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Removable partial dentures in Libya: patient expectations, satisfaction and maintenance

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Abstract

Background: Patient satisfaction is considered the definitive aim of any oral restoration procedure. This study aimed to assess the level of Libyan patient expectation of and satisfaction with a Removable Partial Denture (RPD). Furthermore, to explore the level of patient awareness and application of oral hygiene care pertaining to RPD.

Materials and Methods: A cross-sectional retrospective survey was undertaken by administering self-reported questionnaires to 160 patients wearing RPD and living in Benghazi, Libya. The included questions explored expectation of a RPD as well as subjective satisfaction with the treatment outcome. Moreover, the questionnaire included a section to evaluate the attitude of patients' towards their use of oral hygiene measures. Descriptive statistics and Spearman's correlation coefficient were undertaken to calculate the correlation between the various examined parameters.

Results: revealed that the RPD met the expectations of 63.1% and met the partial expectations of 16.9% of the participants. Overall satisfaction was experienced by 68.1% of the sample, while 31.9% had one concern or more. The majority of patients (91.3%) cared about and paid attention to their oral hygiene. Spearman's correlation coefficient showed a weak but significant correlation between the level of patient expectation and patient satisfaction ($r=0.369$, $P<0001$) and between the type of denture base and the level of satisfaction ($r=0.211$, $P=0.007$). There was a weak but significant correlation between oral health care and sex ($r=0.178$, $P=0.024$) where females surpassed males in their oral hygiene care.

Conclusions: A high percentage of patients were satisfied with their RPDs and most took good care of their oral hygiene after using RPD.

Keywords: Patient satisfaction; Libyan, Patient expectations; Care and maintenance; RPD; Oral hygiene

1. Introduction

Incomplete dentition is a condition found in a high percentage of individuals in various countries. In spite of the consistent improvement in oral health measures worldwide, the number of partially edentulous individuals needing care has actually increased [1].

There are numerous prosthetic preferences for tooth replacement in partially edentulous cases including; Removable Partial Dentures (RPDs), dental implants, tooth-supported fixed partial prosthesis. RPDs continue to be in high demand

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especially in low income, underdeveloped and developing countries. The benefits of an RPD compared to fixed prosthesis include reduced cost and ease of cleaning [2].

Expectations that are too high or are unrealistic might adversely affect the level of post-treatment satisfaction and treatment failure might occur as a result [3]. Satisfaction with an RPD usually relates to comfort and ease of occlusion, aesthetics, retention and articulation [4]. However, patient satisfaction appears to be a complex and multidimensional phenomenon. Patients might remain unsatisfied in spite of the good quality of RPD fabrication (5). Although in most published investigations the majority of patients were satisfied with their RPDs, various complaints were recorded. The most frequent areas of discontent were poor fitting, difficulty in mastication and esthetic concerns (4,6-9).

Previous research confirmed that using an RPD encourages plaque accumulation, especially around the abutment teeth and might facilitate the development of gingivitis (10). Furthermore, there seems to be a greater risk of caries among RPD users, especially in the roots [11,12]. Regular oral and denture hygiene care by RPD users affects their level of satisfaction and wellbeing [13].

Patient expectations and satisfaction with RPD treatment have been explored in various populations including; Americans [14], Turkish [9], Japanese [15], Taiwanese [13], Iranians [7], Pakistanis [16] and Saudi Arabians [6,17,18] individuals. All such studies concluded that patient satisfaction with RPDs was high. However, up to date, there is no information about the Libyan patient expectations and satisfaction with RPD. Thus, the aims of this study were to assess Libyan patient expectation of and satisfaction with removable partial dentures (RPD) and to explore the level of patient awareness and application of oral hygiene care.

2. Material and methods

This was a cross-sectional retrospective survey, carried out at the prosthodontics department at Faculty of Dentistry, University of Benghazi, and in multi private dental clinics. Approval for this study was obtained from the Dean's office of the Dental Faculty and the Benghazi Syndicate of Dentistry and informed consents were obtained from all individual participants included in the study. Benghazi is a city of almost one million inhabitants. However, this study was conducted at a time when civil war was going on in the city forcing more than a quarter of the citizens to move out.

All partially dentate Libyan patients who were wearing RPDs; upper, lower, or upper and lower who were attending the reported clinics were invited to participate in this study (400 subjects). A total of 160 male and female patients agreed to take part and to fill in the questionnaire, a response rate of 40%. Verbal informed consent was obtained from the participants. All patients were using either acrylic polymers or metal (cobalt chrome alloys custom-made) RPDs.

