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Original article

Knowledge, Attitudes, and Practices of Dental Practitioners Toward Laminate Veneer in Benghazi, Libya

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Abstract
Laminate veneers are widely used in esthetic dentistry for managing structural and discoloration defects of anterior teeth. Their success relies on proper clinical knowledge, technique, and patient-centered care. This study aimed to evaluate the knowledge, attitudes, and practice approaches of dental practitioners in Benghazi, Libya, regarding laminate veneer preparation and placement. A cross-sectional, questionnaire-based survey was conducted among 100 registered dental practitioners, with 99 complete responses analyzed. The 15-item questionnaire assessed awareness of veneer techniques, materials, clinical practices, and associated complications. Responses were scored and analyzed using SPSS, with chi-square tests applied to identify associations with clinical experience. Most practitioners demonstrated moderate knowledge regarding veneer preparation, with 77.8% aware of alternatives for fluorosis management and 74.7% familiar with veneer thickness guidelines. Awareness of recent material advances was lower (51.5%). Only 47.5% attended veneer-related courses. Debonding was the most reported complication (48.5%). Statistically significant associations were found between experience and specific knowledge areas, such as alternative treatment awareness [p = 0.008] and cementation techniques (p=0.002). While general awareness of veneer preparation was acceptable, gaps remain in specialized training and continuing education, highlighting the need for targeted professional development initiatives.
Keywords. Laminate, Veneers, Esthetic, Dentistry, Preparation, Knowledge, Attitude, Practice.

Introduction

Laminate veneers, first introduced by Dr. Charles Pincus in 1940, are thin porcelain restorations used to improve the appearance of teeth with structural defects or intrinsic discoloration [1–4]. Indications include enamel hypoplasia, tetracycline staining, diastemas, and morphological anomalies. Their success relies on conservative preparation, precise bonding, and proper patient care. Valued for their minimally invasive nature, durability, and esthetic appeal, veneers remain popular in modern dentistry [5–8]. However, challenges like marginal discrepancies and luting composite wear persist [9]. Advances in ceramic and adhesive technologies have enhanced outcomes, but clinical success depends on practitioners' current knowledge, skills, and attitudes toward veneer procedures [4,8,10,11].

The KAP framework is a widely recognized tool in healthcare research, providing a structured approach to evaluate how knowledge, attitudes, and practices influence professional behavior. In the context of dentistry, KAP studies help assess the clinical awareness and procedural competencies of practitioners, while also revealing gaps in education and areas requiring targeted intervention[12–14]. Knowledge refers to a practitioner's understanding of material properties, preparation techniques, and treatment protocols. Attitudes reflect their professional commitment, aesthetic sensibility, and confidence in using veneers as a restorative solution. Practice assesses the implementation of these concepts in clinical settings, including shade matching, incisal edge preparation, and luting techniques. Together, these components are essential for ensuring evidence-based, patient-centered care [4,10,15].

Practitioners' attitudes in healthcare, including dentistry, greatly affect job satisfaction, performance, and career commitment. Positive attitudes boost motivation and adaptability, while negative ones can lead to disengagement. Studies show attitudes vary by region and institution, with some students enthusiastic about their careers and others dissatisfied due to systemic issues. This highlights the need for curricula and clinical training to better align with students' evolving expectations[16,17]. Despite the widespread application of laminate veneers in restorative dentistry, limited data exist regarding the knowledge, attitudes, and practices of dental practitioners in Benghazi, Libya. Given the esthetic and functional importance of veneers, it is imperative to assess how well practitioners understand and implement veneer-related procedures. Moreover, identifying attitudes toward their use can reveal potential barriers to optimal care and inform continuing education strategies.

Accordingly, this study aims to evaluate the level of knowledge, attitudes, and practice approaches among dental practitioners in Benghazi regarding laminate veneer preparation. The findings will contribute to the development of targeted educational programs and evidence-based practice guidelines aimed at enhancing restorative outcomes and patient satisfaction.

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Methods

A total of 100 registered dental practitioners were invited to participate in this cross-sectional, close-ended, questionnaire-based survey. The self-administered questionnaire consisted of 15 items designed to evaluate the knowledge and practices of dental professionals regarding the techniques and materials used in the preparation of laminate veneers.

Eligible participants included dentists with a minimum of one year of clinical experience following graduation. The survey was distributed among dental practitioners practicing in Benghazi, Libya. Of the distributed questionnaires, 99 were completed and returned. One response was excluded due to incomplete data.

To assess the knowledge and attitude of dental practitioners regarding laminate veneer preparation, each respondent's answer to 15 relevant questions was scored. A positive or knowledgeable response was given 1 point, while a negative or unknowledgeable response was given 0 points. The total score per respondent group was then calculated and expressed as a percentage of the maximum possible score (15 points).

Data were collected, coded, and analyzed using SPSS statistical software (version 25). Categorical variables were presented as frequencies and percentages. The Chi-square test was used to assess the association between variables, and a p-value of less than 0.05 was considered statistically significant.

