

# Single versus multiple-visit root canal treatment: Preference amongst private and public dental practitioners in the Federal Capital Territory, Abuja, Nigeria.

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## Abstract

**Background:** There is no consensus on the preferences of dental practitioners for the single-visit or multiple-visits endodontic treatment, also there is often no agreement on the factors that influenced these preferences including the practice type-either private or public.

**Materials and Methods:** The study was conducted using a descriptive study design that employed a cross-sectional survey. Semi-structured self-administered questionnaires were given to one hundred and twenty-six dental practitioners in FCT, Nigeria stratified into private and public dental practitioners. Out of this, one hundred and twenty-one questionnaires were correctly filled and returned. Data were analyzed using SPSS version 23 and level of significance was set at  $p \leq 0.05$ .

**Results:** Findings of the study showed that many (94.2%,  $n=114$ ) of the practitioners in the study area preferred multiple visits RCT and the main reason for that was to take advantage of the positive effects of inter-appointment (70.2%,  $n=80$ ,  $p < 0.0005$ ) medications.

Those who preferred single visit RCT among the private practitioners do so because it is time saving, cost effective and saves materials while among public dental practitioners, it was because it prevents patient and operator's fatigue.

The preference for multiple visits RCT is higher among public dental practitioners because it prevents patient and operator fatigue and allows for inter-appointment medication.

**Conclusion:** Majority of dentists in the private sector preferred the single visit RCT because it is timesaving and cost effective. While public dental practitioners prefer single visit RCT because it prevents patient and operator's fatigue and allows for inter-appointment medication.

**Key Words:** Public, Private, Single-visit RCT, multiple-visit RCT, root canal treatment.

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## I. Introduction

Root canal therapy whether single or multiple-visits aims at maintaining the integrity of natural dentition through elimination of protein degradation products, bacteria and bacterial toxins from necrotic root canals through adequate root canal instrumentation, disinfection and obturation [1].

Conventional root canal treatment requires multiple visits [1], but some clinicians have queried the rationale behind this practice and proposed that single-visit treatment is a viable alternative. Single-visit and multiple-visits endodontic treatment have their merits and demerits. The main reason for multiple-visits endodontic is the short chair-side time which helps to avoid patient fatigue [2]. However, some of the drawbacks include inter-appointment contamination and flare ups caused by leakage or loss of temporary seal, inability to provide esthetic restorations on time in case of traumatically damaged crowns and missed appointment leading to prolonged treatment time resulting in operator fatigue [3]. Also, the tooth may be susceptible to reinfection through failed temporary filling and dressing during the interim period[4].

The concept of a single-visit root canal treatment was described as early as the 1880s[5] but was actively propagated by Ferranti in 1950s.[1] He described the most important criteria for achieving successful results as the proper shaping and cleaning of the canals[1] and not dependence on intracanal medicaments for

elimination of bacteria from the root canals. Furthermore, root canal therapy has become increasingly automated and can be performed more quickly with the use of contemporary endodontic techniques and equipment, such as rubber dam, magnifying devices, electronic apex locators, engine-driven rotary nickel titanium files. These instrument does not only increase the success rate of endodontic treatment but also, shortens the time needed for the treatment to a single visit[6].

On the contrary, some dentists believe that the traditional multiple-visits protocol has a long history and a high clinical success rate, hence prefer multiple-visits endodontic treatment. The preference for selection of either single-visit or multiple-visits endodontic treatment appears to be based on significant cultural differences. For example, two surveys from the US reported that 70% and 90% of respondents, respectively, would consider single-visit endodontic treatment, after proper case selection[7,8]. Another survey from Australia documented that a majority of the Australian endodontists preferred the multiple-visits approach based on their experience, unrelated to the biological concerns or patient interest.[9] Similarly, a study from Japan indicated that single-visit endodontic treatment was not popular among the dentists in Japan[10].

The argument for single visit treatment relies heavily on convenience, patient acceptance and reduced postoperative pain. Some researchers argue that bacterial eradication cannot be predictably maximized without Ca(OH)<sub>2</sub> dressing between appointments thus, the potential for healing may be compromised[11]. This assertion is however not supported by clinical studies[5,6,12] which posited that no additional benefit is provided by the use of an inter-appointment antibacterial dressing.

The demand for endodontic treatment is on the rise in Nigeria due to the treatment cost subsidy by the National Health insurance scheme. The burden of cost of treatment increases with multiple visits for both the patient and the dentists, and may also have negative impact on school or work-related activities. Any decision for single or multiple visit must be based on evidence and follow well thought out clinical guideline. The aim of this study was to compare the use of single visit or multiple visits RCT amongst public and private dental practitioners in FCT, Abuja and to identify reasons for their preference.

