PalArch's Journal of Archaeology of Egypt / Egyptology

KNOWLEDGE, ATTITUDE AND PRACTICE PROTOCOLS OF DIRECT AND INDIRECT VENEERS AMONG DENTAL PRACTITIONERS- A CROSS SECTIONAL QUESTIONNAIRE BASED SURVEY

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Keywords: Ceramic veneer, Composite veneer, Veneers, Veneer preparation designs, Veneer techniques.

ABSTRACT

Dental veneers are made of directly applied composite, processed composite, porcelain or pressed ceramic materials. A cross-sectional survey was conducted in the month of April, 2020 among all general dentists and various dental specialists to test their knowledge and clinical practice of direct and indirect veneers. The questionnaire consisted of 15 questions and was structured under the headings of knowledge, attitude and practice. Responses were collected through google forms and statistically analyzed. Only 31 % of dentists had a sound knowledge on the preparation designs of veneer. Endodontists and other dental specialists were aware that veneers can be performed without root canal treatment as well as in root canal treated teeth, P value=0.01, hence statistically significant. The most challenging step in veneers was veneer cementations followed by tooth preparation for endodontists and other dental specialists. Most Endodontists preferred choice of veneer was EMAX press followed by EMAX CAD. Within the limitations of the study, it can be concluded that dentists should acquire sound knowledge in the case selection of veneers, shade matching,optimal preparation techniques and designs and recent advances in veneer materials and adhesive techniques.

INTRODUCTION

Veneers is a minimally invasive procedure that aids in achieving excellent esthetic outcomes in case of discolorations, mild rotation and space closure in anterior teeth.(Cardoso *et al.*, 2012) Factors that influence successful veneer

treatment include proper case selection, treatment planning, shade selection, optimal preparation designs, veneer fabrication, try in, luting materials and techniques.(Trushkowsky, 2020)

With the advent in advances in adhesive technology, veneers have become the esthetic treatment modality that is more predictable, less invasive, good longevity and excellent clinical performance. (Layton and Clarke, 2014) Composite veneers have good aesthetic results when appropriate care selection is done, treatment done under strict isolation, proper shade selection and good oral hygiene practices to avoid staining (Baratieri and), 2005). Composite veneers may be fabricated using direct and indirect techniques. The veneers fabricated from indirect techniques have better strength due to optimal polymerisation and polishability. Laminate veneers have better translucency, longevity and glazed surfaces that do not stain easily. (Morsy, Ghoneim and Afifi, 2020)(Tannir *et al.*, 2018)(Korsel, 2019)

Two types of materials are indicated for the translucency and potential to be used in small thickness: sintered feldspathic porcelain and pressable ceramic (Peumans *et al.*, 2000) Ceramic veneers can be milled using CAD-CAM technique.(Chelule, Coole and Cheshire, 2001; Akoğlu and Gemalmaz, 2011) Nevertheless function, form and esthetics are adequately restored in direct procedures with composite resins which are done in one or two visits with the restorative conception in close relation to conservative operative interventions.(Nahsan *et al.*, 2012)
Direct composite resin veneers are a one-visit procedure, where composite is adapted to mask discoloration.(Akoğlu and Gemalmaz, 2011; Tannir *et al.*, 2018) and shade matching should be done with extreme care. (Nahsan *et al.*, 2012)Indirect veneers are time consuming, but offer better esthetics and longevity.(Burke and Trevor Burke, 2012) Careful try in and use of preselected shade of luting cement is very crucial step in fabrication of ceramic veneers, since they are very delicate and translucent which favorably enhances the esthetic value of smile.(Aboushelib and Sleem, 2016; Li, 2019)
We have numerous highly cited publications on well designed clinical trials and lab studies (Govindaraju, Neelakantan and Gutmann, 2017; Azeem and Sureshbabu, 2018; Jenarthanan and Subbarao, 2018; Manohar and Sharma, 2018; Nandakumar and Nasim, 2018; Teja, Ramesh and Priya, 2018; Janani and Sandhya, 2019; Khandelwal and Palanivelu, 2019; Malli Sureshbabu *et al.*, 2019; Poorni, Srinivasan and Nivedhitha, 2019; Rajakeerthi and Ms, 2019; Rajendran *et al.*, 2019; Ramarao and Sathyanarayanan, 2019; Siddique and Nivedhitha, 2019; Siddique *et al.*, 2019; Siddique, Nivedhitha and Jacob, 2019). This has provided the right platforms for us to pursue the current study.

The aim of this study was to assess the knowledge of dental practitioners towards veneers as an esthetic treatment option, the types of veneers, ideal preparation protocols and to evaluate the preference of dentists towards recent veneer materials and commonly encountered postoperative complications.

MATERIALS AND METHODS

A cross-sectional survey was conducted in the month of April, 2020 among all general dentists and various dental specialists to test their knowledge and

clinical practice of direct and indirect veneers. The questionnaire consisted of 15 questions and was structured under the headings of knowledge, attitude and practice. The questions were framed to evaluate the various veneer techniques, preparation designs and materials that were used as well as common difficulties and post op complications faced. The questionnaire was distributed via google forms and responses collected. A total of 100 responses were collected and assessed. After collecting data, the results were recorded and analyzed. The data were entered in Microsoft Excel sheets and a Chi-square test was performed to find the association between the variables. The level for a statistical significance was set at $p<0.05$. The statistical analysis was performed using SPSS software(SPSS Version 21.0, SPSS, Chicago, IL, USA). Only p values less than 0.05 were considered to have statistical significance.

RESULTS AND DISCUSSION

According to the study, 92.9% of dentists were aware of veneer treatment for esthetic corrections. 84.8% of dental practitioners knew the exact indications and 88% were sure of the contra indications. 88% of dentists had knowledge on types of veneers. Only 85% dentists had a knowledge of materials for veneer fabrication and only 78% of dentists believed that veneers are a more conservative option than crown. 74% of dental practitioners were aware that veneer can be done without root canal treatment. Only 31 % of dentists had a sound knowledge on the preparation designs of veneer. 42% of dentists preferred chamfer finish line and 40% of them suggested equi gingival finish line with 47.5% dentists insisting that margins should ideally be located in enamel.

35.4% opted for EMAX PRESS and 33.3% opted EMAX CAD material for veneers in regular practice. The challenging step for most dentists in veneer treatment was evaluated which showed that 33.3% had difficulty in cementation, 31.3% in tooth preparation and 29.3% found both procedures to be difficult. The common operative complaint that the dentists regularly come across in practise was assessed. 8% of dentists faced staining as a major complaint, 25% opted dislodgement of veneer and 13% for tooth sensitivity. Majority of 51% of dentists mentioned all of the above as common postoperative complications. 58% dentists practised composite veneers as they felt it was a cost effective option, 15 % preferred ceramic veneers and 28% believed both composite and porcelain veneers to be cost effective.