Results

The final study sample included 99 dental practitioners. Among them, 13.13% were male, and 86.87% were female (Figure 1). The majority of participants (54.55%) were under the age of 30, followed by 29.29% aged between 31 and 40 years, 13.13% aged 41 to 50 years, and 3.03% over the age of 50 (Figure 2]) Regarding clinical experience, 64.65% of the participants had 1–5 years of experience, 19.19% had 11–20 years, and 8.08% had more than 20 years or between 6 and 10 years (Figure 3).

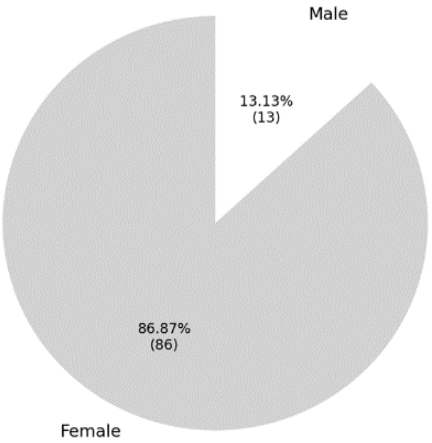

Figure 1. Male and female ratio of the study participants

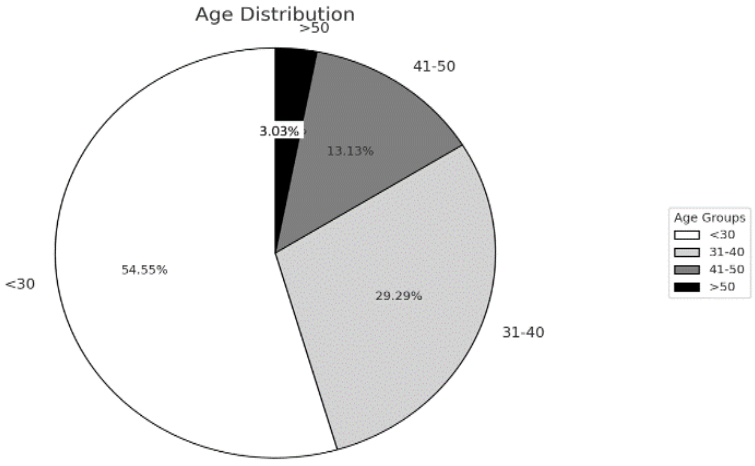

Figure 2. Distribution of the study participants according to age group

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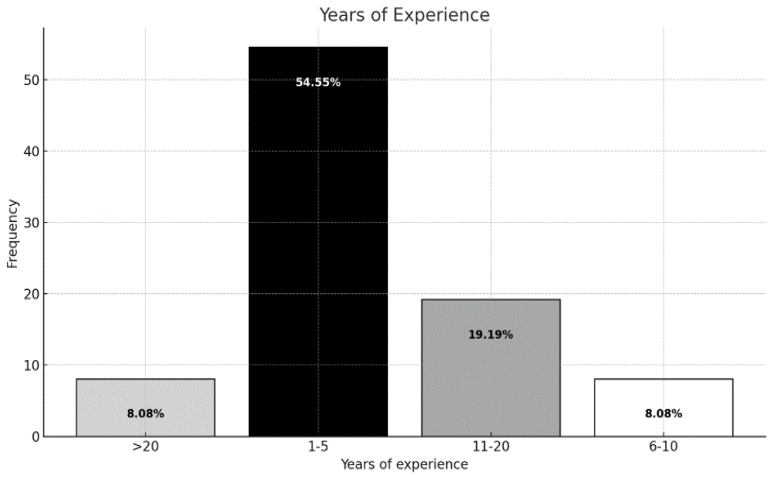

Figure 3. Distribution of the study participants according to years of experience

The survey revealed that while most dental practitioners demonstrated awareness in key areas of veneer procedures, notable knowledge gaps persist. A majority (77.8%) were aware of alternative treatments for fluorosis, and 69.7% understood veneer classifications. Familiarity with the biplane incisal preparation technique and proper veneer thickness was reported by 74.7% of participants. However, only 51.5% were aware of recent advancements in materials and adhesives. Although 83.8% correctly identified the ideal finish line position, just 47.5% had attended formal veneer training. Awareness of clinical differences between vital and non-vital teeth was recognized by 55.6% of respondents. Debonding (48.5%) and tooth sensitivity (22.2%) were the most common postoperative complications. Despite 70.7% understanding the risks of improper placement (Table 1).