## **II. Material And Method**

**Study Design:** Descriptive cross-sectional survey.

**Study Location:** The Federal Capital Territory. Health care delivery system in FCT comprises of public and private hospitals with all three levels of health services available, primary, secondary and tertiary

**Study Duration:** August 2017-2019 October

**Sample size:** 121 participants

A non-response or attrition rate of 5% was applied.

**Subjects & selection method:** Representation of dental surgeons in private and public practice was ensured by doing a stratified random sampling; dental surgeons were stratified by private (51 practitioners) and public (70 practitioners) practice before they were randomly selected into the study until the minimum sample size calculated was attained and surpassed. A dental practitioners' list sourced from the regulatory body of the nation was used.

**Inclusion criteria:** All dental practitioners who perform root canal treatment in the study area and consented to the study were included in the study.

**Exclusion criteria:**

1. Dental practitioners who do not perform root canal treatment in study area
2. Dental practitioners who perform root canal but did not consent to the study

**Procedure methodology:** Prior to the commencement of this study, ethical clearance for the study was obtained from the Ethics Committee of the University of Abuja Teaching Hospital, Gwagwalada.

Informed verbal consent was obtained from the respondents before administering the questionnaires.

To ensure confidentiality, the instrument for data collection was identified using codes (Arabic numerals) and not respondents' names. Also, the filled instruments were handled only by the principal investigator and the statistician.

**Instrument of Measurement:** The instrument for data collection was a semi-structured self-administered questionnaire. It comprises sixteen questions including those involving demography, knowledge of RCT, type of RCT preferred and reasons for it.

To ensure data reliability and validity, the questionnaire was pre-tested among dental practitioners at a Federal Medical Centre, and private dental clinics in nearby state; which is about 30km from the study area to avoid sensitizing the study participants. At the end of the pre-test, ambiguous questions were rephrased and appropriate modifications made.

The questionnaires were taken to the practice locations of the dental surgeons by the principal investigator. Thereafter, the questionnaires were inspected for appropriate responses and completeness.

**Statistical analysis**

Data analysis was done using Statistical Package for Social Science version 23 (SPSS 23).

Univariate analysis was used to generate frequencies and percentages for socio-demographic and other appropriate variables to describe the study population. Also, measures of central tendency (mean) and measure of dispersion (standard deviation) were generated for the description of appropriate variables. Bivariate analysis was done using Fisher's Exact Test as test statistics to test independence or relationship between selected categorical variables. Multivariate analysis was employed to determine factors that influence choice of root canal treatment.

### III. Result

One hundred and twenty-six dentists were given the questionnaire to fill for this study. One hundred and twenty-one were included in the study giving a response rate of 96%. Respondents were made up of 80 (66.1%) males and 41 (33.9%) females. Their ages ranged from from 23 to 64 years with a mean age of 35.95 years. Forty-six (38.0%) of the respondents were not more than 30 years, 44 (36.4%) were between 31-40 years and 31(25.6%) were at least 41 years old.

More than 88% (107) of the dentists interviewed had Bachelor of Dental Surgery (BDS) as their highest professional qualification, seven (5.8%) possessed a Fellowship in one specialty of dentistry or the other and only one dentist had a diploma. The remaining dentists (6) had other qualifications such as master's in public health.

About 54% (65) of the dentists interviewed have practiced for at least six years after their first dental degree. The remaining 46% (56) were within five years of practicing dentistry. The dental practitioners included in the study were made up of fifty-one (42.1%) private and seventy (57.9%) public focused practitioners.

**Table 1: Socio-demographic characteristics of dental practitioners**

Variables	Frequency (n = 121)	%
<b>Age group (years)</b>		
<= 30	46	38.0
31-40	44	36.4
>= 41	31	25.6
<b>Sex</b>		
Male	80	66.1
Female	41	33.9
<b>Highest professional qualification</b>		
BDS	107	88.4
Fellowship	7	5.8
Diploma	1	0.8
Others	6	5.0
<b>Post BDS (Years)</b>		
<=5	56	46.2
6-10	29	24.0
>=11	36	29.8

**Table 2: Determinants of multiple and single visit RCT (A Logistic Regression Model)**

	N	B	OR	P
<b>Age</b>				
<= 30	46		1	
31-40	44	-0.139	0.87	0.909
>=41	31	19.598	3.244E-08	0.998
<b>Sex</b>				
Male	80		1	
Female	41	0.237	1.268	0.799
<b>Highest professional qualification</b>				

