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Measurement of patient satisfaction with two different restorative materials in non-aesthetic zone area by using OHIP5: Prospective study

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ABSTRACT

Background: Many dental restorative materials are used in dental clinics, while in a new practice, many countries are trying to ban dental amalgam for many reasons. Dental mercury is the main issue for suspending the use of dental amalgam. Another restoration method, the composite restoration for posterior and anterior teeth for esthetic porous, became the alternative to amalgam.

Aim: To measure patient satisfaction with two different materials based on multiple criteria using an oral health impact profile (OHIP) form.

Method: This is a prospective study on two groups. The patients visiting the clinic with a vital posterior tooth indicated for restoration were requested to participate in the study. The first group received composite restoration of the posterior teeth. Contrarily, the second group underwent an amalgam restoration application. Patient satisfaction was assessed using the OHIP5 to assess different aspects of patient satisfaction. The patients were asked to fill out a form before starting the procedure, and after 4 weeks, the procedure was reported. The operators were requested to fill out their forms based on the procedure done to determine the participant eligibility criteria.

Results: Overall 64 subjects were involved in the study among them 35 participants who received composite restoration, 48.5% were female, whereas 51.5% were male. Under other conditions, the patients who underwent amalgam application were 29, and 41.4% were female. Based on the study results, the participants underwent before and after assessment and showed no demands for different aspects with the two different materials.

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Conclusion: No significant differences using amalgam or composite restoration regarding appearance, functional, and psychological factors in the posterior teeth were noted.

Keywords: *Quality of Life, dental restoration, amalgam, composite, dentistry*

INTRODUCTION

Quality of Life (QoL) is defined as an individual's perception of their position in life concerning the culture and value systems where they live and their goals, expectations, standards, and concerns.[1–3] We evaluated the patient's physical health, psychological state, level of dependence, social relationships, and relationships with the surrounding environment. The precise method to evaluate the patient quality of life is with OHIP, which initially was the OHIP49 (Slade and Spencer et al. developed. The validated the original 49-item OHIP[4]) and this has been reduced to five items, providing 90% of the information. They tested the OHIP in Swedish,[5] Dutch,[6] German,[7] Japanese[8] and US English for validation,[9] and these 5 items have been translated to the Arabic language by Mohammed Nasser Alhajj.[10]

In the past, amalgam was the material of choice used for a posterior cavitated tooth. Nowadays, some countries limit the use of amalgam.[11–14] There are some drawbacks of amalgam due to its mercury content, and whether it has an adverse effect or not and the esthetics, is controversial. Gradually, resin composites have come into the market as an alternative to amalgam. In modern dentistry, the composite has become the first choice for many clinicians, and the primary cause is the patient's concern and interest in esthetics.[15] However, a composite resin is usually associated with some disadvantages.

The two materials used for restoring the posterior teeth in the present study are amalgam and composite restoration. Each has different properties that will provide different options for choosing the appropriate material. The serviceable parts of amalgam withstand high occlusion force, but its main disadvantage is its color. Tooth-colored restoration, composite resin, is highly preferable due to its esthetics. Meanwhile, its main disadvantages are polymerization shrinkage, postoperative sensitivity, and clinician skills in material success. Fortunately, some factors could decrease polymerization shrinkage.[16–18]

The concern with this field is that many studies look at aesthetic acceptance in a non-aesthetic zone, whereas non-aesthetic factors should be considered. The aims of the study were (i) to measures patient satisfaction with amalgam and composite restorations on posterior teeth based on criteria like happiness, oral function, and psychological factors and (ii) to understand the patient's consideration and preference for the esthetic value of the materials while getting a posterior restoration.

MATERIALS AND METHODS

The prospective study for comparing two direct restorative materials ensued for a month. Sixty-four participants with class I or II (G.V Black Classification) Carious posterior permanent teeth on upper and lower jaws will be restored with either resin composite Tetric N-ceram (hybrid) using total etching fifth generation, including using a rubber dam and this group had 35 participants. Twenty-nine teeth were restored with silver amalgam (high copper with a mixed shape by a specialist, general dentist, or dental student under specialist observation at the Majmaah University, and in some private clinics in Zulfi town, Riyadh, Saudi Arabia). Composite restorations were much higher than amalgam in samples, so we conducted random sampling to reach a total of 35 for better statistical comparison. However, the amalgam restoration samples have been considered as convenience sampling. The protocol for this research was approved

by the Research Ethics Committee no. (2019/7) at the Majmaah University, Saudi Arabia.

