Polytechnic Journal. 2022. 12(2): 121-128
ISSN: 2313-5727
http://journals.epu.edu.iq/index.php/polytechnic

RESEARCH ARTICLE

Knowledge protocol of direct and indirect Veneers among dental practitioners - A case study

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Received: 8 Jul 2022
Accepted: 27 Sep 2022
Published: 1 February 2023

DOI
10.25156/ptj.v12n1y2022.pp121-128

ABSTRACT

Background and objectives: Dental veneers are constructed from different materials such as porcelain, pressed ceramic, processed composite, or directly applied composite. The purpose of this study was to ascertain the preferred dental materials for veneers and the knowledge about its procedures by dentists in the Kurdistan region/Erbil city

Methods: To assess general dentists' knowledge and practical use of direct and indirect veneers, a cross-sectional survey was undertaken in March 2022 among all general dentists and different dental specialties in Erbil city. The questionnaire was composed of 16 questions and was organized into knowledge, attitude, and practice sections. Google forms were used to collect responses, which were then statistically examined.

Results: This study revealed respondents were having difficulty in veneer cementations followed by tooth preparations, P value=0.025, hence statistically significant. The most popular veneer among practitioners were EMAX press and EMAX CAD. In addition, veneer dislodgement was the most common problem faced by dentists followed by tooth sensitivity, p value 0.012 so statistically significant.

Conclusions: Given the study's limitations, it may be stated that dentists should get good expertise in case selection for veneers, shade matching, optimal preparation processes and designs, and current advancements in veneer materials and adhesive techniques.

Key Words: dental veneers, designs, cementations, complications

INTRODUCTION

Researching dental professionals' prescription preferences for ceramic or composite veneers can give essential information on which treatment modality is preferred owing to the rise in the demand for aesthetic dentistry (Lonely, 2011), Veneers are a minimally invasive treatment that can close spaces between anterior teeth and treat discolorations and slight rotation to provide good aesthetic results. Correct case selection, treatment planning, shade selection (Smithson et al.,2011) ideal preparation designs, veneer manufacture, try in, and luting materials and processes are among the factors that affect effective veneer treatment (Gomes and Perdigão, 2014; Cangul, 2017).

Since its inception, the uses and indication of veneers have evolved significantly. Previously used to cover up discolouration, veneers are now largely employed in patients with erosion, misaligned teeth, and wear offs (Leonardo, 2015). With the development of new adhesive technologies, veneers have emerged as a more predictable, less invasive, long-lasting, and clinically effective aesthetic treatment option. (keerthana, 2020). The fabrication of composite veneers can be done directly or indirectly. Because of the best possible polymerization and polish ability, indirect technique materials are stronger. Veneers made of laminate have superior translucency, longevity and easily-cleanable glazed surfaces (El-Badrawy and El-Mowafy, 2009).

The composite veneers offer benefits like lower cost and treatment time, but they have drawbacks like a tendency to stain readily, the need for sufficient rubber dam isolation, and trouble getting high polishability and gloss. Ceramic veneers are more costly than composite veneers despite not staining as easily and having a higher aesthetic value (Ho, 2017). Direct composite veneers cannot take the place of the well-known ceramic veneer method. Although they might be a time-consuming technique,

they provide an option to directly veneering or bolstering anterior teeth (Bomfim et al., 2020). Direct composite resin veneers require just one visit (Bomfim et al., 2020), and composite is modified to cover discolouration and shade matching should be carried out carefully (Cardoso et al., 2009).

Most dental professionals frequently treat veneers for diastema corrections, staining/discolorations, fluorosis, moderate space closure, as well as rectifying tooth abnormalities such as peg laterals. The technique required in the treatment of putting up veneers necessitates the creation and maintenance of a number of ideal conditions and environments. They normally give quite a conservative therapy with the prospect of an outcome that may generate wonderful results and can also be advantageous in the long term with the aid of the proper sort of directions and signals. Because veneers are usually implanted for aesthetic purposes, their placement can be selective (Herman, 2016).

