

Prevalence and Associated Factors of Self Medication Practices among Dental Patients with Toothache Visiting Central Hospital, Benin City

***Nosakhare Victor OGBEIDE,
Gabriel OGBEBOR, *Ngozi
EBIOGWU, *Adesuwa EBOMWONYI**

**Department of Family Dentistry, Edo
Specialist Hospital, Benin City, Nigeria.*

*** Department of Family Dentistry,
University of Benin Teaching Hospital Benin
City*

****Department of Restorative Dentistry,
Central Hospital Benin City*

ABSTRACT

Background: Self-medication is the use of medicines by individuals to treat self-recognized illnesses or symptoms devoid of medical supervision. Such practices may result in antimicrobial resistance, treatment failure, economic loss, serious health hazards, missed diagnosis, delayed appropriate treatment, drug dependency, and adverse drug effects. However, basic evidence is limited to the current status of its practices and associated factors among dental patients with toothache visiting Central Hospital, Benin City. Thus, the aim of this study was to assess the prevalence and associated factors of self-medication practices among dental patients with toothache visiting Central Hospital, Benin City.

Methods: This was a hospital -based cross-sectional study which was carried-out within 1 year. A total of 403 patients were surveyed with a self-administered structured questionnaire. The Excel Spreadsheet and SPSS (version 22) were used for data entry and analysis, respectively. Results were presented using figures, frequencies and tables, with Chi square and Fisher's test conducted as appropriate. Binary logistic regression analysis was performed to determine predictors of self-medication. Statistical significance was evaluated at P-value <0.05 and a 95% confidence interval (CI).

Results: The prevalence of self-medication practices among dental patients presenting with toothache was 61% (246). Analgesics and Antibiotics were the most self-medicated drugs with patent medicine store the major source of drugs. Age, Educational status, Occupational status and Ethnicity were significant predictors of Self-medication. The main reasons for self-medication were nearness of chemist/pharmacy shops (16%); lack of access to dental services: (15.1%); financial problems (13.3%), and lack of time due to work (12.7%). Majority of the patients (63.0%) who self-medicated for toothache experienced side effects, with stomach ache being the most common side effect.

Conclusion: More than half of the respondents practiced self-medication, which is moderately higher than findings on prevalence in some studies. The major sources of the self-medicated drugs were Patent Medicine Stores and Pharmacy Shops. Therefore, interventions to decrease self-medication should emphasize access to drugs based on Doctor's prescription.

Correspondence

Dr Victor Ogbeide

*Department of Family Dentistry
Edo Specialist Hospital
Benin City, Edo State
Nigeria*

Email: victorogbeide2002@gmail.com

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INTRODUCTION

Self-medication refers to the improper use of medicines without recourse to a doctor's prescription for the treatment of diseases (Anyanechi & Saheb, 2014). This practice, regarded by the World Health Organization (WHO) as a part of self-care, has been reported to be higher in developing nations (Bown et al., 2000; Togoobaatar et al., 2010). Various factors have been ascribed to be responsible for this, which include drug availability, academic status, socio-economic status, societal laws, exposure to advertisement etc (Afolabi et al., 2010). A patient with toothache exhibits various types of health seeking characters based on the intensity and severity of pain. These include usage of orthodox and non-orthodox means in the form of non-prescription medicines, herbs, home remedies and prayer in an attempt to alleviate the pain before seeking definitive dental care (Cohen et al., 2009). The pharmacological agents most frequently used as self-medication for the management of toothache include analgesics and antimicrobials (Al-Ramahi, 2013). These agents require adequate knowledge of their indications and contraindications before prescription and usage. Analgesics are used in the management of pain, though other medications like antibiotics are also used in the management of the aetiology and rapid resolution of other symptoms (Hargreaves & Abbott, 2005). The selection of analgesics must be individualized for each patient, depending on the aetiology and severity of the pain as well as patients' age and concomitant medical conditions that may alter the drug response (Matzke, 1997). The severity of pain has been documented as a known factor that influences the choice of analgesics. Paracetamol and NSAIDs (Ibuprofen, Naproxen and others) are common choices for the treatment of mild-to-moderate acute dental pain among patients lacking the contraindications for such agents (Hargreaves & Abbott, 2005). Meanwhile Opioids are powerful analgesics with more significant side effects, which are commonly reserved for severe pain only (Jeske, 1999). Co-morbid medical conditions may be contraindications and/or may alter the metabolism of pharmacological agents thereby heightening the chances of toxicity (Donaldson & Goodchild, 2010). The major contraindications to intake of NSAIDs, are illustrations of the influence of medical history on prescription of analgesics, these include peptic/gastric ulcer, asthma, allergy, diabetes, gout, influenza, bleeding diathesis, pregnancy and hepatic/renal diseases (Jeske, 1999). Patient's age also influences choice of analgesics due to its reported implication in Reyes syndrome (Azodo & Umoh, 2013). Epidemiological data indicates that aspirin usage during or shortly after viral infections (e.g. influenza and chickenpox) in children increases the risk of developing Reye's syndrome (Azodo & Umoh, 2013).