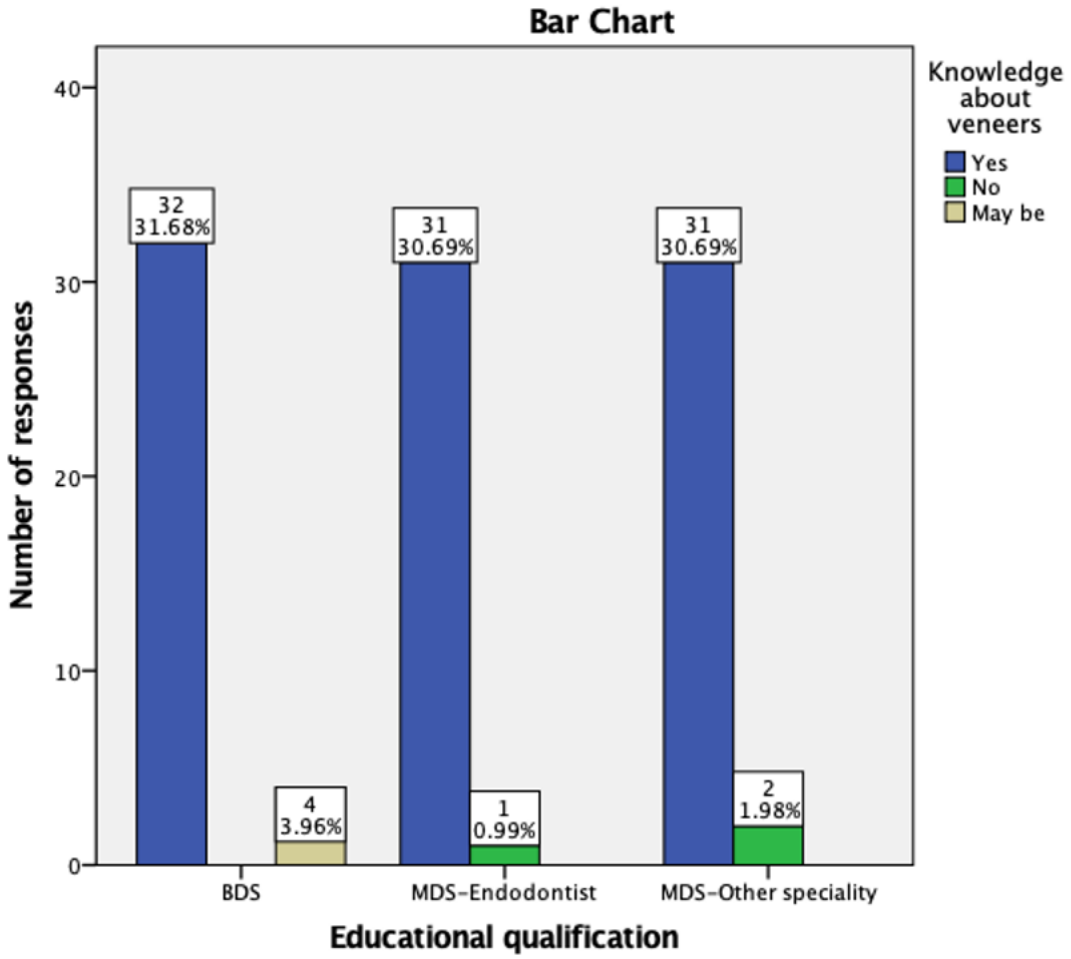

FIGURE 1- Bar graph representing the association between type Educational qualification of dentist(X axis) and number of responses to the question(Y axis). P value= .050 (>0.05), hence statistically not significant. Both general practitioners as well as dental specialists had knowledge on veneers as an esthetic treatment option.

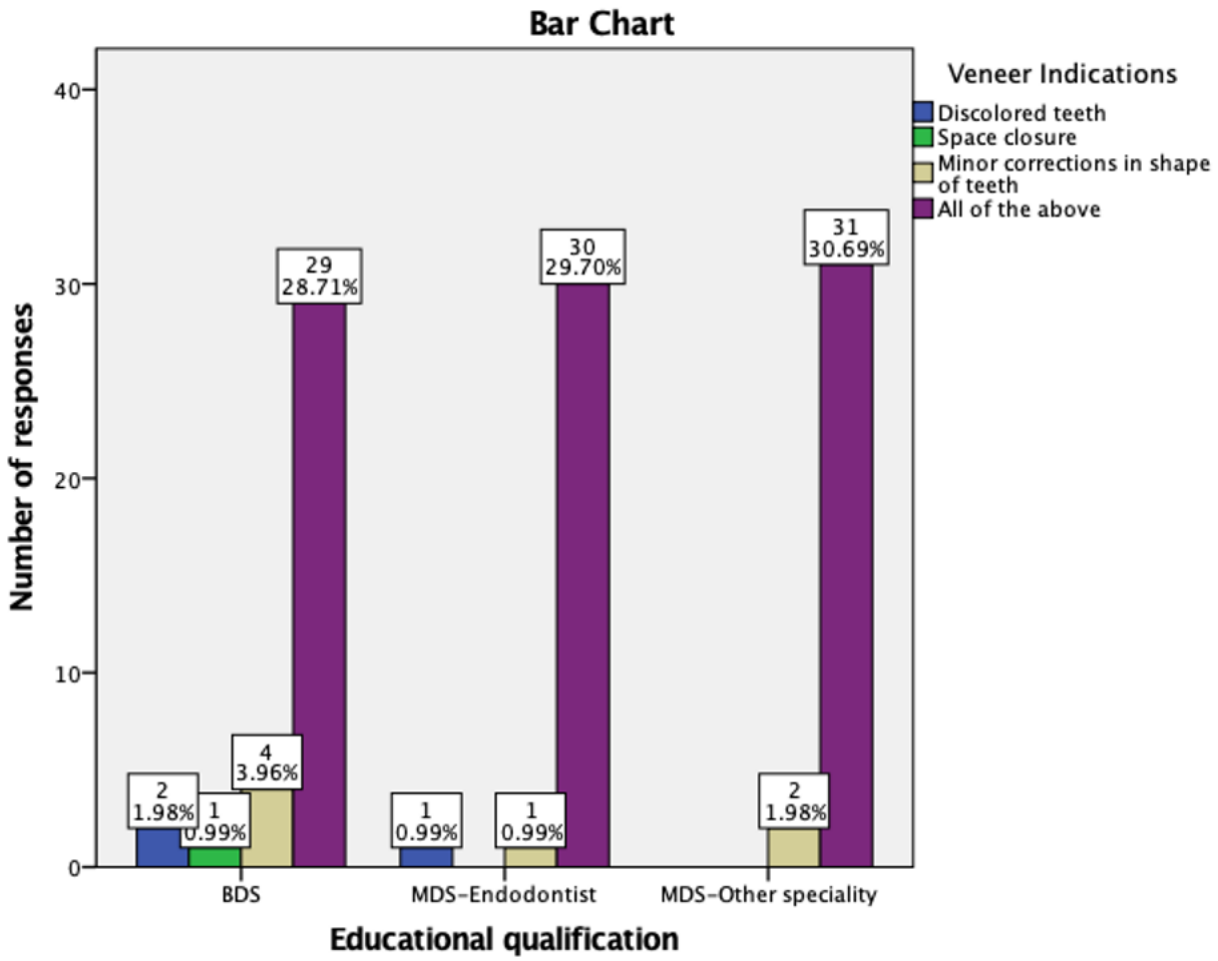

FIGURE 2- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .461 (>0.05) and hence there was no statistically significant difference between general practitioners and dental specialists regarding knowledge of indications for veneers. Graph infers that most preferred indication for veneers was minor correction in shape of the teeth followed by discolouration

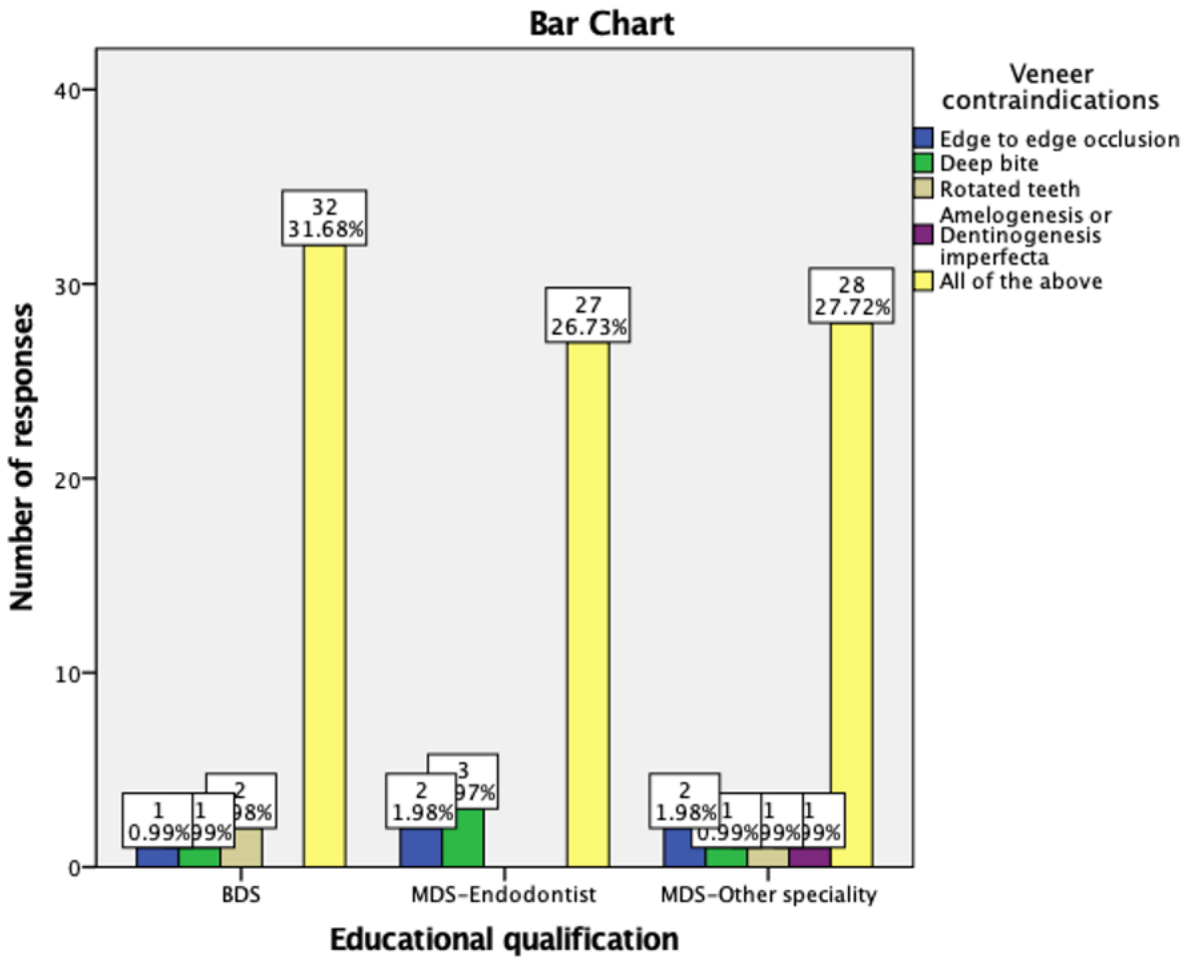

FIGURE 3- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .618 (>0.05) and hence there was no statistically significant difference between general practitioners and dental specialists regarding knowledge of contraindications for veneers.

