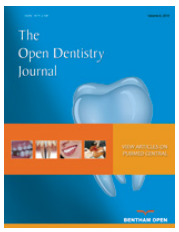

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RESEARCH ARTICLE

Awareness of Novo Types of Composites among Dental Students and Interns in Makkah Region, Saudi Arabia. Cross Sectional Study

Rahaf Abdulkhaliq Salem[1,*], Basem Adel Danish[2] and Nada Ali Abdulaleem[3]

[1]*Umm Al-Qura University, College of Dental Medicine, Makkah, Saudi Arabia*
[2]*Umm Al-Qura University, Preventive Dentistry, Makkah, Saudi Arabia*
[3]*Umm Al-Qura University, Restorative Dentistry, Makkah, Saudi Arabia*

Abstract:

Background:

The tooth structure is important to be restored at the very beginning of any decay or any recession that may affect the gingiva, to prevent any further complications. Moreover, as the patient's priority is to have an esthetic smile, the use of esthetic materials such as gingival pink composite and single-shaded composite is indicated for an immediate result.

Objective:

This study aimed to assess the awareness among dental students and interns of novo types of composite (gingival pink, and single shade) in the Makkah region of Saudi Arabia.

Methods:

A cross-sectional study with an online survey was formulated and distributed on different social media platforms. A total of 190 participants responded to the study questionnaire. Data were collected from filled-out questionnaires and analyzed using Microsoft Excel 2019. Descriptive statistics were used.

Results:

The results showed a low level of awareness of gingival composite material (40.5%), and 51% of the students and interns were aware of single-shaded composites. The awareness level of the advantages of the esthetic use of gingival composite materials was 36%, and 56% were aware of the advantages of the esthetic use of the single-shaded composite.

Conclusion:

This study indicated a low level of awareness regarding the use and characteristics of gingival composite materials among dental students and interns. There was a higher level of awareness about single-shade composites. It is recommended that education on novo composites should be prioritized.

Keywords: Awareness, Esthetics, Composite, Single shade composite, Omnichroma, Gingiva, Recession, Restorative, Dentistry.

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1. INTRODUCTION

Permanent teeth and their supporting tissues are designed to remain functional throughout life [1]. The teeth play an important role in mastication, speech, esthetics, and protection of the supporting structure [2]. However, dental caries, periodontal attachment loss, and gingival recession can occur over time, causing hypersensitivity, loss of tooth structure integrity, root caries, and alveolar bone loss [1 - 3]. When restoring the missing tooth structure, the essential concept is to restore it to its proper function, shape, and esthetics in a short period of time with minimal biological cost [4]. New dental materials, working procedures, and treatment methods have been implemented over the last decade because of the environmental problems associated with mercury in previous dental materials [5].

* Address correspondence to this author at the Umm Al-Qura University, College of Dental Medicine, Makkah, Saudi Arabia;
E-mail: ariadnafloresortega@gmail.com

Most replacements of direct restorations have recently depended on composite restorative materials [6]. Composite restorations are the choice materials and the most commonly used because they resemble natural teeth because of their physical characteristics and good mechanical properties [7 - 9]. Composite filling materials have been used for nearly 50 years in restorative dentistry [10]. However, matching the composite resin restoration to the surrounding tooth structure remains a challenge, even for experienced dental practitioners [11, 12]. Normally, the shade selection is achieved visually by matching the chosen natural teeth with the shade table tabs from commercially available shade guides [13]. Sometimes, various shades of composites have to be layered to create a perfect match for the tooth [14]. Therefore, the shade of the restoration is the most important aspect from the patient's perspective, and the patient always has high esthetic expectations [13, 15].

Following developments in restorative dentistry, a unique dental material was produced to blend and match with every tooth shade, including shades that are challenging to match [12]. Its final restorative color has been shown to be extremely natural. This restoration material is known as a single-shade universal composite, or omnichroma [11]. To create a perfectly matching shade, omnichroma depends on the surrounding tooth structure [16]. The single-shade restoration can attain tooth color when light is altered in the red and yellow regions of the color spectrum, to accept and match the color of the patient's teeth as light travels through the spherical fillers of the composite resin [16]. This can potentially save clinicians chair time by reducing the need for shade selection [17]. A recent study found that omnichroma had the highest ΔE compared to other composites [18].

