



Research Article

Preference of materials for posterior restorations: A cross-sectional study among Palestinian dentists

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The aim of the study is to evaluate the preferences of materials for posterior restorations among Palestinian dentists and to assess whether postgraduate training or clinical experience had an influence on their material preferences. A cross-sectional study was carried out among 216 dentists in Palestine using an online survey, which consisted of closed questions asking about socio demographic variables, the level of specialization and time since graduation. It further probed into the preferences for posterior restorations through questions about the first choice of material, type of composite resin (if used), use of rubber dam and preferences for curing. It was observed that 66.2% of the dentists preferred using composite and 72.9% preferred nano-hybrid composite restorations over other types of composite material. However, the majority (88.4%) did not prefer using a rubber dam. There was no significant association between the time of clinical training or post-graduate training and their choices for the materials. The study reports that composite was the preferred material for posterior restoration among the Palestinian dentists, and nano-hybrid their preferred type of composite. However, these dentists seldom used rubber dam and their postgraduate training or time of training did not influence their choice of material.

Keywords: Posterior restoration, composite resin, dentists, Palestine, cross-sectional study, material choice

INTRODUCTION

When it comes to restoring the tooth, dentists have adopted ways to restore the tooth more conservatively, thanks to the rise of composite restorations with high success rates (Demarco et al., 2012). Direct restorations are being more preferred than indirect restorations. When comparing both, the former has become preferable due to their low cost, less need for the removal of sound tooth substance and their acceptable clinical performance (Brunthaler A et al., 2003, da Rosa Rodolpho et al., 2006, Da Rosa Rodolpho et al., 2011, Manhart et al., 2004). According to Cenci M et al., (2005) Amalgam has faced a constant decline in its use, owing to dentists preferring composite for its advantages such as aesthetics, enhanced adhesive properties, and conservation of tooth structure, which in turn, leads to reinforcing the remaining tooth structure (Coelho-De-Souza et al., 2008). As

explained by (Opdam et al., 2008). The bonding of composite is also capable of alleviating the pain caused by a fractured amalgam restoration. Although composites have many advantages, they have their own share of disadvantages, such as increased susceptibility to secondary caries (Bernardo et al., 2007, Soncini et al., 2007).

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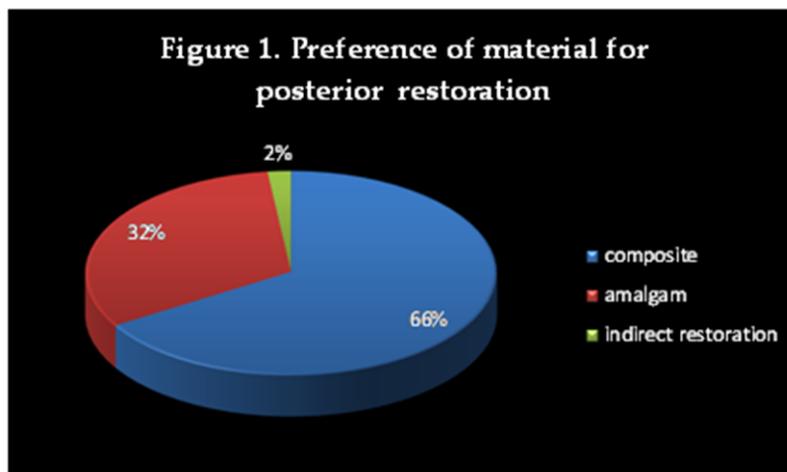


Figure 1. Preference of material for posterior restoration.

Recent advancements have led to the development of improved composite materials, with better properties such as polishability, wear resistance and surface smoothness. As explained by Ferracane et al., 2011, Nano-fillers have been incorporated in resin composites, claiming to provide improved mechanical properties, combining polish ability and strength. All of these factors have led to a gradual rise of popularity of composite over amalgam. However, this has paved the way for dentists spending a significant amount of time replacing restorations, contributing to the repetitive restorative cycle as reported by Elderton et al., 1988.

Even though acceptable survival rates are achieved with Class I and II restorations in dental health care, the replacement of failing restorations is still a relevant issue. Factors related to the patient, operator, tooth, cavity size, and materials have been reported in the literature as potentially relevant for restoration failures (Brunthaler A 2003, da Rosa Rodolpho 2006, Bernardo M 2007, Burke FJ 2009, Opdam NJ 2010, Opdam NJ 2007), although evidence of this is still limited. Besides, the preferences and attitudes of dentists towards restorative dentistry practice might vary from one geographical area to the other. Hence, the aim of this study is to evaluate the preferences of materials for posterior restorations among Palestinian dentists, and also to assess whether postgraduate training or clinical experience had an influence on their material preferences.

