Annals of Clinical and Analytical Medicine

Acceptance of Veneer among Patients with Anterior Teeth Restorations

Talal Muteb Alshammari (1)*, Hussain Adi Aldayhani (2), Nawaf Ghadeer Alshammari (2), Ahmad Mohammed Alshammari (3), Majed Hamad Alenzi (4), Hamed Ratham Aldefheri (5), Rajeh Handhal Almarri (6),Ghazai Jamman Aldhafeeri (7), Sami Marzouq Alzabni (6),

(1) Restorative Dentist, Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.
(2) General Dentist, Mental Health Hospital in Hafr Al Batin, Saudi Arabia.
(3) Paediatric Dentist, Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.
(4) Endodontist, , Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.
(5) General Dentist, Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.
(6) Orthodontist, Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.
(7) Periodontist, Hafr Al Batin Dental Canter, Hafr Al Batin, Saudi Arabia.

Received 13/11/2022; revised 4/12/2022; accepted 19/12/2022

**Corresponding author*

Abstract

Introduction: Although, poor dental esthetics was found to undermine self-esteem and had an adverse psychological effect, only one study was found in the literature which assessed veneers impact on patients' acceptance. This study determine the acceptance of patients for total aesthetic improvement affected by factor of tooth alignment, followed by shape and color of teeth after veneer treatment.

Methods: The design is interventional pre and post design, since the patients' acceptance was assessed before veneer treatment (the intervention). After that, the patients' acceptance was assessed again after veneer treatment. This study is a hospital based study, where it was conducted in dental clinics in Saud-Arabia. The sample size calculation was made by G*power software. The consecutive eligible patients were included in this study, where all patients. The inclusion criteria include patients who treated in the dental clinics who are going to do porcelain veneers. The inclusion criteria including age range of 18 – 60 years old, indications of PLV such as discoloration of teeth, failing existing fillings, shade alteration , alignment correction, morphology correction, and space management.

Results: A total of 45 patients were included in this study, the majority of them were females (77.8%) and 22.2% were males. The vast majority of patients were at the university level of education and about 71% of them were 21-30 years old. The findings related to the patients' acceptance showed different levels of acceptances before and after the placement of veneers. Before veneer restorations, only 66.7% were satisfied about the color of the teeth, whereas after veneer placement 93.3 % of them were satisfied or strongly satisfied. About 51.1% of the patients were unsatisfied about the shape of teeth before veneering, while

64.4% were satisfied about teeth alignment after veneer restorations. Before veneering, most of the patients sometimes (31.1%) or always (66.7%) avoided smiling in order to prevent exposure of their teeth.

Conclusions: We concluded that patients; acceptance about either teeth color or alignment increased markedly after veneer treatment and the patients felt most satisfied about teeth color of the veneer. The experience of the dentists and lab technicians influenced significantly acceptance about teeth shape and alignment.

Keywords: ***Veneer, Esthetic, Anterior teeth, Restoration, Agreement.***

Introduction

The appearance of teeth was a concern of people since 2,000 years, when Romans and Asians covered their teeth with inlay or used urea for whitening their teeth [1]. Recently, the improvement in dental care during the last decades associated with reduction in dental caries and control of periodontal diseases. Thus the main concern of patients shifted towards the dental appearance [2, 3]. A study found that, the most significant factor for an esthetic dental appearance was the shade of teeth; followed by the shape of teeth and smile line [4]. Veneers introduced to the dental practice as direct composite veneers in late 1970s, when the main purpose was to correct the shade and shape of discolored or disfigured anterior teeth to improve the dental aesthetics [4]. However, composite veneers were disappointing for patients due to wear and poor stability of the shade [5]. This allowed for introducing of porcelain veneers (PLV), which provides better esthetic and survival outcomes. Few studies aimed to evaluate the effect of using veneers for improvement of dental esthetics. They focused in number of restored teeth and the survival rate of porcelain veneers [6]. Although, poor dental esthetics was found to undermine self-esteem and had an adverse psychological effect [7], only one study was found in the literature which assessed veneers impact on patients' acceptance.