The second challenge facing the dentist is the gingival recession. The gingiva is a complex tissue structure filled with blood vessels and nerves beneath the alveolar bone [3]. Gingival recession can affect all age groups [19] and can result from gingival inflammation, periodontitis associated with bone resorption, and aggressive brushing or flossing [20]. The use of gingival pink composites as artificial gingival tissue offers an alternative solution to the surgical treatment choice, which may require prolonged treatment and may not be successful [19]. Available literature suggests that the novo types of composite materials—gingival and single shade composite—have the potential to overcome the two major challenges faced by dentists when using composites in restoring missing tooth structures. However, researchers have not explored Saudi Arabian dental students' awareness of these materials. This study aims to assess the awareness among dental students and interns of novo types of composites (gingival pink, and single shade) in the Makkah region of Saudi Arabia.

2. MATERIALS AND METHODS

This population-based cross-sectional evaluation was conducted from February 2021 to April 2021. The study was approved by the institutional review board (IRB) of Umm Al-Qura University, College of Dentistry, with approval No.(HAPO-02-K-012-2021-02-576). Using a convenience sampling method, 190 participants were recruited via an online survey posted on different social media platforms, such as Twitter, WhatsApp, Instagram, and Snapchat. Inclusion criteria included undergraduate dental students and dental interns who consented to participate in the study. Exclusion criteria included dentists. To maintain confidentiality, each questionnaire was given a serial number without revealing participants' information.

Data were collected through a self-administered questionnaire filled out in English. The questionnaire consisted of three sections. The first section includes the participants' demographic data: gender, academic level, and university. The next section included 9 multiple-choice questions related to gingival composites, aimed at assessing the knowledge of shades, mechanisms, indications, advantages, and disadvantages of the gingival composites [3]. The third section also included 9 multiple-choice questions related to single-shade composites [16], and it also aimed to assess the knowledge of bleaching effects, mechanisms, indications, advantages, and disadvantages of single-shade composites. All questions are close-ended. The questionnaire took 4 to 6 minutes to fill out.

The final version of the questionnaire was used for the pilot study phase with 10 eligible participants. The questionnaire was given to them twice within 1-week intervals for test-retest validation. These questionnaires were excluded from the main study sample.

Data analysis was performed using Microsoft Excel 2019. The data were descriptively analyzed using frequencies and percentages.

3. RESULTS

A total of 190 participants returned the completed questionnaires, representing a response rate of 76%. There were more female than male participants (n = 108; 56.8%) and senior (5^{th} and 6^{th} year) dental students made up more than half of the respondents(n = 112; 58.9%). The majority of respondents (54.7%) were students of Umm Al Qura University. Table **1** presents details of the sociodemographic characteristics of the participants.

About 40.5% of respondents reported awareness about gingival composites, among whom 7.8% had used the material in a clinical setting. A higher proportion of senior dental students (5^{th} and 6^{th} years) and interns were aware of gingival composites compared to students in the early years of dental education. The results of the study showed that 59% of the participants lacked awareness about gingival composites, while 40.5% were aware, and only 6% of the dental students used it in dental practice. Regarding awareness of the main advantages of gingival composites, 63.7% of participants were not aware that "esthetics" was the main advantage; most of them (37.9%) chose "biocompatibility". Furthermore, most of the participants (71.6%), were unaware of "Plaque accumulation" as the main disadvantage of gingival composites. Response to different shades of gingival composite availability showed that 19% were aware of the different shade types, while 81% were unaware. The level of awareness regarding the indication for the use of gingival composites was as follows: recession (16.8%), which is the indication for using the gingival

composites, Non-carious cervical lesion (17.9%), Periodontal soft-tissue defects (9.5%), all the above (55.8%). About 19.5% were aware of the gingival composite bonding mechanism. Regarding the placement technique for gingival composites, 64.8% chose incremental manipulation rather than bulk-filled placement (35.2%), as shown in Table **2**.

Regarding awareness on single-shade composites, the results showed that about half of the participants (51.6%) were aware of it. Only 21% have used it in dental practice, and most of them were 6th-year students. Furthermore, more than half of the students (56.3%) were aware that "esthetics" was the main advantage of single shade composites, and only about 40% of participants were aware that "allergy to methacrylics" was the main disadvantage. Based on the indications for the use of single shade composites, the majority (51%) chose "all of the above," consisting of diastema closure, direct bonded composite veneer, and direct restoration. Only 25.2% were aware of the bleaching effect of single-shade composites. About 28.4% were aware of bonding mechanisms, while 24.2% were aware of finishing and polishing techniques for single-shade composites. Regarding manipulation and placement techniques, 71.6% chose incremental, while 28.4% chose bulk-filled, as shown in Table **3**.

