

# Treatment and Care Trends at the Paedodontics Clinic of a Teaching Hospital in Southern Nigeria.

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## ABSTRACT

**Objective:** To determine the trend of dental treatment and care at the Paedodontic Clinic of the University of Benin Teaching Hospital over a ten-year period

**Methods:** The case records of patients seen at the paediatric Dental Clinic of the University of Benin Teaching Hospital between November 2004 and October 2014 were retrieved from the Medical Records Department and analyzed for age, gender and type of treatment provided.

**Results:** Six thousand, one hundred and sixty-nine (6169) clinical records of children who received a total of seven thousand, one hundred and eighty-five (7185) treatment procedures were analyzed. More females (53.4%) participated in the study. The school-aged patients accounted for 50.7% of the participants and the least age group were the neonates (0.7%). Trend analysis shows a gradual increase in the number of dental patients seen and procedures done with the highest number of children and treatment done during 2008-2009 period. The most treatment carried out was extraction (32.3%) followed by scaling and polishing (27.4%), glass ionomer cement restoration (13.9%), primary tooth pulp therapy (8.6%).

**Conclusion:** The number of children that attended the clinic and the scope of treatment procedure/care provided increased. More so the quality of care improved with the engagement of adequate support manpower, improvement in dental facilities and materials, intake of Paedodontic residents' doctors in training and the employment of consultants.

**Key words:** Trends, Treatment, Care, Child patient

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### INTRODUCTION

In industrialised societies, oral health care provision for children and adolescent has improved greatly due to advancement in technology, improvement in dental materials as well as availability of adequately trained manpower<sup>1</sup>. A wide variety of oral care services are available for the oral health problems of children.<sup>1,2,3</sup> In Nigeria, extraction has been reported in most literature as the most common type of treatment provided to Paediatric dental patients.<sup>3-6</sup>

Nevertheless, the degree of oral health care services provided to a child is reliant on the socioeconomic status of the country, the epidemiology of oral disease, adequately equipped clinical facilities, adequate and well-trained manpower, available dental materials and equipment as well as the oral health policy of the country. Common oral conditions that present at the Paediatric Dentistry clinics include dental caries and its sequelae such as pulpitis, apical periodontitis, dental abscesses, fistula and ulcerations. Others are: dentine hypersensitivity, gingivitis/periodontitis, orofacial cleft, traumatic maxillofacial/tooth injury, hereditary or acquired tooth defects, dental anomalies, oral pathological condition and oral habits.

In the dental management of children, emphasis is on behavioural management as it plays an important role, most especially in younger and uncooperative patients<sup>7</sup>. While most young children readily accept dental treatment with the aid of non-pharmacological behavioural management, some children fail to respond and require pharmacological behaviour management techniques such as conscious sedation.<sup>7</sup>

The Paediatric Dental Clinic of the University of Benin was previously located outside the teaching hospital premises with a few support staff and no consultant to attend to the comprehensive care of paediatric dental patients. In 2009, the clinic was relocated to the teaching hospital premises with the employment of support staff, core resident doctors and procurement of materials and equipment.

This study was carried out to determine the treatment and care trends at Paediatric Dental Clinic of the University of Benin Teaching Hospital, Benin City from November 2004 and October 2014 and to assess the effect of change in clinic location and employment of core resident doctors and support

staff to the type of treatment and care provided in the clinic.

### MATERIALS AND METHOD

The Paediatric Dentistry Clinic of the University of Benin Teaching Hospital, a subspecialty unit in the Department of Preventive Dentistry, provides overall oral health care services for children aged 16 years and below as well as those with special health care needs. The clinic was previously located within the University of Benin Main Campus but relocated to the University of Benin Teaching Hospital premises. The clinic provides both primary and comprehensive preventive and therapeutic oral health care services to a large population of paediatric dental patients in the South-South Geo-political zone.

A retrospective study was conducted at the Paediatric Dentistry Clinic of the University of Benin teaching hospital involving all children and adolescent that presented and completed their treatment. The case records of patients seen at the Paediatric Dental Clinic between November 2004 and October 2014 were retrieved from the Medical Records Department and analyzed for age, gender and type of treatment provided. Data was retrieved by two researchers and case notes with incomplete data excluded.