MATERIALS AND METHODS

A cross-sectional study was conducted among the Palestinian dentists. The study sample was calculated to be the 300 dentists who are registered with the Palestinian Dental Association. An online survey request was sent to them and of which 216 dentists responded with a response rate of 72%. The online survey had a questionnaire instrument devised on the guidelines of a

previous study (Nascimento GG, 2013): It consisted of sections related to sociodemography, the level of specialization and when did they finish their graduation. Questionnaire further probed into the preferences for posterior restorations like the first choice of material (amalgam, direct composite, indirect restoration), type of composite resin (microhybrid, microfilled, nanohybrid, condensable, flow) and use of rubber dam (yes/no). Preferences for curing were also asked, such as the average time taken for curing, the average time taken for etching and the most common light unit used for curing. The study was approved by the Ethics committee of the Al Quds University.

Data were submitted to descriptive analyzes and the association existing between vital time since graduation and post-graduation training was tested with chi-square or Fisher's exact test. The analyzes were carried out with Stata 10.0 software (StataCorp, College Station, TX, USA). A significance level of $\alpha=0.05$ was adopted for the study.

RESULTS

50.9% & 49.1% of the study population was female and male dentist respectively. Only 31.5% of the study population had dental practicing experience of more than 10 years. Majority of the dentist (40.5%) had an experience between 6-9 years.

While 13.4% of the dentists had been trained in some kind of formal continuing education (i.e., master's degree, Ph.D. degree, courses), 86.6% of the population did not undergo any such training.

Direct composite resin was selected by 66.2% as the first-choice material for restoration of posterior teeth, while amalgam was preferred by 31.9% of the dentists, followed by indirect composite resins (1.9%)(Figure 1). Regarding the type of direct composite, nano-hybrid resins were selected by 74.5% of the dentists, followed

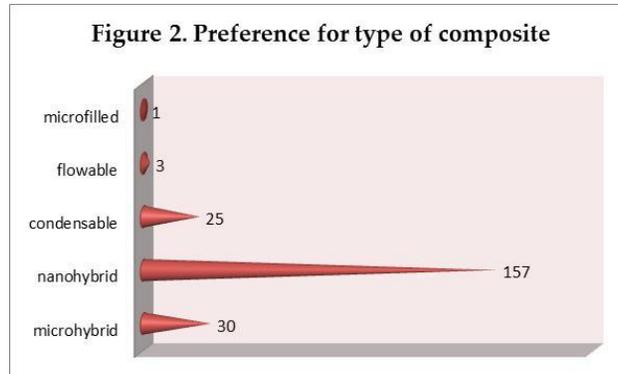


Figure 2. Preference for type of composite

Table 1. Association between the time of clinical practice (time since graduation) of dentists and variables related to practices for posterior restorations, Palestine (n=216)

Variable	Time since graduation in years (n)			Total	p-value
	0-5 years	6-9 years	More than 10 years		
Type of material					
Amalgam	2	44	23	69	0.213
Direct composite resin	57	42	44	143	
Indirect restoration	1	2	1	4	
Type of composite					
Microhybrid	21	3	1	25	0.443
Microfilled	0	75	0	75	
Nanohybrid	20	7	62	89	
Condensable	19	2	4	25	
Flowable	0	1	1	2	
Rubber dam use					
No	39	86	66	191	0.141
Yes	9	1	2	12	
Sometimes	12	1	0	13	

¹ P value<0.05

by microhybrid chosen by 13.8%, condensable preferred by 11.9%, whereas, microfilled resins were preferred only by 1.9% of the professionals (figure 2). Eighty-nine percent of the dentists did not use rubber dam isolation in daily practice for placement of posterior restorations, 5% never used rubber dam and 6% used it occasionally. When it came to curing, the majority of the dentists (42.1%) preferred curing for 10 seconds and when given a choice between halogen and LED for curing light, almost all preferred LED. 72.7% of the dentists did etching for 15 seconds. 70.4% of the dentist chose to use liner or base depending upon the need of the case but 28% used it irrespective of the case. No significant association was observed in the current study between years of experience and use of material in restorative procedures (table 1).

Table 2 summarizes the association of restorative procedures and the level of specialization of dentists. Most participants did not use rubber dam; the study did not show any significant differences in non-usage of

rubber dam between specialists (75.9%) compared with non-specialists (90.4%).