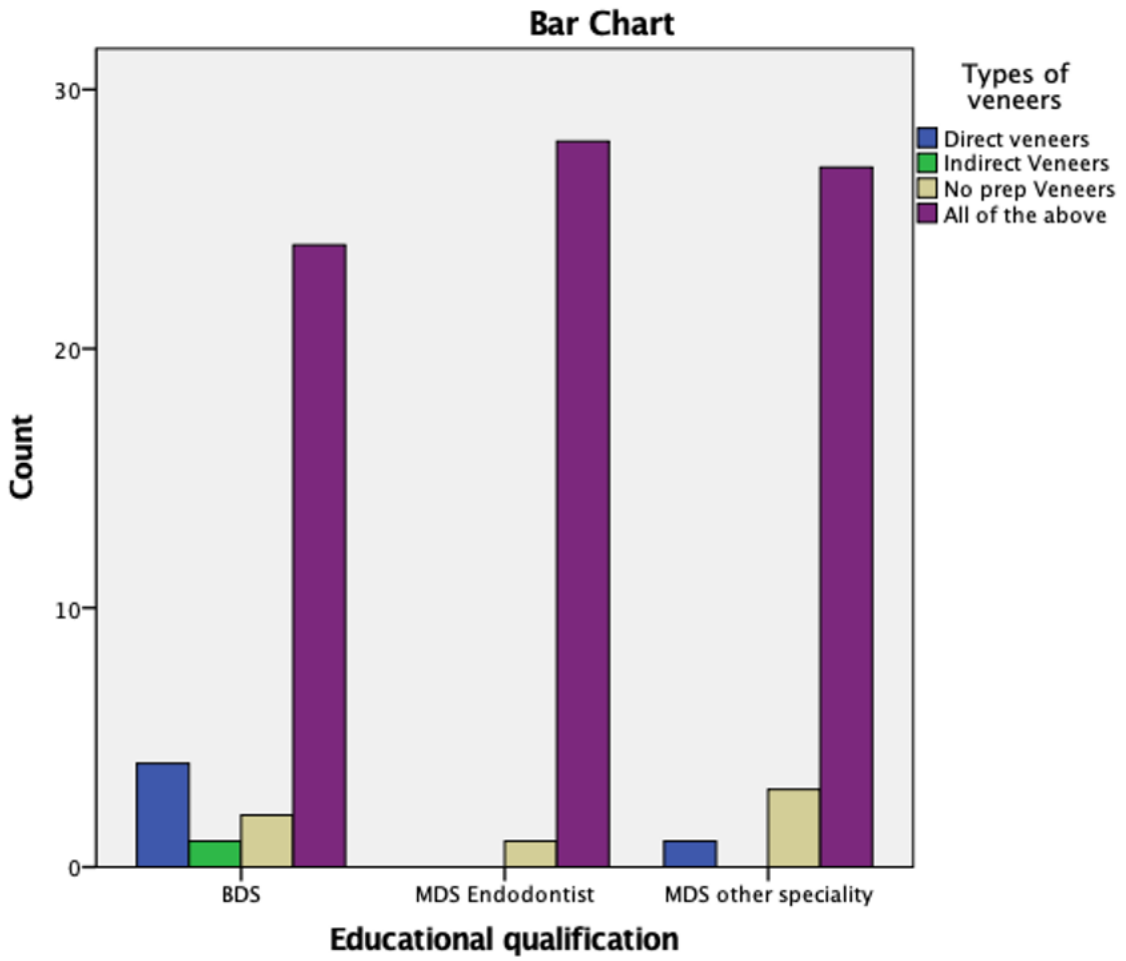

FIGURE 4- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .303 (>0.05) and hence there was no statistically significant difference between general practitioners and dental specialists, regarding knowledge on Types of veneers. Graph infers that everyone has the knowledge about various types of veneers available.

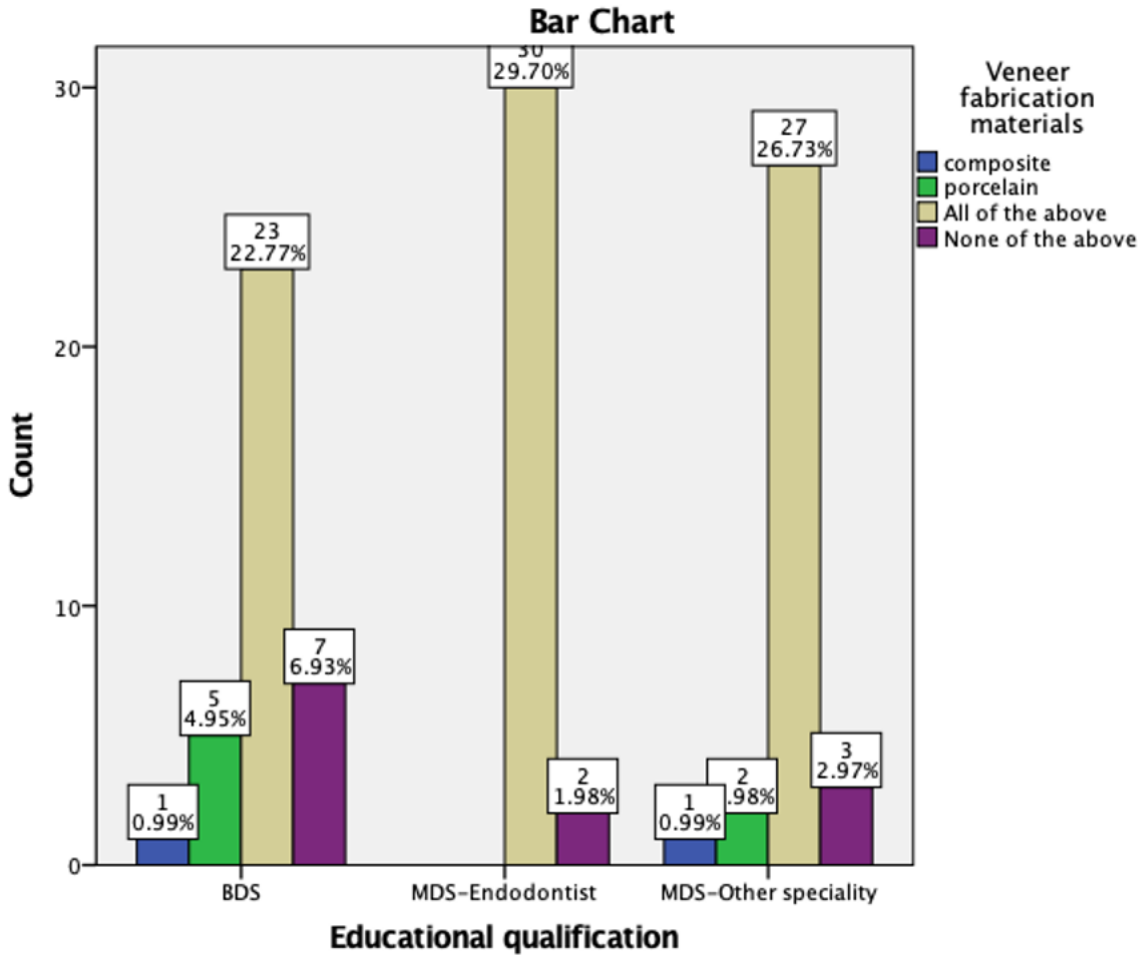

FIGURE 5- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .107 (>0.05) and hence there was no statistically significant difference between general practitioners and dental specialists, regarding knowledge on materials used for veneer fabrication.

