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ABSTRACT

***Objective*: To determine the influence of past dental treatment experience on patients' attitude towards follow-up oral health care intervention.**
***Study design*: This was a descriptive cross-sectional study.**
***Clinical setting*: The University of Nairobi Dental Hospital.**
***Participants*: Patients aged 18 and above with history of at least one past dental visit.**
***Methods:* A total of 188 patients were interviewed. Data on past dental experiences, attitude towards follow up oral health care and dental anxiety among the participants was collected using closed-ended, self-administered questionnaires. The visual analogue scale and modified dental anxiety scale were used to measure pain intensity and dental anxiety.**
***Results:* Dental check-up was the procedure received by the highest number of participants in the study, 117(62.2%). It was also the procedure with the highest number of pleasant experiences, 104 (88.8%). Extractions was the treatment procedure with the highest percentage of unpleasant experiences (65.4%). Pain was the most commonly encountered post-treatment complication as reported by 115(61.2%) patients. Patients with pleasant past dental experiences were more likely to have a positive attitude towards follow up oral healthcare intervention (X^2 = 10.956, P=0.001) whereas patients with any level of dental anxiety were less likely to have a positive attitude (X^2 = 4.395, p = 0.036).**
***Conclusion:* Patient's attitude towards follow-up oral health care intervention is influenced by their experience during and after dental treatment and their level of**

dental anxiety. Presence of post treatment complications was identified as a common cause of unpleasant treatment experience

INTRODUCTION

Poor oral health seeking behaviour increases the number of people in a population with oral health problems that are untreated and deteriorating in severity. Therefore, identifying factors that influence oral health seeking behaviour plays a key role in oral health care promotion. Patient experiences during and after dental treatment determine patient satisfaction which consequently may affect their likelihood of arranging and keeping subsequent appointments and complying with dentists' instructions after receiving dental treatment. Several authors have stated that a patient is more likely to have a good experience before and after dental treatment if the dentist communicates comprehensively to the patient about their problem, the treatment procedures to be done and the results expected.[1, 2] Other studies have demonstrated that patients prefer communicatively involved and non-domineering dentists.[3, 4] Additionally, a pleasant environment within the dental clinic has been shown to positively affect patient satisfaction. This encompasses good quality dental care, friendly staff at the dental clinic, convenient appointment times and use of modern technology.[5, 6]

On the other hand, post-operative complications have been reported as a major discouraging factor in receiving dental treatment.[7] One of the documented post-operative complications is postoperative pain, this is a common complaint from patients after receiving dental operative treatment.[8] Unpleasant experiences during and after dental treatment can be classified as; events relating to dental specific procedures and stimuli, events relating to injuries, events relating to emotional responses and events relating to dental personnel behavior.[9]

Dental anxiety has also been recognized as a significant factor which influences one's dental treatment experience. Patients who experience dental anxiety and dental phobia have been reported as more likely to be unsatisfied with dental treatment and more likely to report unpleasant experiences before and after treatment.[10] Dental anxiety is a major problem in patients, and it may cause them to entirely avoid acquiring dental services. Patients who exhibit dental anxiety have been shown to have higher rates of decayed and missing teeth, and less filled teeth compared to patients who are not affected by dental anxiety.[4] A high rate of decayed teeth that are unrestored indicates unmet treatment needs in this population. On the other hand, patients with a history of regular dental visits have been shown to have better experiences during and after dental treatment.[10]

There is limited data from local studies on factors that influence oral health seeking behaviour yet identifying these factors will provide necessary information to dentists on how to promote a positive attitude towards oral health care. The main objective of this study, therefore, is to determine the factors that influence patient experiences while undergoing dental treatment and to determine whether past dental treatment experience has an influence on patient attitude towards follow-up oral health care intervention.

METHODS

This study was conducted at the University of Nairobi Dental School based in Nairobi, the Capital City of Kenya. This is a teaching Hospital, which attends to patients from all

over the country. Patients seen at this hospital are managed by undergraduate dental students, dental interns and graduate students under the supervision of consultant dental specialists. The study was conducted from March to August 2018. Ethical approval to conduct the study was obtained from the Kenyatta National Hospital-University of Nairobi Ethics and Research Committee (Ref: KNH-ERC/UA/56).

