JKMU

Journal of
Kerman University of Medical Sciences

https://jkmu.kmu.ac.ir
doi:10.34172/jkmu.4058
JKMU 2026;33:4058

Original Article

Closing the Gap: Knowledge and Practice of Finishing and Polishing Composite Restorations Among Senior Dental Students and General Dentists in Zahedan, Iran

Somayeh Hosseini Tabatabaei[1], Mohammad Rasoul Asadi[2*], Abolfazl Payandeh[3], Mehdi Rezvaniamin[4]

[1]Department of Operative Dentistry, Oral and Dental Disease Research Center, Zahedan University of Medical Sciences, Zahedan, Iran
[2]Student Research Committee, Oral and Dental Disease Research Center, Zahedan University of Medical Sciences, Zahedan, Iran
[3]Department of Biostatistics and Epidemiology, School of Health, Infectious Diseases and Tropical Medicine Research Center, Research Institute of Cellular and Molecular Sciences in Infectious Diseases, Zahedan University of Medical Sciences, Zahedan, Iran
[4]Community Nursing Research Center, Zahedan University of Medical Sciences, Zahedan, Iran

*Corresponding Author: Mohammad Rasoul Asadi, Email: mohammadrasadi378@gmail.com

Abstract

Introduction: Finishing and polishing are key determinants of the surface quality, esthetics, and long-term success of resin-composite restorations. Inadequate technique can increase surface roughness, promote plaque retention and staining, and ultimately shorten the longevity of the restoration. This study evaluated knowledge (awareness) and self-reported clinical practice related to composite finishing and polishing among final-year dental students and general dentists in Zahedan, Iran.

Methods: In this cross-sectional survey, final-year dental students and general dentists in Zahedan were included. Data were collected using a structured questionnaire covering demographics, awareness items, practice items, and reasons for not performing finishing/polishing. Content validity was assessed by expert review, and reliability by internal consistency. Analyses used descriptive statistics and appropriate group comparisons (e.g., Chi-square tests and confidence intervals), with two-sided $P<0.05$ considered statistically significant.

Results: Ninety-five participants completed the questionnaire. Overall, awareness scores were generally moderate, and practice scores were lower than awareness scores. General dentists scored higher than students in both awareness and practice, and greater work experience was associated with better performance. Across groups, gaps were most evident in selecting polishing systems and following the recommended sequence of finishing procedures.

Conclusion: Although practicing dentists reported better knowledge and practice than students, clinically relevant deficiencies were identified in both groups. Strengthening undergraduate skills training and offering continuing professional education—especially hands-on workshops—may improve the quality and consistency of finishing and polishing for composite restorations.

Keywords: Students, Dental, Dentists, Surveys and questionnaires, Cross-sectional studies, Iran

Citation: Hosseini Tabatabaei S, Asadi MR, Payandeh A, Rezvaniamin M. Closing the gap: knowledge and practice of finishing and polishing composite restorations among senior dental students and general dentists in Zahedan, Iran. Journal of Kerman University of Medical Sciences 2026;33:4058. doi:10.34172/jkmu.4058

Received: September 17, 2025, **Accepted**: December 25, 2025, **ePublished**: May 5, 2026

Introduction

A variety of esthetic approaches—such as bleaching, veneers, ceramics, and direct resin-composite restorations—are used to manage discolorations, developmental defects, and tooth fractures. The clinical popularity of resin composites has grown because they can provide acceptable esthetics with conservative tooth preparation and reasonable cost. (1–3)

Beyond routine direct restorations, composite materials are also used for preventive and reconstructive purposes, including sealants and core build-ups. When correct protocols (isolation, bonding, and appropriate finishing/polishing) are followed, these restorations can demonstrate satisfactory longevity; conversely, failures may occur due to discoloration, marginal breakdown, or secondary caries. (4,5)