Studies show that dental specialties have a solid understanding of veneer preparation and materials (Banerji et al., 2017; Recen et al., 2019; Fahl and Ritter, 2020), but little or no clinical evidence was present regarding level of knowledge and attitudes of dentist regarding veneer preparation, design and practice protocol of indirect veneer in the Erbil city. The purpose of this study was to evaluate dental professionals' understanding of veneers as aesthetic treatment options and estimate the practice experience during veneer preparations regarding types of veneers, appropriate preparation processes, and dentists' preferences for contemporary veneer materials.

SUBJECTS AND METHODS

To assess general dentists' knowledge and practical experience with direct and indirect veneers, a survey of all general dentists and other dental specialists was undertaken in March 2022 in Erbil city. The study was authorized by the Ethical Committee of the College of Dentistry Research Center at Hawler Meical University/Erbil, and it was carried out in compliance with the Helsinki Declaration principles. The questionnaire was given alongside an explanation letter seeking participation and guaranteeing privacy.The questionnaire had 16 questions and was divided into three basic sections: knowledge, attitude, and practice. The questions were designed to assess the different veneer processes, preparatory designs, and materials utilized, as well as frequent issues and post-operative complications encountered. Data collected for one month using an online questionnaire created using google form that was randomly distributed among all dental practitioners regardless of the age and educational qualification degree among all participants via social media. A total of 123 respondents were collected. The data were input into Microsoft Excel sheets, and a Chi-square test was used to determine the relationship between the variables. The threshold for statistical significance was established at p0.05. SPSS software was used for the statistical analysis (SPSS Version 21.0, SPSS, USA).

RESULTS

Various parameters among the output data were evaluated. The age group of 20–29 years was the largest among the respondents that gathered about (48.8%), followed by the 30–39 years age group were higher than (26.8%), the lowest responses collected from the above 39-year age group about (24.4%) as shown in (Figure 1).

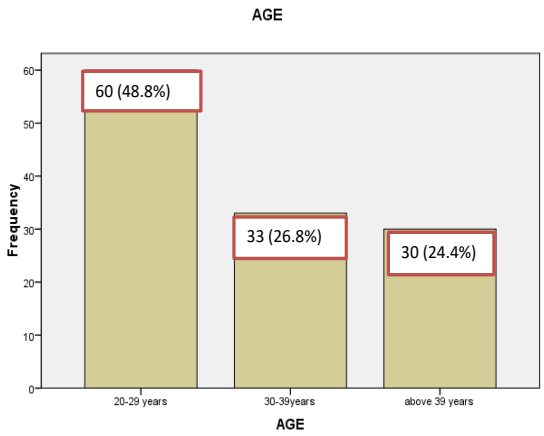

Figure 1: Age group

A total of 124 participants, male respondents made up the majority about higher than (66.7%), followed by female respondents (33.3%) as illustrated in (Figure 2). The respondents were dentists and their level of study and the mean percentage of B.D.S was highest (40.7%), followed by other majorities as shown in (Figure 3).