BDS	107		1	
Fellowship	7	-20.117	0	*0.998
Diploma	1	18.751	1.39E-08	*0.999
Others	6	16.961	2.324E-07	*0.999
<b>Post-graduation</b>				
<= 5	56		1	
6-10	29	1.092	2.981	0.443
>= 11	36	-0.761	0.467	0.608
<b>Type of practice</b>				
Public	70		1	
Private	51	-1.632	0.195	0.073

\*

With respect to age, the overall picture is that as age increased, the OR decreased (inverse or negative relationship) i.e. it is less likely that multiple visits will be used as respondents become older; though not a significant relationship. Female dental surgeons were more likely to use multiple visits compared to male dental surgeons. Those with additional qualifications were less likely to use multiple visits. Beyond 10 years after graduation from dental school, multiple visits were likely going to be used. **Also, private dental practitioners were less likely to use multiple visits for treatment.**

Hosmer and Lemeshow goodness of fit test for the model was not significant ( $p = 0.897$ ). This indicates that the model does not differ significantly from the observed data, that is, the model is predicting the real-world data fairly well.

Nagelkerke R Square for the model is 0.211. R Square indicates the amount of variance in influencers of number of visits that can be accounted for by the model. For this model, the explanatory variables included accounts for 21.1% of the factors that determine the use of multiple or single visit.

**Table 3: Distribution of dental practitioner by type of dental practice and number of treatment visits.**

Type of practice	Number of visits		Total
	single visit	Multiple visits	
Public	2 (28.6)	68 (59.6)	70 (57.9)
Private	5 (71.4)	46 (40.4)	51 (42.1)
<b>Total</b>	7 (100.0)	114 (100.0)	121 (100.0)

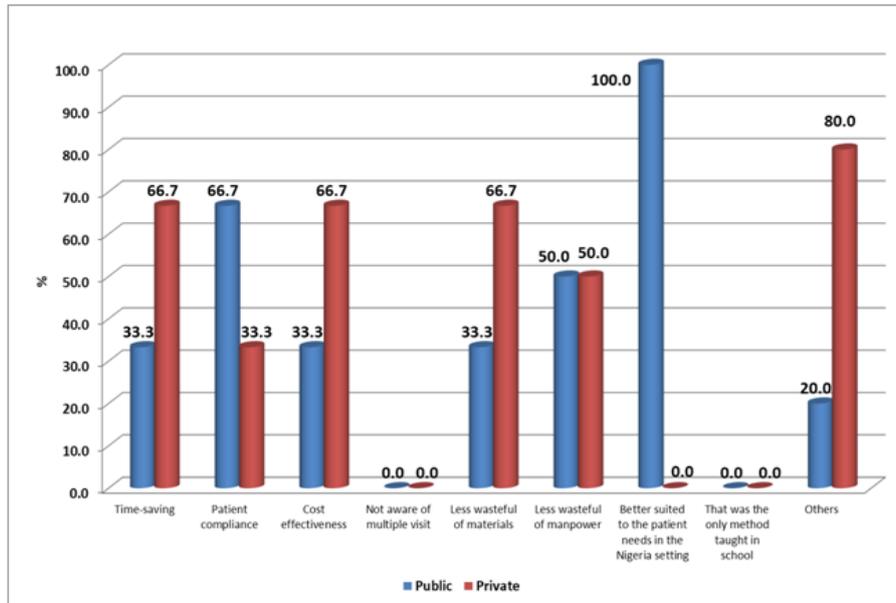
Fisher's Exact test:  $P = 0.131$

\* Private practitioners are less likely to use multiple visit RCT; but not statistically significant ( $P = 0.131$ )

Among the 114 dental practitioners that preferred multiple visits RCT, sixty-eight (59.6%) of them practice in public dental clinics. Single visit RCT was preferred by five dentists (71.4%) in private practice and 2 (28.6%) in public practice. This difference was not statistically significant ( $p = 0.131$ ).

About 67% of the practitioners who claimed single visit RCT was time-saving, cost effective and less wasteful of materials were private practitioners.