Table 1. Respondents' Answers to Laminate Veneer Questionnaire

Question	Response	Frequency	Percent [%]
Q1: Are you aware of alternative treatments for fluorosis-related discoloration other than veneers?	Yes	77	77.8
	No	22	22.2
Q2: Are you aware of the types of classification of veneers?	Yes	69	69.7
	No	30	30.3
Q3: Are you aware of the biplane type of reduction for incisors?	Yes	74	74.7
	No	25	25.3
Q4: Are you aware of the impact of preparation design on restoration survivability?	Yes	62	62.6
	No	37	37.4
Q5: Do you know the appropriate thickness of porcelain laminate veneers?	Yes	74	74.7
	No	25	25.3
Q6: Are you aware of recent advances in veneer materials and adhesive techniques?	Yes	51	51.5
	No	48	48.5
Q7: Are you aware of the most favorable position for the finish line?	Yes	83	83.8
	No	16	16.2
Q8: Have you attended any courses related to veneer preparation or placement?	Yes	47	47.5
	No	52	52.5
Q9: Do you differentiate between vital and non-vital teeth when placing ceramic veneers?	Yes	55	55.6
	No	44	44.4
Q10: Do you consider principles of patient selection before starting treatment?	Always	64	64.6
	Sometimes	33	33.3
	Never	2	2.0
Q11: Do you perform occlusal analysis before starting veneer treatment?	Always	61	61.6
	Sometimes	32	32.3
	Never	6	6.1
Q12: Do you use rubber dam isolation during cementation?	Always	37	37.4
	Sometimes	37	37.4
	Never	25	25.3
	Always	15	15.2

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Q13: Do you recommend or fabricate a night guard for patients after treatment?	Sometimes	50	50.5
	Never	34	34.3
Q14: Most commonly reported postoperative complications in veneer procedures	Debonding	48	48.5
	Tooth sensitivity	22	22.2
	Fracture	13	13.1
	Marginal discoloration	9	9.1
	Chipping	5	5.1
	Secondary caries	2	2.0
Q15: Are you aware of the consequences of laminate veneer failure?	Yes	70	70.7
	No	29	29.3

The comparative analysis of dental practitioners' knowledge based on years of experience revealed that less experienced dentists (<5 years) were significantly less aware of alternative treatments for fluorosis-related discoloration (P = 0.008), while those with 6–10 years showed the highest awareness of cementation techniques (P = 0.002). No significant differences were found in knowledge of veneer classifications, materials, biplane reduction, preparation design, or finish line location, suggesting that these areas are not strongly influenced by experience. Despite younger practitioners being more informed about recent advancements, the difference was not statistically significant (P = 0.079). Continuing education attendance did not vary significantly with experience, nor did practices like using veneers on non-vital teeth, patient selection, occlusal analysis, rubber dam usage, or night guard prescriptions. Debonding was the most common postoperative complication, especially among those with 1–5 and 11–20 years of experience, but differences were not significant. Overall, awareness of complications from improper veneer placement was consistently high across all groups (Table 2).

Table 2. Comparison of Practitioners' Knowledge According to Years of Experience

Question	Response	>20 Years	1–5 Years	11–20 Years	6–10 Years	P Value
Are you aware of the alternative treatment for fluorosis discoloration besides veneers?	No	0 (0.0%)	10 (15.6%)	8 (42.1%)	4 (50.0%)	0.008*
	Yes	8 (100%)	54 (84.4%)	11 (57.9%)	4 (50.0%)	
Are you aware of veneer classification types?	No	3 (37.5%)	17 (26.6%)	9 (47.4%)	1 (12.5%)	0.218
	Yes	5 (62.5%)	47 (73.4%)	10 (52.6%)	7 (87.5%)	
Are you aware of the materials used in laminate veneer constructions?	No	3 (37.5%)	12 (18.8%)	6 (31.6%)	3 (37.5%)	0.371
	Yes	5 (62.5%)	52 (81.3%)	13 (68.4%)	5 (62.5%)	
Are you aware of the cementation technique?	No	5 (62.5%)	10 (15.6%)	8 (42.1%)	0 (0.0%)	0.002*
	Yes	3 (37.5%)	54 (84.4%)	11 (57.9%)	8 (100%)	
Are you aware of biplane incisor reduction?	No	2 (25.0%)	16 (25.0%)	6 (31.6%)	1 (12.5%)	0.778
	Yes	6 (75.0%)	48 (75.0%)	13 (68.4%)	7 (87.5%)	
Are you aware of the impact of preparation design on restoration survivability?	No	5 (62.5%)	19 (29.7%)	9 (47.4%)	4 (50.0%)	0.163
	Yes	3 (37.5%)	45 (70.3%)	10 (52.6%)	4 (50.0%)	
Do you know the thickness of porcelain laminate veneers?	No	4 (50.0%)	14 (21.9%)	7 (36.8%)	0 (0.0%)	0.071
	Yes	4 (50.0%)	50 (78.1%)	12 (63.2%)	8 (100%)	
Are you aware of recent advances in veneer materials and adhesive techniques?	No	6 (75.0%)	25 (39.1%)	12 (63.2%)	5 (62.5%)	0.079
	Yes	2 (25.0%)	39 (60.9%)	7 (36.8%)	3 (37.5%)	
Are you aware of the most favorable finish line position?	No	2 (25.0%)	10 (15.6%)	4 (21.1%)	0 (0.0%)	0.503
	Yes	6 (75.0%)	54 (84.4%)	15 (78.9%)	8 (100%)	
Have you attended any courses about veneers?	No	5 (62.5%)	29 (45.3%)	13 (68.4%)	5 (62.5%)	0.273

