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The impact of laminate veneer restoration on oral health-related quality of life: A case series study

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Original Article

Abstract

BACKGROUND AND AIM: Laminate veneer restorations exhibit excellent ability to reproduce the natural teeth regarding esthetic and biomechanics. The aim of the present study was to determine the impact of laminate veneers on oral health-related quality of life (OHQoL).

METHODS: In this case series study, the impact of treatment on OHQol was measured using the standard questionnaire OHIP-14. This tool was applied to 19 patients who visited the private office of restorative and cosmetic specialist before and six months after treatment.

RESULTS: The maximum score recorded by Oral Health Impact Profile-14 was 34 before treatment, with 31 after treatment. The average score decreased from 13.1 ± 9.44 (before treatment) to 12 ± 10.6 (after treatment). Comparison of the frequencies of patient's responses to OHQoL suggested that changes in OHQoL for question number 4 (uncomfortable to eat food) and question number 9 (difficult to relax) were significant, respectively (P = 0.03, P = 0.02) and for question number 10 (feeling embarrassed) were nearly significant (P = 0.07). Nineteen subjects in this study exhibited improvement in OHQoL.

CONCLUSION: Esthetic dental treatment using laminate veneers would significantly affect OHQoL enhancement in some aspects.

KEYWORDS: Oral Health; Quality of Life; Cosmetic Dentistry; Laminate Veneer

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Oral health-related quality of life (OHQoL) represents a personal assessment of how much and how a person's social life and its functional and emotional aspects are affected by the health-related issues of their mouth.[1] In other words, OHQoL is considered to be a measure that shows the impact of oral and dental changes on various aspects of life, including eating, sleeping, socializing and self-esteem.[2] Nowadays, reliable standard devices are available to researchers for measuring OHQoL, but the majority of studies in this field are dedicated to the impact of chronic disease conditions (e.g. oral cancers) on quality of life.[1-3] However, it appears that professional treatments and cosmetic restorative dentistry can have a significant impact on OHQoL through their impact on the quality aspects of life, such as an increase in confidence and improved smiling, speech and facial appearance. White teeth have been positively correlated with high ratings of social competence, intellectual ability, psychological

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adjustment and relationship status.[4] Alternatively, untreated dental caries, non-aesthetic or discolored anterior teeth restorations and missing anterior teeth usually lead to dissatisfaction with dental appearance.[5,6] Furthermore, treatments improving dental aesthetics have been found to increase patient quality of life and psychological status.[7,8]

Makino-Oi et al. showed the effect of prosthesis on quality of life in patients with shortened dental arch.[9] Another study reported the effect of using denture during nights on OHQoL of the patients.[10] All studies have shown that despite the diversity of modern research carried out in terms of dental interventions, the cosmetic domain of quality of life among patients has received less attention in comparison to all the other domains of quality of life.[11-16] Laminate veneer treatment is among these treatments with cosmetic and conservative mechanical properties in relation to health and beauty and is ideal for use in anterior teeth.[17,18] Conservation of more tooth structure and its integrity are the most important features and the success rate of these cosmetic restorations is around 94%–96%. Therefore, laminate veneer treatment is highly favorable for dentists and patients due to its excellent imitation of natural tooth characteristics such as color, translucency, shape and surface characteristics.[19, 20]

Assessment of the success rate of dental treatments is carried out through clinical criteria (such as CPITN index) in the treatment of periodontal diseases, radiography (alveolar bone healing after surgical treatment) and photography and casts and corrected occlusion after orthodontic treatment; but in cosmetic treatments, patient's satisfaction with treatment in certain aspects of his life is particularly important.[21] Therefore, more measuring OHQoL following cosmetic dentistry treatments is highly important. This study aimed to evaluate OHQoL in patients following laminate veneer treatments.

Methods

In this case series study, the OHQoL was evaluated for 19 patients who visited a private office of restorative and cosmetic specialist, before and 6 months after laminate veneer treatments for anterior teeth (canine to canine). Sampling was carried out consecutively.

The inclusion criterion for patients was an age of 14 years and over. Patients with known systemic diseases and those unable to complete the questionnaire for whatever reason were excluded from the study.