Patient selection

Patients came to the university or private clinics with teeth that required removal and/or direct restoring/replacing with a direct restoration. The patients included in the research were those with class I or class II caries lesions upon G.V. Black classification concerning upper and lowered vital permanent posterior teeth. At the same time, those who completed the phases of data collection and filled in the patient contact number didn't undergo any procedure between the 2 phases. Also, all the restorations were placed in isolated environments using rubber dam sheets or cotton rolls with the additional treatment required, such as dental varnish application or pulp protection, especially if the cavity was more than 2.5mm in depth. Patients with root canal treatment or mixed dentition were excluded from the research. In addition, the data were precluded if there was an absence of response in the recall phase or a lack of patient interest. The composite restorations in the anterior region were excluded to compare the difference between these restorations in the same application area. Composite layering techniques should be done to be eligible for the study.

Data collection

The questionnaire used in this research was the OHIP5 Arabic language version (Table 1). There were two phases for data collection from the patients and one postoperative procedure from the operator. The patients were asked to fill out the data collection form in two phases with the same questions before the treatment and again four weeks after the procedure by contacting the patient through WhatsApp, telephone call, or clinical appointment. The patient satisfaction assessment depended on mouth function—esthetic fascinating—pain exhibition. The patient's conviction column was divided very often, occasionally, hardly ever, and never. Two more

TABLE 1. Questionnaire used in study.

Q. No	Question	Options			
Q1	صعوبة في مضغ الطعام بسبب أسنانك؟ Have you had difficulty chewing any foods because of problem with teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q2	الم مزعج بسبب أسنانك؟ Have you had painful aching in your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q3	عدم الارتياح اتجاه مظهر أسنانك؟ Have you felt uncomfortable about the appearance of your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q4	شعرت بنقص بالتذوق لطعامك بسبب مشاكل في أسنانك؟ Have you felt that there has been less flavor in your food because of problem with your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q5	صعوبة في القيام بأعمالك المعتادة بسبب مشاكل بأسنانك؟ Have you had difficulty doing your jobs because of problems with your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q6	شعرت بصعوبة بتنظيف أسنانك؟ Have you had difficulty in cleaning of your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never
Q7	شعرت برائحة كريهة بالفم بسبب مشاكل بأسنانك؟ Have you had bad odor because of problem with your teeth?	دائما very often	غالبا fairly often	نادرا hardly ever	لا يوجد never

questions were added about the cleanability of the teeth and social smell, if present. Language validation forwards and backward was done by independent translators. The operators filled in their data directly. After the data was filled out, they were required to mention the restored tooth, cavity properties, status of restoring the cavity using which material, and if the procedure required any additional materials (base/sub-base). A material-based comparison was performed for each item in the questionnaire and the total score. The response to each item was recorded in an ordinal scale with a score of 0 never representing, a score of 1 as hardly ever, a score of 2 as reasonably often, and a score of 3 very often.

Statistical analysis

The data obtained were compiled in a Microsoft Excel Spreadsheet and segregated meaningfully. The data were analyzed using the Statistical Package for Social Sciences (V.19, IBM, USA). Descriptive statistics of qualitative data were measured using frequency, whereas the median score and interquartile range were used for the ordinal scale. The data was described in terms of median and interquartile range. Inter-comparison between composite restoration and amalgam patients and between males and females was done using the Mann–Whitney U test for ordinal scale data. In contrast, responses to each question were compared using the chi-square test. P-value <0.05 was considered statistically significant.

RESULTS

Overall 64 subjects were involved in the study among them 35 participants who received composite restoration, 48.5% were female, whereas 51.5% were male. Under other conditions, the patients who underwent amalgam application were 29, and 41.4% were females. There was no statistically significant difference between the two materials concerning the total score and the individual items in the questionnaire, except for the pain sensation question preoperatively in the females and the total score (<0.05; Table 2).

Material-based comparison of responses between subjects in each group:

The responses were treated as qualitative data and were described as frequencies (Table 3). A comparison between the two materials was made using the chi-square test. There were no significant differences between the two groups regarding questions (P>0.05). The gender-based responses to individual items and the total score for the (OHIP) questionnaire among subjects receiving composite and silver amalgams. The comparison between males and females was made using the Mann–Whitney U test. Among subjects who received composite, a statistically significant difference was seen between males and females regarding all questions and the total score pre-test. No such difference was observed post-test. Among the participants who received amalgam, a statistically significant difference was observed between males and females regarding the total score of both pre-and post-tests. Apart from that, the pretest cleaning efficacy question and post-test aesthetic problem were more visible in conjunction with males (Table 4).

