%). Female to male ratio was 2.57:1, and the employed subjects were slightly higher compared to unemployed. The majority of the patients was married (81%), table 1.

Table 1: Sociodemographic characteristic

Variables	Percentage
Number	100
Age (Years), mean ± SD	41.5 ± 11.7
<30 years	18.0%
30 – 39 years	19.0%
40 – 49 years	38.0%
50 – 59 years	15.0%
60 – 69 years	10.0%
Gender, n (%)	
Female	72%
Male	28%
Working status, n (%)	
Unemployed	38.0%
Student	15.0%
Employed	47.0%
Marital status, n (%)	
Unmarried	19.0%
Married	81.0%

Table 2: Assessment of dental status

Variables	Percentage
Number	100
Groups, n (%)	
Zircon	67.0%
Porcelain fused to metal	33.0%
Selection criteria, n (%)	
Doctor advice	34.0%
Internet	36.0%
Cost	30.0%
Teeth number, n (%)	
Anterior teeth	50.0%
Posterior teeth	40.0%
Both	10.0%

Tables 2,3 revealed that the male, and the married patients were significantly higher in choosing Porcelain fused to metal. In terms of selection criteria, the cost was the main cause in adopting Porcelain fused to metal. While the doctor's advice, and the internet information was the major cause in choosing Zircon.

Table 3: Comparison for the selection between the two types fixed restoration for all variables.

Variables	Zircon	Porcelain fused to metal	p-value
Number	67	33	-
Age (years), mean ± SD	39.0 ± 11.4	46.6 ± 10.9	0.002 [S]
Gender, n (%)			
Female	54 (80.6%)	18 (54.5%)	0.009 [S]
Male	13 (19.4%)	15 (45.5%)	
Selection criteria			
Doctor advice	31 (46.3%)	3 (9.1%)	<0.001 [S]
Internet	34 (50.7%)	2 (6.1%)	
Cost	2 (3.0%)	28 (84.8%)	
Working status, n (%)			
Unemployed	25 (37.3%)	13 (39.4%)	0.852
Student	11 (16.4%)	4 (12.1%)	
Employed	31 (46.3%)	16 (48.5%)	
Marital status, n (%)			
Unmarried	18 (26.9%)	1 (3.0%)	0.004 [S]
Married	49 (73.1%)	32 (97.0%)	
Teeth number, n (%)			
Anterior teeth	37 (55.2%)	13 (39.4%)	0.330
Posterior teeth	24 (35.8%)	16 (48.5%)	
Both	6 (9.0%)	4 (12.1%)	

Discussion

This study focused on the patient chooses for the type of fixed prosthesis zirconia-based and PFM.

The selection was either by patient getting information from internet, or through doctor advice,plus the cost. The result showed that the selection of patient based on internet information demonstrated a significant effect. This indicated that patients actively contributed in decisions relating to the internet dental care information. Many authors postulated that a big number of patients used the internet as a source of information for this purpose[14].

The second criteria regarded in this study were the advice of the dentist. The results showed that dentist advice was also one of the most causes for choosing Zircon, as illustrated in table 2. Doctor advice based on the following zirconia properties.

Zirconiaused as a restorative material satisfying the esthetic and functional requirements. Zirconia framework is more accepted than metallic, speasully when manufacturers introduce colored zirconia matching the natural tooth colors[15]. Furthermore, the exceptional zirconia Strength make it adequate core material for dental crowns and bridges. Also its high esthetic directed to specific development of materials that are capable of replacing porcelain-fused-to-metal systems [16, 17].

Ozer et al in their survey on durability of posterior zirconia and porcelain-fused-to-metal crowns in private practice revealed that crowns fabricated with zircon corepluse the three commercial zirconia coping systems showed superior long-term survival. Murray et al postulated that zirconia crwns were more durable than the conventional PFM ceramic[15].

Nowadays dental manufacturers fibricate zirconia crowns and bridges with the assisment of the CAD CAM milling machine or 3D printing. The output of these techniques produce crowns with superb fiting[8,19].

The metal based crowns and bridges provid excellent biocompatibility but still some patient's possess allergic reactions using them. Whil zirconia owns excellent biocompatibility with extrimly safe propreties [10].

Conclusion

1. The doctor advice and the internet were the main cause for choosing Zircon
2. The cost was the main cause for choosing Porcelain fused to metal
3. The male, and married patients were significantly higher in intending Porcelain fused to metal.