2.1 Development of the questionnaire

The used questionnaire was adapted from published examples written in English language [4,8,19]. The questionnaire was translated to English language by the first two authors and compared. This Arabic version of the questionnaire was then reviewed by staff at the department of prosthodontics. Furthermore, the questionnaire then was translated back to English to confirm the consistency of the questions with the original version.

The first section of the questionnaire consisted of socio-demographic items including sex, age, and the level of education. The second section comprised questions relating to patient satisfaction and patient perception of subjective clinical outcome measures, including esthetics, speech and masticatory function, in addition to patient expectations of the prosthesis. The third section dealt with patient oral health care and measured patients use, including the simplicity and frequency of use of these measures. A single open-ended question was added, which asked patients whether they would recommend RPDs to their family members and friends.

2.2 Statistical analysis

Social Package of Statistical Science software (SPSS, version 17, Chicago, III) was used to conduct validity test employing Intra-class Correlation Coefficient test (ICC). Descriptive statistical tests including frequencies Spearman's rank correlation coefficient tests were used to explore the correlation between sociodemographic factors, patients' expectation of with their satisfaction from RPD and with oral hygiene care. The level of significance was set at $P < 0.05$.

2.3 Validity test

Fifteen patients refilled the questionnaires after a two-week interval to assess the validity of the questionnaire. ICC tests showed a high degree of agreement between the two trials (0.90), indicating an excellent level of internal consistency.

3. Results

There were 160 patients in this study, of whom 30.6% were males and 69.4% were females. The mean age of the participants was 52.17 years (SD =13.75), with a maximum age of 75 years and minimum age of 24 years. Almost two-thirds of the participants (60.6%) were ≥ 50 years old and 39.4% were < 50 years of age.

The RPDs used were made from acrylic in 86.9% of the cases with the remainder (13.1%) fabricated from cobalt chromium. Just over half of the participants (51.3%) had worn their prosthesis for ≤ 3 years, while, 26.3% of the patients had used their RPDs for periods ranging between 4 and 7 years. Only 22.5% had worn their RPDs for ≥ 10 years. Roughly one third of the participants (33.1%) were using only upper RPD and 13.8% only were wearing just lower RPD. Furthermore, approximately half the participants (53.1%) had upper and lower RPD. The RPD met the expectations of almost two thirds (63.1%) and met the partial expectations of 16.9% of the participants. Only 20% revealed that the RPD did not meet their expectations.

Overall satisfaction with the RPD was reported by 68.1% of the participants (Figure 1). But, nearly one third (31.9%) had one concern or more; 22% of the whole sample complained of impaired masticatory function, 8.58% suffered from a poorly fitting prosthesis, 7.78% had compromised phonation, 2.87% reported feeling pain while eating and 1.98% observed food impaction around their RPD. Only, 11.9% found their RPD esthetically unpleasant due to; mismatch in colour with their natural teeth (3.1%), mismatch of shape and size (5%) or improper artificial tooth position (1.3%).

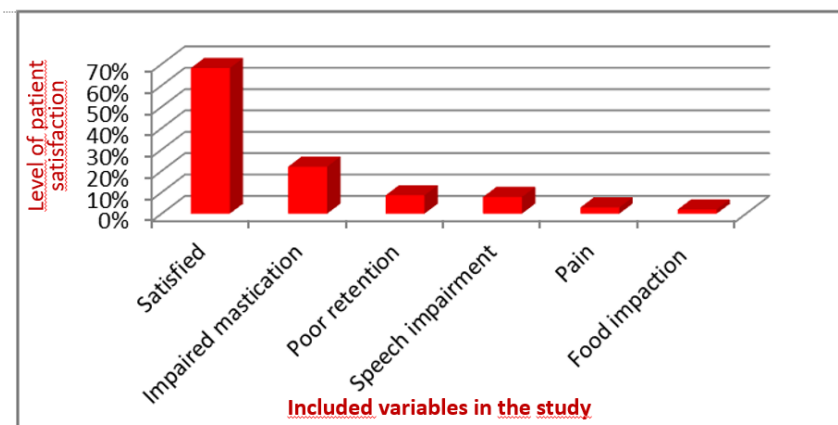


Figure 1 Bar chart displaying the percentage of patients' satisfied with their removable partial denture and the percentage of each of the concerns of the unsatisfied patients