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	Yes	3 (37.5%)	35 (54.7%)	6 (31.6%)	3 (37.5%)	
Do you know if ceramic veneers are different in vital vs non-vital teeth?	No	5 (62.5%)	29 (45.3%)	8 (42.1%)	2 (25.0%)	0.504
	Yes	3 (37.5%)	35 (54.7%)	11 (57.9%)	6 (75.0%)	
Do you consider patient selection before starting veneer treatment?	Always	5 (62.5%)	41 (64.1%)	11 (57.9%)	7 (87.5%)	0.756
	Never	0 (0.0%)	2 (3.1%)	0 (0.0%)	0 (0.0%)	
	Sometimes	3 (37.5%)	21 (32.8%)	8 (42.1%)	1 (12.5%)	
Do you perform occlusal analysis before treatment?	Always	3 (37.5%)	39 (60.9%)	13 (68.4%)	6 (75.0%)	0.182
	Never	2 (25.0%)	2 (3.1%)	1 (5.3%)	1 (12.5%)	
	Sometimes	3 (37.5%)	23 (35.9%)	5 (26.3%)	1 (12.5%)	
Do you use rubber dam isolation during cementation?	Always	0 (0.0%)	28 (43.8%)	8 (42.1%)	1 (12.5%)	0.119
	Never	4 (50.0%)	13 (20.3%)	4 (21.1%)	4 (50.0%)	
	Sometimes	4 (50.0%)	23 (35.9%)	7 (36.8%)	3 (37.5%)	
Do you prescribe or make night guards for patients' post-treatment?	Always	0 (0.0%)	13 (20.3%)	2 (10.5%)	0 (0.0%)	0.491
	Never	4 (50.0%)	19 (29.7%)	7 (36.8%)	4 (50.0%)	
	Sometimes	4 (50.0%)	32 (50.0%)	10 (52.6%)	4 (50.0%)	
What are the commonly reported postoperative complications in veneer procedures?	Chipping	0 (0.0%)	3 (4.7%)	2 (10.5%)	0 (0.0%)	0.467
	Debonding	5 (62.5%)	33 (51.6%)	6 (31.6%)	4 (50.0%)	
	Fracture	1 (12.5%)	9 (14.1%)	1 (5.3%)	2 (25.0%)	
	Discoloration	1 (12.5%)	5 (7.8%)	3 (15.8%)	0 (0.0%)	
	Secondary caries	0 (0.0%)	1 (1.6%)	0 (0.0%)	1 (12.5%)	
	Sensitivity	1 (12.5%)	13 (20.3%)	7 (36.8%)	1 (12.5%)	
Are you aware of the consequences of failed laminate veneer placement?	No	2 (25.0%)	18 (28.1%)	6 (31.6%)	3 (37.5%)	0.936
	Yes	6 (75.0%)	46 (71.9%)	13 (68.4%)	5 (62.5%)	

(*Statistically significant values are marked with an asterisk ***)

The highest mean score was observed among practitioners with 1–5 years of experience (80%), suggesting that recent graduates may possess more updated theoretical knowledge, likely due to their recent exposure to contemporary dental curricula and advances in esthetic dentistry. This group demonstrated strong awareness of fundamental concepts such as veneer classification, preparation techniques, and material selection.

Interestingly, practitioners with more than 20 years of experience followed closely with a score of 66.7%, reflecting the benefit of extensive clinical exposure and accumulated professional knowledge. However, this group may still lack awareness in specific areas where recent advancements have occurred, particularly in adhesive techniques and minimally invasive preparation protocols.

On the other hand, mid-career practitioners, particularly those with 6–10 years of experience, demonstrated the lowest knowledge score (53.3%), indicating potential gaps in continuous professional development during this career stage. Similarly, those with 11–20 years of experience scored 60.0%, reflecting a moderate level of awareness, though with room for improvement in several technical and procedural areas.

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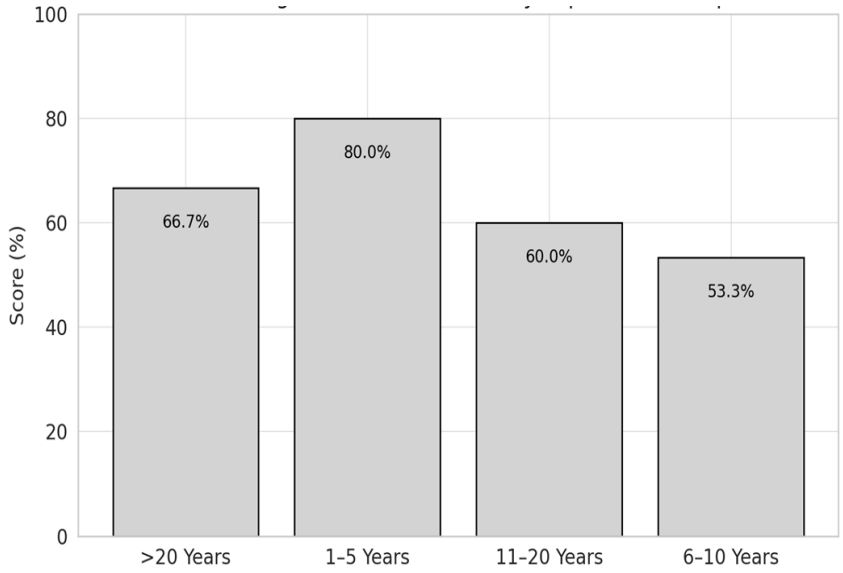

Figure 4. knowledge and attitude score by level of experience

Discussion

This study outlines the demographic and clinical characteristics of dental practitioners in Benghazi involved in laminate veneer procedures, revealing a predominantly female (86.87%) and youthful workforce, with most under 30 years old and having 1–5 years of experience. This mirrors broader regional trends and emphasizes the need for structured continuing professional development (CPD) and mentorship programs to support early-career dentists. The findings also underscore the importance of integrating esthetic dentistry training into dental curricula to foster essential clinical and interpersonal skills [18–22].