For resin composite veneering of the teeth, at the first step, the desired shade was selected using day light as well as dental unit light source (according to the adjacent teeth, two or more composite shades was seleted from the following list: Vit-l-escence shade B1, A1, A2, A3, Pearl Neutra (PN), Pearl Frost (PF) or Pearl Amber (PA), (Ultradent, USA) or Z350 shades Enamel A1, A2 or A3 and Dentin A1, A2 or A3, 3M, (Ultradent, USA). Afterwards, all the caries affecting hard tissues were removed while in cases without any caries, surface roughening was done by a high speed hand piece in order to increase the bond strength. Prior to acid etching (35% phosphoric acid gel, Ultradent, USA) and bonding (Universal bond, 3M, USA), the field was isolated by cotton roll. The selected resin composites were incorporated subsequently using layering technique while each 2 mm thick layer was light cured for 40 seconds (LED 695C, Dentamerica, Taiwan). Finally, occlusal adjustment, finishing and polishing were accomplished using diamond bur (Dia, Swiss), silicon carbide disks (Soflex, 3M, U.S.A), polishing rubbers (Jiffy, Ultradent, U.S.A) and diamond paste (Diamond composite polishing paste, Ultradent, U.S.A) in a rubber cup (Jiffy, Ultradent, U.S.A), respectively.

Oral Health Impact Profile-14 (OHIP-14), which is the most available tool for assessing OHQoL changes following dental treatment interventions, was used in this study.[1,2,22] The original OHIP-14 was in English which had been translated into Farsi and the validity and

reliability of the Persian version has been confirmed by Navabi et al.[23]

A standardized Persian version of this tool consists of 14 questions and was filled out for all study participants in separate (before and after) sessions in the form of an interview. OHIP-14 measures quality of life in seven domains (2 questions for each domain) of functional limitation, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability and physical disability.

The structure of questionnaire is in a way that each two consecutive questions are related to one of the seven domains, for example, questions 1 and 2 are related to the first domain and questions 5 and 6 are related to the third domain.

Each question on OHIP-14 is designed in such a way that respondents should answer a particular problem in relation to the recent experience with the teeth or mouth. For example, question 1 runs as follows: Have you had any trouble pronouncing any words because of problems with your teeth or mouth? Replies were recorded in Likert scale with zero for (never), one for (rarely), two for (sometimes), three for (often), and four for (almost always). The final total score of OHIP-14 ranged from zero to 56. A lower total score and closer to zero indicated a higher level of quality of life and a better OHQoL.[16,17] The aim of the study was explained to the patients and patients participated in the study voluntarily.

Oral consent was obtained from all patients. Purpose of the study was explained for the patients and they were given a choice to exit from the study whenever they want. Patients' data were kept confidential. Demographic data of the patients as well as information obtained from OHIP-14 at the two time points were analyzed with SPSS (version 22.0, SPSS Inc., Chicago, IL, USA) using descriptive statistics. Shapiro-Wilk test was used to check the normality of data and Wilcoxon test was used to compare the average scores of the questionnaire before and after treatment.

Results

A total of 19 patients participated in the study. Table 1 shows the demographic data of the patients. The age of the patients ranged from 14 to 61 years with a mean of 27.7 ± 12.8 years. The maximum score recorded by OHIP-14 was 34 before treatment and 31 after treatment. The average score decreased from 13.1 ± 9.44 (before treatment) to 12 ± 10.6 (after treatment).

Table 1. Demographic characteristics of the patients

Independent variable	Variable levels	Frequency [n(%)]
Sex	Male	4 (21.1)
	Female	15 78.9 ()
Age (Years)	Under 20	6 (31.6)
	20 to 40	11 (57.9)
	Above 40	2 (10.5)
Education	Student	6 (31.6)
	Diploma	4 (21.0)
	Above	9 (47.4)

In figures 1 and 2, patients' clinical status before and after the laminate veneer restorations are visible.

Figure 1. Patient's clinical status before and after laminate veneer restorative

OHIP-14 scores were not significantly associated with sex and education (P = 0.64 and P = 0.16, respectively) but were significantly associated with age (P = 0.02). Laminate treatment had greatest impact on patients' quality of life at the age range of 20 to 40 years.