The treatment procedures were categorized as non-restorative and restorative preventive procedures, aesthetic and non-aesthetic restorations, primary and permanent pulp therapies and other procedures. Non-restorative preventive procedures included Scaling and Polishing plus Oral Hygiene Instruction (S & P + OHI) and Fluoride Therapy (FT). Restorative preventive procedures included Fissure Sealant (FS) and Preventive Resin Restoration (PRR). Aesthetic restorations were composite (CMP) and Glass Ionomer Cement (GIC) while non-aesthetic restorations included Amalgam Filling (AF) and Stainless Steel Crowns (SCC). Primary pulp therapies included pulpotomy and pulpectomy while pulp capping and root canal treatment were classified under permanent pulp therapies.

Other forms of treatment and care provided were: Extraction (EXO), Oral Hygiene Instruction (OHI), Occlusal Grinding (OG), Pre-surgical Elastic Strapping (PES), Desensitization (DST), Counselling and Reassurances(C&RA), Curettage (CT). Excisional Biopsy (EXB), Suturing (SU), Space Management (SM), Prosthesis (PS) and Splinting (SPL). Data from six thousand, one hundred and sixty-nine (6169)

## Treatment and Care Trends at the Paedodontics Clinic

clinical records of children who received a total of seven thousand, one hundred and eighty-five (7185) treatment procedures were analyzed using the Statistical Package for Social Sciences (SPSS) software version 21.0. Cross-tabulation of some variables were done to determine any pattern or association. The confidence level was set at 95% and probability value (p-value) less than 0.05 was regarded as significant.

**Ethical consideration:** The protocol for this study was reviewed and approval granted by the Ethics and Research Committee of the University of Benin Teaching Hospital, Benin City, Nigeria. Permission was obtained from the Head of Department, Preventive Dentistry, University of Benin Teaching Hospital with protocol number ADM/E 22/A/VOL. VII/14649.

### RESULTS

A total of six thousand, one hundred and sixty-nine (6169) clinical records of children was analyzed, comprising 3295 (53.4%) females and 2874 (46.6%) males. There was no statistically significant difference in gender during the study period ( $P = 0.76$ ,  $df = 4$ ,  $\chi^2 = 1.895$ ). The yearly distribution of the patients according to gender is shown in Table I. Slightly more females were treated from November 2006 to 2009, and from November 2011 to October 2013.

The total number of treatment procedures received by the children in the period under review was seven thousand, one hundred and eight five (7185). School-age patients were the highest (50.7%), followed by adolescent (32.1%), pre-school (15.1%), infants (1.3%) while the least were neonates 0.7%.

Trend analysis shows a gradual increase in the number of dental patients seen and procedures done from four hundred and nineteen (419) children in 2004-2005 to eight hundred and twenty-one (821) in 2008-2009, accounting for highest number (13.3%) of children seen. During the same period, the highest number of treatment procedures done in this study 1113(15.5%) was recorded. (Table I)

Trend in treatment and care carried out up to 2006-2007 was mostly tooth extraction. Thereafter, scaling and polishing became more common for just about two years and then again extraction. Subsequently, aesthetic and non-aesthetic procedures as well as pulp therapies, fluoride therapy, fissure sealing and

space management were carried out. The most treatment carried out was extraction (32.3%) followed by S&P (27.4%), GIC (13.9%), primary tooth pulp therapy (8.6%). (Table II)

### Preventive Procedures

A total of two thousand, one hundred and sixty-eight (2168) preventive procedures was done. S&P +OHI accounted the most with 90.9%, followed by FT 6.7%, FS 1.9% and the least was PRR, 0.4%. The trend in non-restorative preventive procedures carried out from 2004 to 2014 was majorly S & P + OHI, with minimal FT. From 2008, FS was among the treatment done and in 2009, PRR were carried out as part of the restorative preventive procedures. (Table III)