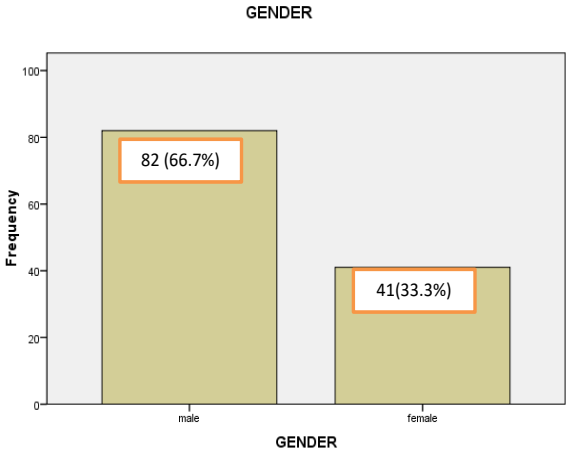

Figure 2: Gender group

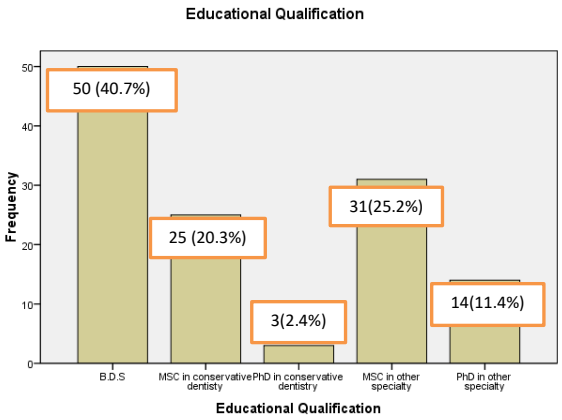

Figure 3: Educational Qualifications

While, Table 1 shows that most dentists were aware of veneer therapy for adjustments 114 (92.68%). More than half of participants 72 (58.54%) recognized the precise indications of dental veneer most of the time, and some of them 18 (14.63%) had familiarity with the contraindications. Only 31(25.2%) of dentists have knowledge about veneer fabrication materials and most of practitioners 117(95.12%) were aware that crown is a more suitable choice for endodontically treated teeth than veneer. Only 8(6.5%) of dentists had a sound knowledge on the different preparation designs of veneer. 81(65.85%) of dentists preferred chamfer finish line and majority of them 62(50.41%) suggested equi-gingival finish line with 48 (39.02%) of them chose minimal invasive preparations. While only 8(6.5%) of participants opted dentinoenaml junction (DEJ) for locating veneer margins.

The challenging step for most dentists in veneer treatment was evaluated, which showed that 38(30.89%) had difficulty in cementation, 27 (21.95%) in tooth preparation and 50 (40.65%) of them found both procedures to be challenging. The common post-operative complications that the dentists regularly faced in practice were assessed. 6(4.88%) of dentists chose staining as a major complaint, 28(22.76%) opted dislodgement of veneer and 11(8.94%) for tooth sensitivity, while the majority of practitioners 30 (24.39%) chose all of the above as common post-operative complications.

In addition, (Table 1) demonstrates the association between educational qualifications and other parameters. There was a statistically significant difference between general practitioners and dental specialists (p 0.045), regarding knowledge on making of veneers that most dental specialists have the knowledge about making indirect veneers. Regarding association between veneer contraindications and educational level, P value= 0.000 (<0.05) and hence there was statistically significant difference between general practitioners and dental specialists regarding knowledge of contraindications for veneers such as edge to edge occlusion, deep bite a rotated tooth and amelogenesis imperfecta. Also, significant association between preferred veneer material by dental professionals was found (p 0.013). in which, most of them preferred choosing lithium disilicate CAD-CAM or press materials than using composite. Moreover, there were not any statistical significant differences between general practitioners and dental specialists regarding preferred finish line for veneer procedure (p 0.071). Most practitioners considered veneer cementation to be the most difficult step followed by tooth preparation for B.D.S and other dental specialists; the association was found to be statistically significant. Pearson's Chi square P value of 0.025 < 0.05. furthermore, there was statistically significant difference between commonly reported postoperative complication in veneers amongst general practitioners and dental specialists (p 0.012) the most commonly occurring post-operative complication is dislodgement of veneers followed by tooth sensitivity.

Table 1: Response rate of the participants on different parameters evaluated

Parameters		*B.D.S*	*MSC in conservative dentistry* *N*	*PhD in conservative dentistry* *N*	*MSC in other specialty* *N*	*PhD in other specialty* *N*	*Total* *N*	*Significance*
Knowledge about dental veneers	***Yes***	*46*	*20*	*3*	*31*	*14*	*114*	*P. 0.045*
	Maybe	*4*	*5*	*0*	*0*	*0*	*9*	
Experience in making	***Yes***	*32*	*17*	*3*	*22*	*14*	*88*	*p. 0.017*