Figure 2. Patient's clinical status before and after laminate veneer restorative

Shapiro-Wilk test showed that the distribution of mean scores before and after treatment were not normal. Therefore, Wilcoxon analysis showed that despite lower average score of OHIP-14 after the laminate veneer treatment, the average reduction was not significant (P = 0.40). Table 2 shows the distribution of participants' responses to questions of OHIP-14 before and after treatment. As can be seen, comparison of the frequencies of these responses suggested that after treatment, changes in OHQoL for question number 4 (uncomfortable to eat food) and question number 9 (difficult to relax) were significant (P = 0.03, P = 0.02, respectively) and for question number 10 (feeling embarrassed) was marginally significant (P = 0.07).

Discussion

This study confirmed the improvement of OHQOL-14 in the psychological disability domain. After cosmetic dental treatment, significant and nearly significant results were achieved regarding question number 9 and 10, respectively, which were related to psychological disability domain. This finding has considerable importance and shows the impact of cosmetic dental treatments to improve quality of life in the psychological aspects that certainly will affect the patient's general mental health. In other words, the majority of patients in this study had confirmed that the laminate treatment increased their comfort and confidence which showed the depth of this cosmetic treatment impact on patient's quality of life.

The role of dental treatments on health-related and functional aspects of quality of life is more than the cosmetic aspect of dental treatments; for example van Eekeren et al. reported the effect of implant therapy on OHQoL of the patients with different occlusion classes.[24] da Silva et al. reviewed the impact of metal-ceramic restorations on 50-year-old women's OHQoL and concluded that OHIP-14 score decreased from 28 (before treatment) to zero (after treatment).[25] While the study was conducted on one patient, evaluation of 19 patients in our study provided the possibility of a closer examination of the quality of life after dental treatments.

In this study, OHQoL level after laminate veneer treatment improved but this change was not statistically significant. In our study, OHQoL changes were assessed in a group of patients and each patient was compared with himself/herself. Meireles et al. evaluated the OHQoL changes subsequent to bleaching treatment in a randomized, double-blind study and showed that tooth whitening had a positive impact on the quality of life of some patients but negative effect on some others.[26] Our results were similar to Meireles et al. study in terms of overcoming embarrassment of showing teeth, but their study showed some hygiene problems and sensitivity in some patients following treatment, which were not reported in the present study. The differences are justified in two ways:

Table 2. The comparison of OHIP-14 scores in 19 patients before and after laminate veneer treatment

Questions	Before treatment					After treatment					P
	Never	Rarely	Sometimes	Frequently	Almost always	Never	Rarely	Sometimes	Frequently	Almost always	
Have you had trouble pronouncing any words because of problems with your teeth, mouth or dentures?	18	1	0	0	0	15	3	1	0	0	0.15
Have you felt that your sense of taste has worsened because of problems with your teeth, mouth or dentures?	17	1	1	0	0	17	0	0	1	1	0.56
Have you had painful aching in your mouth?	10	3	4	1	1	9	6	3	0	2	0.60
Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	12	2	2	1	2	6	4	7	0	4	0.03*
Have you been self-conscious because of your teeth, mouth or dentures?	7	5	4	2	1	8	3	2	2	1	0.45
Have you felt tense because of problems with your teeth, mouth or dentures?	8	4	4	3	0	5	6	4	3	1	0.32
Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	14	1	2	2	0	12	3	0	2	1	0.83
Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	13	3	1	2	0	12	3	0	2	1	0.13
Have you found it difficult to relax because of problems with your teeth, mouth or dentures?	9	4	4	1	1	3	6	3	3	5	0.02*
Have you been a bit embarrassed because of problems with your teeth, mouth or dentures	6	5	3	2	3	3	1	6	5	4	0.07
Have you been a bit irritable with other people because of problems with your teeth, mouth or dentures?	3	4	3	6	3	3	3	4	7	0	> 0.99
Have you had difficulty doing your usual jobs because of problems with your teeth, mouth or dentures?	12	3	2	0	2	11	4	3	1	0	0.55
Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	12	4	0	2	1	12	5	1	1	0	0.35
Have you been totally unable to function because of problems with your teeth, mouth or dentures?	14	3	1	1	0	19	2	1	0	0	0.39

* Significant

1. Meireles et al. tool for measuring OHQoL was OIDP (Oral Impacts on Daily Performances), which was somewhat different to the tool used in this study (OHIP-14) in terms of domains of quality of life. For example, aspects of the problem in the dental hygiene are not included in OHIP-14.