The non-selective NSAIDs are best avoided in older patients because of the increase in tendency for gastrointestinal bleeding with increasing age (Haas, 2002). A lower likelihood of children than adults has been reported to have similar complaint after receiving narcotics (Hauswald & Anison, 1997). Paracetamol being the most commonly available analgesics without gastrointestinal and nervous side effect could be abused in the self-medication of dental pain, to the extent of ingesting toxic doses (Azodo & Umoh, 2013).

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Of utmost concern is the possibility of the development of multi drug resistant strains of microbes to antibiotic (Chalker, 2001). The use of antimicrobials for self-medication and the development of resistance has been established hence, the need for more caution (Nys et al., 2004; Sarahroodi et al., 2010). The improper use of antimicrobial by patients has effects on treatment cost and the emergence of resistant bacterial strains, drug toxicities, adverse drug interactions, prolong sufferings, drug dependence and tolerance, missed diagnosis, delay of appropriate and effective treatment and under or overdosing of drugs (Hughes et al., 2001; Malhotra-Kumar et al., 2007; Babatunde et al., 2016). According to the WHO (2001), improper antimicrobial usage consists of inappropriate selection, improper antimicrobial under dosage and short duration of use (WHO, 2001).

SUBJECTS AND METHODS

A close ended questionnaire consisting of 33 questions, based on dental problems and self-medication was given to the patients with toothache visiting dental outpatient departments of Central Hospital, Benin City. Edo State

Sample size

It was calculated using the Cochrane formula for calculating single samples $n = Z^2pq/d^2$ Where, n = desired sample size, Z = Standard normal deviation = 1.96 (at 95% confidence value), p = prevalence = 49.6% (Pozzi & Gallelli, 2010) $q = 1.0 - p = 1 - 0.496 = 0.504$, d = degree of accuracy = 0.05, $n = Z^2pq/d^2$

$$n = (1.96)^2 \times 0.496 \times 0.504 / (0.050)^2 = 384.13$$

$n = 384.13$ as the sample size for the study, however we have taken $n = 403$

Sampling technique

A consecutive sampling method was used to recruit participants into the study. Specifically, every eligible patient that presented to the dental clinic was screened for eligibility. Eligible cases who consented to participate in the study were consecutively included in the study, until the desired sample size was achieved.

Study design and population

This was a descriptive cross-sectional study carried out among Dental Patients with Toothache visiting Central Hospital, Benin City, Edo State, Nigeria, within a duration of one (1) year: October 2020- September 2021. A sample of 403 patients was taken.

Statistical analysis

After collation, Data cleaning was done to fix and remove any incorrect or corrupted data within the dataset. The final collected data were checked for completeness, and responses were entered into the Excel spreadsheet in Windows and then transferred, coded and analyzed using the Statistical Package for the Social Sciences software version 22.0 (SPSS v22.0; IBM, Chicago). Tabulation, and descriptive statistics, like frequencies and percentages were used to express different variables. Binary logistic regression analyses were used to determine factors associated with self-medication practice. In the unadjusted binary logistic analysis, variables, with a p value of less than 0.2 were entered into the adjusted binary logistic analysis. Variables that had a P-value less than 0.05 in the adjusted logistic regression analysis were taken as statistically significant factors for the dependent variable. Statistical significance was evaluated at $p < 0.05$, and at 95% Confidence Interval (CI).

RESULTS

A total of four hundred and three (403) Dental patients with toothache who presented to the dental clinic at Central hospital, were recruited for this study. The prevalence of self-medication practices among dental patients presenting with toothache was 61% (246 patients) as shown in Figure 1.

As shown in Table 1, there was a higher prevalence among females 109(71.2%), compared to the males 137(54.8%). Respondents aged ≥ 45 years had the highest prevalence of 76.0%, while those with primary school as the highest educational level had the highest prevalence of self-medication of 85.7%. There was a significant difference in sex ($p=0.001$), Age category ($p=0.002$), marital status ($p<0.0001$), occupational status ($p<0.0001$), Level of Education ($p<0.0001$) and Ethnicity ($p=0.001$) distribution among patients with Toothache who Self-medicated and patients who did not self-medicate, as shown in Table 1.

The unadjusted Binary logistic regression showed that females had 2.043 times the odds of self-medication for toothache compared to males ($p=0.001$). Analysis also showed that patients aged 18-24 years had 0.477 times the odds to self-medicate compared to patients aged 45 and above ($p=0.023$). Unmarried patients had 0.345 the odds of self-medication compared to married patients, which was statistically significant at $p < 0.0001$. The odds of self-medication reduced with respect to the reference group of patients who had no formal education: primary [OR: 0.511(0.14-1.868); $p=0.31$]; Secondary level [OR: 0.25(0.084-0.747), $p=0.013$]; and tertiary level [OR: 0.045(0.016-0.131), $p<0.0001$] as shown in Table 2.