This study reveals that dental practitioners in Benghazi have a strong grasp of conservative esthetic treatments, with 77.8% acknowledging options like bleaching and microabrasion for fluorosis-related discoloration, reflecting a global shift toward minimally invasive dentistry. Rosa et al [23] similarly reported that many practitioners consider non-invasive or minimally invasive options when managing mild to moderate fluorosis cases, indicating a shift toward more conservative esthetic approaches. Additionally, 69.7% of participants demonstrated knowledge of veneer classification systems, a rate comparable to findings by Prath and Jain (67%) among Indian dentists [10].Together, these results indicate a solid foundational understanding of both conservative treatment alternatives and veneer design among practitioners.

Approximately 74.7% of dental practitioners in Benghazi were familiar with the biplane (incisal overlap) veneer preparation, known for superior fracture resistance, while 25.3% lacked this knowledge, indicating a training gap. Studies by Bergoli et al. and Tamimi et al. demonstrated that the biplane design offers higher load-bearing capacity compared to butt joint or bevel designs [24,25]. Prath & Jain [10]., and Alenezi et al., the latter of whom highlighted the superior long-term survival of veneers with incisal overlap[26]. 62.6% acknowledged the importance of proper preparation design for veneer longevity, aligning with international standards and studies like Peumans et al., [27]. There were 4.7% who were aware of optimal veneer thickness [0.3–0.7 mm], though the remaining 25.3% risked complications from over- or under-reduction. Research also cautions that no-prep veneers, while conservative, can cause esthetic and periodontal issues due to altered emergence profiles. These findings emphasize the need for reinforced training on preparation design and thickness in both undergraduate education and continuing professional development. [28,29]

Advancements and Margin Awareness: Only 51.5% had moderate awareness of new materials and adhesives, lower than in international counterparts, possibly due to limited CPD access [30]. A high 83.8% recognized the importance of supragingival margins, supporting periodontal health [31].

Training and Clinical Variation, just 47.5% had attended formal veneer-related courses, reflecting a significant gap in practical, hands-on learning. This supports prior suggestions to incorporate digital tools and instructional videos to improve clinical skills [32–34].

55.6% of respondents recognized clinical differences between vital and non-vital teeth in veneer application—an important consideration for esthetics and bonding. This aligns with Zarow et al. [35]., who emphasized the complexity of color matching in endodontically treated teeth. Overall, the findings highlight a need for improved access to updated educational resources and CPD. Greater emphasis on skills-based veneer training. And enhanced curriculum coverage of clinical variations, especially for non-vital teeth[36–41].

This study highlights the prevalence and causes of postoperative complications following veneer restorations, as well as the influence of clinical experience on treatment awareness. Debonding was the most common complication (48.5%), often linked to inadequate adhesive protocols or lack of enamel support, consistent with previous research emphasizing bonding failures as a common issue, particularly when proper adhesive protocols are not followed or when enamel support is insufficient [42].. Tooth sensitivity

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(22.2%) was frequently associated with over-preparation and excessive enamel removal, emphasizing the importance of minimally invasive techniques. Studies have suggested that maintaining preparations within enamel, using minimally invasive approaches, significantly reduces the incidence of postoperative sensitivity [43,44]. Other complications such as veneer fractures (13.1%), chipping [5.1%], marginal discoloration (9.1%), and secondary caries (2%). These issues often stem from poor preparation, occlusal mismanagement, or inadequate hygiene practices [45]. While 70.7% of respondents were aware of the risks associated with improper veneer placement, 29.3% lacked awareness, indicating a clear need for improved clinical training and ongoing education Awareness of the etiology and presentation of complications can guide practitioners in modifying techniques and improving patient outcomes[46]. A comparative analysis showed that practitioners with less than five years of experience had significantly lower awareness of alternative treatments for fluorosis (P = 0.008), echoing AlShehri et al.'s call for enhanced undergraduate and postgraduate curricula[35].

Knowledge Consistency Across Experience Levels shows no significant differences were found regarding knowledge of veneer classification (P = 0.218) or materials used (P = 0.371), indicating these topics are well-covered in dental education across generations [47]. Similarly, awareness of biplane incisal reduction (P = 0.788), the impact of preparation design (P = 0.163), patient selection (P = 0.756), occlusal analysis (P = 0.182), and rubber dam use (P = 0.119) showed no significant variation by experience level, though trends toward better practices were noted in more experienced groups. This trend underscores the dynamic nature of dental materials science and the need for continuous learning [48]. Patient selection prior to treatment was consistently acknowledged across experience levels (P = 0.756), emphasizing its fundamental role in treatment planning. Similarly, the practice of performing occlusal analysis prior to veneer treatment did not significantly differ across groups (P = 0.182), although a trend towards increased frequency with experience was noted. This is noteworthy given the documented benefits of rubber dam usage in enhancing restorative outcomes [49].