### Restorative procedures

One thousand, four hundred and forty-eight (1448) restorative procedures were done. GIC accounted the most with 69.1%, followed by AF 19.4%, CMP 10.6% and the least was SSC 0.9%. Trends in aesthetic procedures was majorly with glass ionomer cement which peaked in 2007-2008 with about 18.8%. Amalgam was the most common non-aesthetic procedures with very minimal stainless steel crown restoration. (Table IV)

### Endodontics procedures

Eight hundred and sixty-one (861) endodontics procedures were done on both primary and permanent dentitions. There is an increase in the number of endodontics procedures done over the years. Generally, the rate of pulpotomy was higher than that of pulpectomy during the study period, with 2010-2011 and 2013-14 periods being the exceptions. Permanent tooth root canal treatment accounted for 28.1%, pulp capping 27.3% while in primary tooth, pulpotomy was 24.3% and pulpectomy was the least with 20.3%. (Figure 1)

### Others

Treatment procedure/care carried out during the period under review included oral hygiene instructions, occlusal grinding, pre surgical elastic strapping and desensitization. Others were: reassurances, curettage, debridement, space management, splinting, prosthesis, excisional biopsy and suturing. Table V shows the categorization of all the procedures carried out including others highlighted with content herein.

## Treatment and Care Trends at the Paedodontics Clinic

**Table I:** Total number of children, gender and number of procedures done annually

Year	No of Children	(%)	Gender		No of procedures	(%)
			Male	Female		
2004-2005	419	6.8	7.4	6.3	449	6.2
2005-2006	515	8.3	8.5	8.2	589	8.2
2006-2007	651	10.6	10.1	11.0	762	10.6
2007-2008	561	9.1	8.8	9.4	727	10.1
2008-2009	821	13.3	13.3	13.4	1113	15.5
2009-2010	568	9.2	9.0	9.3	680	9.5
2010-2011	585	9.5	9.5	9.4	681	9.5
2011-2012	617	10.0	9.9	10.0	710	9.9
2012-2013	733	11.9	11.8	12.0	792	11.0
2013-2014	699	11.3	11.7	11.0	682	9.5
<b>Total</b>	<b>6169</b>	<b>100.0</b>	<b>100((46.6%)</b>	<b>100((53.4%)</b>	<b>7185</b>	<b>100</b>

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**Table II:** Procedures carried out yearly (2004 to 2014)

Year of treatment	NO OF PX	CMP	EXO	GIC	PT	RCT	S&P	AF	PES	CT	DB	FS/PRR	C&RA/OHI	EXB/SU	PD/SSC
												/ FT	DST/OG	SPL	SM
2004-2005	419	5	164	65	28	15	121	30	13	0	1	0	0	5	2
2005-2006	515	10	193	87	37	15	187	38	7	2	4	1	2	4	2
2006-2007	651	8	279	108	40	14	233	31	14	5	6	9	7	7	1
2007-2008	561	12	212	137	49	14	216	22	9	3	7	37	2	5	2
2008-2009	821	15	299	198	49	21	390	38	10	5	10	58	7	9	4
2009-2010	568	6	196	126	81	28	168	38	12	5	4	1	6	6	3
2010-2011	585	19	224	114	58	19	180	19	10	4	9	7	9	6	3
2011-2012	617	14	247	76	84	19	210	13	4	5	9	9	6	7	7
2012-2013	733	34	266	77	109	50	118	23	3	6	15	43	26	17	5
2013-2014	699	30	241	12	84	47	149	29	0	3	15	31	15	6	20
<b>TOTAL</b>	<b>6169</b>	<b>153</b>	<b>2321</b>	<b>1000</b>	<b>619</b>	<b>242</b>	<b>1972</b>	<b>281</b>	<b>82</b>	<b>38</b>	<b>80</b>	<b>196</b>	<b>80</b>	<b>72</b>	<b>49</b>
<b>Percentage%</b>		<b>2.1</b>	<b>32.3</b>	<b>13.9</b>	<b>8.6</b>	<b>3.4</b>	<b>27</b>	<b>3.9</b>	<b>1.1</b>	<b>0.5</b>	<b>1.1</b>	<b>3</b>	<b>1.1</b>	<b>1.01</b>	<b>0.76</b>