Modern composites consist of an organic resin matrix with inorganic fillers. Depending on filler size and distribution, they are described as macrofilled, microfilled, nanofilled, or hybrid formulations, which influence handling, polishability, wear resistance, and long-term esthetic stability. (6,7)

Resin composites are widely used for anterior teeth and

are increasingly common in posterior restorations, aided by advances in adhesive dentistry that improve marginal sealing and bonding effectiveness. Reported survival rates underscore that technique-sensitive steps—including surface finishing and polishing—contribute meaningfully to long-term clinical performance. (2,8–10)

Finishing and polishing are performed after contouring to optimize surface smoothness and gloss. A smoother surface can reduce plaque retention and staining, improve patient comfort, and support periodontal health, which together may reduce the risk of premature replacement. (4,11)

Conceptually, finishing shapes and refining anatomy and margins, whereas polishing removes fine scratches to achieve luster. Because different instruments and sequences can produce different surface outcomes, clinicians benefit from clear protocols and practical training. (12,13)

Survey data from other settings suggest that although many clinicians recognize the importance of finishing and polishing, knowledge and practice can vary across training levels and clinical experience, highlighting the need for continuing education. (2)

Given the clinical relevance of surface quality and the potential variability in technique, we assessed awareness and self-reported practice regarding composite finishing and polishing among senior dental students and general dentists in Zahedan, Iran.

Methods

We conducted a cross-sectional study among senior (final-year) dental students (n = 65) and general dentists (n = 30) in Zahedan, Iran. Participants completed a self-administered questionnaire; for dentists who were not reachable in person, an online version was provided. Ethics approval was obtained from Zahedan University of Medical Sciences (Ethical code: IR.ZAUMS.Rec.1402.322). Participation was voluntary, and individuals could withdraw at any time.

Questionnaire content validity was evaluated through expert assessment, and internal consistency was examined in a pilot sample of 10 eligible respondents. Cronbach's alpha was 0.86, supporting acceptable reliability ($\alpha \geq 0.70$). (14)

A content validity index (CVI) of 0.81 was achieved following review by restorative dentistry experts. The full instrument is provided as supplementary material to facilitate replication and appraisal.

The questionnaire included: (1) demographics and educational background; (2) six awareness items scored on a three-point response scale; (3) eight practice items; and (4) reasons for not performing finishing and polishing.

Awareness scores were summed across six items (range 0–12) and practice across eight items (range 0–24). For interpretability, awareness was categorized as low (< 5), moderate (5–8), or high (> 8), and practice was categorized as low (< 8), moderate (9–16), or high (> 16).

Data were entered into SPSS (version 26) and checked for completeness and plausibility. Categorical variables are reported as frequencies/percentages, and continuous variables as mean ± standard deviation, as appropriate.

The associations between categorical variables were tested using Chi-square tests. Intra-group differences (students vs. dentists) in composite scores were examined with independent-samples t-tests and effect sizes (Cohen's d), with a Mann–Whitney U test used as a sensitivity analysis. The relationship between awareness and practice was evaluated using Spearman's rank correlation coefficient. A two-tailed $P < 0.05$ was considered statistically significant, and reporting followed STROBE guidance.

Results

The characteristics of the participants are shown in Table 1. In total, 95 individuals were included (30 general dentists and 65 senior dental students). Overall, 51.6% were male, and 48.4% were female. Among dentists, 46.6% worked in private clinics/offices and 53.3% in public or university settings.

The mean (± SD) awareness score was 7.74 ± 1.64 (range 4–12), and the mean practice score was 12.92 ± 3.45 (range 6–22). Based on the predefined cut-offs, most participants fell in the moderate awareness category (66.3%) and moderate practice category (53.7%); 27.3% had high awareness, and 18.9% had high practice (Figures 1 and 2).

