

## Original Article

# Patient Satisfaction Towards Composite and Amalgam Restorations in IIUM Dental Polyclinic

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Received: 28-07-20  
Revised: 20-08-20  
Accepted: 16-09-20  
Published Online: 17-10-20

## INTRODUCTION

Dentistry continues to evolve with the development of new restorative materials. Carious lesion restoration in dental schools is performed using both tooth-colored and amalgam restorations. These materials differ largely in their properties, longevity, and esthetic value.<sup>1</sup> Resin composite provides good esthetic value. These materials bind micromechanically to the tooth structure and require minimal cavity preparation.<sup>1</sup> However, their application is very technique sensitive, and proper isolation is important since these materials require a dry field during application and setting.

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	DOI: 10.4103/SDJ.SDJ_37_20

**ABSTRACT** **Background:** Dentistry continues to evolve with the development of restorative materials. Patient satisfaction is an increasingly significant issue in dental practice; therefore, knowledge of the level of patient satisfaction with restorative materials is important. **Objectives:** The objective was to assess patient satisfaction with composite and amalgam restorations carried out by International Islamic University Malaysia (IIUM) dental students and the criteria that influence satisfaction. **Methods:** This cross-sectional study involved 42 patients treated by year 4 and 5 dental students of the Kulliyyah of Dentistry, IIUM. Sampling was conducted using a single proportion formula, and patients were reviewed 2 weeks following placement of amalgam and composite restorations. Satisfaction was assessed using a self-administered five-point Likert scale questionnaire previously validated by a pilot study involving ten patients. Data were analyzed using independent sample *t*-tests and the Chi-square tests. **Results:** Patients were more satisfied with composite restorations than with amalgam restorations in terms of color and esthetics ( $P < 0.001$ ). Other criteria, such as operator skills, treatment procedures, and external factors, had no significant effect on patient satisfaction with the restoration ( $P > 0.05$ ). Overall, patient satisfaction with amalgam (81.0%) and composite restoration (88.1%) did not differ when restorations were placed by IIUM dental students. **Conclusion:** Most patients were satisfied with the amalgam and composite restorations placed by IIUM dental students. The color and esthetic value were the major criteria affecting patient satisfaction. Treatment procedures, operator skills, and external factors did not significantly influence patient satisfaction. Hence, in terms of satisfaction, amalgam remains a reliable material for use in restorative dentistry.

**KEYWORDS:** Amalgam restoration, composite restoration, patient satisfaction

Contamination by saliva or blood may interfere with the bonding of the composite to the tooth structure, and this can later result in dislodgement of the resin composite.<sup>2</sup> Resin composite also experiences some polymerization shrinkage during light curing. This polymerization shrinkage will cause microleakages at the interface of the composite and tooth structure and will result in poor

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**How to cite this article:** Kusumawardani A, Sukmasari S, Ab Halim N, Raja Nhari RH, Abdul Habi SA. Patient satisfaction towards composite and amalgam restorations in IIUM dental polyclinic. *Sci Dent J* 2020;4:93-6.

restoration quality, as well as exposure of the tooth to the risk of secondary caries formation.<sup>3</sup>

Unlike resin composite, dental amalgam is a metal alloy that generally consists of mercury, silver, and tin.<sup>4</sup> It has been an accepted part of dental treatment for the past 170 years.<sup>5</sup> Amalgam is considered the best dental restorative material, especially for posterior teeth that are subject to high occlusal loads. It is a relatively inexpensive, long-lasting, and durable material that is easy to place in the prepared tooth, has high compressive strength and high resistance to wear, and undergoes minimal dimensional changes over time.<sup>5</sup> Amalgam is the only dental material known for its marginal sealing capacity due to the formation of corrosion products at the amalgam and tooth structure interface. However, its use is undesirable due to poor esthetics and because it requires extensive removal of tooth structures for its placement. The issue of mercury toxicity has also been a concern.<sup>4</sup>

These advantages and disadvantages of restoration materials can affect patient satisfaction with dental restorations. Satisfaction is defined as “a person’s feeling of pleasure or disappointment resulting from comparing a product’s perceived performance or outcome, in relation to his or her expectations.”<sup>6</sup> For example, patient–dentist satisfaction is achieved when procedures are explained to patients before the treatment is started.<sup>7</sup> The quality of treatment provided also gives fulfillment to patients, while technical competency increases patient satisfaction. When the patient receives treatments that are not painful, with fillings that do not dislodge or break, and when the dentist uses sterilized instruments and provides a thorough dental examination before proceeding, then patient confidence in the dentist and dental care is increased, thereby leading to an increase in satisfaction.<sup>8</sup>

Patients’ rights have become an issue of increasing importance in dental practice; therefore, understanding the patient’s satisfaction and perspective regarding the different types of restoration is important. Patient satisfaction can affect the patient’s decision in choosing a dentist, making and being compliant with appointments, and following the dentist’s recommendations.<sup>9</sup> When the patient is satisfied with dental care, better compliance and better attendance at appointments are achieved.<sup>8</sup> Patient satisfaction also depends on the quality of the dental treatment, so commitment to providing high-quality service and achieving patient satisfaction has become an important goal for most dental health-care providers.<sup>10,11</sup>

Several studies have previously assessed patient satisfaction with the restorations placed in their mouths.