Table 1. Socio-demographic characteristics of study participants (*N* = 190).

Characteristic/Variable	**Frequency n (%)**
Gender: Female	 108 (56.8)
Male	82 (43.2)
Academic Level:	
2nd year	7 (3.7)
3rd year	14 (7.4)
4th year	23 (12.1)
5th year	46 (24.2)
6th year	66 (34.7)
Intern	34 (17.9)
University: Al Farabi College	 11 (5.8)
Ibn Sina College	34 (17.9)
King Abdulaziz University	41 (21.6)
Umm Al Qura University	104 (54.7)

Table 2. Awareness of gingival composite variables.

Composite Materials	**Yes (%)**	**No (%)**
Aware of Gingival Composite:	**77 (40.5)**	**113 (59.5)**
2nd year	2 (1.0)	5 (2.6)
3rd year	1 (0.5)	13 (6.8)
4th year	9 (4.7)	14 (7.4)
5th year	23 (12.1)	23 (12.1)
6th year	28 (14.7)	38 (20.0)
Intern	14 (7.4)	20 (10.5)
Used Gingival Composite if Aware	6 (7.8)	71 (92.2)
Main Advantage: Biocompatibility Esthetic Low cost Reduced hypersensitivity	 72 (37.9) 69 (36.3) 14 (7.4) 35 (18.4)	**N/A**
Aware of Different Shades	36 (19.0)	154 (81.0)
Aware of Disadvantage: Plaque accumulation Polymerization shrinkage Technique sensitivity	 54 (28.4) 45 (23.7) 91 (47.9)	**N/A**
Awareness of Indications: Non-carious cervical lesions Periodontal soft tissue defects Recession All of the above	 34 (17.9) 18 (9.5) 32 (16.8) 106 (55.8)	**N/A**

(Table 2) contd.....

Composite Materials	Yes (%)	No (%)
Aware of Bonding Mechanism	37 (19.5)	153 (80.5)
Aware of Placement Technique Bulk filled Incremental	 67 (35.2) 123 (64.8)	**N/A**

Table 3. Awareness of single shade composite variables (*N* = 190).

Composite Materials	Yes n (%)	No n (%)
Aware of Single Shade Composite:	**98 (51.6)**	**92 (48.4)**
2nd year	2 (1.0)	5 (2.6)
3rd year	4 (2.1)	10 (5.3)
4th year	13 (6.8)	10 (5.3)
5th year	16 (8.4)	30 (15.8)
6th year	42 (22.1)	24 (12.6)
Intern	21 (11.0)	13 (6.8)
Used Single Shade Composite if Aware	**40 (21.0)**	**N/A**
2nd year	3 (1.6)	
3rd year	1 (0.5)	
4th year	1 (0.5)	
5th year	3 (1.6)	
6th year	17 (8.9)	
Intern	15 (7.9)	
Main Advantage: Biocompatibility Esthetics Low cost Reduced hypersensitivity	 25 (13.2) 107 (56.3) 39 (20.5) 19 (10.0)	**N/A**
Main Disadvantage: Allergy to methacrylics Polymerization shrinkage Technique sensitivity	 76 (40.0) 54 (28.4) 60 (31.6)	**N/A**
Indications for Use: Diastema closure Direct bonded composite veneer Direct restoration All of the above	 25 (13.2) 16 (8.4) 52 (27.4) 97 (51.0)	N/A
Aware of Bleaching Effect	48 (25.2)	142 (74.8)
Aware of Bonding Mechanism	54 (28.4)	136 (71.6)
Aware of Finishing and Polishing Technique	46 (24.2)	144 (75.8)
Placement technique Bulk filled Incremental	 54 (28.4) 136 (71.6)	N/A

4. DISCUSSION

This study explored the level of awareness of gingival pink composite and single shade composite among dental students and interns in the Makkah Region, Saudi Arabia. The results showed a low level of awareness about gingival composites. Indeed, less than half of the participants (40.5%) reported awareness of gingival composites. The low level of awareness of this novo composite material is consistent with participant responses to the different questions on the material. For example, most of the participants were unaware of the main advantages (esthetic) and disadvantages (Plaque accumulation) of gingival composites, with less than one in every five (16.8%) citing "recession" as the primary indication for gingival composites. Gingival composites have even been proposed as an alternative to surgical techniques in managing gingival recession [21]. In contrast to the low level of awareness regarding various aspects of gingival composites, most of the participants were knowledgeable about the placement techniques of the material. Close to two-thirds (64.8%) indicated that the "incremental technique" was the correct method, which is consistent with the results of a previous study [3].

