



Correlation Between Perceived Patients' Satisfaction And Dental Students' Competence In Oral Surgery

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ABSTRACT

Objective(s): The study was conducted with an aim to evaluate the self-perceived patients' satisfaction in Oral Surgery clinic and assess its correlation with dental students' level of competence. **Materials and Method(s):** A cross-sectional questionnaire study was conducted among 312 ASA I and II category adult patients, who visited the students' Oral Surgery clinic at College of Dentistry, Princess Nourah bint Abdulrahman University. The questionnaire consisted of patients' demographic data, baseline health status, and patient satisfaction survey. A pre-designed rubric was used to evaluate the competency level of dental students in performing tooth extraction. Data was collected using Google Forms and analyzed by using SPSS version 24. **Result(s):** The study participants were mostly females (62.5%), belonging to the – age group 18-25 (26.6%), employed (60.9%), and low-income categories (57.69%). The overall patient satisfaction rate was (92.87%). No statistically significant difference in patients' satisfaction score was observed in relation to education, employment status, income level, cultural and ethnic background ($p > 0.05$). Patients' satisfaction was significantly differing with regards to patients' age ($p = 0.04^*$). There was no significant correlation between students' competence and patient satisfaction ($r = 0.05$, $p = 0.39$). **Conclusion(s):** Patients who underwent treatment at oral surgery clinics staffed by dental undergraduates expressed high levels of satisfaction. However, the overall satisfaction was neither influenced by patients' socio-demographic factors, nor the students' level of competence.

Keywords: *Dental extraction, Oral surgery, Patient satisfaction, student competence*

INTRODUCTION

Healthcare facilities are intended to be a place where patients with different ailments visit to regain their health and sense of well-being. In this regard every health care provider strives to provide quality healthcare services by incorporating trained personals, advanced equipment and modern infrastructure. Quality healthcare implies doing the right thing for the right person and obtaining the best results in a safe and patient-centered manner (1). Patient satisfaction is a well-recognized measure of quality of healthcare from the patients' and their relatives' perspectives. It informs us about the extent to which the healthcare services match the patients' expectations. It also helps us in understanding patients' experience in the healthcare facility, and further understanding and predicting their behavior. Measuring the performance and quality of care of a hospital is essential to develop and improve the healthcare provided (2). High patient satisfaction reflects high credibility and quality of care provided by an institute (1). It is crucial to evaluate the clinical factors that influence patient satisfaction because patients often struggle to distinguish between the delivery of optimal care and the acknowledgement of it leading to significant gap in their understanding (3).

In the field of dentistry, patients frequently experience dental anxiety and fear, which can increase the pain perceived by them (3, 4). This is not just limited to children but also found to be common in youth (5). The fact that students would be treating patients in a teaching institute, might itself aggravate their anxiety levels. Patients experiencing an alleviation of dental anxiety if satisfied with the dental treatment provided will continue to seek dental treatment in that institute. Although perceived patient satisfaction is dependent on multiple factors – provider-related and patient-related (6), the major contribution is from the treatment procedure itself which relies on healthcare providers' competence. This is believed to be the crucial factor, especially in teaching hospitals, where the students' performance reflects their quality of training. Previous research addressed the factors determining patient satisfaction (3, 6 - 8); however, none of them determined the

correlation between patient satisfaction and students' ability to render the treatment. Therefore, the current study aimed to determine the relationship between dental students' competency in performing tooth extractions and patients' self-reported satisfaction. The objectives of the study were:

To evaluate the self-perceived patients' satisfaction after undergoing a dental extraction procedure performed by undergraduate dental students of different levels.

To compare the perceived patient satisfaction with different sociodemographic backgrounds.

To correlate perceived patients' satisfaction and students' level of competence.