About one third of the adult population in the USA is dissatisfied with the color or shape of one or more of their natural or restored teeth'. The same conclusion was found in the Dutch National Dental Survey which was preformed [7]. The growing importance placed on aesthetics may result in an increased demand for cosmetic dental treatment. Cosmetic dentistry has the purpose to maintain or improve the aesthetic appearance of the teeth. A good option to restore unaesthetic anterior teeth is a veneer restoration (VR). Both direct and indirect bonding techniques can be used for this type of restoration. The technique of VR is not new, but the materials and preparation design have changed over time. The clinical success of restorations depends on technical aspects, aesthetic result and performance in time. Most of the studies dealing with evaluations of VR have been performed by dentists [8]. These studies report the survival rate of VR with or without well described evaluation criteria. If evaluation criteria were used they often differ from standardized criteria, for example as in Quality Evaluation for Dental Care of the California Dental Association (CDA-rating) or United States Public Health Service Criteria (USPHS). The parameters employed were mostly surface characteristics, marginal integrity, anatomic form and the color of the restoration. Except for the criterion 'color' these are all objective parameters and the levels are relatively easy to quantify [9].

The aesthetic requirements of dentists are not the same as those of patients. They vary not only from person to person but are also dependent on professional interests. There is a few studies performed to investigate the patients' satisfaction with bonded or porcelain restorations. This study determine the acceptance of patients for total aesthetic improvement affected by factor of tooth alignment, followed by shape and color of teeth after veneer treatment [8-9].

Methods

The design is interventional pre and post design, since the patients' acceptance was assessed before veneer

treatment (the intervention). After that, the patients' acceptance was assessed again after veneer treatment. This study is a hospital based study, where it was conducted in the dental clinics. The sample size calculation was made by G*power software Version (3). The priori estimation for a sample size sufficient to detect difference between two means of paired samples with effect size of 0.4 and, alpha error of 0.05 and statistical power of 0.80 was 41 subjects. To compensate for possible drop out patients, 10% of original sample size will be added. The final sample size was 41 + (41X 10%) = 45 subjects. The consecutive eligible patients were included in this study, where all patients. This type of sampling belongs to random sampling methods and sometimes called complete coverage sample or systematic sample with interval equal to zero. It is based on the hypothesis that stated, "The patients present themselves to the hospital randomly".

The inclusion criteria include patients who treated in the dental clinics who are going to do porcelain veneers. The inclusion criteria including age range of 18 – 60 years old, indications of PLV such as discoloration of teeth, failing existing fillings, shade alteration , alignment correction, morphology correction, space management, i.e. diastema or imbrications, existing periodontal health, gingival zeniths, tooth surface, loss restitution, restoring collapse of occlusal vertical dimension, correcting iatrogenic insult, maxillary gingival exposure at rest & during smiling/laughter).

The written informed consents were obtained from the patients before including in this study, and the right of withdrawal at any time of the study was explained for the patients. After one month of veneer treatment, the data about acceptance were collected again. The exclusion criteria included patients who refuse to participate to this study and patient who lose or damage their restoration directly after treatment for any reason. The data were collected using Arabic translate of a standard questionnaire uses to calculate Orofacial Esthetic Scale (OES-G). The OES-G has proper psychometric characteristics and is a good instrument for the evaluation of self -perceived oral esthetics. Nalbandian and Millar used a similar questionnaire to assess patients acceptance in regards to esthetic improvement after veneer treatment [8]. The version that was employed in this study used a 5-gade Likert scale with items ranged from unsatisfactory to most satisfactory. The questionnaire investigating the patients acceptance about the facial appearance, appearance of facial profile appearance of patient's mouth (smile, lips, and visible teeth), appearance of teeth rows, shape/form of teeth, gum appearance, and overall acceptance [9]. The data were introduced into the Statistical Package of Social Science (SPSS) Version 20. After that, the data were analyzed to yield the descriptive and inferential statistics. The categorical variables were presented in percentage, tables and bar graphs. The inferential statistics were conducted to calculate significant difference between means of pre and post acceptance using paired-t test. The significance alpha level set at 0.05 and any P values less than 0.05 was considered statistically significant.