More public dental practitioners (66.7%) reported that patient compliance was a reason to prefer single visit RCT. Equal percentage (50%) of public and private dental practitioners claimed that single visit RCT is less wasteful of manpower. All the public practitioners that preferred single visit RCT claimed it is better suited to the patient's need in Nigeria setting; none in private sector gave this reason for preferring single visit. (Figure 4)



\* Figure 4: Comparison of preference for multiple visit among public and private dental practitioners n=7

More public dental practitioners (greater than 60%), preferred multiple visits RCT because it prevents patient and operator fatigue and allows for inter-appointment medication. One point eight percent (1.8%) of those in the public sector claimed not to be aware of single visit RCT. Seventy-five percent of public practitioners claimed that multiple visits RCT was the only method taught in school. More than 68% of public practitioners reported that multiple visits RCT is better suited to the patient’s need in Nigeria setting. (Figure 5)

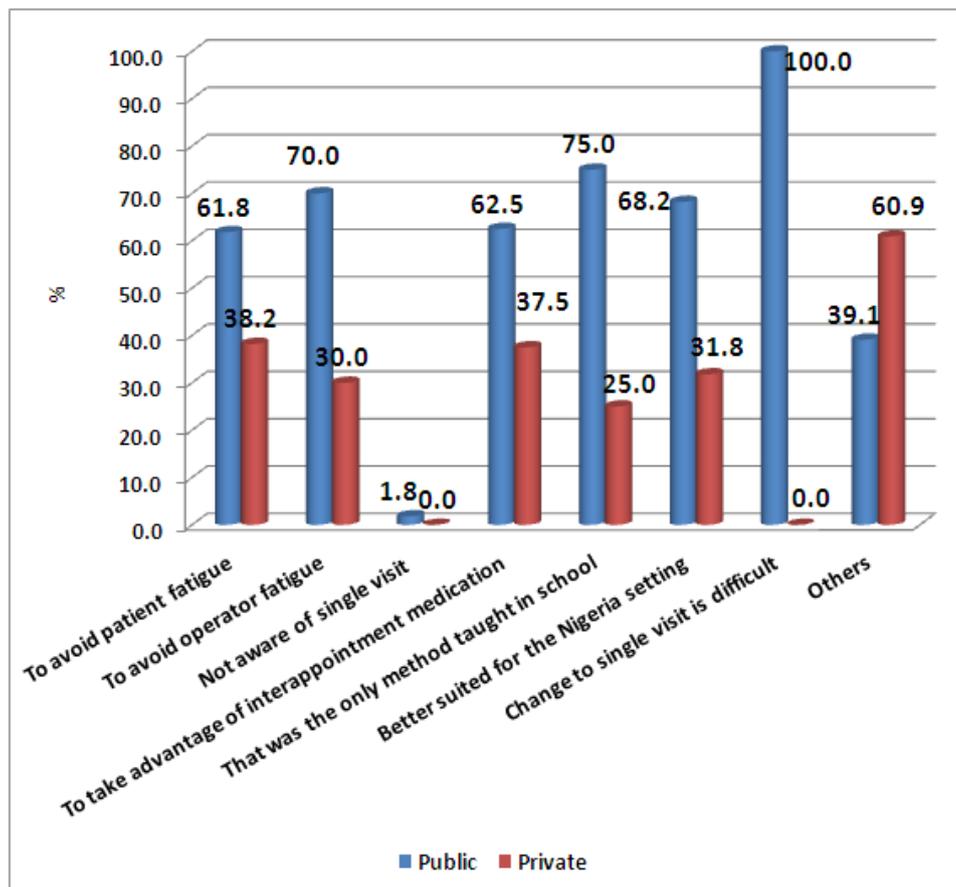


Figure 5: Comparison of preference for multiple visits among public and private dental practitioners

#### **IV. Discussion**

Literature search reveals dearth of data comparing the use of multiple versus single visit RCT amongst private and public practitioners. Single-visit endodontic treatment is indicated when both operators and patients want to save chair side time. Wong AW et al. reported the chair side time for single-visit treatment was shorter than multiple-visits treatment. In this study, 71.4% of those who opted for single visit are in private practice. This is probably due to the fact that profit maximization is one of the goals private practitioners. So a significant number of them gave the reasons for single visit being time-saving, less wasteful of materials & manpower and being cost-effective (66.7%). Some of the respondents use automated instruments which also is the reason while those in private practice preferred single visit. About 60% of those who opted for multiple visits are in public practice. This may be due to the overwhelming number of patients that usually attend the public health facilities and secondly, shortage of manpower in public health institutions.

#### **V. Conclusion**

Majority of participants in the study preferred multiple visits RCT and the type of practice whether private or public did not have any significant effect on this choice.. Therefore, irrespective of treatment type or practice type no aspect of the standard endodontic guidelines/principles should be circumvented throughout the treatment procedures.

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