indirect veneers	***No***	*16*	*8*	*0*	*6*	*3*	*33*	
	maybe	*2*	*0*	*0*	*0*	*0*	*2*	
Veneer indications	***Discolored teeth***	*0*	*6*	*3*	*0*	*0*	*9*	*p.0.001*
	Space closer	*3*	*0*	*0*	*0*	*0*	*3*	
	Minor correction in shape of teeth	*0*	*3*	*0*	*3*	*0*	*6*	
	All of the above	*32*	*8*	*0*	*23*	*9*	*72*	
Veneer contraindications	***Edge to edge occlusion***	*5*	*0*	*0*	*10*	*0*	*15*	*p. 0.000*
	Deep bite	*2*	*0*	*0*	*0*	*0*	*2*	
	Rotated teeth	*5*	*0*	*0*	*0*	*0*	*5*	
	Amelogenesis or dentinogenesis imperfecta	*0*	*2*	*0*	*0*	*0*	*2*	
	All the above	*6*	*0*	*3*	*9*	*0*	*18*	
Veneer fabrication materials	***Lithium disilicate CAD CAM & press***	*27*	*14*	*3*	*22*	*9*	*75*	*p. 0.013*
	Feldspathic porcelain	*0*	*5*	*0*	*0*	*0*	*5*	
	composite	*0*	*3*	*0*	*0*	*0*	*3*	
	All of the above	*5*	*12*	*3*	*6*	*5*	*31*	
Crown for endodontically treated teeth	***Yes***	*47*	*22*	*3*	*31*	*14*	*117*	*p. 0.037*
	No	*0*	*3*	*0*	*0*	*0*	*3*	

	Maybe	*3*	*0*	*0*	*0*	*0*	*3*	
Veneer for endodontically treated teeth	***Yes***	*4*	*3*	*0*	*6*	*0*	*13*	*p. 0.230*
	No	*24*	*8*	*0*	*9*	*14*	*55*	
	maybe	*22*	*14*	*3*	*16*	*0*	*55*	
Veneer preparation designs	***Incisal lap preparations***	*8*	*3*	*0*	*17*	*9*	*37*	*p. 0.024*
	Window preparations	*6*	*14*	*0*	*6*	*0*	*26*	
	Butt joint preparations	*31*	*5*	*3*	*0*	*5*	*44*	
	All of the above	*5*	*0*	*0*	*3*	*0*	*8*	
Finish line of veneer	***Chamfer***	*34*	*20*	*3*	*19*	*5*	*81*	*p. 0.07*
	Knife edge	*7*	*0*	*0*	*3*	*0*	*10*	
	Shoulder	*5*	*0*	*0*	*12*	*0*	*17*	
	All of the above	*4*	*5*	*0*	*9*	*9*	*27*	
Position of finishing line	***Equigingival***	*21*	*14*	*3*	*19*	*5*	*62*	*p. 0.027*
	Supra gingival	*5*	*3*	*0*	*0*	*0*	*8*	
	subgingival	*17*	*8*	*0*	*6*	*9*	*40*	
	All of the above	*7*	*0*	*0*	*6*	*0*	*13*	
Ideal location of veneer margin	***Minimum invasive prep***	*19*	*20*	*0*	*4*	*5*	*48*	*p. 0.027*

	Enamel	*24*	*3*	*0*	*3*	*9*	*39*	
	dentine	*5*	*0*	*0*	*12*	*0*	*17*	
	DEJ	*2*	*0*	*0*	*6*	*0*	*8*	
Challenge step in veneer treatment	***Tooth preparations***	*7*	*11*	*0*	*0*	*9*	*27*	*p. 0.025*
	Veneer cementations	*18*	*9*	*3*	*8*	*0*	*38*	
	All of the above	*25*	*5*	*0*	*15*	*5*	*50*	
	None of the above	*0*	*0*	*0*	*0*	*0*	*0*	
Post-operative complications in veneer	***Tooth sensitively***	*7*	*0*	*0*	*4*	*0*	*11*	*p. 0.012*
	Dislodgement of veneer	*16*	*0*	*0*	*3*	*9*	*28*	
	Staining of veneer	*3*	*0*	*0*	*3*	*0*	*6*	
	All of the above	*13*	*11*	*0*	*6*	*0*	*30*	
	None of the above	*9*	*9*	*3*	*6*	*0*	*27*	
Total		*50*	*25*	*3*	*31*	*14*	*123*	