In responding to the questions, participants may have drawn from their general knowledge regarding composites, given that the "incremental technique" is a popular approach for placing composite restorations [22]. We expect that as more dental students become aware of gingival composites and use them in clinics, their general knowledge of the chemical and technical properties of the materials will increase.

We found that more than half of the participants (51.6%)

were aware of single-shade composites. Although this proportion is low, it is slightly higher than that of gingival composites. It is not surprising that senior dental students and interns were more aware of and even used single-shade composites, given that they are more involved with providing clinical patient care at that stage of their training [23].

Overall, less than half of the participants reported awareness of various aspects of single-shade composites, except for the main advantage, indication, and placement techniques. Over half of the participants indicated "esthetics' as the main advantage of Omnichroma, the new universal composite. This view aligns with the declaration of the manufacturer that the principal advantage of Omnichroma, a single-shade composite, is its esthetic compatibility with various shades of teeth. Because of the advanced manufacturing technology of the material, the single-shade composite encompasses all conventional shades of traditional composites [14]. While novo composites present potential benefits to dental professionals and patients, it is important for both parties to understand the limitations or disadvantages of these materials. In this study, only 40% of the participants were aware that "allergy to methacrylics" is the main disadvantage of single-shade composites.

This is the first study in Saudi Arabia to assess the awareness of gingival and single-shade composites. The exploratory study indicates a low level of awareness of the two types of composites among dental students and interns. Although the results are not generalizable, this initial data suggests the need to promote awareness of novo composites among dental students in the region. Enhancing the student's knowledge and technical competence with the use of novo composites is important, given the clinical and biomechanical advantages of the restorative material [18].

Furthermore, in-depth knowledge about novo composites is at the core of restorative dentistry, as composites increasingly become the material of choice for the restoration of simple and complex carious dentition [24].

Many factors have been demonstrated to have a significant influence on dental materials, such as microhardness, polymerization type, color change, and mineral deposition on composite [26 - 29].

Another study [25] found that dental students in Saudi Arabia have a greater affinity for composites and believe that composites can conveniently replace amalgams as restorative materials. The results should be interpreted with caution, given that our sample size and sampling techniques do not allow for the generalization of the study results.

The cross-sectional design only allows for a snapshot of the variables and descriptive statistics of the data. In spite of this limitation, the results of this exploratory study provide initial insights into dental students' awareness of novo composites. The study can serve as a useful baseline for a more robust study design that uses a representative sample and sampling technique, Future studies are needed in order to test also these variables with novo types of composites.

CONCLUSION

This study indicates that there is a low level of awareness regarding the use and characteristics of gingival composites among dental students and interns in the Makkah Region of Saudi Arabia. In addition, there is a higher level of awareness of single-shade composites compared to gingival composites. As the awareness of gingival composites among dental students and interns has been found to be inadequate, dental education programs should include novo composite materials in the educational curriculum to ensure better awareness among dental students

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Institutional Review Board (IRB) of Umm Al-Qura University's College of Dentistry in Saudi Arabia. (IRB No. HAPO-02-K-012-2021-02-576).

HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Informed consent was obtained from all participants.

STANDARDS OF REPORTING

STROBE guideline followed.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available from the corresponding author [R.S] upon reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declare none.

Section 1. Demographic data.

1	**Gender:** □ Male □ Female
2	**Academic Level:** □ 2nd □ 3rd □ 4th □ 5th □ 6th □ Intern
3	**University:** □ Umm Al Qura University □ King Abdulaziz University □ Taif University □ Ibn sina College □ Al Farabi College