The adjusted logistic regression indicated that females had 1.757 the odds of self-medication compared to males ($p=0.052$); the age category of 25-34 had 0.491 the odds of self-medication compared to 18-24-year-old age bracket, which was statistically significant. Also, patients with tertiary education had significantly lesser odds to self-medicate in comparison to those patients without formal education: OR: 0.148(0.034-0.644), $p=0.011$; as shown in Table 3.

Among the patients who self-medicated: 54(62.6%) took such drugs more than two times in the space of a month before presentation. The major reason the patients gave for self-medication was Nearness of Chemist/Pharmacy shops (16%); the second most common reason given was Lack of Access to dental services (15.1%) and was followed by financial problems (13.3%) as shown in Table 4.

Majority of, patients who self-medicated for toothache experienced side effects (155), as against 91(37%) who did not observe any side-effect. The most common side effect was stomach ache (24%). Most of the drugs were recommended by Relatives: 87(35.4%) and Friends: 57(23.2%). After taking the self-medication a total of 109 (44.3%) patients reported they had Temporary relief and 50(20.3%) found it useful in a stressful situation.

The dosages of the drugs were mostly derived through enquiry from the seller (56.9%), followed by dosages regimen based on a previous prescription (19.5%). The sources of the drugs included Patent Medicine Store (38.3%) and Pharmacy Shops (33.2%) as shown in Table 5.



Figure 1: Prevalence of Self-medication among Dental Patients

Table 1: Socio-Demographic Characteristics of Study Participants

Variable	Self-Medication for Tooth-ache		Total	Test Statistic	P value
	Yes(n=246)	No(n=157)			
Sex					
Male	137(54.8%)	113(45.2%)	250(100%)	$\chi^2=10.790$	0.001*
Female	109(71.2%)	44(28.8%)	153(100%)		
Age Category					
18-24	77(60.2%)	51(39.8%)	128(100%)	$\chi^2=14.719$	0.002*
25-34	71(50.7%)	69(49.3%)	140(100%)		
35-44	41(68.3%)	19(31.7%)	60(100%)		
≥ 45	57(76.0%)	18(24.0%)	75(100%)		
Marital Status					
Single	84(45.9%)	99(54.1%)	183(100%)	$\chi^2=35.401$	<0.0001*
Married	128(71.1%)	52(28.9%)	180(100%)		
Widowed	22(81.5%)	5(18.5%)	27(100%)		
Separated	12(92.3%)	1(7.7%)	13(100%)		
Religion					
Christianity	188(55.8%)	149(44.2%)	337(100%)	$\chi^2=26.084$	<0.0001*
Islam	35(81.4%)	8(18.6%)	43(100%)		
ATR†	23(100%)	0(0%)	23(100%)		
Occupational Status					
Unemployed	113(71.5%)	45(28.5%)	158(100%)	Fishers'=70.326	<0.0001*
Civil/public servant	27(51.9%)	25(48.1%)	52(100%)		
Business/trade	85(75.9%)	27(24.1%)	112(100%)		
Student	15(20.5%)	58(79.5%)	73(100%)		
Retiree	6(75%)	2(25%)	8(100%)		
Level of Education					
None	47(92.2%)	4(7.8%)	51(100%)	$\chi^2=93.925$	<0.0001*
Primary	42(85.7%)	7(14.3%)	49(100%)		
Secondary	97(74.6%)	33(25.4%)	130(100%)		
Tertiary	60(34.7%)	113(65.3%)	173(100%)		
Ethnicity					
Bini	111(64.9%)	60(35.1%)	171(100.0%)	$\chi^2=21.983$	0.001*
Esan	39(53.4%)	34(46.6%)	73(100.0%)		
Ibo	24(44.4%)	30(55.6%)	54(100.0%)		
Yoruba	22(51.2%)	21(48.8%)	43(100.0%)		
Hausa	27(87.1%)	4(12.1%)	31(100.0%)		
Others	23(74.2%)	8(25.8%)	31(100.0%)		
Total	246(61.0%)	157(39%)	403(100.0%)		

*Statistically significant, †ATR=African Traditional Religion

DISCUSSION

The study findings showed that the prevalence of Self-medication for tooth-ache among the Dental patients was 61% (246 patients), which was high. The predictors for self-medication were Age category, educational level, occupational status and ethnicity. The results of the evaluation of the self-medication practices of dental patients with toothache presenting to the Central Hospital Benin, are discussed in line with the study objectives in the following sections.