Table 1 showed that there was a medium but significant correlation between the level of patient expectation of their RPDs and the level of their satisfaction ($r=0.369$, $P<0.001$). Furthermore, there was a weak but significant correlation between the level of satisfaction with the type of the denture base ($r=0.211$, $P=0.007$). However, there was no significant correlation between patient satisfaction with their RPD and; the patient's age ($r=0.023$, $P=0.771$), sex ($r=-0.069$, $P=0.384$), level of patient education ($r=-0.008$, $P=0.921$), number of missing teeth ($r=-0.071$, $P=0.370$), whether the prosthesis was for the maxillary, mandibular or both arches ($r=-0.062$, $P=0.439$) or with the how long the patient had had their RPD ($r=-0.088$, $P=0.266$).

Majority of the participants revealed that they were aware of and practiced oral hygiene measures (91.3%). Only, 8.7% of participants acknowledged that they did not take proper care of their oral hygiene (Figure 2). The reasons given for not using dental aids were as follows: 6.9% laziness, difficulty in obtaining oral cleaning aids (0.6%), had not been informed by their dentist (0.6%) and not knowing when and how to use cleaning aids (0.6%). Of the large majority following oral hygiene practice (91.3%); 64.4% used only a tooth brush for cleaning. While, 9.4% used dental floss in addition to a tooth brush and 5.6% preferred tooth picks combined with a tooth brush. Other participants (8.8%) acknowledged that they used either a tooth brush or one of the oral hygiene aids but these were not combined in the cleaning process. Only, 3.1% of patients reported that they used all the described oral hygiene aids (Figure 3).

Table 1 Correlation coefficient (r) between the level of patient satisfaction and the analyzed factors. The significant correlation p values are marked with * (Satisfaction with expectations and with type of the prosthesis)

Variables	Level of satisfaction		Variables	Level of satisfaction	
	r	P		r	p
Expectations	0.369	<0.0001*	Number of missing teeth	-0.071	0.370
Age	0.023	0.771	Type of prosthesis	0.211	0.007*
Sex	0.069	0.384	Position of the prosthesis	-0.088	0.266
Education	-0.008	0.921			

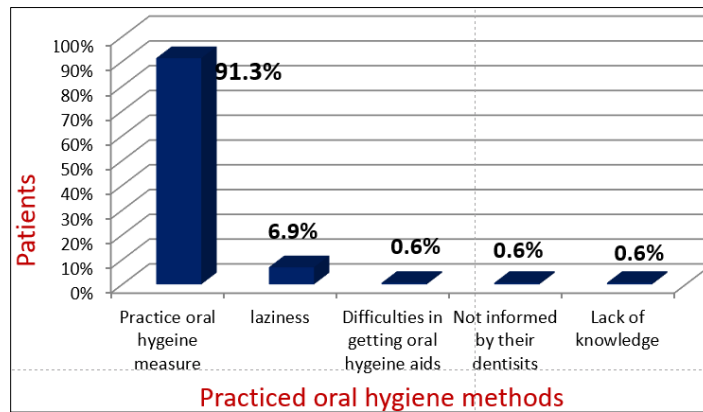


Figure 2 Bar graph displaying the percentage of patients practicing oral hygiene measures and the percentage of the reasons given for not practicing those measures

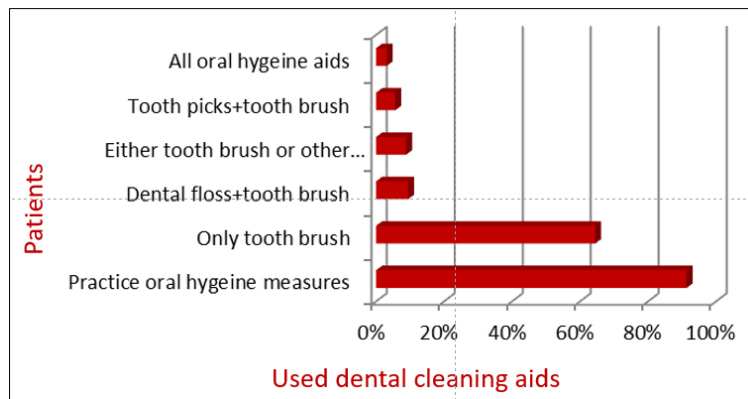


Figure 3 Bar graph displaying in percentage the type of used cleaning aids by the participants in this study

Spearman correlation coefficient (Table 2) revealed that there was a weak but significant correlation between sex and taking care of oral hygiene ($r=0.178, P=0.024$) where females surpassed males in their oral hygiene care. But, there was no significant correlation between the level of education and patient oral health care ($r=0.116, P=0.145$), nor between patients age and maintaining their oral hygiene ($r=0.023, P=0.771$).