Section 2: Gingival composite.	
1	**Are you aware of gingival composites in dentistry?** □ Yes □ No
2	**If yes, have you used it in clinical practice?** □ Yes □ No
3	**What do you think is the main advantage of gingival composites?** □ Esthetic □ Biocompatibility □ Low cost □ Reduce hypersensitivity
4	**Are you aware of the different shades of gingival composite available?** □ Yes □ No
5	**What do you think is the disadvantage of using gingival composite?** □ Plaque accumulation in gingival margin, □ Polymerization shrinkage □ Technique sensitivity
6	**What are the indications for gingival composite?** □ Recession, □ Non-carious cervical lesion, □ Periodontal soft-tissue defects □ All of the above
7	**Are you aware of the mechanism of bonding of gingival composite?** □ Yes □ No
8	**Are you aware of the finishing and polishing technique for gingival composite?** □ Yes □ No
9	**Which technique do you think will be effective for placement of gingival composite?** □ Bulk-filled □ Incremental
Section 3: Single shade composite.	
1	**Are you aware of single shade composites in dentistry?** □ Yes □ No
2	**If yes, have you used it in clinical practice?** □ Yes □ No
3	**What do you think is the main advantage of single shade composites?** □ Esthetic □ Biocompatibility □ Low cost □ Reduce hypersensitivity
4	**Are you aware of the bleaching effect on single shade composite ?** □ Yes □ No
5	**What do you think is the disadvantage of using single shade composite?** □ Polymerization shrinkage □ Allergy to methacrylic □ Technique sensitivity
6	**What are the indications for single shade composite?** □ Direct restoration □ Diastema closure □ Direct bonded composite veneer □ All of the above
7	**Are you aware of the mechanism of bonding of single shade composite?** □ Yes □ No
8	**Are you aware of the finishing and polishing technique for single shade composite?** □ Yes □ No

9	**Which technique do you think will be effective for placement of single shade composite?** □ Bulk-filled □ Incremental

REFERENCES

[1] Müller F, Shimazaki Y, Kahabuka F, Schimmel M. Oral health for an ageing population: The importance of a natural dentition in older adults. Int Dent J 2017; 67(Suppl. 2): 7-13. [http://dx.doi.org/10.1111/idj.12329] [PMID: 29023743]

[2] Ritter AV. Sturdevant's art & science of operative dentistry-e-book: Elsevier Health Sciences. Elsevier Health Sciences 2017.

[3] Sambandam V, Patturaja K, Ganapathy D. Awareness on gingival composites among dental students. Drug Invention Today 2020; p. 14.

[4] Iyer RS, Babani VR, Yaman P, Dennison J. Color match using instrumental and visual methods for single, group, and multi□shade composite resins. J Esthet Restor Dent 2021; 33(2): 394-400. [http://dx.doi.org/10.1111/jerd.12621] [PMID: 32844567]

[5] Pallesen U, van Dijken JWV, Halken J, Hallonsten AL, Höigaard R. Longevity of posterior resin composite restorations in permanent teeth in Public Dental Health Service: A prospective 8 years follow up. J Dent 2013; 41(4): 297-306. [http://dx.doi.org/10.1016/j.jdent.2012.11.021] [PMID: 23228499]

[6] Cramer NB, Stansbury JW, Bowman CN. Recent advances and developments in composite dental restorative materials. J Dent Res 2011; 90(4): 402-16. [http://dx.doi.org/10.1177/0022034510381263] [PMID: 20924063]

[7] Choudhari S, Ranjan M. Knowledge, awareness, and perception regarding occlusal stamp technique for composite restorations. Drug Invention Today 2019; p. 10.

[8] Ilie N, Hickel R. Resin composite restorative materials. Aust Dent J 2011; 56(Suppl. 1): 59-66. [http://dx.doi.org/10.1111/j.1834-7819.2010.01296.x] [PMID: 21564116]

[9] Schwendicke F, Göstemeyer G, Blunck U, Paris S, Hsu LY, Tu YK. Directly placed restorative materials: Review and network meta-analysis. J Dent Res 2016; 95(6): 613-22. [http://dx.doi.org/10.1177/0022034516631285] [PMID: 26912220]

[10] Sachdeva A, Vats V. Advances in composite resin: A review. IP Indian Journal of Conservative and Endodontics 2020; 5(2): 40-3. [http://dx.doi.org/10.18231/j.ijce.2020.011]

[11] Brown KM, Gillespie G. Overcoming restorative challenges with novel single-shade composite: Case reports. Compend Contin Educ Dent 2019; 40(Suppl. 2): 7-9. [PMID: 31730359]

[12] Peyton I. Restoring Large Class III cavities with a one-shade composite. Dental Town 2019; pp. 28-33.