2. Bleaching treatment has potential side effects such as tooth sensitivity; such complications of treatment did not exist in this study (laminate veneer).

In the present study, some aspects of OHQoL, such as feeling relaxed improved significantly following the intervention of cosmetic dentistry, which was consistent with the study by da Silva.[25] Likewise, in Meireles et al. study, the cosmetic treatments caused significant changes in the patient's discomfort in relation to their appearance.[26] The impact of cosmetic dental treatments on OHQoL was expected to affect the response to question 5 (self-consciousness), 6 (feeling tense), 9 (difficult to relax) and 10 (feeling embarrassed). The results of this study showed significant changes in two of these 4 questions. For a closer look at the impact of dental cosmetic treatments on OHQoL, clinical trials in two groups (or more) are recommended in future studies so that the effects of different cosmetic treatments can be compared and more effective treatment in relation to OHQoL can be identified.

Nowadays, due to increased awareness of people about beauty and importance of beauty in the community, many patients are seeking cosmetic restorations, natural tooth color and correction of dental problems with cosmetic treatments to change their appearance in an attempt to achieve improvements in their quality of life. Actually, regarding to the decreased prevalence of dental caries in modern societies, the mandatory demand in referring to dental clinics has been gradually shifted from functional needs toward esthetic dentistry.[4] Accordingly, it has been frequently documented that the esthetic dentistry could improve the individual's self-confidence.[26] Based on this, resin composite laminate veneers are increasingly popular due to their numerous advantages compared to other esthetic treatments such as orthodontic therapy and even ceramic veneers. In view of that, resin composite veneers could be accomplished in a single visit treatment while is it categorized as a quite non-invasive protocol, since there is no need for tooth preparation as it is discussed in in-direct ceramic veneers.[19] Therefore, resin composite veneers are becoming widespread among dentists.

Conclusion

The present study showed that proper cosmetic treatments such as laminate veneer may impact on the OHRQoL of younger adults, may improve their satisfaction with dental appearance and decrease embarrassment.

Conflict of Interests

Authors have no conflict of interest.

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References

1. Nabavi N. Unacceptable performance in oral health related quality of life assessments in Iran (letter to editor). J Res Dent Sci 2015; 11(4): 181-3.
2. Navabi N. A Science metric study of Iranian published articles about oral health-related quality of life. J Oral Health Oral Epidemiol 2013; 2(2): 49-55.
3. Barrios R, Tsakos G, Gil-Montoya JA, Montero J, Bravo M. Association between general and oral health-related quality of life in patients treated for oral cancer. Med Oral Patol Oral Cir Bucal 2015; 20(6): e678-e684.

