

## EVALUATION OF KNOWLEDGE AND ATTITUDES OF YEMENI GENERAL DENTAL PRACTITIONERS TOWARDS THE PORCELAIN LAMINATE VENEERS

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### ABSTRACT

**Objective:** The present study assessed the knowledge and attitude of Yemeni General Dental Practitioners (GDPs) in private clinics towards the porcelain laminate veneer (PLV).

**Method:** In this cross sectional study, questionnaire was designed and distributed to 340 respondents and 270 questionnaires were completed and returned. The questionnaire composed of two parts. The first part includes the demographic characteristics of participate. The second consist of close end question related to the knowledge and attitude of participants, and the main obstacles hindering the use of PLVs.

**Results:** The majority (97.8%) of Yemeni GDPs in the private clinics had previous scientific information. 50% of them acquired the knowledge from the faculty and 50% from other sources. 60.4% of the participants never practiced it in clinics, whereas 90% of the participants supported the use of PLVs in private clinics. 50.4% of participants said that the main obstacle was the patient.

**Conclusion:** The low level of scientific knowledge and training on PLV restorations was associated with the low level of applying this restoration in Yemeni dental private clinics. Therefore, applying continuous education programs among the GDPs could improve the knowledge and attitudes to PLV restorations in private dental clinics.

**KEYWORDS:** Dental Porcelain, Prosthodontics, General Practitioners & Dental Clinics

### 1. INTRODUCTION

The conventional fixed prosthodontic procedures require removal of much tooth structure to perform full coverage restorations and provide enough space for restoration. If this coverage is necessary for aesthetic or mechanical purposes due to the presence of large carious lesion or preexisting restorations, it will be acceptable. However, when the remaining tooth structure or the abutment teeth are sound, conventional full coverage restoration is more destructive procedures (1, 2).

Therefore, the recent advances in fixed prosthodontic restorations are concerned with fabrication of a dental prosthesis to provide functional and aesthetic requirements. These restorations will preserve the sound tooth structure as possible (1, 3).

For that reason, several studies showed that there was more conservative procedure that was used to restore or replace the missing tooth structures with no or minimal preparation. These restorations provided a favorable option for restoring the aesthetic or replacing the missing tooth structures (4-9).

Therefore, the PLVs are the conservative and alternative restorations to the full veneer crown that is used only for aesthetic improvement of the anterior tooth/teeth (3, 8–12). Hence, the PLV restorations were introduced successfully to the clinical practice in 1983, and used to mask the intrinsic discoloration of teeth that caused by various reasons (13, 14). After that, these restorations were used for correction of the alternations in the tooth form or position, close diastema or other spaces. In addition to that, these restorations were used for replaced old composite restorations, restored the enamel destruction (i.e. abrasion, attrition and erosion) and repaired of incisal fractures (4, 15, 16).

Technically, the PLV is the best type of the laminate veneer styles. This PLV restoration consists of an extremely thin sheet of porcelain that is applied onto a minimally prepared labial surface of affected teeth. This alternation derives its strength from the ability of a bonding system that consists of a composite resin luting agent and a silane coupling agent to be bonded efficiently with the etching surfaces of both the porcelain and enamel (8, 17, 18)

The PLVs preserve the sound tooth structure, decrease the chance of failure and loss of tooth, preserve the pulp, minimize soft tissue irritations, less stressful to the patient and able to retrieve (17, 18). On the other view, the PLVs sometimes increase the tooth contour, chipping and cracking the porcelain may occur because of the thin nature of these restorations and the high cost of PLVs are the most disadvantages of PLVs (17, 18).

At the present time, no published data are available on the current status of PLV restorations in Yemen. Therefore, the purpose of the present study is to survey the knowledge and attitudes of Yemeni GDPs towards PLV restorations.

## **2. MATERIALS AND METHODS**

### **2.1 Study Design**

This is a cross-sectional study that was conducted among the Yemeni GDPs in private dental clinics. The study protocol had the agreement from ethical committee in deanship of postgraduate studies and scientific research at UST-Yemen.

### **2.2 Inclusion Criteria**

Inclusion criteria include the Yemeni GDPs, who formerly graduated from either local or international university. The study selected randomly 340 Yemeni GDPs in private clinics in Sana'a, Dhamar and Ibb cities.

### **2.3 Data Collection**

The survey was designed in the form of a questionnaire, containing close end questions. A total of 28 well-structured questions accompanied with complete description of the study. The questionnaire was constructed and distributed in both Arabic and English languages, in order to facilitate filling by the language that was easy for the participants.

The questionnaire composed of two parts, the first part included the general information of participants, namely university of graduation (local or international university), year of experience (<5 years, 5–10 years, >10 years), place of practice (Sana'a, Dhamar or Ibb), work time (full-time or part-time) and gender. The second part was consisted of PLVs close end questions, these questions related to knowledge and the source of the information about PLVs, the attitudes and support for using the PLVs and the main obstacle hindering applying these restorations.

Participants also received instructions to complete the surveys and return them. Survey questionnaires were anonymous.