CMP=Composite, EXO=Extraction, FT=Fluoride Therapy, GIC=Glass Ionomer Cement, PT=Primary Pulp Therapy, RCT=Root Canal Therapy, S&P=Scaling and Polishing, OHI=Oral Hygiene Instructions, OG=Occlusal Grinding, AF=Amalgam Filling, PES=Pre-surgical Elastic Strapping, DST=Desensitization, C&RA=Counselling and Reassurance, CT= Curettage, DB=Debridement, PRR=Preventive Resin Restoration, FS=Fissure Sealant, SM=Space Management, EXB=Excisional Biopsy, SSC=Stainless Steel Crown, SU= Suturing, PD=Partial Denture, SPL= Splinting

## Treatment and Care Trends at the Paedodontics Clinic

**Table III:** Total number/percentage of preventive procedures done annually (2004-2014)

Year	Non-Restorative Preventive Procedure		Restorative Preventive Procedures		Total (%)
	S&P + OHI n(%)	FT n(%)	FS n(%)	PRR n(%)	
2004-2005	121(27.0)	0(0.0)	0(0.0)	0(0.0)	27.0
2005-2006	187(31.7)	1(0.2)	0(0.0)	0(0.0)	31.9
2006-2007	233(30.6)	9(1.2)	0(0.0)	0(0.0)	31.8
2007-2008	216(29.7)	36(5.0)	1(0.1)	0(0.0)	34.8
2008-2009	390(35.0)	48(4.3)	9(0.8)	1(0.1)	40.2
2009-2010	168(24.7)	1(0.1)	0(0.0)	0(0.0)	24.8
2010-2011	180(26.4)	6(0.9)	1(0.1)	0(0.0)	27.4
2011-2012	210(29.5)	6(0.8)	3(0.4)	0(0.0)	30.7
2012-2013	118(14.9)	18(2.3)	21(2.7)	4(0.5)	20.4
2013-2014	149(21.8)	21(3.1)	7(1.0)	3(0.4)	26.3
<b>Total</b>	<b>1972(90.9)</b>	<b>146(6.7)</b>	<b>42(1.9)</b>	<b>8(0.4)</b>	<b>2168(100)</b>

S&P + OHI=Scaling and Polishing plus Oral Hygiene Instructions, PRR=Preventive Resin Restoration, FS=Fissure Sealant

**Table IV:** Total number of restorative procedures done annually (2004-2014)

Year	Aesthetic Restorative Procedures		Non-Aesthetic Restorative Procedures		Total (%)
	CMP n(%)	GIC n(%)	AF n(%)	SSC n(%)	
2004-2005	5(1.1)	65(14.5)	30(6.7)	0(0.0)	22.3
2005-2006	10(1.7)	87(14.7)	38(6.5)	1(0.2)	23.1
2006-2007	8(1.0)	108(14.2)	31(4.1)	0(0.0)	19.3
2007-2008	12(1.6)	137(18.8)	22(3.0)	2(0.3)	23.7
2008-2009	15(1.3)	198(17.8)	38(3.4)	1(0.1)	22.6
2009-2010	6(0.9)	126(18.5)	38(5.6)	0(0.0)	25.0
2010-2011	19(2.8)	114(16.7)	19(2.8)	0(0.0)	22.3
2011-2012	14(2.0)	76(10.7)	13(1.8)	1(0.1)	14.6
2012-2013	34(4.3)	77(9.7)	23(2.9)	2(0.3)	17.2
2013-2014	30(4.4)	12(1.8)	29(4.3)	7(1.0)	11.5
<b>Total</b>	<b>153(10.6)</b>	<b>1000(69.1)</b>	<b>281(19.4)</b>	<b>14(0.9)</b>	<b>1448(100)</b>

CMP=Composite, GIC=Glass Ionomer Cement, AF=Amalgam Filling, SSC=Stainless Steel Crown.