Prevalence of Self-Medication

The prevalence of 61% in this study was higher than 49.6% recorded in a similar study conducted at the Oral Diagnosis clinic of the Dental Centre, University of Benin Teaching Hospital (Olawuyi et

al., 2018). The prevalence in this study was also higher than the 45.5% reported amongst dental out-patients in a tertiary hospital in Lagos State, Nigeria (Olawuyi et al., 2018), and 41.5% reported by Afolabi et al (2010) in a study in Ondo State dental services. It is to be noted that the studies by Okoh & Enabulele (2017), Afolabi et al. (2010) and in the study in Ibadan were conducted among patients who sought relief from oral health problems was not restricted to toothache. This could explain the lower figures obtained in these studies. Also, the differences in the prevalence of the previous studies in Nigeria, could be ascribed to the differences in socio-demographic characteristics of the study population. However, the prevalence recorded in this study was lower

than the 80.6% reported in Niger Delta by Anyanechi & Saheeb (2014) who restricted their investigation to patients that presented with only toothache. In contrast, the lower prevalence in our study may be attributed to the presence of two major tertiary hospitals in the city center with functional dental clinics, thus reducing the need to self-medicate.

The prevalence in this study was also lower than the 76 % reported in Pakistan, which could be due to differences in demographic characteristics of the Benin and Pakistani study populations; as well as socio-economic factors such as proximity to nearest health post/medical store, cheapness/affordability of drugs and belief in

herbal system of medicines which were reported in the Pakistani study. Also, the prevalence recorded in this study was comparable to the 67.8 % recorded by Agbor & Azodo (2011) in a community-based survey of self-medication for oral health problems in Cameroun. As shown in table 6, the most self-medicated drugs were analgesics (40.1%) and antibiotics (31.9%). The most self-medicated analgesics was Paracetamol (45.2%) which was followed by Ibuprofen (22.2%). For the Antibiotic use, Amoxycillin (21.5%) and Ciprofloxacin (14.6%) were the most self-medicated antibiotics. As shown in figure 2, 121 (49.2%) of the out-patients who self-medicated engaged in multi-drug combination.

Table 2: Unadjusted Binary Logistic Regression of Predictors of Self-medication

Variable	Ref Cat.	B	OR(95 CI%)	P value
Sex				
Male	Ref			
Female		0.715	2.043(1.333-3.140)	0.001*
Age Category				
18-24		-0.741	0.477(0.252-0.902)	0.023*
25-34		-1.124	0.325(0.174-0.607)	<0.0001*
35-44		-0.384	0.681(0.319-1.456)	0.322
≥ 45	Ref			
Marital Status				
Married	Ref			
Single		-1.065	0.345(0.223-0.532)	<0.0001*
Separated/Divorced		1.584	4.875(0.618-38.452)	0.133
Widowed		0.581	1.788(0.643-4.973)	0.266
Religion				
Christianity	Ref			
Islam		1.243	3.467(1.562-7.698)	0.002*
ATR		20.97	1280349759.533(0-.)	0.998
Occupational Status				
Unemployed	Ref			
Civil/public servant		-0.844	0.43(0.226-0.819)	0.010*
Business/trade		0.226	1.254(0.72-2.181)	0.424
Student		-2.273	0.103(0.053-0.2)	<0.0001*
Retiree		0.178	1.195(0.232-6.141)	0.831
Level of Education				
No Formal education	Ref			
Primary		-0.672	0.511(0.14-1.868)	0.31
Secondary		-1.386	0.25(0.084-0.747)	0.013*
Tertiary		-3.097	0.045(0.016-0.131)	<0.0001*
Ethnicity				
Bini	Ref			
Esan		-0.478	0.62(0.355-1.082)	0.093
Ibo		-0.838	0.432(0.232-0.805)	0.008*
Yoruba		-0.569	0.566(0.288-1.113)	0.099
Hausa		1.294	3.649(1.219-10.918)	0.021*
Others		0.441	1.554(0.655-3.686)	0.317

*Statistically significant

Table 3: Adjusted Binary Logistic Regression of Predictors of Self-medication

Variable	Ref Cat.	B	OR (95CI%)	P value
Sex				
Male	Ref			
Female		-0.564	1.757(0.994-3.104)	0.052
Age Category				
18-24		0.969	2.636(0.910-7.638)	0.074
25-34		0.257	1.293(0.534-3.312)	0.569
35-44		0.369	1.446(0.529-3.952)	0.472
≥ 45	Ref			
Marital Status				
Married	Ref			
Single		-0.34	0.712(0.344-1.474)	0.360
Separated/Divorced		1.606	4.985(0.53-46.911)	0.160
Widowed		0.528	1.695(0.485-5.932)	0.409
Religion				
Christianity	Ref			
Islam		-0.543	0.581(0.126-2.687)	0.487
ART		19.329	247894959.391(0-.)	0.998
Occupational Status				
Unemployed	Ref			
Civil/public servant		-0.112	0.894(0.397-2.01)	0.786
Business/trade		0.099	1.104(0.541-2.252)	0.785
Student		-1.363	0.256(0.116-0.564)	0.001*
Retiree		0.197	1.218(0.183-8.108)	0.838
Level of Education				
No Formal education	Ref			
Primary		-0.245	0.782(0.159-3.851)	0.763
Secondary		-0.525	0.592(0.139-2.515)	0.477
Tertiary		-1.909	0.148(0.034-0.644)	0.011*
Ethnicity				
Bini	Ref			
Esan		-0.996	0.369(0.183-0.747)	0.006*
Ibo		-1.112	0.329(0.154-0.702)	0.004*
Yoruba		-0.503	0.605(0.238-1.535)	0.290
Hausa		0.563	1.756(0.252-12.259)	0.570
Others		0.388	1.474(0.491-4.422)	0.489