Despite the higher levels of awareness in female participants and performance levels in male participants, there was no statistically significant difference in the frequency distribution of awareness and practice levels regarding composite restorations finishing and polishing between male and female participants (all $P > 0.05$) (Table 2). Likewise, no significant association was observed between

Table 1. Descriptive and demographic information of the samples

Variables	N	%
Gender		
Female	46	48.4
Male	49	51.6
Group		
Senior dental student	65	68.4
Dentist	30	31.6
Location of practice*		
Private clinics or offices	14	46.6
Public healthcare centers	16	53.3
Work experience*		
Less than 5 years	17	56.6
More than 5 years	13	43.4
Type of training received*		
In-person presentation and demonstration	12	12.6
Hands on	7	7.4
Virtual and non-in-person presentation and demonstration	11	11.6
Education during college	65	68.4

*For dentists only. N = number; % = Percent.

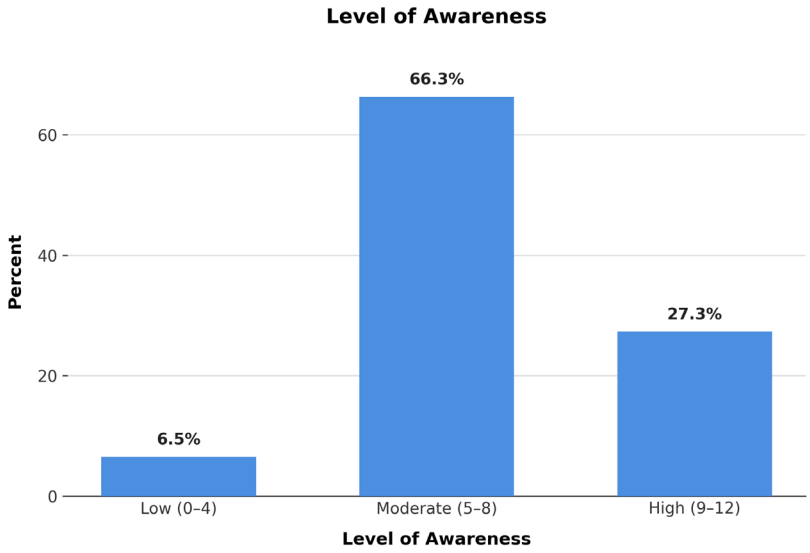

Figure 1. Distribution of awareness levels regarding composite restorations finishing and polishing among senior dental students and general dentists

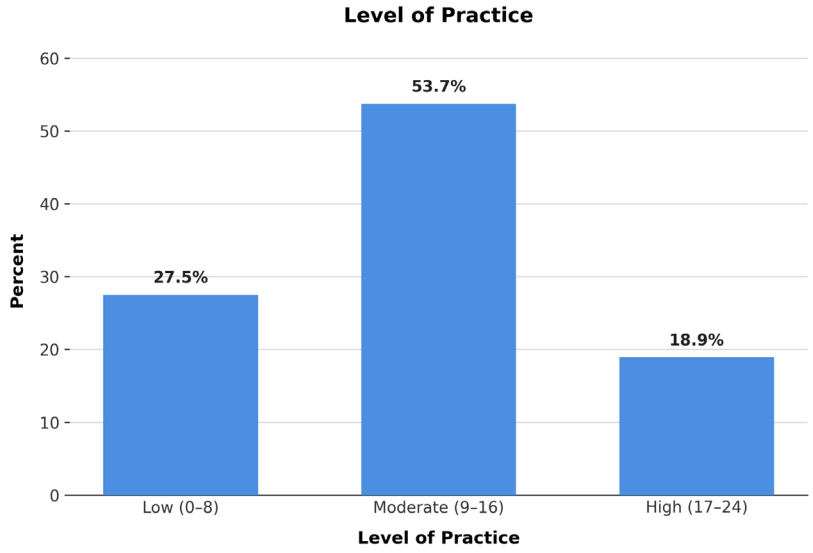

Figure 2. Distribution of practice levels regarding composite restoration finishing and polishing among senior dental students and general dentists

location of practice (private vs. public) and awareness or practice among general dentists ($P > 0.05$), although dentists working in private clinics or offices tended to have slightly better awareness and practice compared to those working in public clinics (Table 2).