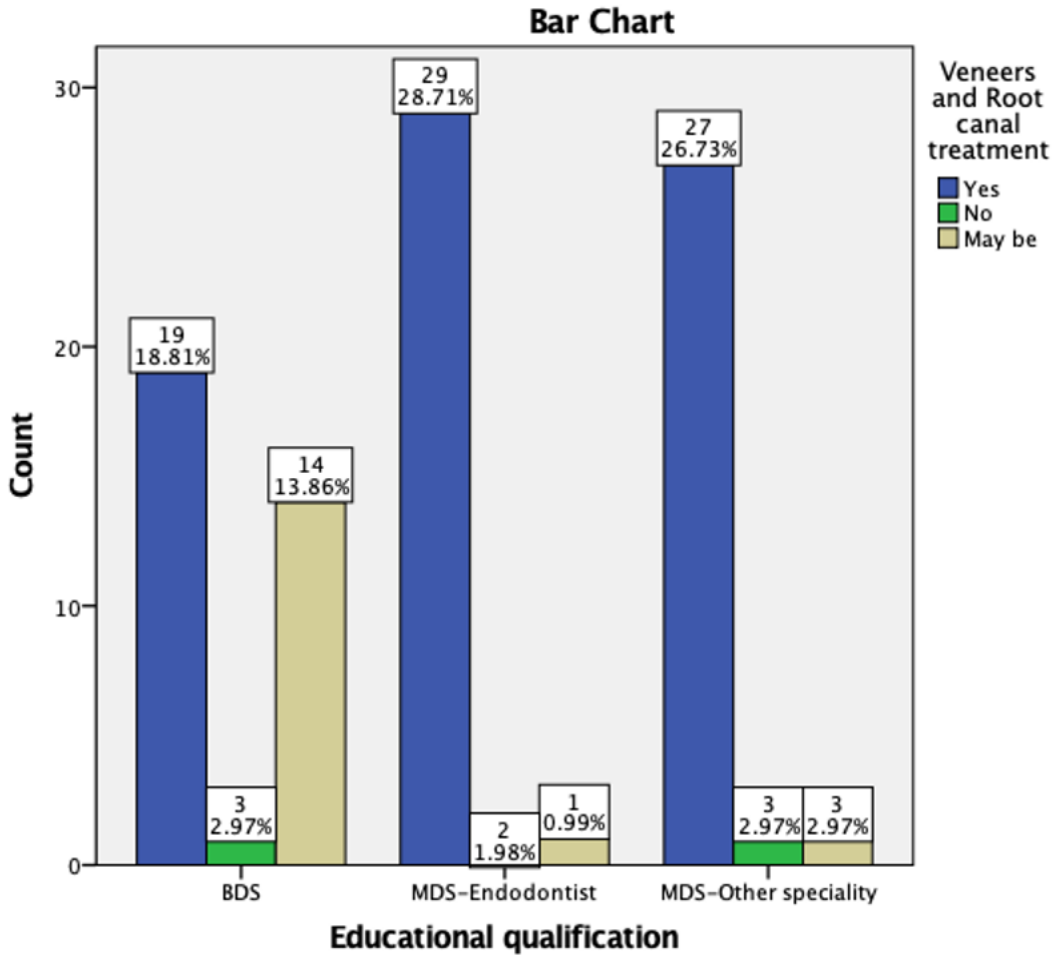

FIGURE 6- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .001 (<0.05) and hence there was statistically significant difference in attitude between general practitioners and dental specialists, regarding veneers and root canal treatment. Therefore we can infer that Endodontists and other dental specialists were aware that veneers can be performed without root canal treatment as well as in root canal treated teeth.

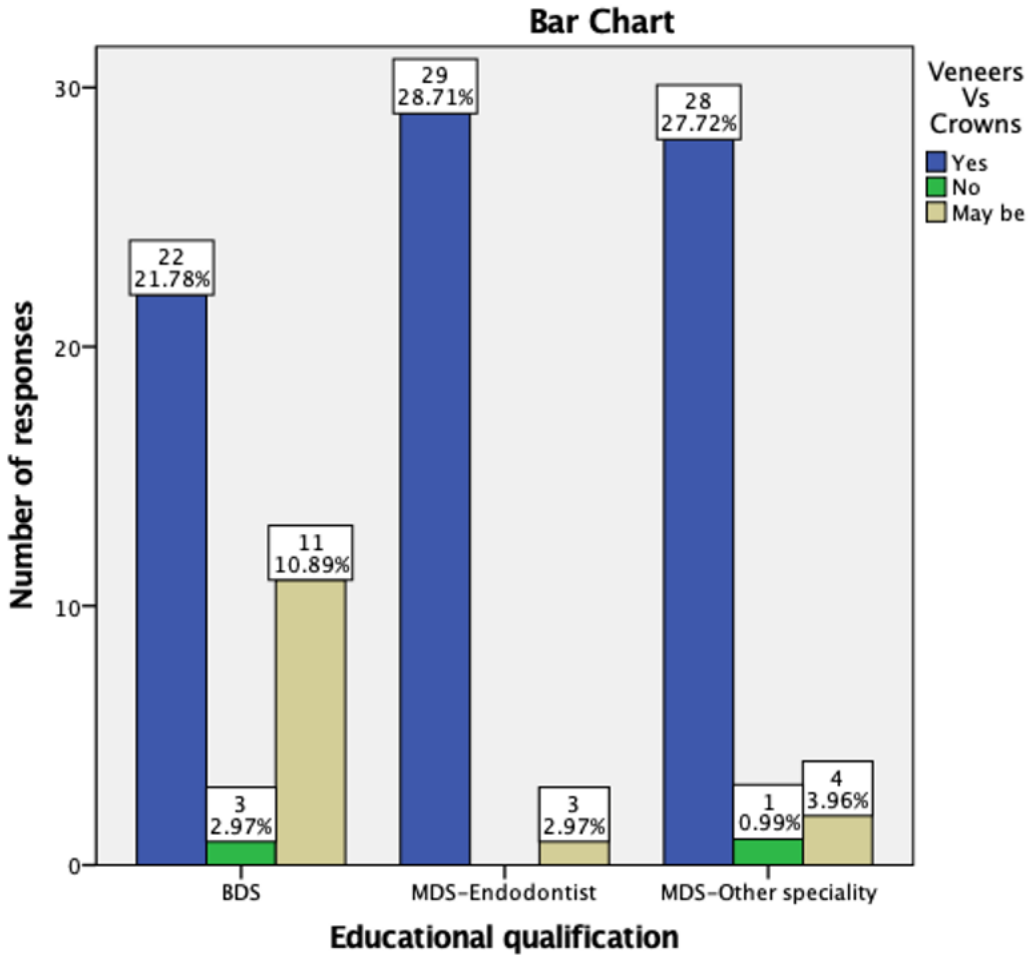

FIGURE 7- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .034 (>0.05) and hence there was statistically no significant difference in attitude between general practitioners and dental specialists, regarding choice of veneers as a more conservative option than crown.