Results

A total of 45 patients were included in this study, the majority of them were females (77.8%) and 22.2% were males. The vast majority of patients were at the university level of education and about 71% of them were 21-30 years old. More than half of included patients were singles, while 44.4% of them were currently married. In regards to oral hygiene, 60% of the patients described their oral health as fair, followed by 22.2% said they had poor oral health, while only 17.8% reported good oral health. Concerning the oral hygiene practices, about 24.4% said they do not brush their teeth, while 56% of the patients said they brush their teeth one time per day, while 20% reported tooth brushing two times per day.

The findings related to the patients' acceptance showed different levels of acceptances before and after the placement of veneers. Before veneer restorations, only 66.7% were satisfied about the color of the teeth, whereas after veneer placement 93.3 % of them were satisfied or strongly satisfied. About 51.1% of the patients were unsatisfied about the shape of teeth before veneering, while 64.4% were satisfied about teeth alignment after veneer restorations. Before veneering, most of the patients sometimes (31.1%) or always (66.7%) avoided smiling in order to prevent the

Table (1): Patients' acceptance before and after veneers restoration

Patients' characteristics		*Frequency*	*Percentage*
Patients' acceptance about their teeth color before veneer placement	Agree	30	66.7
	Disagree	15	33.3
Patients' acceptance about their teeth shape before veneer placement	Agree	23	51.1
	Disagree	22	48.9
Patients' acceptance about their teeth color after veneer placement	Strongly Disagree	1	2.2
	Disagree	2	4.4
	Neutral	0	0.0%
	Agree	15	33.3
	Strongly Agree	27	60.0
Patients' acceptance about their teeth alignment after veneer placement	Strongly Disagree	0	0.0%
	Disagree	7	15.6
	Neutral	9	20.0
	satisfied	11	24.4
	strongly satisfied	18	40.0
The veneer characteristic patients feel most Agreement	Tooth color	42	93.3
	Tooth shape	21	46.7
	Tooth alignment	0	0.0%
	Tooth occlusion	0	0.0%

exposure of their teeth. After veneering, the veneer characteristic most patients (93.3%) felt most satisfied about was the tooth color, followed by tooth shape which 46.7% of patients felt satisfied about (table 1). In regards to materials used in veneer fabrication were as follows, E-max express used in 80.0% of the patients, Fieldpathic porcelain used in 13.3%, and Zirconia which used in only 6.7 of patients. About 80% of the veneers fabricated by press technique, followed by powder liquid build-up technique (in 13.3% of veneers), and finally Cad/Cam milling technique which used in only 6.7% of veneers. The vast majority of veneers (93.3%) was cemented by L.C., while the three cases veneered by zirconia were cemented by dual cure. Concerning experience of working dentists, 42.2% of the dentists had 1-2 years of experience, while 20% and 37.8% had 3-5 and >5 years of experience respectively. The experience of lab technicians were 1-2 years, 3-5 years and >5 years in 33.3%, 28.9 and 37.8% of the lab technicians. Significant difference was detected between males and females in regards to acceptance about alignment of teeth in veneer restorations, where 68.6% of females were satisfied in comparison to 50% of males (P=0.017). As the years of dentists experience increased, the acceptance about alignment of teeth in veneer restorations increased from 13.3% in 1-2 years of experience to 100% in > 5 years of experience (P=0.000). Similar results were reported for lab technician experience, where the acceptance about alignment of teeth in veneer restorations increased from 15.8% to 100% for 1-2 years to > 5 years of experience (P=0.000). Materials used in veneer fabrication showed no statistically significant effect on acceptance about alignment of teeth in veneer restorations.