Specifically, the level of awareness and performance in dentists with more than 5 years of experience was higher compared to dentists with less than 5 years of experience. A significant difference was observed between the awareness and performance of general dentists regarding the finishing and polishing of composite restorations based on their work experience ($P < 0.001$). Among dentists, those with more than 5 years of work experience showed markedly higher proportions of high knowledge and high practice than those with ≤ 5 years of experience (Table 2), and this pattern was confirmed when knowledge and practice scores were treated as ordinal: both knowledge and practice scores were significantly higher in the > 5-year group (Mann–Whitney U tests, $P < 0.001$ for both).

The level of knowledge and practice of participants regarding composite restorations significantly differs based on the type of training received. Specifically, the level of knowledge and performance in participants who received in-person and hands-on training was generally higher ($P < 0.05$). Participants whose exposure to finishing and polishing was limited to undergraduate didactic education reported lower levels of knowledge and practice compared with those who had in-person presentations, hands-on training, or virtual/non–in-person presentations. The distribution of low, moderate, and high practice differed significantly across the four categories of educational exposure ($\chi^2(6) = 30.10$, $P < 0.001$), with higher practice levels generally observed among participants who had received more intensive and hands-on training (Table 2).

A direct and meaningful relationship was found between the level of awareness and the practice of participants

Table 2. Frequency distribution of awareness and practice level regarding composite restoration finishing and polishing among senior dental students and general dentists based on demographic variables

Variables		N(%)					
		Level of awareness			Level of practice		
		Low	Moderate	High	Low	Moderate	High
Gender	Female	2(4.3)	30(65.2)	14(30.4)	13(28.3)	25(54.3)	8(17.4)
	Male	4(8.2)	33(67.3)	12(24.5)	13(26.5)	26(53.1)	10(20.4)
	P[a]		0.64			0.92	
Work experience	Less than 5 years	1(5.9)	14(82.4)	2(11.8)	2(11.8)	14(82.4)	1(5.9)
	More than 5 years	0	2(15.4)	11(84.6)	1(7.7)	1(7.7)	11(84.6)
	P[a]		<0.001			<0.001	
Location of practice	Private clinics or offices	0	5(35.7)	9(64.3)	1(7.1)	5(35.7)	8(57.1)
	Public healthcare centers	1(6.3)	11(68.8)	4(25.0)	2(12.5)	10(62.5)	4(25.0)
	P[a]		0.08			0.20	
Type of training received	In-person presentation	1(8.3)	5(41.7)	6(50.0)	1(8.3)	7(58.3)	4(33.3)
	Hands on	0	2(28.6)	5(71.4)	0	1(14.3)	6(85.7)
	Virtual and non-in-person presentation	1(9.1)	6(54.5)	4(36.4)	2(18.2)	6(54.5)	3(27.3)
	Education during college	4(6.2)	50(76.9)	11(16.9)	23(35.4)	37(56.9)	5(7.7)
	P[a]		0.02			<0.001	

N = Number; % = Percentage. The associations were tested using the Chi-square test. $P<0.05$ was considered statistically significant.

(The Spearman's correlation coefficient was 0.51), with higher levels of awareness associated with better practice ($P<0.001$).

There was a moderate, positive correlation between knowledge (awareness) and practice scores (Spearman's ρ = 0.51; 95% CI: 0.35–0.65; $P<0.001$), indicating that participants with higher knowledge tended to report better clinical practice regarding finishing and polishing of composite restorations. The cross-tabulation of awareness levels by practice levels is presented in Table 3, indicating that high awareness was most common among those with high practice and least common among those with low practice ($P<0.001$).

In the present study, the most common reasons for not performing finishing and polishing of composite restorations include insufficient education on composite restorations (41.9%) and lack of access to necessary materials and equipment for finishing and polishing of composite restorations (32.2%) (Table 4).