DISCUSSION

The options for dental restorative materials are many, which makes it difficult for dentists and patients to choose the best for different statuses. Meanwhile, several factors need to be considered before making a choice, including patients' acceptance and oral health status. Here, we are comparing amalgam and composite resin restorations based on patient satisfaction. The present study showed that male participants were more demanding in the esthetic look on the posterior teeth than females. Contradictory articles show esthetic appeal is more lenient toward females than males.[19] A study found that males have better esthetic perception than

TABLE 2. Comparison of overall score based on gender.

Questions	Overall			Males			Females		
	Material A (n = 35)	Material B (n = 29)	p value	Material A (n = 18)	Material B (n = 17)	p value	Material A (n = 17)	Material B (n=12)	p value
Q1 - pre	0±1	0±2	0.08	0±1.25	1±2	0.36	0±0	0±1.5	0.13
Q2 - pre	0±1	1±2	0.09	1±2	1±2	0.85	0±0	0±1.75	0.01
Q3 - pre	0±2	0±1.5	0.51	1.5±2	0±2	0.12	0±0	0±0	0.34
Q4 - pre	0±1	0±1	0.60	1±1.25	0±1.5	0.52	0±0	0±1	0.07
Q5 - pre	0±1	0±1.5	0.50	0.5±2	0±2	0.83	0±0	0±0	0.09
Q6 - pre	0±1	0±2	0.22	0±2	1±2	0.37	0±0	0±0	0.66
Q7 - pre	0±1	0±1	0.44	0.5±2	1±2	0.96	0±0	0±0	0.34
Q1 - post	0±0	0±0	0.81	0±0	0±0	0.95	0±0	0±0	0.40
Q2 - post	0±0	0±0	0.83	0±0	0±0	0.72	0±0	0±0	0.99
Q3 - post	0±0	0±0	0.42	0±0.25	0±2	0.31	0±0	0±0	0.40
Q4 - post	0±0	0±0	0.19	0±0	0±0	0.16	0±0	0±0	0.99
Q5 - post	0±0	0±0	0.40	0±0	0±0	0.59	0±0	0±0	0.40
Q6 - post	0±0	0±0	0.83	0±0	0±0	0.70	0±0	0±0	0.23
Q7 - post	0±0	0±0	0.78	0±0	0±0	0.99	0±0	0±0	0.40
Total Score-Pre	0±6	6±5	0.08	4.5±12.5	7±2.5	0.56	0±0	2±6.25	0.007
Total Score-Post	0±1	0±0	0.58	0±1	0±2	0.93	0±0	0±1	0.13

Material A: Composite restoration B: Amalgam restoration; P<0.05 significant

females regarding different criteria.[20] The divergence may be due to the age of females included. Contrarily, females are more cosmetically sensitive in the esthetic zone area, but only the posterior teeth were included in our study.[19]

Different research published in various databases show that women consider oral health more than men based on their regular visits to dental clinics.[21] In our study, female patients were statistically higher considering their oral health than male counterparts, as women visit dental clinics before developing dental issues for better oral health. The general population may ignore regularly visiting health practitioners due to the absence of knowledge about the importance of oral health and its effect on body health.[22,23]

In an American Dental Association statement concerning amalgam in 2021, they proposed that amalgam is considered safe to use. Nevertheless, different studies are trying to determine if there is any effect of the mercury content of amalgam on patient health.[24] Many studies mention better properties of an amalgam than composites in the posterior area.[25] Based on the results of the present study, there was no significant difference in patient preference in relation to which material was used. So, the clinicians should make amalgam restoration a restorative option for many reasons, beginning with the longevity of this material and lesser cost depending on patient affordability[26] and it is biologically compatibility.[27] The availability of silver amalgam capsules in the workplace was not sufficient so the

TABLE 3. Comparison of pre- and post- scores based on material used for restoration.