However, these studies have focused on only one type of restoration. Some studies have only assessed patient satisfaction with the quality of treatment and dental care and not on the restoration itself. No specific studies have been carried out on patient satisfaction with composite versus amalgam restorations.

The objective of this study was to assess patient satisfaction with composite and amalgam restorations placed by International Islamic University Malaysia (IIUM) dental students. This study was also carried out to assess the criteria that influence patient satisfaction with composite and amalgam restorations placed by IIUM dental students.

## MATERIALS AND METHODS

This cross-sectional study was conducted on patients treated by 4<sup>th</sup> and 5<sup>th</sup> year dental students at the IIUM Dental Polyclinic from February to December 2016. Inclusion criteria were adult patients aged 18 years and older who had composite and amalgam restorations placed by IIUM dental students, who had no allergies to these two types of restorations, and who had no pain or abscess present. Exclusion criteria were patients who had their teeth restored by operators other than IIUM dental students. The sample size was calculated using the single proportion method described by Daniel.<sup>12</sup>

Eligible patients according to inclusion and exclusion criteria were reviewed 2 weeks following placement of amalgam and composite restorations. Sampling was carried out using a self-administered five-point Likert scale questionnaire.

All the participants included in the study gave written informed consent. Ethical approval was obtained from the IIUM Research Ethics Committee with approval number: IREC 575. Data obtained from the questionnaire were analyzed with SPSS v16.0 software (IBM Corp., NY, USA) using descriptive analysis, independent sample *t*-tests, and the Chi-square test.

## RESULTS

Questionnaires were completed by 42 respondents from a calculated sample size derived from Daniel,<sup>12</sup>  $n = 80$  (89% confidence level). The majority of respondents were female (28 respondents; 67%) [Figure 1]. The general satisfaction of the patients with the composite and amalgam restorations is shown in Figure 2.

### Type of restoration providing patient satisfaction

Figure 2 shows the total number of patients that were either satisfied or dissatisfied with the restoration performed by dental students. In general, most patients felt satisfied with both restoration types, with satisfaction

being slightly higher for composite restorations (88.1%) than for amalgam restorations (81.0%). However, when analyzed by Chi-square tests, no significant difference was noted between patient satisfaction with amalgam versus composite restorations ( $P > 0.05$ ).

### Criteria influencing patient satisfaction with the placed restorations

The criteria affecting patient satisfaction were assessed by dividing the questionnaire into four main sections of esthetics, operator skills, treatment procedures, and other factors (e.g., cost and the polyclinic environment). Table 1 shows the results for each criterion after analysis using the independent sample *t*-test.

Table 1 also shows the results of independent sample *t*-test analysis comparing patient satisfaction with the esthetics of amalgam restorations and composite restorations. The difference in patient satisfaction with the esthetics between composite (mean =  $3 \pm 0.61$ ) and amalgam (mean =  $2 \pm 0.84$ ) restoration was significantly

different ( $P < 0.001$ ). However, the other criteria affecting patient satisfaction, namely operator skills ( $P = 0.301$ ), treatment procedures ( $P = 0.621$ ), and other factors ( $P = 0.970$ ), did not differ significantly between the two restoration types.

### DISCUSSION

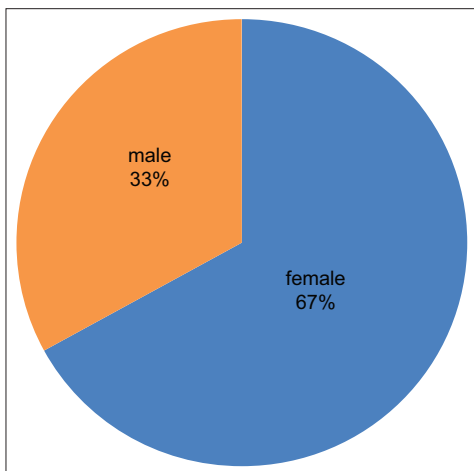
Color and esthetic value can affect patient satisfaction with restoration procedures.<sup>7</sup> The results of this research revealed significant differences in patient satisfaction with the esthetics of composite versus amalgam restorations ( $P < 0.001$ ). This finding supports a previous report by the Australian Dental and Oral Health Therapists' Association (2015), where the majority of patients chose composite over amalgam restorations because of the higher esthetic value of the composite. This higher value is due to the availability of a wide range of colors with tooth-colored restorations, so the material can be nearly the same color as the restored tooth and results in a high-quality finish after polishing.<sup>4</sup>