DISCUSSION

To the best of our knowledge, this is the first study in Palestine examining the attitude of dentists towards preferences of materials for posterior restorations. The current study reported that the majority of the dentists preferred composite fillings over amalgam; this in accordance with various studies, where, composite material was seen as the material of choice for posterior restorations. In a similar study conducted in the United Kingdom, the dentists surveyed placed load bearing posterior composite restorations regularly, as explained by Gilmour AS, (2007). The study also reported that their choice of restorative material was influenced by clinical indications and the patient's aesthetic demands. It was also seen that the techniques used were appropriate, although there was confusion around the usage of

Table 2. Association between the post-graduation training of dentists and variables related to practices for posterior restorations. Palestine. (n=216)

Variable	Post-graduation training (n)			
	yes	No	Total	p-value
Type of material				
Amalgam	13	56	69	0.241
Direct composite resin	15	128	141	
Indirect restoration	1	3	4	
Type of composite				
Microhybrid	3	22	25	0.453
Microfilled	0	1	1	
Nanohybrid	18	139	157	
Condensable	7	23	30	
Flowable	1	2	3	
Rubber dam use				
No	22	169	191	0.107
Yes	6	6	12	
Sometimes	1	11	12	

¹ P value<0.05

rubber dam and the most appropriate method to line the cavity.

Another study conducted in Brazil reported that for the majority of dentists, direct composite was their first choice for posterior restorations and the use of rubber dam for composite resin placement in posterior teeth was not frequent. However, in this study, it was seen that microhybrid was the preferred type of composite and time since graduation and level of specialization affected dentists' choices, as explained by Nascimento GG, 2013. However, in this study it was observed that clinical experience and postgraduate study did not have an influence on the choice of material. This could be due to the attitude of the dentists to prefer composite material universally (Burke FJ 2003, Brown LJ 2000), irrespective of training or experience. It has been considered that a large number of dentists are restricting their practices to the use of composites as opposed to amalgam in the UK (Burke FJ 2003), US (Brown LJ 2000) and Europe (Widstrom E 1998, Mjor IA 1997, Forss H 2001). Composite offers number of advantages over amalgam when it comes to the restoration on posterior teeth. Among them is the ability to achieve an aesthetically pleasing restoration, the need to remove less tooth structure because adhesive technology is being employed, and reduce microleakage by using bonding agents. Other problems, such as the poor wear resistance of early composite materials, appear largely to have been overcome, with a reduction in the size of filler particles leading to improved polish ability and higher filler loading values, as reported by El-Mowafy OM, 1994. In the current study, it was seen that the dentists preferred nano_hybrid. This could be attributed to the improved material properties such as better polish ability and strength. According to Mitra et al., nanofilled

composites had mechanical properties similar to hybrid composites and polish ability and esthetics equal to microfilled composites (Mitra SB, 2003). This was followed by a preference for microhybrid composites as they are considered universal materials and may be used in both anterior and posterior teeth, as they imbibe both the mechanical properties of hybrid composites and the polishing characteristics of microfilled composites (Manhart J 2004, Burke FJ 2009, Opdam NJ 2010). The very less preference of microfilled composites among the dentists might be attributed to its properties such as reduced physical strength which prove insufficient in stress-bearing areas. However, due to their high polishability, they are used in anterior teeth or Class V restorations in posterior teeth.

With regards to the use of rubber dam, rubber dam usage is seemingly low as indicated in many studies. A survey showed that 73%, 63%, and 55% never or seldom used a rubber dam when placing amalgam, anterior, or posterior direct resin composite restorations, respectively (Dillman DA, 1995). Similarly another study by Joynt RB (1989) showed that 53, 45, 39 percent of the dentists never used a rubber dam when placing amalgam, anterior, or posterior direct resin composite restorations, respectively (Hill EE, 2008). Hill 2008, reported that the reasons for infrequent usage of rubber dam were the following: inconvenience (40 percent); unnecessary (28 percent); other (12 percent); patient refusal (11 percent); and time (9 percent), as explained by (Hill EE, 2008).

The limitation of the study is the online nature of the data. Future studies should be conducted with a larger sample, and evaluate the effect of bias of previously perceived notions of the dentists. Longitudinal studies evaluating the attitudes and preferences over longer periods of time will help in concluding the results better.

CONCLUSIONS

The study shows that composite material was the preferred material for posterior restoration among the Palestinian dentists, with nano-hybrid being their preferred type of composite. However, these dentists seldom used rubber dam and their postgraduate training or training period did not influence their material choices. This study emphasizes the rising trend among the dentists to prefer composite material over amalgam and the gradual decrease of amalgam usage in dentistry. At present, the reduced usage of rubber dam is, however, unwarranted and the dental educators and organizations should implicate better means to improve its popularity among dentists.

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