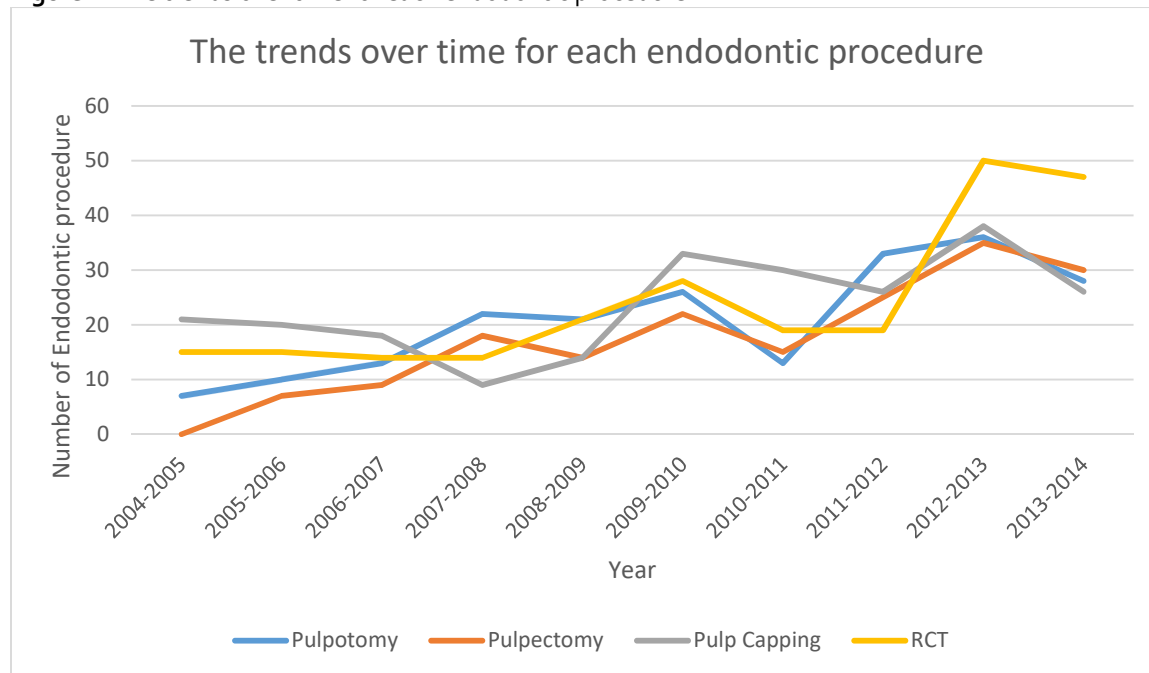
## Treatment and Care Trends at the Paedodontics Clinic

**Table V:** Total number/percentage of other procedures and their number/percentage in procedure done annually (2004-2014)

Year	Number of procedure	Exo N (%)	Pulp therapy N (%)	R&NRPP N (%)	A&NARP N (%)	Others N (%)
2004-2005	449	164(36.5)	43(9.7)	121(27.0)	100(22.3)	20(4.5)
2005-2006	589	193(32.8)	52(8.8)	188(32.0)	136(23.0)	20(3.4)
2006-2007	762	279(36.5)	54(7.0)	242(32.0)	147(19.3)	40(5.2)
2007-2008	727	212(29.2)	63(8.6)	253(34.8)	173(27.8)	26(3.6)
2008-2009	1113	299(26.9)	70(6.3)	448(40.3)	252(22.5)	44(4.0)
2009-2010	680	196(28.8)	109(16.0)	169(24.9)	170(25.0)	36(5.3)
2010-2011	681	224(32.9)	77(11.3)	187(27.5)	152(22.3)	41(6.0)
2011-2012	710	247(34.8)	103(14.6)	219(30.8)	104(14.6)	37(5.2)
2012-2013	792	266(33.7)	159(20.0)	161(20.3)	136(17.2)	70(8.8)
2013-2014	682	241(35.3)	131(19.2)	180(26.4)	78(11.4)	52(7.6)
<b>Total</b>	<b>7185</b>	<b>2321(32.3)</b>	<b>861(11.9)</b>	<b>2168(40.1)</b>	<b>1448(20.2)</b>	<b>386(5.4)</b>