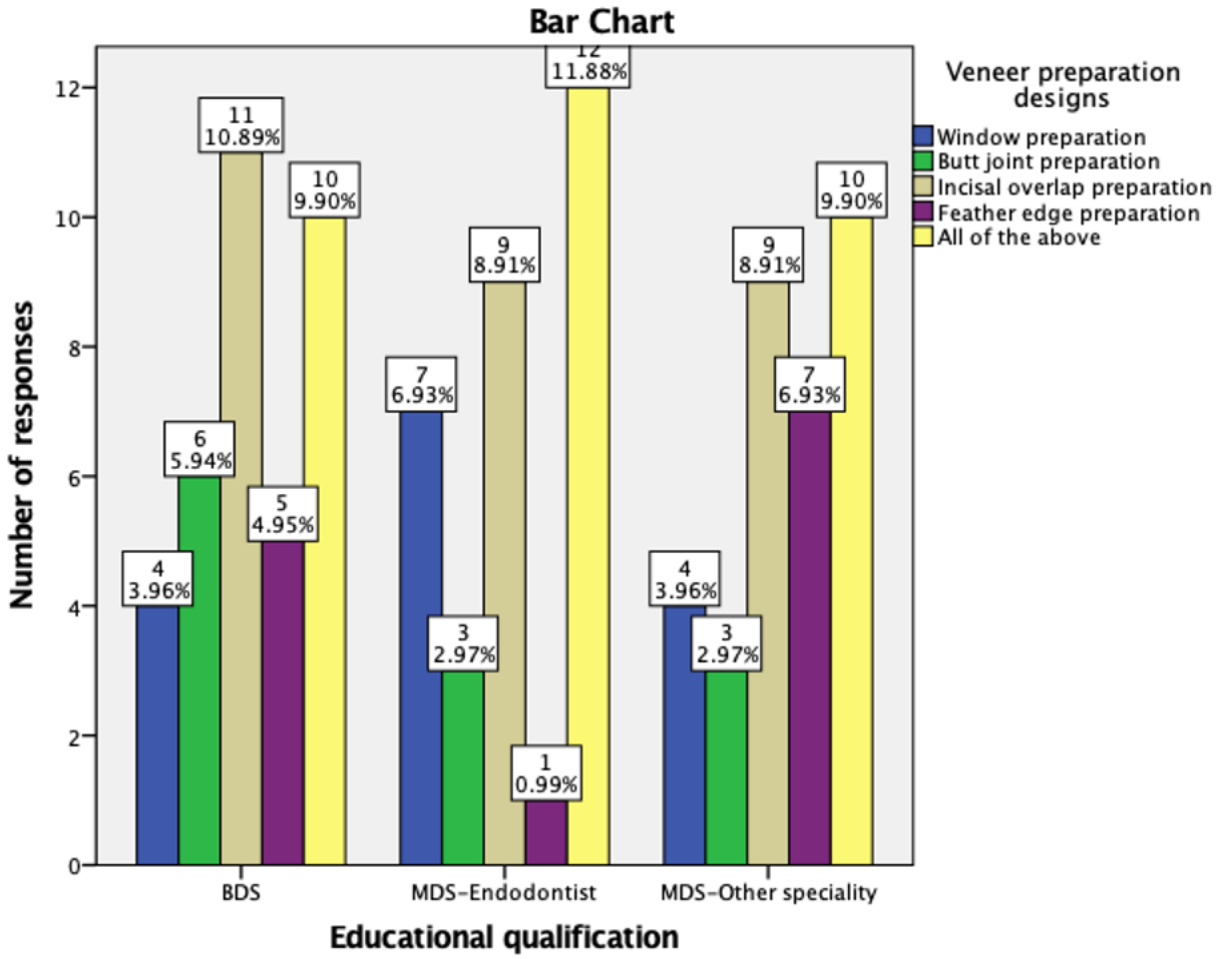

FIGURE 8- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .491 (>0.05) and hence there was statistically no significant difference in attitude between general practitioners and dental specialists, regarding choice of preparation design for veneers.From this graph we infer that incisal overlap preparation is the most preferred design for veneers.

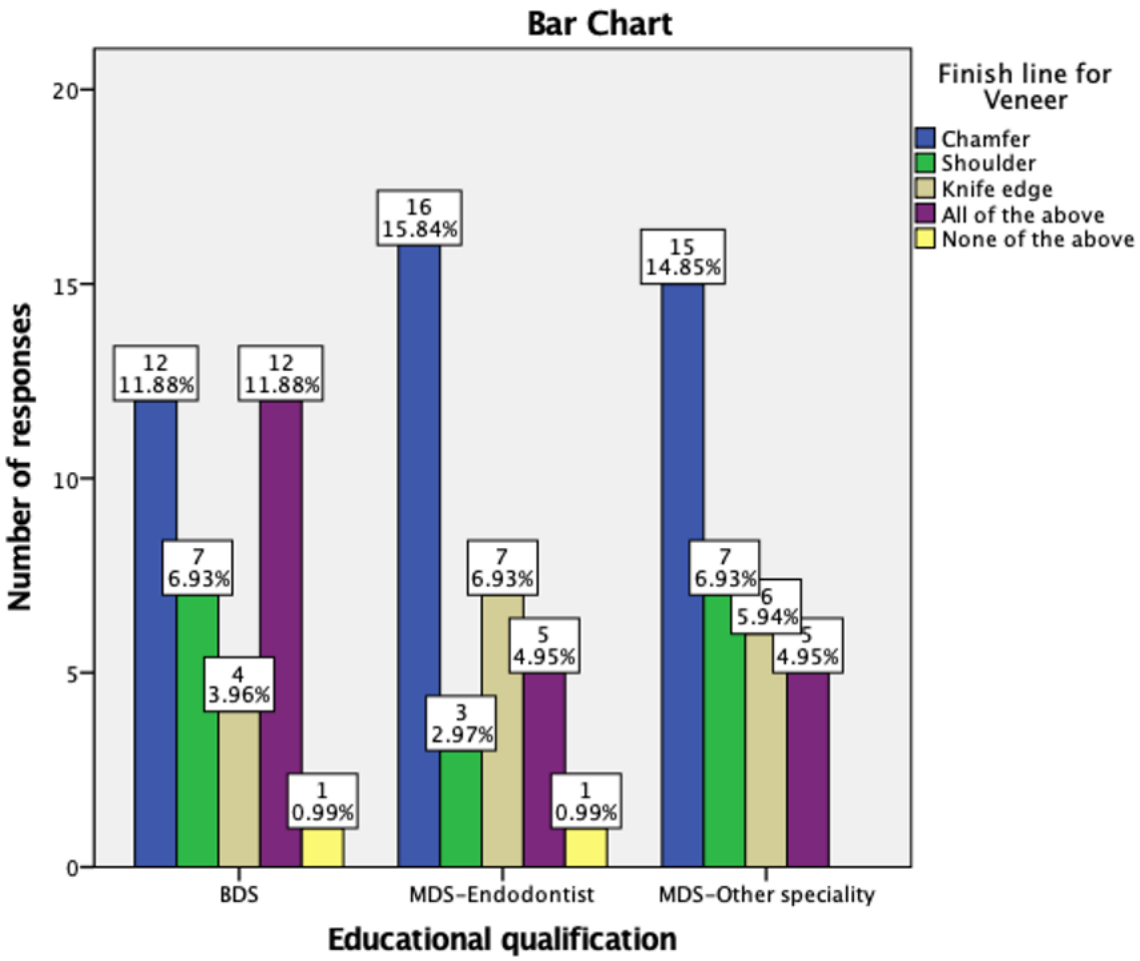

FIGURE 9- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .395 (>0.05) and hence there was statistically no significant difference in attitude between general practitioners and dental specialists, regarding choice of finish line for veneer preparation.Graph infers that the most preferred finish line is chamfer finish line.

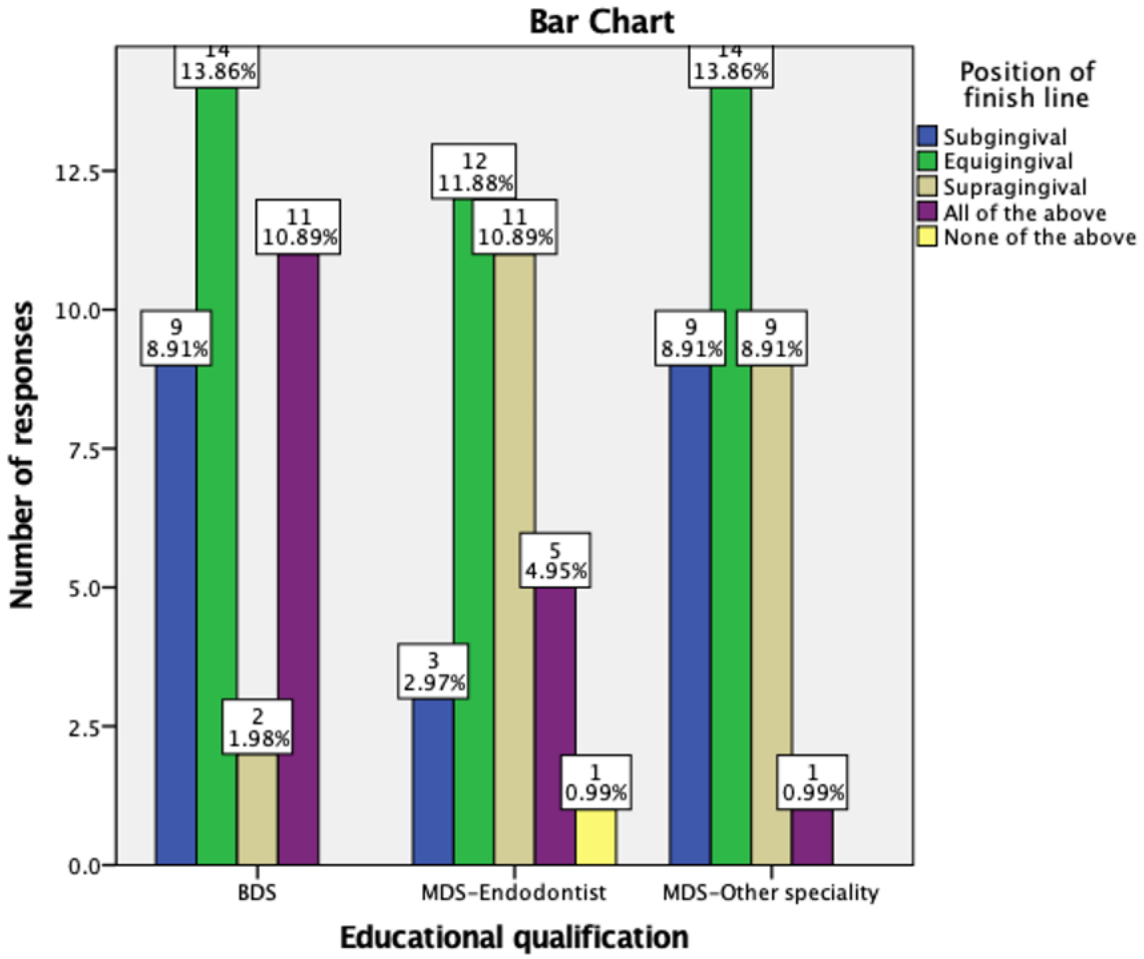

FIGURE 10- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .010 (>0.05) and hence there was statistically no significant difference in preference of position of finish line for veneer preparation, between general practitioners and dental specialists, regarding choice of finish line for veneer preparation. Graph also infers that the preferable position of finish line is equi gingival finish line.