MATERIALS AND METHODS

At College of Dentistry, Princess Nourah bint Abdulrahman University (CD-PNU), Saudi Arabia, students provide dental and oral surgical care to patients during their third (D3), fourth (D4), and fifth (D5) years of undergraduate dental program. Suitable patients are assigned to them based on the difficulty of procedure. During the clinical procedures, they are guided by clinical instructors, who also evaluate their clinical performance based on a pre-designed evaluation rubric and provide real-time feedback to students. This cross-sectional questionnaire study was initiated following the acquisition of ethical approval from the institutional review board. The study included patients aged 18 years and older who visited the student Oral Surgery clinics at CD-PNU and were classified as ASA I or II category.

A previous study (9), which reported a patient satisfaction rate of 86% was used to calculate the sample size for the current study. Using the formula $n = (1.96)^2 * p(1-p) / d^2$ a sample size of 289 was obtained and rounded up to 300. To meet this sample size requirement, the study was conducted over a period of 6 months. To achieve the objectives of the study, a modified questionnaire was created by drawing from existing validated questionnaires such as the 19-item Dental satisfaction Questionnaire (DSQ) (10), 31-item Australian Dental Satisfaction Scale (DSS) (11), and the psychometric scale

developed by Perera and Usgodaarachchi (7). This modified questionnaire was divided into demographic data, baseline health status, and patient satisfaction survey. The section on patient satisfaction survey comprised 24-items organized into four domains including clinic environment, treatment process, general satisfaction, and outcome of care factors. The content validity of the questionnaire developed in English (Appendix 1) was checked by six subject experts (CVI - 0.87).

Two language experts translated the English version of the questionnaire into the native Arabic language (Appendix 2) using a forward translation technique to suit the patient population. One language expert translated the English version to Arabic, followed by another expert (not exposed to the original English questionnaire) who translated it back into English. Both the Arabic and English questionnaires were checked for their content and comprehension. To check for the reliability of the translated questionnaire, it was distributed twice among fifteen patients at one-week intervals.

All patients who were over 18 years of age and had visited the students' Oral Surgery clinic specifically for tooth extraction were recruited. Participation was voluntary, and only those who provided their consent were included in the study. The study's purpose was clearly communicated to the patients, and they were reassured that their responses would be kept anonymous. The questionnaire was administered online using Google Forms. The patient satisfaction survey section of the study utilized a 5-point Likert scale to measure participants' agreement with various statements related to their experience at the students' Oral Surgery clinic. Participants were instructed to use a scale ranging from 1 (strongly disagree) to 5 (strongly agree), with a score of 3 indicating no comment/neutral. The total satisfaction score was calculated by summing the scores for each item, resulting in a score range of 24 (highly dissatisfied) to 120 (highly satisfied). However, only the cumulative score of the items of the domain "treatment process" was considered for correlation with the competency level of dental students. The response to the items of "outcome of care" was assessed through a telephonic

conversation two weeks after the dental procedure.

To evaluate the competency level of undergraduate dental students in performing a tooth extraction, a rubric assessing the students' level of competence in the fields of pre-extraction preparation, tooth extraction, and post-extraction care was used. As per the rubric, the students will attain a score ranging between 6 to 24.

Statistical analysis

The study data was collected using Google Forms and Axiom patient management software and it was transferred to a Microsoft Office Excel database. IBM SPSS Statistics, Version 24 (Armonk, NY: IBM Corp) was used to analyze the data. Descriptive statistics for categorical variables were presented as frequencies and percentages, while for continuous variables, the means and standard deviations were reported. The patient satisfaction scores were compared across various study parameters using One way ANOVA followed by Tukey Post Hoc Test or Unpaired t test. Similarly, the patient satisfaction scores across different levels of undergraduate students were compared using One way ANOVA followed by Post Hoc Tukey Test. The correlation between the students' competence score and patient satisfaction score was evaluated using Pearson's Correlation test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The questionnaire was completed by a total of 312 patients. Their demographic data is presented in Table 1. Majority of the participants were females (62.5%), married (60.57%), and belonged to 18–29 year age group (26.6%). Most responses were from Saudi patients accounting for 67.6% of the participants. Similarly, most participants were from Saudi Arabian descent (79.16%) with the remainder being mostly from Southeast Asia (Filipino, Malaysian, Indonesian) (15.7%). The highest educational attainment of most participants was a high school diploma (37.8%). The majority were employed (60.9%) and most had a monthly income of less than 5000

SAR/month (57.7%). The basic health status domain results demonstrated that 63.46% of the participants answered with "excellent" for their general health, and 74.67% of the participants answered "excellent" for their mental health.