Experience-Dependent Disparities, such as cementation technique awareness, were significantly lower among dentists with >20 years of experience (37.5%) compared to 100% of those with 6–10 years (P = 0.002), suggesting that newer practitioners are more updated with recent adhesive protocols. While awareness of recent veneer material and adhesive advances was highest among those with 1–5 years of experience, the difference was not statistically significant (P = 0.079), but it reinforces the need for continuous learning in a fast-evolving field.

Professional Development Gaps, for example, attendance of veneer-focused training courses was generally low and unrelated to experience (P = 0.273), indicating a broad need for increased access to continuing education. Clinical Practice Trends, such as the use of ceramic veneers for vital vs. non-vital teeth, did not vary significantly (P = 0.504), aligning with evidence showing good outcomes in both scenarios. This is consistent with findings by Ziętek et al. (2023), who reported satisfactory clinical performance of ceramic veneers in both vital and non-vital teeth [35].

The most common complication, debonding, was more frequent among practitioners with 1–5 and 11–20 years of experience, possibly due to varying skill levels or familiarity with techniques[50].. Night guard usage post-veneer placement did not correlate with experience (P = 0.491), showing inconsistent adherence to protective protocols despite their recommended use, especially for bruxism patients [51].

Finally, awareness of the consequences of improper laminate veneer placement did not differ significantly between experience levels (P = 0.936), indicating a generally consistent understanding of potential risks and clinical implications across the profession.

The study revealed that early-career dentists (1–5 years of experience) had the highest knowledge scores (80%), reflecting their exposure to updated curricula emphasizing esthetic dentistry, minimally invasive preparations, and modern adhesive systems. In contrast, mid-career dentists (6–10 years) had the lowest scores (53.3%), suggesting a decline in ongoing educational engagement post-graduation. Senior practitioners (>20 years) showed relatively strong scores (66.7%), likely driven by clinical experience rather than formal training in recent advancements. These results are supported by literature such as Morimoto et al., which underscores the role of operator experience in the success and complication rates of porcelain laminate veneers (PLVs), particularly in relation to debonding and fractures[52]. Despite known benefits, night guard usage remains inconsistent, particularly among patients with bruxism, highlighting a gap between evidence-based recommendations and clinical practice [53].

Conclusion and recommendations

Although most dental practitioners had a basic understanding of veneer procedures, significant knowledge gaps, particularly regarding modern materials and adhesive techniques, were identified. Newer graduates (1–5 years) showed the highest knowledge, while mid-career practitioners (6–10 years) lagged, highlighting the need for targeted continuing education. Frequent complications such as debonding and tooth sensitivity point to clinical shortcomings, and low participation in specialized veneer training remains a concern. Enhancing outcomes requires regular CPD, improved dental school training, refresher courses for mid-career dentists, greater awareness of conservative fluorosis treatments, standardized protocols, outcome audits, and interdisciplinary collaboration.