This was a descriptive cross-sectional study. Any patient above 18 years seeking treatment at the Dental Teaching Hospital, who had acquired dental treatment at least once before in any dental set up was deemed eligible for the study upon satisfying the consenting procedures. Individuals who had not received any prior dental treatment and those who failed to consent to the study were excluded. Sample size determination was done using Fisher's method of sample size determination as follows:

$N=Z^2P(1-P)/d^2$
Whereby, N=sample size
P=prevalence
Z=Z value
d= degree of accuracy set at 0.05
Taking a confidence level of 95%, a Z value of 1.96 and a prevalence of 71%

$$N=\frac{1.96^2\times 71(100-71)}{(0.05)^2}$$

N=316.4
=316 persons for a population of more than 10,000
But for a population of less than 10,000
nf= n/ (1+n/N)

Where:
nf= the derived sample size for a population less than 10,000
n= the derived sample size for a population greater than 10,000
N= the estimated population size taken as 420 adults (approximate population of adults visiting the dental school clinic in a period of two months, the estimated time for data collection in this study)

Therefore,
nf= 316/(1+316/420)
nf= 316/1.75
= 180

A sample size of 180 participants was established. Simple random sampling method was utilized to select participants.

Data was collected using closed-ended, self-administered questionnaires. Pre-testing of the questionnaire was conducted on 20 subjects attending the dental clinic prior to the main study. Cronbach's Alpha measure of internal consistency (reliability) was used to validate the research questionnaires and it demonstrated a high level of internal reliability (Cronbach's Alpha = 0.865, n = 20). Adjustments were made where necessary to further enhance reliability and validity of the study findings. The questionnaire was used to gather demographic data, information on past procedures done on the patients, patient experiences intra-operatively and post-operatively, patient perception towards dental treatment received and type of facility where treatment had been sought. The Visual Analogue Scale, [11] was used to measure pain intensity for those who reported to have experienced pain either intra-operatively or post-operatively. This is a continuous scale that subjectively measures an individual's pain intensity from a scale of 1 to 10. The intensity of pain can either be mild, moderate or the worst possible pain. Dental anxiety was assessed using the Modified Dental Anxiety Scale.[12] This scale consists of 5 questions each with a 5 category rating scale, ranging from

'not anxious'(1) to 'extremely anxious'(5). The total score is a sum of all five items, and it ranges between 5 and 25. A score of 19 or above indicates a highly dentally anxious patient, possibly dentally phobic.

Data collected was entered into a computer and analyzed using the statistical package for social sciences (SPSS) version 21 and Microsoft excel. The confidence level in this study was 95% and the p-value for statistical significance was set at less than 0.05.

RESULTS

A total of 188 patients participated in the study. Male patients were 75 (39.9%) while the female patients were 113 (60.1%). The age of the participants ranged from 18 to 80 with a mean of 33.13(±12.97SD) years.

Dental check-up was the procedure received by the highest number of participants in the study, 117(62.2%). Of these, 65.8% had received the treatment from private clinics while 34.2% of the patients had received the treatment from public clinics. This was the procedure with the highest number of pleasant experiences, 104 (88.8%). Extractions was the treatment procedure with the highest percentage of unpleasant experiences, out of 81 patients who had received this treatment, 53(65.4%) reported their experience as unpleasant (Table 1).

Table 1

Patient experiences associated with various dental procedures

Procedure	**Facility**		**Pleasant**	**Unpleasant**
Dental check-up	Private	77(65.8%)	64(83.1%)	13(16.9%)
	Public	40(34.2%)	40(100%)	0
Extractions	Private	54(66.7%)	17(31.5%)	37(68.5%)
	Public	27(33.3%)	11(40.7%)	16(59.3%)
Fillings	Private	53(68.8%)	30(56.6%)	23(43.4%)
	Public	24(31.2%)	21(87.5%)	3(12.5%)
Cleaning	Private	53(71.6%)	36(67.9%)	17(32.1%)
	Public	21(28.4%)	19(90.5%)	2(9.5%)
Teeth Whitening	Private	20(64.5%)	11(55.0%)	9(45.0%)
	Public	11(35.5%)	9(87.8%)	2(18.2%)
Scaling	Private	20(64.5%)	11(55.0%)	9(45.0%)
	Public	11(35.5%)	9 (81.8%)	2(18.2%)
Crown/Bridge	Private	20(68.9%)	7(35%)	13(65.0%)
	Public	9(31.1%)	6(66.7%)	3(33.3%)
Denture Procedures	Private	9(60%)	4(44%)	5(55.6%)
	Public	6(40%)	4(66.7%)	2(33.3%)
Dental Implants	Private	10(55.6%)	4(40%)	6(60%)
	Public	8(44.4%)	6(66.7%)	2(33.3%)
Root Canal treatment	Private	31(60.8%)	13(41.9%)	18(58.1%)
	Public	20(39.2%)	8(40.0%)	12(60.0%)