Operator skills may also influence the outcomes of restoration placement and can therefore affect patient satisfaction. A previous study by the Dental Practice-Based Research Network on patient satisfaction with general restorations showed that more than 80% of patients were satisfied with the skills of their dentist.<sup>13</sup> In our research, we found no significant difference in patient satisfaction regarding operator skills for placement of either amalgam or tooth-colored restorations ( $P > 0.05$ ). In the Dental Polyclinic, Kulliyah of Dentistry, IIUM, an individual patient may have multiple restorations performed by the same operator. The same operator has the same skills regardless of the type of restoration placed in the patient's mouth.

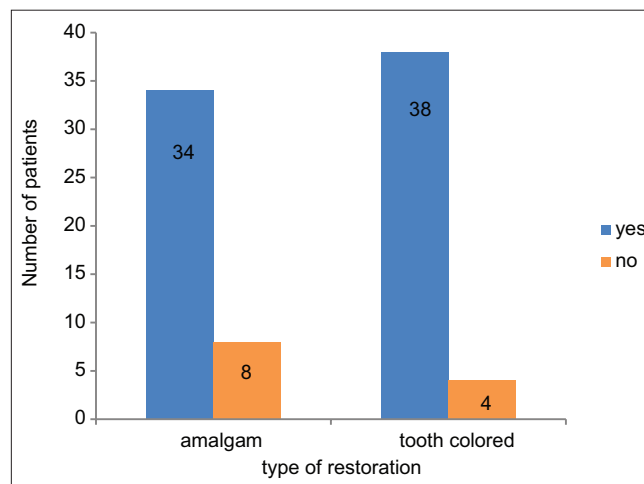
**Table 1: Criteria influencing the level of patient satisfaction (n=42)**

	Mean±SD	Statistics	Df	P
Esthetics				
Composite	3±0.61	4.463	82	0.0000
Amalgam	2±0.84			
Operator skills				
Composite	4±1.30	1.040	82	0.301
Amalgam	4±1.53			
Treatment procedure				
Composite	2±0.36	0.496	82	0.621
Amalgam	2±0.30			
Other factors				
Composite	2±0.36	0.038	82	0.970
Amalgam	2±0.23			

Df: Degree of freedom



**Figure 1: Gender of the respondents**



**Figure 2: Patients' satisfaction with restorations**

Patient satisfaction with the treatment procedures was assessed according to whether they felt pain during the treatment procedure, whether injections were needed to relieve the pain, the level of patient comfort during drilling, the placement of cotton rolls, the placement of filling materials, and the polishing of the restorations. We found no significant difference in patient satisfaction with any of the treatment procedures between amalgam and composite restorations ( $P > 0.05$ ). In the IIUM Dental Polyclinic, deep caries management involves the administration of an injection by the operator, regardless of the type of restoration placed. Both amalgam and composite restorations are performed using similar procedures of drilling, placement of cotton rolls or rubber dams, placement of the final restoration, and polishing. Hence, patients were probably unaware of any differences in the treatment procedures received. Sturdevant, in his textbook, mentioned that tooth preparation procedures for both amalgam and composite restorations were similar, except that amalgam needs retention grooves and is less conservative.<sup>1</sup>

Patient satisfaction with external factors, such as the cost of treatment and the environment of the IIUM Dental Polyclinic, was also assessed in the questionnaire. Neither restoration type was significantly affected by external factors ( $P > 0.05$ ). The IIUM Dental Polyclinic provided a conducive environment for all types of dental treatments. Moreover, no treatment fee is charged to the patient for restorations placed by dental students. Hence, the cost of treatment did not affect the patients' satisfaction with either type of restoration.

Overall, no significant difference was observed in patient satisfaction between composite and amalgam restorations placed by the dental students ( $P > 0.05$ ). This may reflect a lack of concern by the patients regarding esthetics for restorations placed in a posterior tooth. By contrast, most patients are concerned and easily satisfied or dissatisfied when the restoration is placed on a maxillary anterior tooth.<sup>14</sup> A previous study reported that patients preferred amalgam over composite restorations; however, that study focused on patients' satisfaction with posterior tooth restorations only.<sup>15</sup>

## CONCLUSION

Patients were pleased when they had a strong relationship with the dentist, and they felt comfortable when treated by skillful dentists who included the patient in discussions before treatment and then delivered painless treatment.

Amalgam is still a reliable restorative material in dentistry and delivers patient satisfaction. However, the

color of the restoration was the major criterion affecting patient satisfaction with amalgam restorations. Most patients preferred composite restorations as they were esthetically pleasing. Providing treatment that satisfies the patients is important for maintaining a high quality of dental care from dental schools.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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