[13] Elamin HO, Abubakr NH, Ibrahim YE. Identifying the tooth shade in group of patients using Vita Easyshade. Eur J Dent 2015; 9(2): 213-7. [http://dx.doi.org/10.4103/1305-7456.156828] [PMID: 26038652]

[14] Tokuyama dental's OMNICHROMA delivers any shade with one composite. AEGIS Communications Available from: https://www.aegisdentalnetwork.com/cced/2019/02/tokuyama-dentals-omnichroma-delivers-any-shade-with-one-composite

[15] Liberato WF, Barreto IC, Costa PP, de Almeida CC, Pimentel W, Tiossi R. A comparison between visual, intraoral scanner, and spectrophotometer shade matching: A clinical study. J Prosthet Dent 2019; 121(2): 271-5. [http://dx.doi.org/10.1016/j.prosdent.2018.05.004] [PMID: 30722987]

[16] Lowe RA. Simplified esthetic color matching with direct composite: A case report. Dent Econ 2019; 109(4)

[17] OMNICHROMA: Simplifying the restorative process. AEGIS Communications 2019; 40(2)

[18] Abreu JLB, Sampaio CS, Benalcázar Jalkh EB, Hirata R. Analysis of the color matching of universal resin composites in anterior restorations. J Esthet Restor Dent 2021; 33(2): 269-76. [http://dx.doi.org/10.1111/jerd.12659] [PMID: 32989879]

[19] Rafeek R, Paryag A, Mankee M, Lowe J. Exploring the versatility of gingiva-colored composite. Clin Cosmet Investig Dent 2016; 8: 63-9. [http://dx.doi.org/10.2147/CCIDE.S92727] [PMID: 27186079]

[20] Kasaj A. Etiology and prevalence of gingival recession. In: Gingival Recession Management. Cham: Springer International Publishing 2018; pp. 19-31. [http://dx.doi.org/10.1007/978-3-319-70719-8_3]

[21] Cairo F, Cortellini P, Nieri M, *et al.* Coronally advanced flap and composite restoration of the enamel with or without connective tissue graft for the treatment of single maxillary gingival recession with non□carious cervical lesion. A randomized controlled clinical trial. J Clin Periodontol 2020; 47(3): 362-71. [http://dx.doi.org/10.1111/jcpe.13229] [PMID: 31811742]

[22] Rudrapati L, Chandrasekhar V, Badami V, Tummala M. Incremental techniques in direct composite restoration. J Conserv Dent 2017; 20(6): 386-91. [http://dx.doi.org/10.4103/JCD.JCD_157_16] [PMID: 29430088]

[23] Al-Dajani M. Dental students' perceptions of undergraduate clinical training in oral and maxillofacial surgery in an integrated curriculum in Saudi Arabia. J Educ Eval Health Prof 2015; 12: 45. [http://dx.doi.org/10.3352/jeehp.2015.12.45] [PMID: 26442715]

[24] Al-Asmar AA, Al-Khatib KM, Al-Amad TZ, Sawair FA. Has the implementation of the Minamata convention had an impact on the practice of operative dentistry in Jordan? J Int Med Res 2019; 47(1): 361-9. [http://dx.doi.org/10.1177/0300060518802523] [PMID: 30282511]

[25] Pani S, Shakir A, Al Abbassi M, Al Saffan A, Al Sumait M. Factors influencing Saudi dental students′ preference of amalgam or composite for posterior dental restorations. Saudi J of Oral Sci 2014; 1(1): 30. [http://dx.doi.org/10.4103/1658-6816.124183]

[26] Lins FCR, Ferreira RC, Silveira RR, Pereira CNB, Moreira AN, Magalhães CS. Surface roughness, microhardness, and microleakage of a silorane-based composite resin after immediate or delayed finishing/polishing. Int J Dent 2016; 2016: 1-8. [http://dx.doi.org/10.1155/2016/8346782] [PMID: 26977150]

[27] Cacciafesta V, Sfondrini MF, Lena A, Scribante A, Vallittu PK, Lassila LV. Flexural strengths of fiber-reinforced composites polymerized with conventional light-curing and additional postcuring. Am J Orthod Dentofacial Orthop 2007; 132(4): 524-7. [http://dx.doi.org/10.1016/j.ajodo.2005.09.036] [PMID: 17920507]

[28] Raja KK, Hari P, Chin MQK, Singbal K, Fareez IM. Color stability of a new Rice husk composite in comparison with conventional composites after exposure to commonly consumed beverages in Malaysia. Int J Dent 2019; 2019: 1-7. [http://dx.doi.org/10.1155/2019/9753431] [PMID: 31191655]

[29] Butera A, Pascadopoli M, Gallo S, *et al.* SEM/EDS evaluation of the mineral deposition on a polymeric composite resin of a toothpaste containing biomimetic Zn-carbonate hydroxyapatite (microRepair®) in oral environment: A randomized clinical trial. Polymers 2021; 13(16): 2740. [http://dx.doi.org/10.3390/polym13162740] [PMID: 34451279]