More patients reported having had procedures in private facilities, a total of 348 procedures as compared to 177 procedures in public facilities. There was a higher percentage of pleasant experiences reported in the public facilities 133 (75.1%) as compared to those in private facilities 197 (56.6%). The difference was statistically significant (X^2= 2.931, p= 0.042) [Table 2].

Table 2

Comparison of association between past clinical experience and type of facility

			Experience		
			Pleasant	Unpleasant	
Characteristics		n (%)	n (%)	n (%)	Statistical test
Facility	Private	348 (66.3)	197 (56.6)	151 (43.4)	X^2 = 2.931* df = 1 p=0.042
	Public	177 (33.7)	133 (75.1)	44 (24.9)	

Pearson Chi-Square (χ^2) test for association was used.
df; Degrees of Freedom.
**p<0.05*

Pain was the most commonly reported post-treatment complication. A total of 115 (61.2%) patients reported they had experienced pain after a dental procedure. Out of these, 75 (41%) reported experiencing pain alone whereas 40 (21.2%) reported they had experienced pain and associated swelling post treatment. Out of the 115 patients who experienced pain, majority 81(70.4%) experienced moderate pain, whereas 23(20%) and 11(9.6%) reported severe and mild pain respectively. Most of the patients, 107(93%) reported to have had pain for less than a week with the highest percentage 43 (37.4%) having reported to have experienced pain for only one day post-treatment. Other post treatment complications reported included failed treatment with recurrence or worsening of symptoms, failed treatment resulting in a new dental problem and undesirable esthetics (Table 3).

Table 3

Post-treatment complications experienced by participants

Adverse experience	**Patients affected n (%)**
Pain Alone	75(39.9%)
Pain and Swelling	40(21.3%)
Failed treatment with recurrence	22(11.7%)
Failed treatment with worsening of symptoms	8(4.3%)
Failed treatment with new dental problem	13(6.9%)
Undesirable aesthetics	15(8%)
Other	10(5.3%)

There was a statistically significant association between presence of complications and past dental experience (Fisher's = 22.524, p< 0.001). Patients who had experienced post treatment complications were more likely to report their dental experience as unpleasant. (Table 4)

Majority of the participants, 144(76.6%) were deemed to have a positive attitude towards acquiring dental treatment as they reported that they would not hesitate to seek dental treatment, while 44(23.4%) of the patients were deemed to have a negative attitude towards dental treatment. There was a statistically significant association between the nature of past dental experience and the attitude of the patient towards follow-up oral care intervention (X^2 = 10.956, p=0.001). Patients who had pleasant past experiences were more likely to have a positive attitude towards follow up intervention. (Table 4)

Table 4

Comparison of association between attitude, presence of complications and past patient experience

Characteristics			**Anxiety**		
			No	**Yes**	
		n (%)	**n (%)**	**n (%)**	**Statistical test**
Attitude	Seek treatment	144 (76.6)	54 (28.7)	90 (47.9)	X^2 = 4.395* df = 1, p = 0.036
	Avoid treatment	44 (23.4)	9 (4.8)	35 (18.6)	
Experience	Pleasant	128 (68.1)	36 (19.2)	92 (48.9)	X^2 = 5.221* df = 1, p = 0.022
	Unpleasant	60 (31.9)	27 (14.3)	33 (17.6)	

Pearson Chi Square (X2) test was used for all variables
df; degrees of freedom
**p<0.05*

Majority of the patients reported some level of dental anxiety 141 (75 %). Many of these 69(36.7%) were categorized as having low anxiety, whereas the rest were categorized as having moderate anxiety 51(27.1%), high anxiety 16 (8.5%) and dentally phobic 5(2.7%). Forty-seven (25%) did not report any level of dental anxiety. There was a statistically significant association between dental anxiety and attitude towards follow up oral care intervention, patients with any level of dental anxiety were more likely to have a negative attitude towards follow up oral care intervention. (X^2 = 4.395, p = 0.036) [Table 5]. There was a higher percentage of patients who reported unpleasant experiences among those with no dental anxiety (X^2 = 5.221, p= 0.022) [Table 5].