**2.4 Pilot study**

Pilot study was performed among a group that consist of 25 of Yemeni GDPs in Ibb city. After analysis, according to Cronbach's Alpha with the SPSS program, the modifications were made for the final questionnaire.

**2.5 Sampling Method**

Cluster random sampling was adopted in the study with the target participants in Sana'a, Dhamar and Ibb.

**2.6 Sample Size Calculation**

According to the annual statistical health report of the private dental clinics of 2014, the Ministry of Public Health and Population of Yemen, the number of GDPs in the target private dental clinics was 467, the society of the study Sana'a had 377 private dental clinics, Dhamar had 34 private dental clinics, Ibb had 56 private dental clinics (19).

Depending on power of study 80% and confidence level CI 95%, the minimum sample size calculated by using OpenEpi® software consisted of 272 GDPs: 191 from Sana'a city; 32 from Dhamar city; and 49 from Ibb city.

**2.7 Statistical Analysis**

All returned forms were coded with number of questionnaire, by a single operator and the data were checked and entered twice into a personal computer. Data was collected and entered to the computer, and analyzed using SPSS (Statistical Package for Social Science) program (version 22; Inc., Chicago. IL).

Cross-tabulations were used to determine of percentages of tested groups. The Chi-Square analysis test and regression analysis were used. The P-value less than 0.05 was considered as significant.

**3. RESULTS**

Demographic characteristics of GDPs participated are summarized in table 1.

**Table 1: Demographic Characteristics of GDPs Participated in the Study**

Criteria	N	%	
<b>Gender</b>	Male	129	47.8
	Female	141	52.2
<b>Graduation University</b>	Local	224	83.0
	International	46	17.0
<b>Years of Experience</b>	<5 Years	110	40.7
	5-10 Years	88	32.6
	>10 Years	72	26.7
<b>Work Time</b>	Part-Time	116	43.0
	Full-Time	154	57.0
<b>Place of Practice</b>	Sana'a	182	67.4
	Dhamar	33	12.2
	Ibb	55	20.4

97.8% of the participants had previous scientific information of PLVs. The majority of the participants (78.5 %) considered the PLVs permanent restorations (table 2).

**Table 2: Responses of Participant to the Questions of PLVs knowledge**

Items	Response	N	%
I have previous scientific information of PLVs.	No	6	2.2
	Yes	264	97.8
If yes, the main source from which the information of PLVs was gained from books.	No	241	89.3
	Yes	29	10.7
If yes, the main source from which the information of PLVs was gained from medical journals.	No	263	97.4
	Yes	7	2.6
If yes, the main source from which the information of PLVs was gained from college.	No	135	50.0
	Yes	135	50.0
If yes, the main source from which the information of PLVs was gained from internet.	No	195	72.2
	Yes	75	27.8
If yes, the main source from which the information of PLVs was gained from others.	No	252	93.3
	Yes	18	6.7
The PLVs represent permanent restorations.	No	58	21.5
	Yes	212	78.5
The PLV restorations are more successful in the anterior maxilla.	No	27	10.0
	Yes	243	90.0
The PLV restorations are more successful when the occlusion is Class I.	No	59	21.9
	Yes	211	78.1
The remaining amount of enamel was affecting the success of the PLV restorations.	No	44	16.3
	Yes	226	83.7
The proper PLV design to increase their longevity was covered the incisal edge.	No	201	74.4
	Yes	69	25.6
The method of treating the internal surface of the PLV restorations affects their longevity.	No	59	21.9
	Yes	211	78.1
The ideal thickness of PLVs is 0.3 - 0.5 mm.	No	149	55.2
	Yes	121	44.8
The thickness of PLVs affects their longevity.	No	53	19.6
	Yes	217	80.4
Type of bonding agent affects the longevity of the PLV restorations.	No	18	6.7
	Yes	252	93.3
Using the rubber dam during the adhesion procedures increases the longevity of the PLV restorations.	No	55	20.4
	Yes	215	79.6

Based on table 4, the graduation university (OR: 0.514, [95% CI: 0.249-1.058];  $P=0.7$ ) shows no significant association with the level of PLVs knowledge.

The logistic regression indicated that the Years of experience < 5 Years and 5-10 Years (OR: 1.529, [95% CI: 0.844-2.769];  $P = 0.161$ ) and <10 Years (OR: 1.263, [95% CI: 0.638-2.501];  $P = 0.502$ ) were associated with the PLVs knowledge.

The practicing in Sanaa and Dhamar (OR: 1.878, [95% CI: 0.835-4.222];  $P = 0.127$ ) were associated with the PLVs knowledge. Whereas, practicing in Ibb (OR: 0.917, [95% CI: 0.489-1.720];  $P = 0.787$ ) not associated.

The working time (OR: 1.558, [95% CI: 0.926-2.622];  $P = 0.095$ ) shows association. Whereas, the gender (OR: 0.636, [95% CI: 0.360-1.124];  $P = 0.119$ ) show no significant association (table 3).