DISCUSSION

Veneers are less invasive restorations that can be used to treat fluorosis discolouration, cosmetic deficiencies, and anomalies (Parmar, 2019). In young patients and individuals with healthy dentition, it is a fantastic substitute for a full coverage crown (Goldstein et al., 2018). Abrasive or erosive flaws, dental deformities or malposition, diastemas, crown breakage, and yellowing of teeth or restorations are some reasons for direct composite veneers (Albers, 2002; Souza, 2018). Direct laminate veneers are simpler to polish within the mouth, and any cracks or breaks may be fixed inside the mouth. They also perform marginal adaptation better than indirect laminate veneers (Hickel et al., 2004; Burke et al., 2019). However, Indirect veneers offer a great resistance to breakage, wear, and discoloration and are constructed of porcelain or ceramic (Aschheim, 2015). The primary drawbacks of porcelain veneers, however, are the increased number of visits, greater expense, and usage of an adhesive cementing technique. (Ravinthar and Jayalakshmi, 2018).

This was the first study to assess general dentists' and experts' in the knowledge of veneer kinds, procedures, optimal preparation processes, contemporary advancements in veneer manufacturing techniques and materials, and often occurring postoperative problems. Dentists were aware of veneer therapy for cosmetic adjustments in 114 (92.68%) of cases which is in accordance with a study by (Wakiaga et al., 2004). 72 (58.54%) of Dental professionals recognized the precise indications, and 18 (14.63%) participants were confident in the contraindications. For effective treatment planning and long-term veneer therapy effectiveness, proper case selection is essential (Garg and Garg, 2010).

Only 31 (25.2%) of dentists were familiar with the materials used in veneer manufacture while in another study about 85% were aware of different types of veneer materials (Swarna and Subash, 2020). while, 8 (6.5%) of dentists demonstrated a thorough understanding of veneer preparation designs in which butt joint preparations is the most common one. In contrast another study shows that the incisal overlap preparation was the preferred one (Swarna and Subash, 2020).

81(65.85%) of dentists preferred chamfer finish line and majority of them 62(50.41%) suggested equigingival finish line with 48(39.02%) of them chose minimal invasive preparations and 39(31.71%) preferred locating preparation within the enamel. Despite the availability of several self-etching and universal adhesives on the market, studies have shown that enamel is always a far superior and more dependable option for bonding. Additionally, the completion line must be perfectly equi-gingival to provide the profile for the growth of real teeth (Ruiz, 2017). Due to the difficulties in attaining isolation during cementation processes, subgingival finish lines are not suggested (Ruiz, 2017; Freedman, 2011). In everyday practice, about 72 (58.54%) of dentists used EMAX PRESS and EMAX CAD material for veneers which is in accordance with other studies (Smothers, 2009). When the most common dental treatments involving veneers were reviewed, it was shown that most dentists considered cementation to be problematic one (Swarna and Subash, 2020).

In order to prevent moisture contamination, isolation is essential while cementing. Veneer treatment processes have benefited from resin cements (Sunico-Segarra and Segarra, 2014). The most frequent postoperative complaint that dentists see in practice was evaluated. Dentists reported that stains were the most often reported issue (Chaiyabutr et al., 2010). while, in this study it demonstrated that most dentists faced dislodgement of veneer material or veneer debondings (Della Bona, 2009). Veneers are a great treatment option for teeth esthetic correction because of their superior veneer materials, adhesive technology, and CAD CAM technology, as well as their minimally invasive, conservative tooth preparation processes and designs (Swarna and Subash, 2020). The current study discovered that dental practitioners were aware of dental veneers but were uninformed of the potential contraindications of dental veneers and type of veneer preparations. More awareness would improve the efficacy of usage and help overcome the obstacles encountered when practicing. it must be important to raise awareness among dental practitioners about new improvements and the risks of veneer failure. As a result, dentists should update their technical expertise in order to employ cosmetic veneers as a worthwhile, cost-effective treatment choice.

CONCLUSION

According to the study's limitations, it can be said that the majority of dentists were aware of veneers as an aesthetic procedure. The most challenging step in veneer treatment considered veneer cementation to be the most difficult step followed by tooth preparation for general practitioners and other dental specialists and all of them opted lithium disilicate ceramic as material of choice for veneer constructions. Dentists need to be well-versed in case selection for veneers, shade matching, the best preparation methods and designs, as well as the most recent developments in veneer materials and adhesive procedures.

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