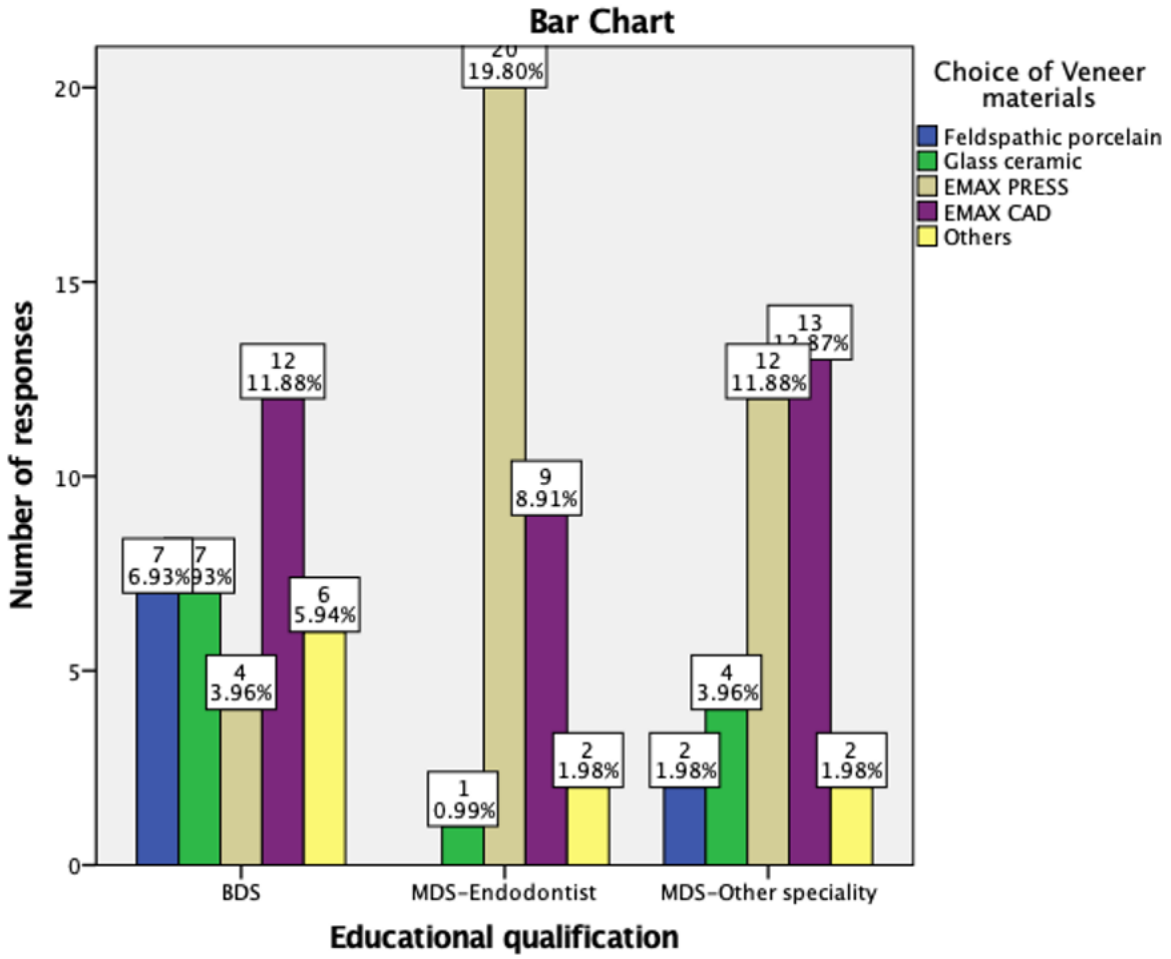

FIGURE 11- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .001 (<0.05) and hence there was a statistically significant difference in preference of material for veneer fabrication between general practitioners and dental specialists. 36% of dentists preferred EMAX press, 34% used EMAX CAD for veneer fabrication. Graph reveals that Most Endodontist preferred choice of veneer is EMAX press followed by EMAX CAD.

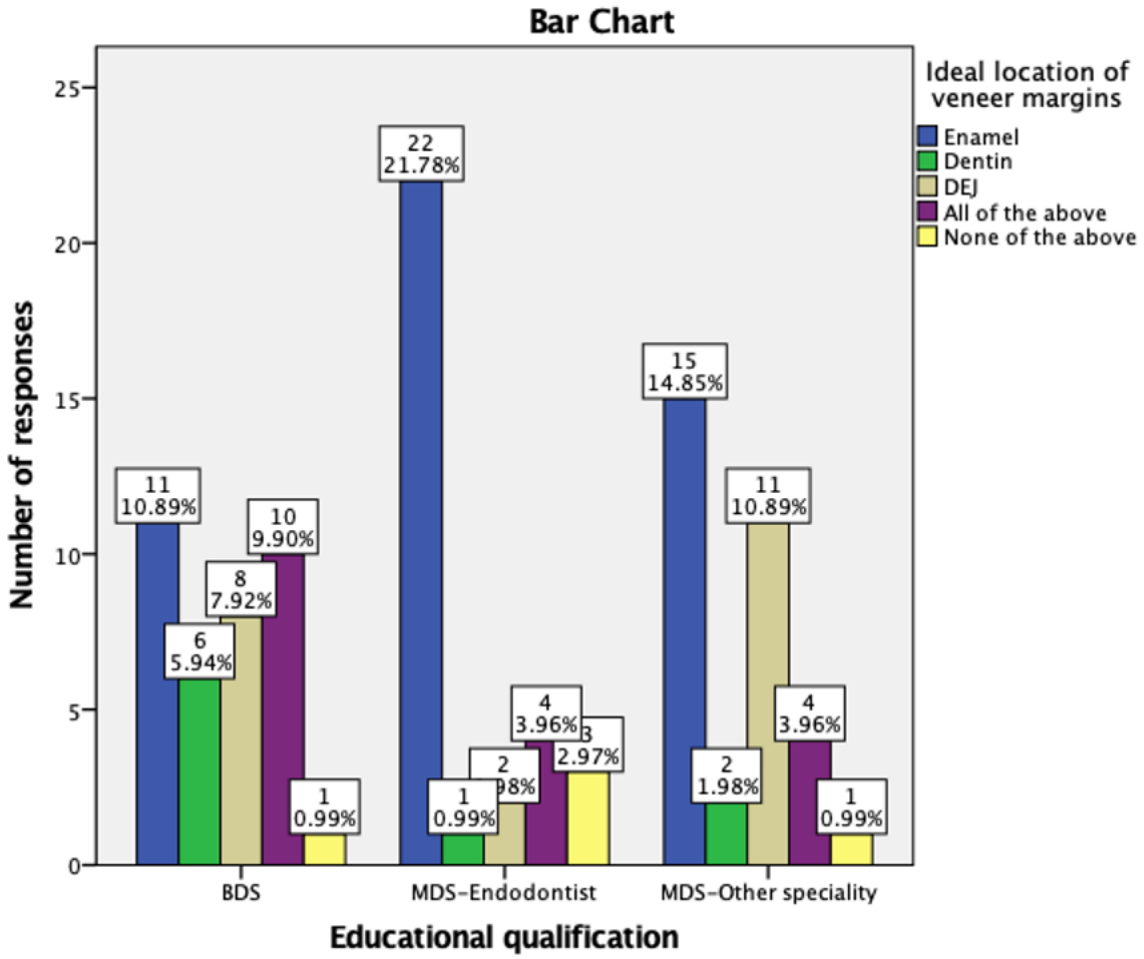

FIGURE 12- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .011 (>0.05) and hence there was statistically no significant difference in preference of location of margin for veneer preparation between general practitioners and dental specialists. Graph Infers that Enamel is the ideal location for veneer margins.