The total number of students in the D3, D4, D5 level were 71(22.7%), 112(35.8%), and 129(41.3%) respectively. The clinical environment domain for measuring patient satisfaction had a mean score of 19.59±0.99 for patients treated by D3 students, 18.99±1.73 for patients treated by D4 students, and 19.18±1.47 for patients treated by D5 students. The treatment process domain revealed a mean score of 61.54(±3.63) for D3 students, 59.72(±4.89) for

D4 students, and 59.60(±4.92) for D5 students. The general satisfaction domain demonstrated a mean score of 23.79(±1.82) for patients treated by D3 students, 22.72(±3.05) for patients treated by D4 students, and 22.76(±2.47) for students treated by D5 students. The last domain assessed in the questionnaire was the outcome of care which demonstrated a mean satisfaction score of 8.80(±1.56) for patients treated by D3 students, 9.21(±1.38) for patient treated by D4 students, and 8.55(±2.12) for patient treated by D5 students. A statistically significant difference ($p<0.05$) in the patient satisfaction scores was observed in all 4 domains when treated by students of different levels (Table 2).

TABLE 1: Demographic data:

Details	N (%)	Mean (Sd)	P-value
Age			
18-29	83(26.6%)	110.53(6.47)	0.04*
30-39	79(25.3%)	109.89(7.74)	
40-49	67(21.47%)	110.72(8.04)	
50-59	50(16%)	113.72(7.35)	
≥6	33(10.57%)	112.18(7.72)	
Gender			
Female	195(62.5%)	110.53(6.47)	0.57 (NS)
Male	117(37.5%)	109.89(7.74)	
Highest educational attainment			
Never attended school	16 (5.12%)	112.69(6.06)	0.18 (NS)
Primary/Middle school	52(16.66%)	112.62(8.59)	
High school	118(37.8%)	111.72(6.02)	
Graduate/Diploma	25(8%)	109.64(7.25)	
Post-graduate	87(27.88%)	109.62(8.25)	
Doctoral	14(4.48%)	109.71(10.48)	
Marital status			
Single	92(29.48%)	110.46(6.03)	0.37 (NS)
Married	189(60.57%)	111.42(8.12)	
Divorced	23(7.37%)	109.78(8.24)	
Widowed	8(2.56%)	114.50(3.89)	
Employment status			
Employed	190(60.89%)	111.07(7.32)	0.69 (NS)
Unemployed	122(39.10%)	111.12(7.80)	
Estimated family Income			
Less than 5000 SAR	180(57.69%)	110.95(7.12)	0.12 (NS)
5000-10000 SAR	71(22.75%)	111.62(8.12)	
10000-20000 SAR	47(15%)	109.68(8.17)	
More than 20000 SAR	14(4.48%)	115.00(5.46)	
Nationality			
Saudi	211(67.62%)	111.27(7.79)	0.39 (NS)
Non-Saudi	101(32.37%)	110.71(6.87)	

Cultural and ethnic background			
Arab	247(79.16%)	111.46(7.68)	0.08 (NS)
South Asian (Indian, Pakistani, Sri Lankan, Bangladeshi)	9(2.88%)	113.11(2.66)	
Southeast Asian (Filipino, Malaysian, Indonesian)	49(15.7%)	109.35(6.33)	
West Asian (Afghan, Iranian)	1(0.32%)	120 (-)	
African	4(1.28%)	104.50(8.66)	
Others, specify	2(0.64%)	108.50(16.26)	