Factors associated with self-medication

There was a significant difference in the proportion of males and females that self-medicated in this study ($\chi^2=10.790$, $p=0.001$), as there was a greater proportion of females (109/153) who self-medicated compared to males (137/250). In the unadjusted logistic regression, the females had two times the odds to self-medicate compared to males. This result was in agreement with Afolabi et al. (2010) and Olawuyi et al (2018) who observed that 54% of females practice self-medication compared to 37% of males. The result from this study however contrasts that by Baig et al (2012), Okoh & Enabulele (2017) and Anyanechi & Saheeb (2014) who reported a higher percentage of male participants practicing self-medication when compared to female participants. In line with this, the unadjusted binary logistic regression indicated that males had lesser the odds compared to females of self-medicating ($p=0.001$). On adjusted logistic

regression sex of study participant was almost significantly associated with self-medication.

The literature shows that the prevalence of self-medication practices varies from place to place depending on the study population, and the age group under consideration (Bown et al., 2000; Afolabi et al., 2010; Al-Ramahi, 2013; Okoh & Enabulele, 2017). The age group with the highest prevalence or proportion of patients with self-medication was ≥45 years, however adjusted logistic regression indicated that patients who were within the age bracket 18-24 years of age have 3 times the odds to self-medicate compared to patients ≥45 years, although this was not statistically significant. Also, patients in the age categories of 25-34 and 35-44 had more odds of self-medicating compared to patients ≥45 years, which was also not statistically significant. This finding is similar to that reported by Al-Qahtani et al (2019) who observed that the highest prevalence of self-medication was observed in patients aged 18- 30 years. Also, the findings in this

study are in agreement with Agbor & Azodo (2011) who found that prevalence of self-medication increased with increasing age climaxing at 21–30 years and decreased thereafter with the lowest level among the elderly. The reason for pattern observed in this study, could be due to the fact that at this age, young people are more likely to resort to informal personal health-care seeking behaviour, seeking health information by Internet browsing / social media and magazines. Also, this age-category of patients could be more likely to engage in substance abuse, experiment with drugs, have poor health-seeking behaviour and low medication literacy which predisposes them to self-medication (Lee et al., 2017). This finding is in contrast with results from studies by Anyanechi & Saheeb, 2014; Olawuyi et al., 2018; Idowu et al 2019 and Bhattarai et al 2020 who observed the trend that patients were more involved in self-medication as they approached middle age.

In this study, marital status and religion were not significant predictors of self-medication; this has also been shown to be the case in other studies conducted in Nigeria (Anyanechi & Saheeb, 2014; Okoh & Enabulele, 2017; Olawuyi et al., 2018; Idowu et al 2019). Although tradesmen/ men and women in business had the highest proportion of self-medication, unadjusted binary logistic regression indicated that Civil servants/ public servants and Students had statistically significantly lesser odds of self-medicating compared to unemployed patients. Adjusted logistic regression further indicated that Students had 0.256 ($p=0.001$) the odds of self-medicating compared to the unemployed i.e. were less likely to self-medicate compared to the unemployed.

The reason for this may be attributed to the fact that the unemployed usually tend to be socio-economically deprived, just as studies have shown that socio-economic factors are major contributors to self-medication practices, with lower income being associated with the tendency to engage in self-medication (Anyanechi & Saheeb, 2014; Okoh & Enabulele, 2017). Another reason for this finding could be that toothache is not being taken seriously by people with low-economic resources or lower class, which could be compounded by systemic issues of the time constraint and time wasting before consultation. This may be due to the ignorance of the people about dental issues and the profession, coupled with the slow consultation process in the clinics in our environment.

Educational level was significantly associated with self-medication, as dental patients with tertiary education had the least proportion of those who

self-medicated. This result was in contrast to findings from other studies that indicated a positive relationship with educational status and the inclination to self-medicate. For instance, Al-Qahtani et al. (2019) had a majority of those with oral health problems who practised self-medication were those with a bachelor's degree. Olawuyi et al (2018) in their study showed that there was a positive association between level of education among the respondents and self-medication practice, which was similar to findings from other studies (Baig et al., 2012; Okoh & Enabulele, 2017). In agreement to this study's finding, another study on self-medication for oral and dental problems in India suggested that lack of education could be a contributory factor towards self-medication (Gandhi et al., 2016), which is apparently the case in this study. Similarly, another study conducted in North-Eastern Nigeria (Idowu et al., 2019) showed a higher level of self-medication among less educated and low socio-economic classes of people. In trying to understand the reason self-medication was more prevalent among the lesser educated in this study, it is important to note that those who were mostly into trade and lower occupations had more odds of self-medicating compared to Civil and public servants that require higher education. Taken together, that is, educational level and type of job; it is possible that access to dental consultation through the National Health Insurance Scheme by the civil servants compared to those in informal sector, (for example traders/self-employed) of the economy may be responsible for less dependence on self-medication for managing dental complaints among the highly educated (Idowu et al., 2019).