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References

1. Hari M, Poovani S. Porcelain laminate veneers: A review. J Adv Clin Res Insights. 2017 Jan 1;4:187–90.
2. Morita RK, Hayashida MF, Pupo YM, Berger G, Reggiani RD, Betiol EAG. Minimally Invasive Laminate Veneers: Clinical Aspects in Treatment Planning and Cementation Procedures. Case Rep Dent. 2016;2016:1839793.
3. S S, Sunitha S, Dhakshaini MR, Swamy KN. Esthetics with Veneers: A Review. Int J Dent Heal Concerns. 2015 Jan 1;1:46–50.
4. Pini NP, Aguiar FHB, Lima DANL, Lovadino JR, Terada RSS, Pascotto RC. Advances in dental veneers: materials, applications, and techniques. Clin Cosmet Investig Dent. 2012;9–16.
5. Gresnigt MMM, Kalk W, Özcan M. Clinical longevity of ceramic laminate veneers bonded to teeth with and without existing composite restorations up to 40 months. Clin Oral Investig. 2013;17:823–32.
6. Fradeani M, Redemagni M, Corrado M. Porcelain laminate veneers: 6- to 12-year clinical evaluation - A retrospective study. Int J Periodontics Restorative Dent. 2005 Mar 1;25:9–17.
7. D'Arcangelo C, Angelis F, Vadini M, D'Amario M. Clinical evaluation on porcelain laminate veneers bonded with light-cured composite: Results up to 7 years. Clin Oral Investig. 2011;16:1071–9.
8. Alothman Y, Bamasoud MS. The Success of Dental Veneers According To Preparation Design and Material Type. Open access Maced J Med Sci. 2018 Dec;6(12):2402–8.
9. Peumans M, Van Meerbeek B, Lambrechts P, Vanherle G. Porcelain veneers: a review of the literature. J Dent. 2000;28(3):163–77.
10. Prath A, Jain A. Knowledge, attitude and practice on laminate veneer preparations among dental practitioners. Res J Pharm Technol. 2017 Jan 1;10:1687–90.
11. (alias) Malathi Suresh SM, Anuradha B, Prakash V, Elanthendral S. Recent advances in the material aspects of veneers. 2020 Dec 29;7:2079–85.
12. Zarei F, Dehghani A, Ratansiri A, Ghaffari M, Raina SK, Halimi A, et al. ChecKAP: A Checklist for Reporting a Knowledge, Attitude, and Practice (KAP) Study. Asian Pac J Cancer Prev. 2024 Jul;25(7):2573–7.
13. Liao X, Nguyen T, Sasaki N. Use of the knowledge, attitude, and practice (KAP) model to examine sustainable agriculture in Thailand. Reg Sustain. 2022 Mar 1;3:41–52.
14. Launiala A. How much can a KAP survey tell us about people's knowledge, attitudes and practices? Some observations from medical anthropology research on malaria in pregnancy in Malawi. Anthr Matters. 2009 Jan 1;11:1–13.
15. Azeez S, Amin B, Hamid N. Knowledge protocol of direct and indirect Veneers among dental practitioners - A case study. Polytech J. 2023 Mar 15;12:121–8.
16. Soegiarto I, Sihite M, Usmany P. The Influence of Training and Development Programs, Job Autonomy, and Organizational Culture on Employee Job Satisfaction and Performance. Int J Business, Law, Educ. 2024 May 10;5:1577–83.
17. Borst RT, Kruyen PM, Lako CJ, de Vries MS. The Attitudinal, Behavioral, and Performance Outcomes of Work Engagement: A Comparative Meta-Analysis Across the Public, Semipublic, and Private Sector. Rev Public Pers Adm (Internet]. 2020;40(4):613–40. Available from: https://doi.org/10.1177/0734371X19840399
18. Sampaio FBWR, Özcan M, Gimenez TC, Moreira MSNA, Tedesco TK, Morimoto S. Effects of manufacturing methods on the survival rate of ceramic and indirect composite restorations: A systematic review and meta-analysis. J Esthet Restor Dent. 2019;31(6):561–71.
19. Gallagher JE, Patel R, Wilson NHF. The emerging dental workforce: long-term career expectations and influences. A quantitative study of final year dental students' views on their long-term career from one London Dental School. BMC Oral Health. 2009;9:1–9.
20. Altier M, Mhanni A, Elsawaay S, Seghayer M. Assessing Knowledge, Attitudes, and Skills in Fixed Prosthodontic Procedures Among Dental Practitioners in Tripoli, Libya: A Cross-Sectional Study. AlQalam J Med Appl Sci. 2025;508–16.
21. Arhoma N, El Tantawi M, Arheiam A. Career expectations and the motivating factors for studying dentistry in Libya. BMC Med Educ. 2022 Dec 7;22.
22. Crespo Hernández OL, Cala Peguero TY. Aesthetic training and critical thinking in the Bachelor's Degree in Sociocultural Management for Development. Mendive-Revista Educ. 2024;22(3].
23. Guyonvarch R, Estivals J, Kérourédan O. Minimally Invasive Direct Approach for Severe Dental Fluorosis: Balancing Aesthetics and Quality of Life. Clin case reports. 2025 Feb;13(2]:e70254.
24. Bergoli CD, Meira JBC, Valandro LF, Bottino MA. Survival rate, load to fracture, and finite element analysis of incisors and canines restored with ceramic veneers having varied preparation design. Oper Dent. 2014;39(5]:530–40.
25. Tamimi S, Essam E, El Guindy J. Effect of Different Preparation Designs on the Fracture Load of Two Machinable Laminate Veneers. Al-Azhar Dent J Girls. 2017;4(1]:63–70.
26. Alenezi A, Alsweed M, Alsidrani S, Chrcanovic BR. Long-Term Survival and Complication Rates of Porcelain Laminate Veneers in Clinical Studies: A Systematic Review. J Clin Med (Internet]. 2021;10(5]. Available from: https://www.mdpi.com/2077-0383/10/5/1074
27. Reis GR, Vilela ALR, Silva FP, Borges MG, Santos-Filho PC de F, Menezes M de S. Minimally invasive approach in esthetic dentistry: composite resin versus ceramics veneers. Biosci j(Online]. 2017;238–46.
28. Jurado CA, Fischer NG, Mourad F, Villalobos-Tinoco J, Tsujimoto A. Conservative ultrathin veneer restorations with minimal reduction: a 5-year follow-up report. J Contemp Dent Pr. 2020;21(11]:1293–7.
29. Alawa D, Karkoutly M, Milly H. Esthetic Rehabilitation with No-Preparation Veneers Applying BOPT: A Case Report with a 12-Month Follow-Up. Case Rep Dent. 2024;2024:6620612.
30. Aslan YU, Uludamar A, Özkan Y. Clinical performance of pressable glass-ceramic veneers after 5, 10, 15, and 20 years: A retrospective case series study. J Esthet Restor Dent Off Publ Am Acad Esthet Dent . (et al]. 2019 Sep;31(5]:415–22.
31. Yu H, Zhao Y, Li J, Luo T, Gao J, Liu H, et al. Minimal invasive microscopic tooth preparation in esthetic