**Table 3: Determinants of Level of Knowledge of PLVs Among Yemeni GDPs**

Criteria		PLV Knowledge				P- Value	Odd-Ratio	95% CI of OR	
		Low Level		Good Level					
		N	%	N	%				
Graduation University	Local (ref.)*	104	46.4	120	53.6	0.071	0.514	0.249	1.058
	International	26	56.5	20	43.5				
Year of Experience	<5 Years(ref.)*	59	53.6	51	46.4	0.374			
	5-10 Years(ref.)*	37	42.0	51	58.0	0.161	1.529	0.844	2.769
	>10 Years	34	47.2	38	52.8	0.502	1.263	0.638	2.501
Place of Practice	Sana'a(ref.)*	91	50.0	91	50.0	0.268			
	Dhamar(ref.)*	11	33.3	22	66.7	0.127	1.878	.835	4.222
	Ibb	28	50.9	27	49.1	0.787	0.917	0.489	1.720
Work Time	Part-Time(ref.)*	65	56.0	51	44.0	0.095	1.558	0.926	2.622
	Full-Time	65	42.2	89	57.8				
Gender	Male(ref.)*	54	41.9	75	58.1	0.119	0.636	0.360	1.124
	Female	76	53.9	65	46.1				

\*(ref.) = reference.

60.4% of the participants never practiced it in clinics. However, 90% of the participants supported using the PLVs in private clinics, and said that the main obstacle was the patient (50.4%) (table 4).

**Table 4: Responses of GDPs to the Questions Regarding the Level of PLVs Practice**

Items	Response	N	%
I have never applied PLVs in my clinic.	No	107	39.6
	Yes	163	60.4
I support the use of the PLV restorations.	No	27	10.0
	Yes	243	90.0
The main obstacle against applying the PLV restorations is information.	No	228	84.4
	Yes	42	15.6
The main obstacle against applying the PLV restorations is technicians.	No	211	78.1
	Yes	59	21.9
The main obstacle against applying the PLV restorations is materials.	No	248	91.9
	Yes	22	8.1
The main obstacle against applying the PLV restorations is patients.	No	134	49.6
	Yes	136	50.4

#### 4. DISCUSSIONS

PLVs progressively increase in popularity among dental practitioners for conservative restoration of aesthetics (2, 20-22). However, aesthetic requires excellent communication among the dentist, patient, and laboratory technician. Each case must be carefully selected and treatment planned to reach clinical success (21).

It is important to refers to a several factors that affect the treatment with PLVs as the patient age, types of occlusion, soft tissues health, position and alignment of teeth (23, 24).

In the present study, 270 of 340 questionnaires were completed and returned, because some participants were not interested in this scientific research.

Prath and Jain (2017) reported that 75% of the dentists were aware about the materials, 71% had the knowledge about the tooth preparation method. 49% had knowledge on the cementation technique (14). A retrospective study was done by Shaini et al. (1997) reported a survival rate of 47% in 7 years, for veneers was done by undergraduate students and staff member at Birmingham University in the United Kingdom (25).

In the present study, 46.4% of the participants who graduated from local universities had a low level of knowledge about the PLV restorations. Whereas, 56.5% of those who graduated from international universities had a low level of knowledge. However, in this study it appears, there are no association between the PLVs knowledge and the graduation university.

Diemah F. *et al.* surveyed the failure associated of PLVs with factors related to patient, materials and reported that the main reason was the insufficient skills or experience of the operators (9).

In this study, the experience of the GDPs were insufficient and showed 53.6% of those who had experienced less than five years, 42% of those who had experienced from five to ten years, and 47.2% of those who had experienced more than ten years had a low level of knowledge. This indicates that the experience of GDPs got increased gradually by the pass of time.

According to the place of practice, 66.7% of the GDPs in Dhamar has a good level of knowledge when compared with 50% in Sana'a and 49.1% in Ibb. This indicates that the presence of dentistry college in Dhamar University had a teaching staff majoring in fixed prosthodontics.

In addition, the work time in the present study affected the knowledge, and the low level of knowledge appear in 56% of that work only part-time and 42.2% of that with full-time. Therefore, 58.1% of male participants had a good level of knowledge more than (46.1%) of female.

Studies refer to that the patients' satisfaction play an important rule in some aspects, such as the durability of the final aesthetic outcome, the required amount of teeth preparation and the cost of the treatment (25). An Iranian study reported that 42% of the GDPs were aware of the PLVs failure (14). Similarly, in this study 50% of the participants believed that the main obstacle behind using the PLV restorations was the patient.

Prath and Jain (2017) reported that 84% of the participants showed that the PLVs were the alternative treatment for discolouring teeth due to fluorosis (14). Similarly, in the present study, 90% of the participants supported the use of PLVs in private clinics.

## 5. CONCLUSIONS

At the present time, no published data are available on the current status of PLV restorations in Yemen. Within the limitations of this study, half of Yemeni GDPs in private dental clinics had a low level of scientific knowledge of PLVs.

Based on the data reported in this study, there was a need to improve the undergraduate dental program of study in order to improve the clinical skills of the GDPs in conservative dentistry. Further study on the undergraduate students should be done. Also, applying continuing education programs among GDPs could improve the outcomes of treatment provided in private dental clinics.

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