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References

1. Jalalian, E., Atashkar, B., & Rostami, R. The effect of preparation design on the fracture resistance of zirconia crown copings (computer associated design/computer associated machine, CAD/CAM system). Journal of dentistry (Tehran, Iran), 2011; 8(3), 123-129.
2. Komine F, Blatz MB, Matsumura H. Current state of zirconia-based fixed restorations. Journal Oral Science.2010;52:531–539.
3. Fusun Ozer, Francis K. Mante. A retrospective survey on long-term survival of posterior zirconia and porcelain-fused-to-metal crowns in private practice. Quintessence international prosthodontics. 2014;45(1):6-12.
4. Irena Sailer, Nikolay Alexandrovich Makarov, Daniel Stefan Thom, Marcel Zwahlenc, Bjarni Elvar Pjetursson. All-ceramic or metal-ceramic tooth-supported fixed dental prostheses, A systematic review of the survival and complication rates. Part I: Single crowns (SCs). Dental Material journal 2015;31(6):603-23.
5. Cavalcanti AN, Foxton RM, Watson TF, Oliveira MT, Giannini M, Marchi GM. Y-TZP ceramics: Key Concepts for Clinical application. Operative Dentistry. 2009;34: 344–351.
6. Shi JY, Li X, Ni J, Zhu ZY. Clinical Evaluation and Patient Satisfaction of Single Zirconia-Based and High-Noble Alloy Porcelain-Fused-to-Metal Crowns in the Esthetic Area: A Retrospective Cohort Study. Journal Prosthodont. 2016;25(7):526-530.
7. Ossama Saleh Abd El-Ghany, Ashraf HuseinSherief. Zirconia based ceramics, some clinical and biological aspects: Review. Future Dental Journal. 2016;2: 55-64.
8. Baig MR, Tan KB, Nicholls JI. Evaluation of the Marginal Fit of a Zirconia Ceramic Computer-Aided Machined (CAM) Crown System. Journal Prosthetic Dentistry. 2010;104: 216–227.
9. Herbert T.Shillingburg, David A. Sather, Edwin L. Wilson, Donald L. Mitchel, Luis J. Blanco. James C. Kessler: Fundamentals of fixed Prosthodontics 4th, Chapter 23/all-ceramic restoration. 2014; 425-466
10. Seok-Joon Ha and Jin-Hyun Cho. Comparison of the fit accuracy of zirconia-based prostheses generated by two CAD/CAM systems. The Journal of Advanced Prosthodontics.2016;8(6):439-448.
11. Ariel J.Raigrodski. Contemporary materials and technologies for All-Ceramic Fixed Partial Dentures: A review of the literature. The Journal of Prosthetic Dentistry. 2004; 29(6):557-562.
12. I. G. Chestnutt and K. Reynolds. How has the Internet affected dentistry?.British Dental Journal. 2006; 200: 161–165.
13. Murray E, Lo B, Pollack L, et al. The Impact of Health Information on the Internet on Health Care and the Physician-Patient Relationship: National U.S. Survey Among 1.050 U.S. Physicians. Journal of Medical Internet Research. 2003;5(3):e17.
14. Von Muhlen M, Ohno-Machado L Reviewing social media use by clinicians. J Am Med Inform Assoc 2012;19: 777-781.
15. Elie E Daou and Maha Al-Gotmeh. Zirconia Ceramic: A Versatile Restorative Material. Dentistry- an open access journal2014;4 (4): 2161-1122.
16. Bajraktarova-Valjakova, E., Korunoska-Stevkovska, V., Kapusevska, B., Gigovski, N., Bajraktarova-Misevska, C. & Grozdanov A. Contemporary Dental Ceramic Materials, A Review: Chemical Composition, Physical and Mechanical Properties, Indications for Use. Open access Macedonian Journal of Medical Sciences. 2018 ;6(9), 1742-1755.
17. Zarone F, Russo S, Sorrentino R. From porcelain-fused-to-metal to zirconia: Clinical and Experimental Considerations. Dental Materials. 2011; 27(1):83-96.

18. Attia A. Influence of surface treatment and cyclic loading on the durability of repaired all-ceramic crowns. Journal of Applied Oral Science. 2010;18(2):194-200.

19. J. Abduo, K. Lyons & M. Swain. Fit of zirconia fixed partial denture: a systematic review. Journal of Oral Rehabilitation. 2010;37:866–876