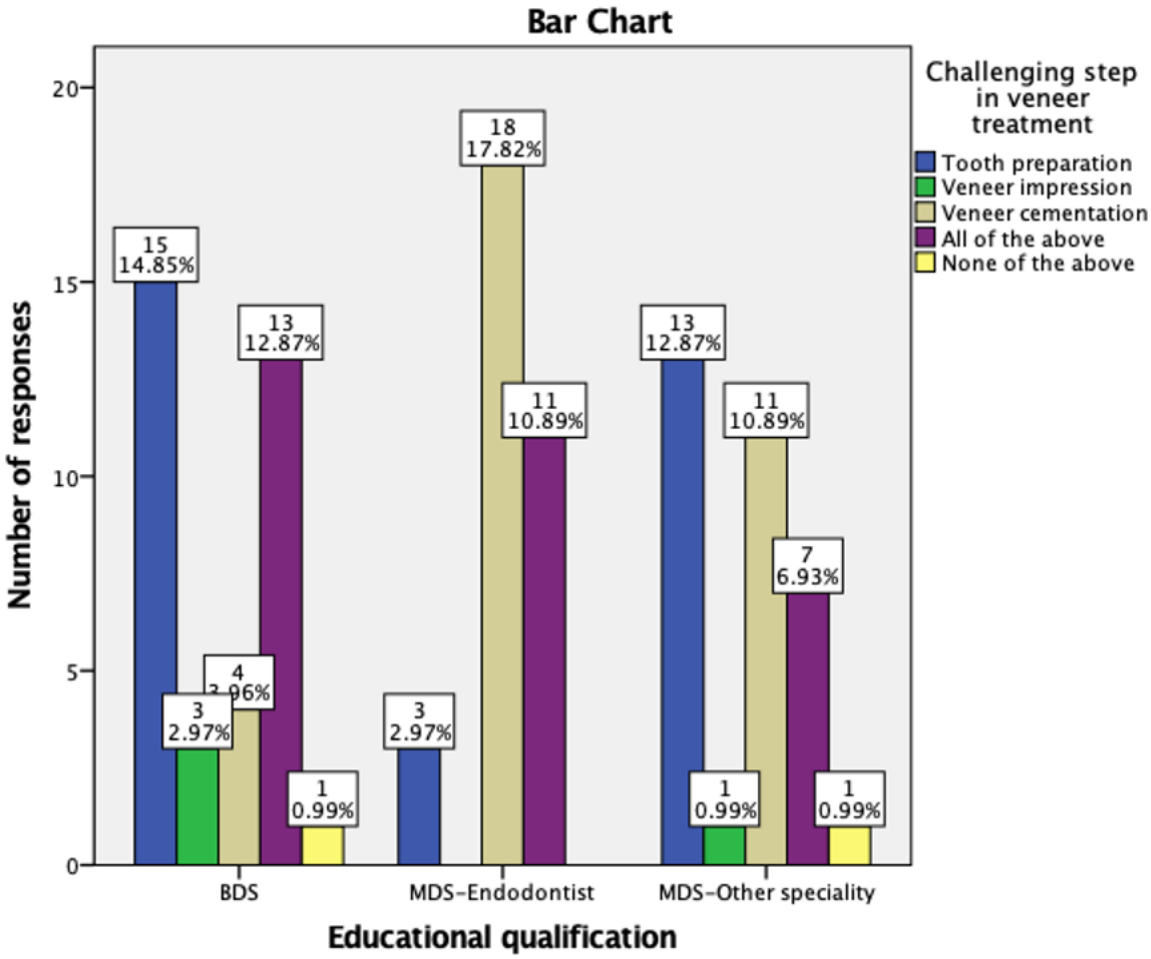

FIGURE 13- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .003 (<0.05) and hence there was statistically significant difference between general practitioners and dental specialists regarding the Most challenging step in veneer treatment. 33% dentists considered veneer cementation to be the most difficult step. Graph infers that the most challenging step in veneers is veneer cementations followed by tooth preparation for endodontists and other dental specialists.

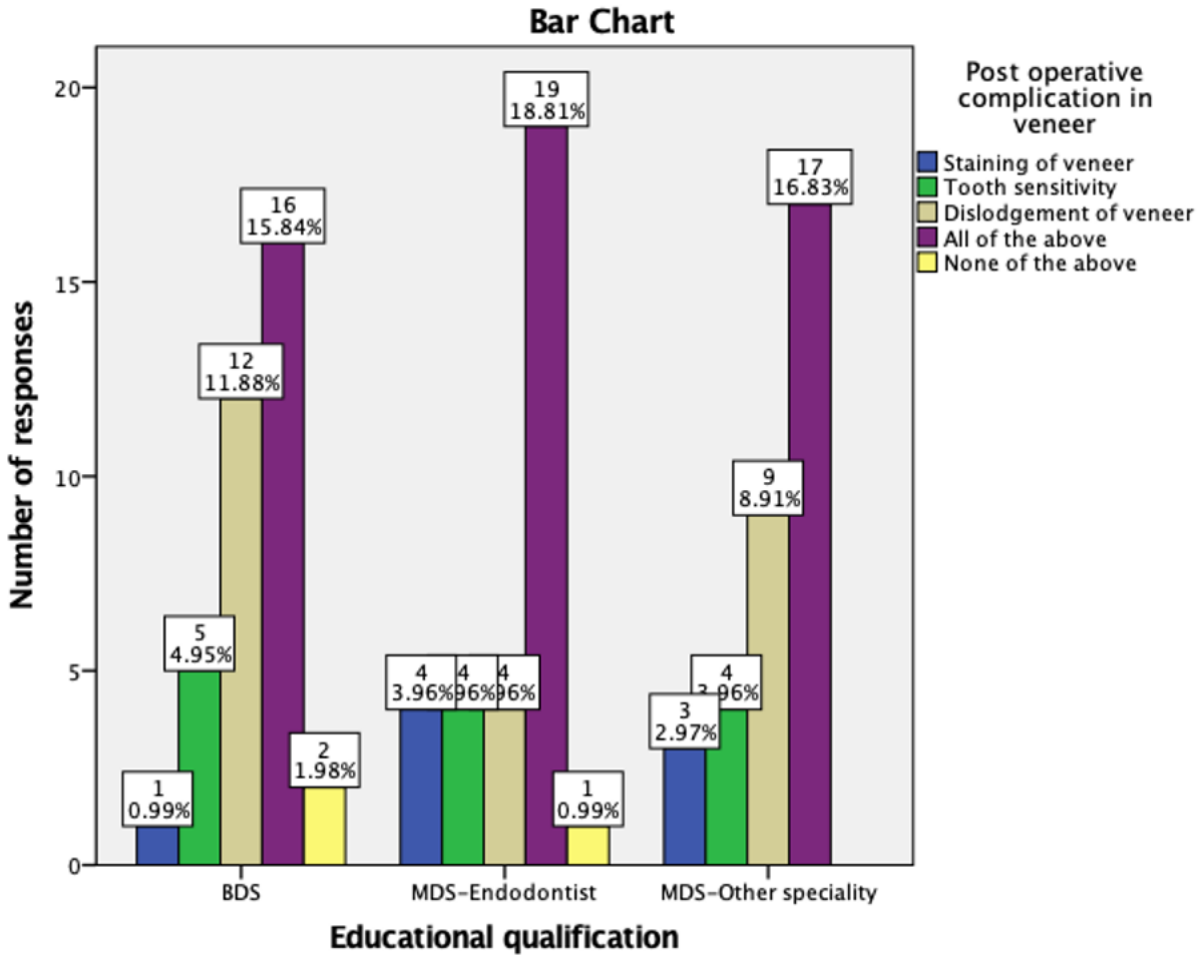

FIGURE 14- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .456 (>0.05) and hence there was statistically no significant difference between commonly reported postoperative complication in veneers amongst general practitioners and dental specialists. Graph infers that most commonly occurring post operative complication is dislodgement of veneers followed by tooth sensitivity.