Three quarters of the patients (75%) thought that they would advise their relatives and friends to have an RPD to substitute their lost teeth where appropriate while, the remaining of the participants (25%) would not be willing to give such an advice.

Table 2 Correlation coefficient (r) between applying oral hygiene measures and sociodemographic factors(sex, age, education). The significant correlation p value is marked with *

Variables	Oral hygiene	
	r	P
Sex	0.178	<0.024*
Age	0.023	0.771
Education	0.116	0.145

4. Discussion

This is the first study to be undertaken in Libya that aimed to exploring the level of expectation and satisfaction with RPD among 160 Libyan subjects wearing RPDs in Benghazi city. A further aim was to evaluate the level of oral health care of the examined cohort.

The response rate in the present study was low (40%). This might be a result of the unstable security and living status in Benghazi City during the data collection phase. This negatively affected their attitude towards and desire to participate in such studies. Aljabri et al. [18] described a much lower response rate of 11% in their Saudi phone interview survey. For most other similar studies carried out on various populations, no response rate was given making it difficult to arrive to a general conclusion on this factor [4,6,7,9,16,17,20,21].

The percentage of females in this Libyan sample (69.4%) was more than double that of males (30.6%). A number of similar studies reported a comparable sex discrepancy [4,8,19,20]. It has been suggested that in general, females are more concerned about personal aesthetic and they are more likely to seek to restore their missing teeth than males [4,19]. Another factor might be that females have a more positive attitude for helping and participating in research studies. In the present study there was no correlation between age and the level of expectations or satisfaction of the RPDs. This outcome confirms the findings of comparable previous works [4,18] and contradicts with others [7].

This study focused only on patients' satisfaction with their RPDs. A number of other studies evaluated the satisfaction of both, patients and clinicians [4–6,9,13,21]. All such studies reported that patient satisfaction level surpassed that of their clinicians. It seems that subjective assessment factors such as; psychology, attitude, comfort and esthetics play a major role in patient evaluations. On the other hand, the clinician's assessment focuses on technical aspects of the prostheses and on clinical requirements of the patients [21]. The fact that patients and clinicians estimate their expectations and satisfaction differently [22] might cause misunderstandings and a worsening of the patient/clinician relationship. Therefore it is important to understand patient expectations prior to planning and starting treatment. It is recommended that another study be carried out in Libya where the level of satisfaction of both the clinicians and patients are evaluated and statistically compared.

In the present study, the RPD met or nearly met the expectations of the majority of patients. Furthermore, there was a weak but significant correlation between the level of patient expectations of their RPD users and the level of their satisfaction. Siqueira et al. [4] noted a significant correlation between the expectations of their RPD users and satisfaction related to phonation. Yet, in the same study a significant correlation between patient expectations and satisfaction with comfort or chewing was not observed. In the present work, patient expectations were assessed as one criterion. It is recommended in future studies that patient expectations of their RPD relating to phonation, aesthetics, mastication and retention be evaluated individually.

Patient satisfaction is considered the definitive aim of any oral restoration procedure. The present study revealed that most participants were satisfied with their RPDs (68.1%). This finding agrees with the reported high percentage (ranging between 60-85%) of satisfied RPD users in Croatia [8], Saudi' Arabia [6,7,17], Iran [7], Brazil [4], USA [5], and Taiwan [13]. The outcome of the present survey found no significant correlation between patient satisfaction and various demographic factors (age, sex, level of education), the number of missing teeth, and whether the prosthesis was for the maxillary, mandibular or both arches, nor with the length of time the RPD had been worn. Siqueira et al. [4] obtained a similar outcome in their Brazilian study. Others [8], have reported that, highly educated Croatian patients wearing RPDs are more satisfied with the appearance of the prosthetics than patients with a lower level of education. In an Iranian investigation, Shams et al. [7] found that higher levels of satisfaction were significantly associated with

older subjects while younger patients reported a moderate level of satisfaction. In contrast, Singh et al. [23] noted that younger patients with RPDs were more satisfied than older ones. However, we must bear in mind that the reported studies were derived from different populations with diverse cultural backgrounds; therefore, their described outcome might only be representative of the specific cohort studied.