The Esan and Igbo tribes were found to be significantly less associated with self-medication compared to the Binis, which implies that conversely that the Binis are more likely to engage in self-medication than these tribes. In line with this finding, Ghandi et al. (2016) observed in their study that cultural factors could be in play in explaining self-medication. Thus, demographic and socio-cultural factors may contribute to differences when comparing the result of this study with researches conducted in different regions. Traditionally, the Binis are known for alternative and unorthodox pharmacology in treating maladies, and the fact that the Central hospital environs is centered around traditional grounds (Ogbe quarters, a district close to the palace of the Oba of Benin) may account for the reason the Binis sampled in this study displayed a predisposition towards self-medication.

Table 4: Frequency and Reasons for Self-medication for toothache

SN	Item	Frequency (n%)
1.	How many times in the last month did you take medications without doctor's prescription?	
	Once	36(14.63%)
	Twice	56(22.76%)
	More Than 2 times	154(62.61%)
	Total	246(100%)
2.	Why do you self-medicate?	
	Lack of Access to dental services	50(15.14%)
	Financial Problems	44(13.25%)
	Previous Prescription	29(8.73%)
	Lack of Time due to Work	42(12.65%)
	Traditional/Religious belief	12(3.61%)
	Non-availability of Doctors	9(2.74%)
	Advice from Family and Friends	29(8.73%)
	Never had counseling on self-medication	7(2.44%)
	Knowledge of Diagnosis	14(4.42%)
	Nearness to Chemist	53(15.95%)
	Advertisement	29(8.73%)
	Fear of Dentist	12(3.61%)
	Total	332(100%)*

*Multiple entries for the reasons totaled above 246

Table 5: Effects of self-medication and Sources of drugs

SN	Item	Frequency(n%)
1.	Side effects of self-medication	
	Stomach Ache	59(23.98)
	Blood/Melena Stool	4(1.63)
	Nausea And Vomiting	20(8.13)
	Diarrhoea	33(13.42)
	Drug Resistance	20(8.13)
	Other	19(7.72)
	None	91(36.99)
2.	How do you feel after taking self-medications?	
	Temporary relief	109(44.30)
	Effective	40(16.26)
	Useful in stressful situation	50(20.33)
	Unsure about the effect	47(19.11)
3.	Who recommended the Drugs for you?	
	Relatives	87(35.36)
	Friends	57(23.17)
	Personal Knowledge	38(15.45)
	Pharmacist	36(14.63)
	Mass media	7(2.85)
	Traditional healer	12(4.88)
	Others	9(3.66)
4.	How did you know the dosage of the drugs?	
	Used a previous prescription	48(19.51)
	Enquired from the seller	140(56.91)
	Informed by a friend	24(9.76)
	Read on the packaging	31(12.60)
	Any other	3(1.22)
5.	*Source of Drugs	
	Pharmacy Shops	91(33.23)
	Patent Medicine Store	105(38.32)
	Shops	7(2.55)
	Traditional Home	12(4.38)
	Commercial Buses	11(4.01)
	Parks	3(1.09)
	Health Workers	8(2.92)
	Others	8(2.92)
	Left Over Drugs from Relative And Previous Prescription	29(10.58)

6. Do you know that the drug you took can cause some unwanted reactions to the body?	
Yes	66(26.83)
No	180(73.17)
Total	246(100.00)

multiple entry

Table 6: Orthodox drugs used for self-medication

Group /name of drug used†	Frequency (%)
Classification of Self-medicated drugs	
Analgesics	171(40.14%)
Native herbs	60(14.08%)
Antibiotics	136(31.93%)
Salt and hot water	54(12.68%)
Others	5(1.17%)
Total	426(100%)*
Name of drugs used	
Analgesics	
Aspirin	32(13.39%)
Diclofenac	21(8.79%)
Ibuprofen	53(22.18%)
Indomethacin	10(4.18%)
Paracetamol	108(45.19%)
Piroxican	15(6.28%)
Total	239(100.0%)
Antibiotics	
Amoxycillin	106(21.50%)
Ampicilin	27(5.48%)
Ampiclox	56(11.36%)
Augumentin	42(8.52%)
Cefuroxime	59(11.97%)
Ciprofloxacin	72(14.60%)
Co-Trimazole	19(3.85%)
Doxycyclin	14(2.84%)
Erythromycin	43(8.72%)
Flagyl	32(6.49%)
Tetracycline	23(4.67%)
Total	493(100.0%)