About reporting tooth color as the most satisfied veneer characteristic, only material of veneers had significant effect on this reporting (P=0.000). Factors such as gender, experience of the dentists, and experience of lab technician showed non-significant association with reporting tooth color as the most satisfied veneer characteristic. About reporting tooth shape as the most satisfied veneer characteristic, experience of the dentists and experience of lab technician showed significant effect on this reporting (P=0.000). However, gender and materials of veneer fabrication showed non-significant association with reporting tooth shape as the most satisfied veneer characteristics.

Discussion

The demand of cosmetic dentistry has been growing in the last decades, because of reduction in dental caries

and periodontal diseases. The measurement of the impact of veneer in esthetic improvement is difficult, because the standard of esthetic differ from person to person. Thus the assessment of patients' acceptance is a complex process that is not fully identified by the characteristics of veneers such as color, shape and alignment of teeth [10]. In a study conducted among USA population, about one third of them was unsatisfied with color or shape of their natural intact or filled teeth [5]. Survival rate of porcelain veneers were reported to be 92% at 5 years follow up period decreasing to 64% at 10 years period of follow up [11].

The findings of the present study showed different levels of acceptances before and after the placement of veneers. Before veneer restorations, at baseline evaluation, only 66.7% were satisfied about the color of the teeth, whereas after veneer placement 93.3% of them were satisfied or strongly satisfied about tooth color. Nalbandian and Millar found a higher improvement in patients' acceptance where 21.8% of their study participants liked the teeth color before and 75.4% liked the teeth color after veneer treatment [8]. In the present study, before veneering, most of the patients sometimes (31.1%) or always (66.7%) avoided smiling in order to prevent exposure of their teeth. Similarly, Nalbandian and Millar found that only 27.3% of their study participants were confident smiling before treatment [8]. About 51.1% of the patients were unsatisfied about the shape of teeth before veneering, while 64.4% were satisfied about teeth alignment after veneer restorations. Nalbandian and Millar found a higher improvement in patients' acceptance where 60% of their study participants liked the teeth shape before and 93.8% liked the teeth shape after veneer treatment.

In addition they found 98% were happy about teeth arrangement after treatment with veneers [8]. In the present study, the veneer characteristic that most patients (93.3%) felt very satisfied about was the tooth color. About reporting tooth color as the most satisfied veneer characteristic, only material of veneers had significant effect on this reporting. In this study, factors such as experience of the dentists and experience of lab technician showed non-significant association with reporting tooth color as the most satisfied veneer characteristic. This significant effect of type of materials used in veneer color could be justified by the known superior color properties of E-max express and fieldpathic porcelain over zirconia veneers. Tooth shape, as the most satisfied veneer characteristic, was reported by 47% in the current study. Factors such as experience of the dentists and experience of lab technician showed significant effect on this reporting. Since porcelain, veneers depend on experience of the dentists in minimal preparation of enamel surface and the experience of the laboratory technician in the fabrication of the restorations [12-15]. In the current study, as the years of dentists experience increased, the acceptance about alignment of teeth in veneer restorations significantly increased from 13.3% in 1-2 years of experience to 100% in > 5 years of experience. This reflected the importance of the dentists experience in achieving the acceptance of the patients. In the current study, materials used in veneer fabrication showed no statistically significant effect on acceptance about shape or alignment of teeth in veneer restorations, which are factors depend mainly on experience of both dentists and lab technicians.

There is no gold standard for esthetics, however thus study aimed to assess the patients' acceptance as a proxy measures for improvement in esthetic following veneer restorations. This study found that patients' acceptance is influenced by factors such as gender of patients, experience of the dentists, experience of the lab technician and material of veneers. The limitations of this study included the inconsistency in scale used to assess patients' acceptance, since binary and five grades scale were used interchangeably. In addition, patients' acceptance was assessed once after treatment, while multiple longitudinal assessment of the patients' acceptance could be more informative.

Conclusions

We concluded that patients; acceptance about either teeth color or alignment increased markedly after veneer treatment and the patients felt most satisfied about teeth color of the veneer. The experience of the dentists and lab technicians influenced significantly acceptance about teeth shape and alignment. However, type of material used significantly affected the acceptance about teeth color of the veneer restorations.

Conflict of interests

The authors declared no conflict of interests.

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