It is generally accepted that cobalt chromium RPDs are superior to their acrylic resin counterparts. The present investigation found a higher satisfaction level correlated to cobalt chromium compared to acrylic resin RPD. Comparable findings were reported by Aljabri et al. [18] and Yoshida et al. [24].

The populations examined in similar published studies revealed a variable hierarchy of problems relating to the use of RPD [4-7,9,13,16-18,25]. The main dissatisfying complaint we encountered were impaired masticatory function (in 22% of the Libyan sample). There are various reasons that might affect the function of mastication with RPDs; some complaints were interlinked such that it is difficult to separate one from another. For example; poor retention might cause difficulty in mastication and speech. Also, tender mucosa with traumatic ulcers or sore points might contribute to poor fitting, painful mastication and impaired phonetics [9,26,27]. These lead many patients in the present study to select more than one reason for their dissatisfaction.

The second most frequent complaint by Libyan patients was poor aesthetics (11.9%). Patient aesthetic complaints concerned mismatch of the colour of the prosthetic teeth with their natural teeth (3.1%), mismatch of shape and size (5%) and improper prosthetic tooth position in the RPD (1.3%). It is important for the clinician to pay a great attention to selecting the proper shade and colour of the prosthetic teeth especially where anterior teeth are involved. Matching to the patient natural tooth and skin colour should be done under natural light. Another major concern is matching the position and angulation of the prosthetic teeth and natural teeth; patients can be discouraged from using their RPDs if such matching is not done with care [27].

Altered phonation was described by 7.78% of our sample. This might be caused by loose dentures or as a result of overextension of the maxillary denture on to the soft palate (Bilhan et al. 2012; Carr et al. 2011). Furthermore, RPDs replacing the maxillary anterior teeth can affect pronunciation and consequently, speech outcome [28]. Bilhan et al. [9] reported that pain and sore spots were the second most occurring complaints in their samples. In the present study just 2.87% of participants suffered from pain.

The vast majority of Libyan participants revealed that they are aware of and practice oral hygiene measures relating to their RPDs (91.3%). This was especially true for female participants using RPDs. These values seem very high especially given that the study was undertaken during a time of war and low financial income for most of the population. This result has to be interpreted with caution as the participants' oral hygiene was not clinically evaluated and the evaluation relied only on the subjective perception of the patients on the quality of the required oral hygiene. Furthermore, the level of education and age seemed to have no impact on oral hygiene care of the participants. This might be a result of the higher expectations of the educated as well as the younger patients compared to the other patients. These findings are considered a subjective assessment from the patients' point of view. It will be interesting if clinical examinations were undertaken to this cohort to allow comparison between subjective and objective outcome.

Almost two-thirds of the Libyan patients reported that tooth brush was their only cleaning tool. A very small number were motivated enough to employ all the cleaning aids included in the questionnaire. In a comparable Sudanese investigation, Geiballa et al. [19] observed that the majority of their sample did not use dental aids after fitting of a fixed prosthesis. They reported that this was due to the limited information and instructions given by their clinicians. In the present study, only 0.6% of participants revealed that they were not informed about oral health care procedure by their dentists. This outcome might indicate that Libyan clinicians who had treated the present participants were aware of the significance of explaining oral hygiene measures to their patients. Clinicians should offer their patients the opportunity to inquire, discuss and demonstrate oral hygiene care to develop and refine patients' knowledge in this area and therefore improve their OHQOL.

When the present participants were asked (based on their personal experience) whether they would advise relatives and friends to use an RPD for missing teeth replacement, 75% responded positively. It was interesting to note that this value (75%) was higher than the percentage of patients who were satisfied with their RPD (68.1%). This discrepancy was clarified after reviewing the patient comments about their reasons for dissatisfaction such as; my dentist told me that an RPD is the optimum treatment for replacing my lost teeth; I had complained of a failed old bridge and I do not want my sound remaining teeth to be trimmed which will end most probably by their extraction. These comments revealed that their discontent was not directly related to the higher expectations set by their clinicians and negative previous dental experiences.

5. Conclusion

- The RPD met or nearly met the expectations of the majority of participants. Furthermore, more than two-thirds of the patients expressed their satisfaction. There was a weak but significant correlation between patient expectations and satisfaction;
- The majority of the patients were taking good care of their oral hygiene where females significantly surpassed males in taking care of their oral hygiene.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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