*p<0.05 Statistically Significant,

p>0.05 Non-Significant, NS

TABLE 2: Mean patient satisfaction score across different student levels

Student level	Four domains of patient satisfaction survey				Overall satisfaction
	Clinic environment	Treatment process	General satisfaction	Outcome of care	
D3	19.59(±0.99)*	61.54(±3.63)*#	23.79(±1.82)*#	8.80(±1.56)	113.63(±5.24)*#
D4	18.99(±1.73)*	59.72(±4.89)*	22.72(±3.05)*	9.21(±1.38)*	110.64(±7.62)*
D5	19.18(±1.47)	59.60(±4.92)#	22.76(±2.47)#	8.55(±2.12)*	110.09(±8.15)#
P-value (ANOVA)	0.03	0.02	0.01	0.02	0.004

p<0.05 Statistically Significant, p>0.05 Non-Significant (NS)

Note: Superscript with same sign indicates statistically significant difference between the groups, analyzed using Turkey's post hoc test.

The mean percentage of patient satisfaction differed across the three levels of students, with

D3 students achieving the highest mean satisfaction score of 94.69%, followed by D4 students with a score of 92.2%, and D5 students with a score of 91.74%. The overall satisfaction rate for patients treated in oral surgery clinics at CD-PNU was 92.87% (Table 3).

TABLE 3: Mean percentage patient satisfaction score across different student levels:

Students' level	Four domains of patient satisfaction survey				Overall satisfaction
	Clinic environment	Treatment process	General satisfaction	Outcome of care	
D3	97.95%	94.67%	95.16%	88.8%	94.69%
D4	94.95%	91.87%	90.88%	92.1%	92.2%
D5	95.9%	91.69%	91.04%	85.5%	91.74%
Overall	96.2%	92.74%	92.36%	88.53%	92.87%

The students' mean competence scores were, 92.86(±8.95) for D3 students, 91.68(±11.11) for D4 students, 92.24(±12.11) for D5 students. No statistically significant difference (p>0.05) was found in the mean students' competence scores

across different student levels. Moreover, the analysis did not show a statistically significant correlation between students' competence and patient satisfaction (r = -0.05, p>0.05), as presented in Table 4 and Figure 1.

TABLE 4: Correlation between students' mean competence scores and patients' mean satisfaction scores:

Mean score:	Students' level:			Overall	P value (ANOVA)
	D3	D4	D5		
Students' competence scores	92.86(8.95)	91.68(11.11)	92.24(12.11)	92.18 (11.08)	0.78 (NS)
Patient satisfaction	61.54(±3.63)	59.72(±4.89)	59.60(±4.92)	60.06 (4.69)	0.02*
R value (p value)	-0.021 [0.86 (NS)]	0.048 [0.62 (NS)]	0.071 [0.42 (NS)]	0.049 [0.39 (NS)]	

*p<0.05 Statistically Significant,

p>0.05 Non-Significant, NS

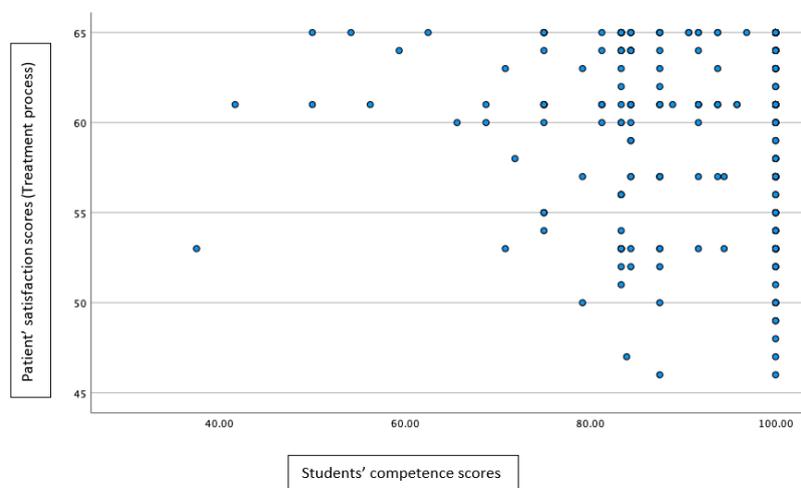


FIGURE 1: Correlation between students' mean competence scores and patients' mean satisfaction scores