Item	Group	0.00	1.00	2.00	3.00	Total	P value
Pre-Q1	Material A	26	4	3	2	35	0.07
	Material B	16	4	4	5	29	
	Total	42	8	7	7	64	
Pre-Q2	Material A	24	5	4	2	35	0.10
	Material B	14	6	5	4	29	
	Total	38	11	9	6	64	
Pre-Q3	Material A	22	4	6	3	35	0.62
	Material B	21	1	5	2	29	
	Total	43	5	11	5	64	
Pre-Q4	Material A	24	6	4	1	35	0.63
	Material B	18	6	4	1	29	
	Total	42	12	8	2	64	
Pre-Q5	Material A	26	4	4	1	35	0.34
	Material B	20	2	4	3	29	
	Total	46	6	8	4	64	
Pre-Q6	Material A	25	4	4	2	35	0.18
	Material B	17	3	5	4	29	
	Total	42	7	9	6	64	
Pre-Q7	Material A	25	3	4	3	35	0.48
	Material B	18	4	3	4	29	
	Total	43	7	7	7	64	
Post Q1	Material A	32	1	1	1	35	0.81
	Material B	27	0	2	0	29	
	Total	59	1	3	1	64	
Post Q2	Material A	32	2	0	1	35	0.97
	Material B	27	0	2	0	29	
	Total	59	2	2	1	64	
Post Q3	Material A	30	4	0	1	35	0.29
	Material B	23	1	5	0	29	
	Total	53	5	5	1	64	
Post Q4	Material A	33	1	1	0	35	0.25
	Material B	29	0	0	0	29	
	Total	62	1	1	0	64	
Post Q5	Material A	32	1	1	1	35	0.43
	Material B	28	0	1	0	29	
	Total	60	1	2	1	64	

(continues)

TABLE 3. Continued

Item	Group	0.00	1.00	2.00	3.00	Total	P value
Post Q6	Material A	31	2	1	1	35	0.45
	Material B	26	3	0	0	29	
	Total	57	5	1	1	64	
Post Q7	Material A	32	2	1	0	35	0.60
	Material B	27	2	0	0	29	
	Total	59	4	1	0	64	

Material A: Composite restoration B: Amalgam restoration; P<0.05 significant

TABLE 4. Comparison of pre- and post- scores based on gender.

Questions	Material A			Material B		
	Males	Females	p value	Males	Females	p value
Q1 - pre	0±1.25	0±0	0.01	1±2	0±1.5	0.19
Q2 - pre	1±2	0±0	<0.001	1±2	0±1.75	0.25
Q3 - pre	1.5±2	0±0	<0.001	0±2	0±0	0.27
Q4 - pre	1±1.25	0±0	<0.001	0±1.5	0±1	0.59
Q5 - pre	0.5±2	0±0	<0.001	0±2	0±0	0.22
Q6 - pre	0±2	0±0	0.02	1±2	0±0	0.03
Q7 - pre	0.5±2	0±0	<0.001	1±2	0±0	0.06
Q1 - post	0±0	0±0	0.59	0±0	0±0	0.23
Q2 - post	0±0	0±0	0.08	0±0	0±0	0.23
Q3 - post	0±0.25	0±0	0.17	0±2	0±0	0.02
Q4 - post	0±0	0±0	0.16	0±0	0±0	0.99
Q5 - post	0±0	0±0	0.59	0±0	0±0	0.40
Q6 - post	0±0	0±0	0.95	0±0	0±0	0.13
Q7 - post	0±0	0±0	0.56	0±0	0±0	0.23
Total –Pre Score	4.5±12.5	0±0	0.001	7±2.5	2±6.25	0.01
Total – Post Score	0±1	0±0	0.19	0±2	0±1	0.02

P<0.05 significant

study was on hold for some time. Creating awareness of restorative materials has also been useful for the clinician and patient.[28,29] A discussion on the merits and demerits of restoration materials with patients will help the clinician to decide the restoration.[30-32] This eventually will help in patient satisfaction.

The limitations faced in the present study were a minimal number of samples regarding amalgam restoration, because most of the private clinics had excluded this material from their treatment options. In the eligibility criteria, only vital teeth were included. For this reason, there was a deficit in

amalgam application even if it was a better choice of application.

CONCLUSIONS

In a comparison of two materials used in non-aesthetic areas, the patients who received tooth-colored material or unaesthetic restorative material had the same satisfaction and no significant statistical difference between their responses. However, many aspects should be considered for choosing the appropriate material, one of the which is patient satisfaction.

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