Finally, direct comparisons of the composite knowledge and practice scores between senior dental students and general dentists are summarized in Table 5. General dentists had moderately higher knowledge scores and substantially higher practice scores than senior dental students, with mean differences of 0.28 (95% CI 0.04–0.51; Cohen's d = 0.52) and 0.56 (95% CI 0.29–0.84; Cohen's d = 0.89), respectively.

Table 3. Frequency distribution of awareness level regarding composite restoration finishing and polishing among senior dental students and general dentists based on practice level

Level of practice	N(%)			*P*-value
	Level of awareness			
	Low	Moderate	High	
Low	2(33.3)	21(33.3)	3(11.5)	<0.001
Moderate	4(66.7)	41(65.1)	6(23.1)	
High	0	1(1.6)	17(65.4)	
Total	6(100.0)	63(100.0)	26(100.0)	

N = Number; % = Percentage. The association between awareness and practice levels was assessed using the Chi-square test. $P<0.05$ was considered statistically significant.

Discussion

Our findings reinforce that the clinical success of direct composite restorations depends not only on material selection and bonding but also on the quality of finishing and polishing, which affects surface roughness, plaque retention, and color stability. (4,11) These steps are therefore important targets for both undergraduate training and continuing professional development.

In this survey of 95 respondents from Zahedan (65 students and 30 general dentists), average awareness and practice were in the moderate range, with awareness exceeding practice. This pattern suggests that knowing recommended principles does not always translate into consistent chairside implementation.

The moderate scores observed here are broadly consistent with reports from other settings, indicating variability in knowledge and technique among dental trainees and practitioners. Differences across studies likely reflect local curricula, access to materials, and the proportion of students versus clinicians in the sample. (2,10)

Because finishing and polishing are technique-sensitive, practical exposure may be as important as didactic instruction. Prior authors have emphasized structured continuing education, hands-on sessions, and case-based learning to strengthen decision-making and treatment planning for restorative procedures. (10)

We did not observe meaningful gender differences in

Table 4. Frequency distribution of reasons for not performing finishing and polishing of composite restorations

		N	%
Not performing the finishing and polishing of composite restorations	Do not believe in composite finishing and polishing	3	9.6
	Finishing and polishing can be time-consuming and expensive	5	16.1
	Insufficient education on composite restorations	13	41.9
	Lack of access to necessary materials and equipment	10	32.2

N = Number; % = Percentage. Descriptive analysis was performed. No inferential statistical test was applied.

Table 5. Comparison of knowledge and practice scores between senior dental students and general dentists

Outcome	Senior dental students (n = 65) Mean ± SD	General dentists (n = 30) Mean ± SD	Mean difference (Dentists –Students) * (95% CI)	t(df)	*P*-value	Cohen's d
Knowledge	1.12 ± 0.52	1.40 ± 0.56	0.28 (0.04 to 0.51)	2.36 (df = 93)	0.02	0.52
Practice	0.74 ± 0.62	1.30 ± 0.65	0.56 (0.29 to 0.84)	4.04 (df = 93)	< 0.001	0.89

Values are presented as mean ± standard deviation (SD). The independent-sample t-test was used. $P < 0.05$ was considered statistically significant. CI: Confidence interval.

awareness or practice categories. A plausible explanation is that students and clinicians within the same educational system receive similar core instruction and are evaluated against comparable clinical standards. (15)

Work experience was strongly associated with both awareness and practice among dentists, with higher scores in those reporting more than five years of clinical experience. This may reflect learning through repetition, mentoring, and exposure to a broader range of restorative scenarios, although findings in the literature are not entirely uniform. (16–18)

Practice setting (private vs. public) was not significantly related to awareness or practice. Where small differences were present, they may be secondary to experience and opportunities for skills development rather than the setting itself.