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restoration: a specialist consensus. Int J Oral Sci. 2019 Oct;11(3]:31.
32. Wu QJ, Wang X, Jin D, Zhang ZS, Jiang F, Wen J, et al. Validation of Digital Evaluation in Systematic Training on Tooth Preparation in Aesthetic Veneer Rehabilitation. Chin J Dent Res. 2021;24:55–60.
33. Liu X, Liu M, Yang Y, Fan C, Tan J. Step-by-step teaching method improves the learner achievement in dental skill training. Eur J Dent Educ. 2019;23(3]:344–8.
34. Gwozdek AE, Klausner CP, Kerschbaum WE. The utilization of Computer Mediated Communication for case study collaboration. Am Dent Hyg Assoc. 2008;82(1]:8.
35. Zarow M, Hardan L, Szczeklik K, Bourgi R, Cuevas-Suárez CE, Jakubowicz N, et al. Porcelain Veneers in Vital vs. Non-Vital Teeth: A Retrospective Clinical Evaluation. Bioengineering (Internet]. 2023;10(2]. Available from: https://www.mdpi.com/2306-5354/10/2/168
36. Zarow M. Nonvital Tooth Bleaching: A Case Discussion for the Clinical Practice. Compend Contin Educ Dent (Jamesburg, NJ 1995]. 2016;37(4]:268–76.
37. Turgut S, Bagis B, Ayaz EA. Achieving the desired colour in discoloured teeth, using leucite-based CAD-CAM laminate systems. J Dent. 2014;42(1]:68–74.
38. Sari T, Ural C, Yüzbasioglu E, Duran I, Cengiz S, Kavut I. Color match of a feldspathic ceramic CAD-CAM material for ultrathin laminate veneers as a function of substrate shade, restoration color, and thickness. J Prosthet Dent. 2018;119(3]:455–60.
39. Mannocci F, Cowie J. Restoration of endodontically treated teeth. Br Dent J. 2014;216(6]:341–6.
40. Hardan L, Bourgi R, Cuevas-Suárez CE, Lukomska-Szymanska M, Monjarás-Ávila AJ, Zarow M, et al. Novel trends in dental color match using different shade selection methods: a systematic review and meta-analysis. Materials (Basel]. 2022;15(2]:468.
41. Calamita M, Coachman C, Sesma N, Kois J. Occlusal vertical dimension: treatment planning decisions and management considerations. Int J Esthet Dent. 2019;14(2].
42. Peumans M, De Munck J, Fieuws S, Lambrechts P, Vanherle G, Van Meerbeek B. A prospective ten-year clinical trial of porcelain veneers. J Adhes Dent. 2004;6(1]:65–76.
43. Magne P, Belser U. Bonded porcelain restorations in the anterior dentition: a biomimetic approach. (No Title]. 2002;
44. Castelnuovo J, Tjan AHL, Phillips K, Nicholls JI, Kois JC, of Washington U, et al. Fracture load and mode of failure of ceramic veneers with different preparations. J Prosthet Dent. 2000;83(2]:171–80.
45. Chen C, others. Zirconia-reinforced dental restorations. Universiteit van Amsterdam (Host]; 2013.
46. Assaf A, Azer SS, Sfeir A, Al-Haj Husain N, Özcan M. Risk factors with porcelain laminate veneers experienced during cementation: a review. Materials (Basel]. 2023;16(14]:4932.
47. Falacho RI, Melo EA, Marques JA, Ramos JC, Guerra F, Blatz MB. Clinical in-situ evaluation of the effect of rubber dam isolation on bond strength to enamel. J Esthet Restor Dent Off Publ Am Acad Esthet Dent . (et al]. 2023 Jan;35(1]:48–55.
48. LeSage B. Establishing a classification system and criteria for veneer preparations. Compend Contin Educ Dent. 2013 Feb;34(2]:104-112,114-117.
49. Wang Y, Li C, Yuan H, Wong MC, Zou J, Shi Z, et al. Rubber dam isolation for restorative treatment in dental patients. Cochrane database Syst Rev. 2016 Sep;9(9]:CD009858.
50. Alhekeir DF, Al-Sarhan RA, Al Mashaan AF. Porcelain laminate veneers: Clinical survey for evaluation of failure. Saudi Dent J. 2014;26(2]:63–7.
51. Alghazzawi TF. Clinical survival rate and laboratory failure of dental veneers: A narrative literature review. J Funct Biomater. 2024;15(5]:131.
52. Morimoto S, Rebello de Sampaio FBW, Braga MM, Sesma N, Özcan M. Survival Rate of Resin and Ceramic Inlays, Onlays, and Overlays: A Systematic Review and Meta-analysis. J Dent Res. 2016 Aug;95(9]:985–94.
53. Ille C-E, Jivănescu A, Pop D, Stoica ET, Flueras R, Talpoş-Niculescu I-C, et al. Exploring the Properties and Indications of Chairside CAD/CAM Materials in Restorative Dentistry. J Funct Biomater. 2025 Feb;16(2].

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