DISCUSSION

Patient satisfaction is a measure of the extent to which patients' desires and needs are met. It also reflects the quality and effectiveness of healthcare services. The present study attempted to correlate patient satisfaction with a specific dental procedure - tooth extraction, which is one of the most common treatments performed in a dental clinic. The study was the first to be done in Saudi Arabia to correlate perceived patients' satisfaction and students' competence. A questionnaire was used to assess perceived patients' satisfaction in four domains clinical environment, treatment process, general satisfaction, and outcome of care. The mean percentage of the level of satisfaction across all levels was 96.2% in the clinical environment, 92.74% in the treatment process, 92.36% in the

general satisfaction, and 88.53 in the outcome of care. Patients treated at CD-PNU Oral Surgery students' clinics have demonstrated a high level of overall satisfaction (92.87%), consistent with the findings of Jayasuriya et al. (6), and Balaguer Marti et al. (12). Similarly, a study conducted in Saudi Arabia, reported patients satisfaction levels of 89% (13).

The current study did not find any statistically significant association between socio-demographic variables and the overall satisfaction score, which is in line with the findings of Jayasuriya et al. (6). However, this result differs from a study conducted at Logos State University Tertiary Care Teaching Hospital dental clinic, which reported that patients' overall satisfaction was significantly associated with their age group and level of education (14).

Similarly, Akbar et al. (15) reported that lower age and lesser education led to higher patient satisfaction. Kikwilu et al. (1) found that female patients were more satisfied when compared to males. As per the results of the current study, the most relevant factor contributing to high patient satisfaction was patients' general health status.

The study revealed a significant difference in patient satisfaction when treated by dental students of different levels (D3, D4, D5) in all four domains of the questionnaire. D3 students achieved the highest satisfaction scores in three domains, namely Clinic environment (97.95%), Treatment process (94.67%), General satisfaction (95.16%), while D4 students obtained higher scores in the 'Outcome of care' domain (92.1%). This disparity could be attributed to the higher level of instructor involvement in the treatment process of D3 students who have undergone intensive pre-clinical training before commencing clinical training under close supervision. Another contributing factor could be the nature of procedures that D3 students are allowed to conduct in students' Oral Surgery clinic at CD-PNU. In previous studies, patients reported high satisfaction when treated by students, as they were found to be more empathetic to patients' concerns, more respectful, and explain the problem and treatment plan clearly to patients (16-20). Balaguer Marti et al. (12) reported practitioners' efficiency, kindness, and dedication as the three most important determinants of patient satisfaction. Hence, dental education should always aim at generating dental professionals who are able to meet patients' expectations (21-23).

Despite the high level of patient satisfaction observed in this study, no correlation was found between patients' satisfaction and students' competency level. This lack of correlation suggests that self-perceived patient satisfaction with the treatment quality might have been influenced by other factors, not necessarily the student's excellence and experience alone. Very often the patients also lack the knowledge to judge the competence of the service provider and the quality of treatment provided (18). Moreover, the patients had an interaction with the staff of the front desk and the whole surgical team

(students, instructors, and dental assistants), which could have influenced the patients' experience at CD-PNU, and thereby satisfaction. Given that this study was conducted in a single setting and had a limited sample size, it is recommended that future studies with larger sample sizes and multiple centers be conducted to obtain more generalizable results. Even though the majority of the patients expressed satisfaction with the treatment received, it is possible that some patients might have hesitated to express negative opinions due to social desirability bias.

CONCLUSION

Patients treated at the CD-PNU Oral Surgery clinics reported high levels of satisfaction with their dental treatment. The overall satisfaction was neither influenced by the patient's socio-demographic factors, nor did the students' level of competence have a meaningful impact. Self-perceived patient satisfaction may not be a good reflector of students' competence. Multi-centric studies conducted in different parts of Saudi Arabia may guide us in better understanding the patients' needs and desires.

Conflict of interest

The authors declare no conflict of interest.

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