Training modality showed clearer differences: Respondents who reported in-person demonstrations or hands-on training tended to report better practice than those whose exposure was limited to undergraduate coursework. This supports the value of structured skills sessions and competency-based training in restorative dentistry. (16,17)

Awareness and practice were moderately and positively correlated, indicating that improving knowledge may contribute to better technique, but additional barriers likely remain (e.g., access to instruments, time constraints, and confidence in selecting polishing systems). (19)

Participants most commonly cited limited education and access to materials/equipment as reasons for omitting finishing and polishing. Addressing these barriers through curriculum enhancement, clinical supervision, and resource availability may improve adherence to recommended protocols.

Several limitations should be acknowledged. The cross-sectional design does not allow causal conclusions about the relationship between knowledge and practice. As participants were recruited from a single city, the findings may not generalize to other regions. Responses were self-reported, therefore, susceptible to recall and social-desirability bias, and we did not include an objective clinical audit of finishing/polishing quality. Finally, the absence of an a priori sample-size calculation and multivariable modeling may limit precision and the ability to control for confounding.

Conclusion

In this cross-sectional study, the average knowledge and practice scores regarding finishing and polishing of composite restorations among senior dental students and general dentists in Zahedan were in the moderate range. Given the importance of finishing and polishing for the longevity and biocompatibility of composite restorations, targeted and systematic educational programs, particularly hands-on training during undergraduate education and continuing education courses, are recommended to improve both knowledge and clinical practice, especially among dental students.

Acknowledgments

The authors would like to express their sincere appreciation to all final-year dental students and general dentists who participated in this study. The authors also thank the faculty members of the School of Dentistry, Zahedan University of Medical Sciences, for their valuable cooperation and support during the data collection process.

Authors' Contribution

Conceptualization: Somayeh Hosseini Tabatabaei, Mohammad Rasoul Asadi.
Data Curation: Somayeh Hosseini Tabatabaei, Mehdi Rezvaniamin.
Formal Analysis: Mohammad Rasoul Asadi, Abolfazl Payandeh.
Funding Acquisition: Mohammad Rasoul Asadi.
Investigation: Somayeh Hosseini Tabatabaei, Mehdi Rezvaniamin.
Methodology: Somayeh Hosseini Tabatabaei, Abolfazl Payandeh.
Project Administration: Mohammad Rasoul Asadi.
Resources: Mohammad Rasoul Asadi, Somayeh Hosseini Tabatabaei.
Software: Abolfazl Payandeh.
Supervision: Mohammad Rasoul Asadi.
Validation: Abolfazl Payandeh, Mohammad Rasoul Asadi.
Visualization: Mehdi Rezvaniamin.
Writing–Original Draft: Somayeh Hosseini Tabatabaei.
Writing–Review & Editing: Mohammad Rasoul Asadi, Abolfazl Payandeh.

Competing Interests
The authors declare that they have no known competing financial or personal interests that could have appeared to influence the work reported in this paper.

Data Availability Statement
The datasets generated and analyzed during the present study are not publicly available due to ethical and privacy considerations, but are available from the corresponding author on reasonable request.

Ethical Approval
This study was retrieved from a dental student thesis (No:4014), which was approved by the Ethics Committee of Zahedan University of Medical Sciences (Ethical code: IR.ZAUMS.REC.1402.322).

Funding
This study was self-funded by the authors and received no external financial support from any funding organization.