4. Samorodnitzky-Naveh GR, Geiger SB, Levin L. Patients' satisfaction with dental esthetics. J Am Dent Assoc 2007; 138(6): 805-8.
5. Kershaw S, Newton JT, Williams DM. The influence of tooth colour on the perceptions of personal characteristics among female dental patients: comparisons of unmodified, decayed and 'whitened' teeth. Br Dent J 2008; 204(5): E9-7.
6. Akarslan ZZ, Sadik B, Erten H, Karabulut E. Dental esthetic satisfaction, received and desired dental treatments for improvement of esthetics. Indian J Dent Res 2009; 20(2): 195-200.
7. Al-Omiri MK, Karasneh JA, Lynch E, Lamey PJ, Clifford TJ. Impacts of missing upper anterior teeth on daily living. Int Dent J 2009; 59(3): 127-32.
8. Gerritsen AE, Sarita P, Witter DJ, Kreulen CM, Mulder J, Creugers NH. Esthetic perception of missing teeth among a group of Tanzanian adults. Int J Prosthodont 2008; 21(2): 169-73.
9. Makino-Oi A, Ishii Y, Hoshino T, Okubo N, Sugito H, Hosaka Y, et al. Effect of periodontal surgery on oral health-related quality of life in patients who have completed initial periodontal therapy. J Periodontal Res 2016; 51(2): 212-20.
10. Fueki K, Igarashi Y, Maeda Y, Baba K, Koyano K, Sasaki K, et al. Effect of prosthetic restoration on oral health-related quality of life in patients with shortened dental arches: a multicentre study. J Oral Rehabil 2015; 42(9): 701-8.
11. John MT, Slade GD, Szentpetery A, Setz JM. Oral health-related quality of life in patients treated with fixed, removable, and complete dentures 1 month and 6 to 12 months after treatment. Int J Prosthodont 2004; 17(5): 503-11.
12. Grossmann AC, Hassel AJ, Schilling O, Lehmann F, Koob A, Rammelsberg P. Treatment with double crown-retained removable partial dentures and oral health-related quality of life in middle- and high-aged patients. Int J Prosthodont 2007; 20(6): 576-8.
13. Feu D, Miguel JA, Celeste RK, Oliveira BH. Effect of orthodontic treatment on oral health-related quality of life. Angle Orthod 2013; 83(5): 892-8.
14. Sadek H, Salem G. Psychological aspects of orthognathic surgery and its effect on quality of life in Egyptian patients. East Mediterr Health J 2007; 13(1): 150-9.
15. Abreu LG, Melgaco CA, Lages EM, Abreu MH, Paiva SM. Effect of year one orthodontic treatment on the quality of life of adolescents, assessed by the short form of the Child Perceptions Questionnaire. Eur Arch Paediatr Dent 2014; 15(6): 435-41.
16. Emami E, Nguyen PT, Almeida FR, Feine JS, Karp I, Lavigne G, et al. The effect of nocturnal wear of complete dentures on sleep and oral health related quality of life: study protocol for a randomized controlled trial. Trials 2014; 15: 358.
17. Prajapati P, Sethuraman R, Naveen YG, Patel JR. Indirect laminate veneer: a conservative novel approach. BMJ Case Rep 2013; 2013.
18. Korkut B, Yanikoglu F, Gunday M. Direct composite laminate veneers: three case reports. J Dent Res Dent Clin Dent Prospects 2013; 7(2): 105-11.
19. Hilton TJ, Ferracane JL, Broome JC. Summitt's fundamentals of operative dentistry: a contemporary approach. 4th ed. Hanover Park, IL: Quintessence Publishing Company; 2013. p. 448.
20. Freedman GA. Contemporary esthetic dentistry lsevieron vital source. Philadelphia, PA: Elsevier Health Sciences; 2011. p. 304-5.
21. Naito M, Yuasa H, Nomura Y, Nakayama T, Hamajima N, Hanada N. Oral health status and health-related quality of life: a systematic review. J Oral Sci 2006; 48(1): 1-7.
22. Navabi N, Farnudi H, Rafiei H, Arashlow MT. Orthodontic treatment and the oral health-related quality of life of patients. J Dent (Tehran) 2012; 9(3): 247-54.
23. Navabi N, Nakhaee N, Mirzadeh A. Validation of a Persian version of the oral health impact profile (OHIP-14). Iran J Public Health 2010; 39(4): 135-9.
24. van Eekeren PJ, Aartman IH, Tahmaseb A, Wismeijer D. The effect of implant placement in patients with either Kennedy class II and III on oral health-related quality of life: a prospective clinical trial. J Oral Rehabil 2016; 43(4): 291-6.
25. da Silva GR, Roscoe MG, Ribeiro CP, da Mota AS, Martins LR, Soares CJ. Impact of rehabilitation with metal-ceramic restorations on oral health-related quality of life. Braz Dent J 2012; 23(4): 403-8.
26. Meireles SS, Goettems ML, Dantas RV, Bona AD, Santos IS, Demarco FF. Changes in oral health related quality of life after dental bleaching in a double-blind randomized clinical trial. J Dent 2014; 42(2): 114-21.