*Restorative/Non Restorative Preventive Procedure ((R&NRPP), Aesthetic/Non Aesthetic Restoration Procedure (A&NARP)*

**Figure 1:** The trends over time for each endodontic procedure



RCT=Root Canal Therapy

### Discussion

The total number of treatment procedures done was seven thousand, one hundred and eighty-five (7185) which is higher than the number of clinical records analyzed. This is definitely because some patients had more than one type of treatment during the period under review. More females attended and had one or more types of child dental treatment done. This finding is similar to other studies from Nigeria,<sup>7,9</sup> and may be due to the fact that females are more conscious of their oral health.<sup>10-11</sup> Meanwhile this finding is contrary to another Nigerian study.<sup>1</sup>

The ten-year study period under review can be classified as five years before and five years after the relocation of the school of dentistry clinical departments, clinics and laboratories from their original location within the University of Benin Main Campus on one hand, to their new location, within the University of Benin Teaching hospital premises, tagged "AO Ejide Dental Complex" and named after an erudite scholar, Professor Anthony.O Ejide. This is a significant period in the history of the clinical departments and units of the school of dentistry. In 2004, reduced number of children were seen and lower number of procedures done. In this period, the Department of Preventive Dentistry and the Paediatric Dental Clinic in particular had inadequate manpower.

From Nov 2005 to Oct 2007, there was a gradual increase observed in the number of patients and procedures which climaxed between Nov 2008 and Oct 2009, when the University of Benin Teaching hospital employed new core resident doctors in training into Paediatric Dentistry Unit and the clinical department also relocated. The relocation provided more dental operating facilities, laboratory space and increased the number of support staff. The peak period of utilization of facilities by patients may be connected to the fear of unknown on the part of the patients as well as the need to explore the new site.

There was a sharp decline in the number of children seen and procedures done a year after the peak period. Following the decline, the number of children seen remained approximately the same for two consecutive years after the peak and then gradually increased. The sharp decline following the peak period may be due to cost of treatment; at a time the hospital had an upward review of the cost of treatment coupled with the complex hospital routines before care could be accessed. The lower

number of patients and procedure done in the last year under review may be connected with the incessant industrial actions by both the clinical and non-clinical staff in the institution.

This study revealed that the main clinical preventive procedures done in the first years under review was in form of non-restorative procedures such as scaling and polishing plus oral hygiene instruction and topical fluoride. A year after, fissure sealant was introduced and thereafter, preventive resin restoration. The aesthetic procedures mostly used were composite and glass ionomer cement while the non-aesthetic was amalgam. The use of stainless-steel crown was infrequent, especially at the earlier period of the study year. Endodontic procedures in primary and permanent tooth constituted the procedure carried out and there was a gradual increase in the number of endodontic procedures done when the earlier and later years this study were compared. Other treatment procedure/care which did not feature earlier such as space management, occlusal grinding amongst others were carried out later in the year but at varied proportions.

Tooth extraction is the most common treatment procedure carried out; this is in agreement with other Nigerian studies<sup>5-6</sup> but differs from a study in Lagos, South West Nigeria<sup>1</sup>, where scaling and polishing was the most common treatment done. The differences observed may be explained by the Committee on Dental Education and Health (CODEH) programme carried out by dental students of the School of Dentistry nationwide.

CODEH programme is one of the means by which dental students invite patients to the clinic and carry out needed treatment and care in order to meet their clinical requirements. In paediatric dental practice, several indications for tooth extraction exist and include caries and its sequelae, orthodontics reasons, trauma, failed endodontics, eruption anomalies, retained tooth and or supernumerary teeth<sup>4,11</sup>. This could account for why extraction is the most common treatment done in paediatric dental practice. Although, extraction was the most treatment done but as more personnel were engaged and facilities improved, number of extractions decreased and number of preventive procedures including endodontic procedures increased.

### CONCLUSION

The utilization of oral health care services by children increased with improvement in clinical dental facilities and the scope of treatment procedures increased with the engagement of adequate manpower. In addition, the quality of care improved, most especially with the employment of consultants and intake of resident doctors in paediatric dentistry.

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