References

1. Sajad M, Shafia S, Sharma N. Knowledge and attitude of dental practitioners towards composite restorations - a questionnaire-based survey. Int J Contemp Med Res. 2018;5(8):9-12. doi:10.21276/ijcmr.2018.5.8.12
2. Vishwanath S, Kadandale S, Kumarappan SK, Ramachandran A, Unnikrishnan M, Nagesh HM. Finishing and polishing of composite restoration: assessment of knowledge, attitude and practice among various dental professionals in India. Cureus 2022;14(1):e20887. doi:10.7759/cureus.20887
3. Silva JP, Coelho A, Paula A, Amaro I, Saraiva J, Ferreira MM, et al. The influence of irrigation during the finishing and polishing of composite resin restorations-a systematic review of in vitro studies. Materials (Basel) 2021;14(7):1675. doi:10.3390/ma14071675
4. German MJ. Developments in resin-based composites. Br Dent J 2022;232(9):638-43. doi:10.1038/s41415-022-4240-8
5. Dietschi D, Shahidi C, Krejci I. Clinical performance of direct anterior composite restorations: a systematic literature review and critical appraisal. Int J Esthet Dent 2019;14(3):252-70.
6. Lauridsen E, Andersson L, Suresh N. The dental trauma guide: an evidence-based treatment guide. Endodontology 2023;35(2):79-84. doi:10.4103/endo.endo_46_23
7. Jose J, Palanivelu A, Subbaiyan H. Different treatment modalities followed by dental practitioners for Ellis class 2 fracture–a questionnaire-based survey. Open Dent J 2020;14:59-65. doi:10.2174/1874210602014010059
8. Ali S, Iqbal K, Asmat M, Farooq I, Mustafa Khan A, Alam MK. Dental resin composite restoration practices amongst general dental practitioners of Karachi, Pakistan. World J Dent 2019;10(2):129-34. doi:10.5005/jp-journals-10015-1618
9. Ferracane JL. Resin composite--state of the art. Dent Mater 2011;27(1):29-38. doi:10.1016/j.dental.2010.10.020
10. Mule AE, Warhadpande MM, Dakshindas DM. Assessment of knowledge, attitude and practice among dental professionals in Central India regarding amalgam restoration and composite restoration as posterior restorative material: a questionnaire-based study. J Clin Diagn Res 2023;17(7):ZC33-8. doi:10.7860/jcdr/2023/62859.18202
11. Zhou X, Huang X, Li M, Peng X, Wang S, Zhou X, et al. Development and status of resin composite as dental restorative materials. J Appl Polym Sci 2019;136(44):48180. doi:10.1002/app.48180
12. Dutra D, Pereira G, Kantorski KZ, Valandro LF, Zanatta FB. Does finishing and polishing of restorative materials affect bacterial adhesion and biofilm formation? A systematic review. Oper Dent 2018;43(1):E37-52. doi:10.2341/17-073-l
13. Rodrigues-Junior SA, Chemin P, Piaia PP, Ferracane JL. Surface roughness and gloss of actual composites as polished with different polishing systems. Oper Dent 2015;40(4):418-29. doi:10.2341/14-014l
14. Alkhudhairy F. Attitudes of dentists and interns in Riyadh to the use of dental amalgam. BMC Res Notes 2016;9(1):488. doi:10.1186/s13104-016-2294-x
15. Davari A, Farahat F, Zare M. Evaluation of Yazd dentist's knowledge, attitude and performance of aesthetic management of anterior composite restorations in 2020. J Shahid Sadoughi Univ Med Sci 2023;31(4):6601-14. doi:10.18502/ssu.v31i4.13030
16. Sarvasri T, Sandeep AH. Knowledge, Attitude and Practice of Dental Students Towards Indirect Dental Restoration. Cuest Fisioter 2025;54(3):4368-77. doi:10.48047/vnr8f867
17. Sibai N, AlFadhel R, AlSaleh L, Durayhim SB, AlMthen H, AlSewailem L. Knowledge and clinical practice of restoration repair among dental undergraduate students in the Kingdom of Saudi Arabia. Open Dent J 2023;17(1):e187421062303280. doi:10.2174/18742106-v17-e230413-2022-171
18. Zimmerli B, Lussi A, Flury S. Operator variability using different polishing methods and surface geometry of a nanohybrid composite. Oper Dent 2011;36(1):52-9. doi:10.2341/10-096-lr1
19. Kumaran T. Knowledge attitude and practice of dental students towards finishing and polishing of composite restoration. J Pharm Negat Results 2022;13(4):1283-9. doi:10.47750/pnr.2022.13.S04.152