Table 5

Association of patient attitude, clinical experience and presence of dental anxiety

			Experience		
			Pleasant	**Unpleasant**	
Characteristics		**n (%)**	**n (%)**	**n (%)**	**Statistical test**
Attitude	Seek treatment	144 (76.6)	107 (56.9)	37 (19.7)	$X^2 = 10.956^{**}$ df = 1 p=0.001
	Avoid treatment	44 (23.4)	21 (11.2)	23 (12.2)	
Presence of complication	Yes	132 (70.2)	76 (40.4)	56 (29.8)	Fisher's = 22.524*** df =1 p<0.001
	No	56 (29.8)	52 (27.7)	4 (2.1)	

Pearson Chi-Square (χ^2) test for association was used for attitude.
Fisher's exact (Fisher's) test for association was used for presence of complication.
df; Degrees of Freedom.
****p<0.001*
***p<0.01*

DISCUSSION

This study was conducted to establish whether patient experiences during treatment affect their subsequent oral health seeking behaviour, additionally it aimed to establish factors that may contribute to negative experiences during dental treatment. This is because delay in seeking treatment many times results in deterioration of existing conditions making treatment more complex and more expensive as compared to intervention in early stages of disease. The study population consisted of patients attending the Dental School (University of Nairobi) who had received dental treatment in the past.

In this study, non-invasive procedures such as dental check-up and tooth whitening had more reports of pleasant experiences compared to invasive procedures such as extractions and root canal treatment. This is probably due to reduced likelihood of adverse experiences during and after non-invasive treatment. This is in contrast with a study conducted in Alabama, USA among patients seen by a select group of private practitioners that reported satisfaction between patients who received invasive and non-invasive procedures did not differ.[1] The study speculated that this could have been due to the high level of trust held by the patients towards their dentists.

A number of patients reported having experienced post-treatment complications such as pain alone 75(39.9%), pain and swelling 40(21.3%), failed treatment with recurrence of original symptoms 22(11.7%) among others. The most commonly experienced adverse effect was pain. Pain as a post-treatment complication is mostly associated with invasive procedures such as extractions as evidenced by a study done by Locker et al, [13] in which 81.8% of patients reported pain on the evening of extraction. Further to that Liddell & Gosse, [9] indicated that procedures, stimuli and events related to injuries are likely to be part of dental events deemed as unpleasant experiences. These findings could therefore explain why extraction procedures were associated with

majority of unpleasant experiences among patients in our study. There was a statistical significance between patient experience and their attitude towards dental treatment. Patients who reported their past dental experience as positive were more likely to have a positive attitude towards follow up oral health care intervention ($X^2 = 10.956$, p=0.001).

In this study, patients reported more pleasant experiences from procedures performed in public facilities as compared to private facilities ($X^2 = 2.931$, p=0.042). This could be attributed to higher expectations usually observed from patients attending private facilities. This was in contrast to a study conducted in Sweden that reported a larger proportion of private sector patients were more satisfied compared to those in the public sector.[14]

Majority of the patients 141(75%), reported some level of dental anxiety. There was a statistical significance between patient attitude and the level of dental anxiety ($X^2 = 4.395$, p = 0.036). This was in agreement with a previous study which showed patients with a high level of dental anxiety had a less positive attitude towards dental care than patients with low dental anxiety.[10] Interestingly, a higher percentage of patients with some form of anxiety reported to have had pleasant experiences as compared to those with no anxiety, this could mean that dental anxiety does not significantly influence patient experience during dental treatment.

CONCLUSION

Patients who have had unpleasant treatment experiences are less likely to have a positive attitude towards seeking subsequent dental treatment. Unpleasant treatment experiences are commonly associated with presence of post treatment complications such as post-operative pain.

Presence of dental anxiety may negatively influence patient attitude towards follow up oral healthcare intervention.

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