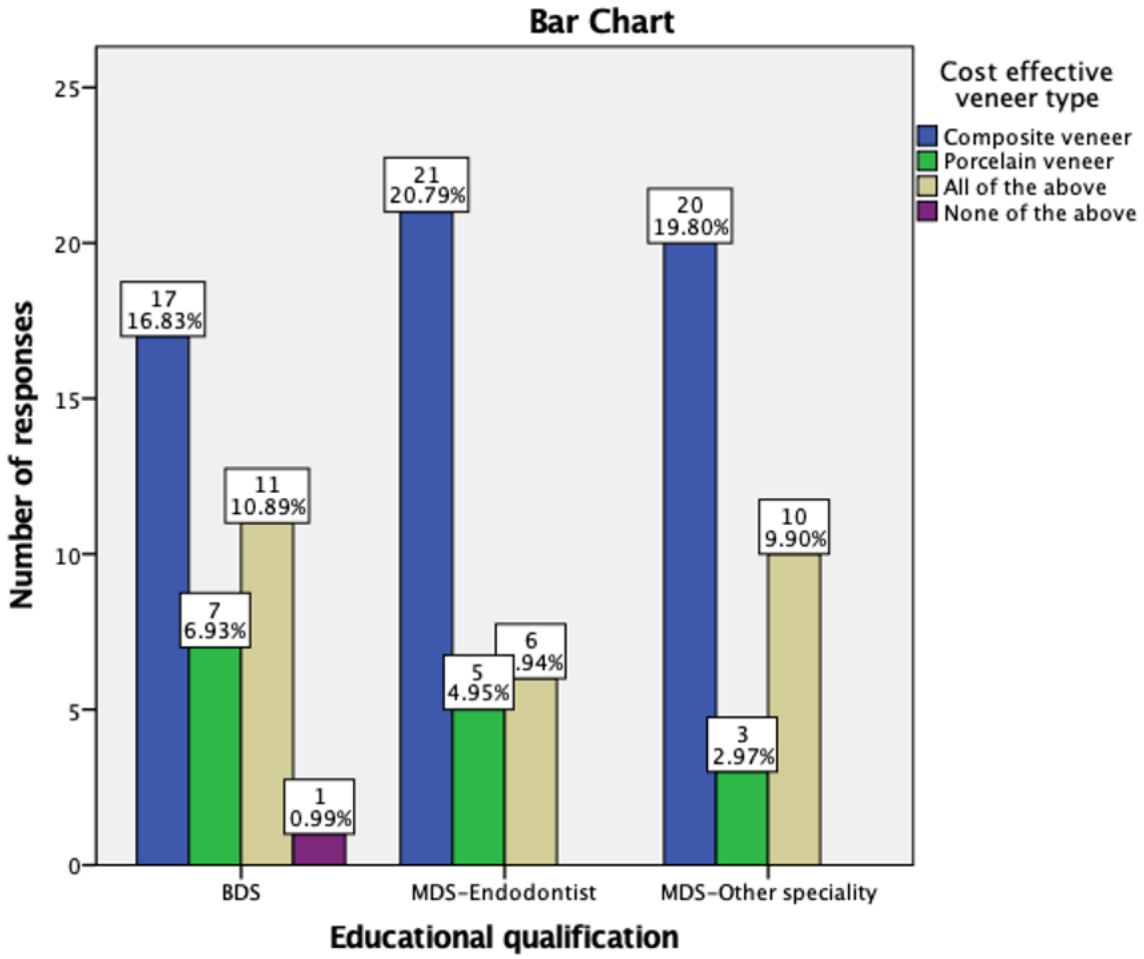

FIGURE 15- Bar graph representing the association between type Educational qualification of dentist (X axis) and number of responses to the question (Y axis). P value= .510 (>0.05) and hence there was statistically no significant difference between general practitioners and dental specialists in preferring to cost effective veneer types. Graph infers that the most cost effective veneer type is composite veneers .

Veneers are minimally invasive restorations to correct abnormalities, esthetic deficiency and fluorosis discoloration.(Parmar, 2019) It is a great alternative to full coverage crown in young patients and patients with healthy dentition. (Goldstein *et al.*, 2018) The indications of direct composite veneers include discoloration of teeth or restorations, dental malformations or malposition, diastemas, crown fracture, abrasive or erosive defects. (Albers, 2002)

Composite resin material is directly placed over the prepared tooth surface. Low cost, reduced number of appointments, reversibility of treatment and no necessity for additional adhesive cementing system are some of the advantages of direct composite veneers. Ritter, 2020)(Souza, 2018) Intraoral polishing of direct laminate veneers is easy and any crack or fracture of the restoration can be repaired intra orally and marginal adaptation is better than indirect laminate veneers.('Direct composite restorations: Extended use in anterior and posterior situations', 2004) However the disadvantages of direct laminate veneers are low resistance to wear, discoloration and fracture. (Burke *et al.*, 2019)

Indirect veneers are made of porcelain/ ceramic, have high resistance against fracture, attrition and discoloration.(Aschheim, 2015)However increased number of visits, higher cost and use of adhesive cementing system are main disadvantages of porcelain veneers.
The appropriate case and material selection based on patient's socioeconomic status, esthetic expectations and oral hygiene conditions.(Ravinthar and Jayalakshmi, 2018)

This was the first survey done to evaluate the knowledge of general dental practitioners and specialists towards veneer types ,techniques, ideal preparation techniques, recent advances in veneer fabrication techniques and materials and the commonly encountered postoperative complications.

92.9% of dentists were aware of veneer treatment for esthetic corrections. 84.8% of dental practitioners knew the exact indications and 88% were sure of the contra indications. Proper case selection plays a vital role in appropriate treatment planning and long term success of veneer treatment. (Garg and Garg, 2010) 88% of dentists had knowledge on types of veneers.(Wakiaga, Brunton and Glenny, 2003) The composite veneers have advantages such as reduced cost and treatment time, but they tend to stain easily, proper rubber dam isolation is mandatory and there is difficulty in achieving good polishability and lustre. Though ceramic veneers do not stain easily, high esthetic value and translucency, it was more expensive than composite veneers. (Ho, 2017)

Only 85% dentists had a knowledge of materials for veneer fabrication and only 78% of dentists believed that veneers are a more conservative option than crown. 74% of dental practitioners were aware that veneer can be done without root canal treatment. Only 31 % of dentists had a sound knowledge on the preparation designs of veneer. Endodontists had a sound knowledge on veneer preparation and materials, as they regularly perform veneer treatment for diastema corrections, staining/ discolorations, fluorosis, mild space closure as well as correcting tooth malformations such as peg laterals. (Banerji, Mehta and Ho, 2017)

42% of dentists preferred chamfer finish line and 40% of them suggested equi gingival finish line with 47.5% dentists insisting that margins should ideally be located in enamel. Studies have proved that the bonding to enamel is always much better and reliable, in spite of various self etch and universal adhesives in the market. Also the finish line must be ideally equi gingival for giving the natural tooth emergence profile.(Ruiz, 2017) Subgingival finish lines are not indicated due to difficulty in achieving isolation during cementation procedures. (Freedman, 2011; Ruiz, 2017)

35.4% opted for EMAX PRESS and 33.3% opted EMAX CAD material for veneers in regular practice. (Smothers, 2009)The challenging step for most dentists in veneer treatment was evaluated which showed that 33.3% had difficulty in cementation, 31.3% in tooth preparation and 29.3% found both procedures to be difficult. Isolation is critical to avoid moisture contamination

during cementation(Gutowski and Dodiuk, 2013)(Bruzi *et al.*, 2011). Resin cements have been a boon to veneer treatment procedures.(Sunico-Segarra and Segarra, 2014)

The common postoperative complaint that the dentists regularly come across in practice was assessed. 8% of dentists faced staining as a major complaint, 25% opted dislodgement of veneer (Chaiyabutr, Kois and Isvilanonda, 2010) or debonding of veneers (Della Bona, 2009) and 13% for tooth sensitivity. Majority of 51% of dentists mentioned all of the above as common postoperative complications. 58% dentists practised composite veneers as they felt it was a cost effective option, 15 % preferred ceramic veneers and 28% believed both composite and porcelain veneers to be cost effective.

CONCLUSION

Within the limitations of the study, it can be concluded that most of the dentists were aware of veneers as esthetic treatment. With minimal conservative tooth preparation techniques and designs and advanced veneer materials, adhesive technology and CAD CAM technology, veneers are an excellent treatment option for esthetic correction of teeth. Dentists should acquire sound knowledge in the case selection of veneers, shade matching, optimal preparation techniques and designs and recent advances in veneer materials and adhesive techniques. Factors that influence successful veneer treatment include proper case selection, treatment planning, shade selection, optimal preparation designs, veneer fabrication, try in, luting materials and techniques. Hence dentists should acquire knowledge as well as update their technical skills regarding esthetic veneers to use it as a valuable, conservative treatment option.

ACKNOWLEDGEMENT

The authors would like to thank Saveetha Dental College and Hospitals for providing a platformto conduct the study.

CONFLICT OF INTEREST

Nil

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