† A list of drugs was provided to aid in the identification of drugs , ---Single or Multiple use

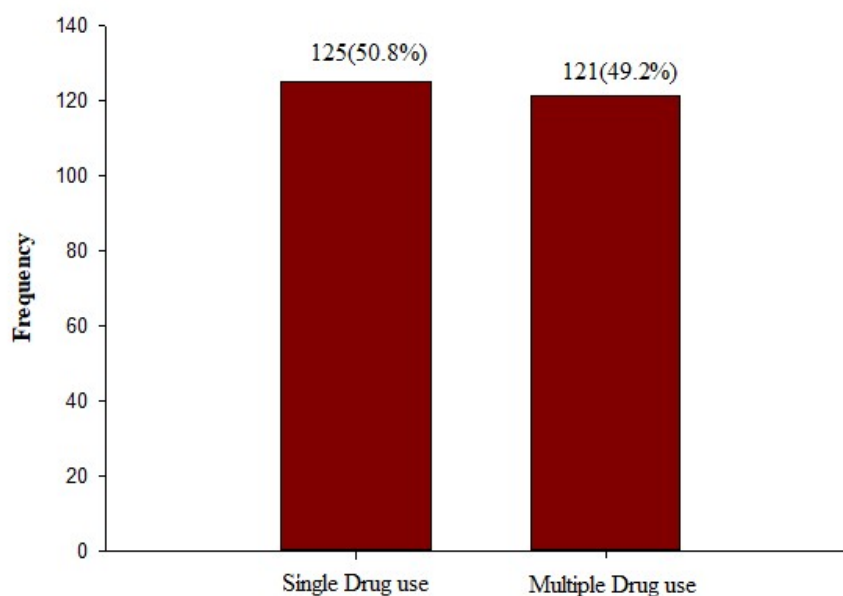


Figure 2: Drug combination among respondents who self-medicated

Sources and Drugs/medicines used in self-medication

In this study, analgesics 171(40.1%) and antibiotics (31.9%) were the most self-medicated drugs. This may be due to the fact that analgesics and antibiotics are widely available and easily procured over the counter in third world countries like Nigeria, as has been confirmed in results from previous studies conducted in Nigeria and other third world countries (Agbor & Azodo, 2011; Anyanechi & Saheeb, 2014; Okoh & Enabulele, 2017; Olawuyi et al., 2018). Self-medication risks in developing countries have been associated with the fact that prescribed drugs are easily obtainable over-the-counter, which is the case in this study, as pharmacies and patent medicine stores were major sources of drugs. The fact that self-medicated drugs were mostly sourced from pharmacies and patent medicine is due to drug regulations for self-medication being limited or weakly enforced (Al-Qahtani et al., 2019).

The present study also highlights the fact that patent medicine dealers and pharmacists are major actors in self-medication practice among the lay public as the major sources of the drugs were Patent Medicine Stores: 105(38.3%) and Pharmacy Shops: 91(33.2%). This is due to the fact that pharmacists and patent medicine dealers in developing countries are consulted for any form of health problem because of their easy accessibility, fast services and no consultation fee. Similar finding was also observed by Gandhi et al. (2016) and Agbor & Azodo (2011).

This is also consistent with the findings of other studies which attributed the high prevalence of self-medication to the ease of access to over-the-counter (OTC) drugs and the presence and pharmacies among other reasons. Equally worrisome from this study is the use of herbal/traditional drugs for dental complaints by 14.1% of the study respondents, which have been previously reported in other studies (Afolabi, 2008; Agbor & Azodo, 2011; Okoh & Enabulele, 2017; Idowu et al., 2019). Though these remedies are easily accessible and affordable, they have no proven dosage, duration or clinical usefulness, neither have their side effects been documented. This could worsen an existing dental complaint and overall health of the patient. Other studies in Nigeria reveal the use of herbal remedies from traditional healers and plant products when dealing with a broad range of oral health concerns from ethno-medicine survey use of plants in the treatment of oral ailments like toothache, plaque and caries, pyorrhea and aphthae (Agbor & Azodo, 2011; Okoh & Enabulele, 2017).

Of note in this study, the second most common reason given for self-medication was lack of access to dental services, which was followed by financial problems and Lack of time due to work. This finding is corroborated by results from similar studies done in Africa and in under-developed climes (Agbor & Azodo, 2011; Anyanechi & Saheeb, 2014; Gandhi et al., 2016; Olawuyi et al., 2018; Idowu et al., 2019; Bhattarai et al., 20220) where scarce resources, time constraint, cost of visiting the physician and limited purchasing power are major reasons for patients engaging in self-medication practices. These could be the reasons pharmacies and patent medicine stores are consulted by the study respondents, as previous studies have reported that they are seen as cost-effective and time-saving, or perceptions that the problem as being too trivial to necessitate making an appointment with a healthcare professional, and in other cases people having few or no other options (Geissler et al., 2000; Ezeoke, 2009; Anyanechi & Saheeb, 2014; Okafor et al., 2017; Esan et al., 2018).

The most self-medicated analgesics was Paracetamol which was followed by Ibuprofen, while for the antibiotics, Amoxicillin and Ciprofloxacin were the most self-medicated. Okoh and Enabulele (2017) reported the commonest analgesics were Paracetamol and Diclofenac while the commonest antibiotic reported was Ampiclox; Anyanechi and Saheeb (2014) reported the most commonly abused substances/medication were analgesics/NSAID (Aspirin, Panadol/Cataflam) and antibiotics (ampiclox, amoxicillin). However, a study conducted among adults living in Riyadh, Saudi Arabia, found the use of salt in hot water and paracetamol, as the most frequent self-medication choices.⁹¹ Paracetamol being the most commonly used analgesic in this study, could be explained as it is cheap, readily available and is a household remedy for pain across all social strata in Nigeria.

Of serious concern is the fact that about half of the respondents who self-medicated (49.1%) in this study engaged in multi-drug administered self-therapy which involved taking analgesics in combination with antibiotics. This figure is higher than the 24.1% recorded for those who adopted multi drugs use for self-medication in a similar study conducted at the University of Benin teaching Hospital (UBTH) (Okoh & Enabulele, 2017).

In this study, most of the dental patients who self-medicated did that on the recommendation of relatives and friends, as corroborated in a study⁵² which showed that lay people, particularly family members, relatives or friends are popular advisors, which is usually based on their experience in using

either prescribed or non-prescribed medicines (Major et al., 2007). From this study, personal knowledge also influenced involvement in self-medication, while the dosage of the drugs was mostly derived through enquiry of the seller, which was followed by Dosage regimen based on a previous prescription. This study's finding is similar to reports in other studies where previous knowledge acquired either through advertisement, patent medicine sellers or friends, previous experience of the illness, the perception of illness and incessant advertising of drugs, knowledge of the treatment of the disease influenced self-medication (Loyola Filho. 2004; Schwenkglenks, 2007; Fakeye et al., 2010; Verma et al., 2010; Auta et al., 2012).

Respondents' perception of Self-medication outcome and Side Effects of Self-Medication

In this study, a majority of the patients who self-medicated for toothache experienced side effects. The most common side effects were stomach ache, diarrhea and nausea/vomiting. Also, a lot of the patients (109) reported temporary relief from self-medication, 50 (20.3%) found it useful in a stressful situation, while 40(16.3%) found the experience effective. The varied nature of respondents' experiences with self-medication for oral health problems may be explained by the severity of toothache, and the drugs utilized for self-medication. Similarly, in the study by Agbor and Azodo (2011) the description of respondents' experiences with self-medication for oral health problems included temporary relief of pain, useful in a stressful situation, effective, curative in nature and no felt effect.

CONCLUSION

Based on the study findings the following conclusions are made:

1. There is a high prevalence of self-medication (61%) among dental patients presenting with toothache to the Dental Clinic at the Central Hospital, Benin City, Nigeria.
2. Age, Educational status, Occupational status and Ethnicity are significant predictors of Self-medication due to Toothache.
3. Analgesics and antibiotics were the most self-medicated drugs.
4. The main reasons for self-medication were nearness to chemist/pharmacy shops, lack of access to dental services, financial problems and lack of time due to work.

5. The major sources of the self-medicated drugs were Patent Medicine Stores and Pharmacy Shops.
6. A lot of the patients had temporary relief from self-medication while some found it useful in a stressful situation.
7. Most of the patients had side-effects due consumption of self-medicated drugs, with stomach ache the most common side-effect, while 66% of the study respondents were aware of the adverse side effects of self-medication.

LIMITATION OF THE STUDY

The study was limited by its cross-sectional nature and also the fact that results were based on self-reported assessment by respondents. Efforts were made to ensure accuracy in recollecting self-reported practices especially in the instance of stating self-medication drugs by presenting respondents with a list of drugs alongside pictures of drug labels.

RECOMMENDATIONS

1. The use of drugs without doctor's prescription should be discouraged using public-health campaigns to increase the awareness of dangers of self-medication on social media, print and electronic media.
2. The availability of and accessibility to antibiotics and analgesics over the counter without prescription by authorized health professionals should be discouraged because this can lead to issues of inadequate dosing and antibiotics resistance may arise
3. The Pharmaceutical Society of Nigeria should regulate and check the activities of Patent medicine dealers and Pharmacy Shops to reduce to the barest minimum the availability and accessibility of drugs without prescription.
4. The Government as a major stakeholder should formulate policies aimed at bringing Oral Health Care to the grassroots by engaging with Primary Healthcare Centers. Also, legislation to enforce sales of drugs only on doctor's prescription should be passed at the State and Federal houses of assembly.
5. There is a need for reorientation of the public through public health campaigns as complications emanating from the use of these substances can be very harmful.

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