

Self-Medication of Prescription Only Non-Steroidal Anti-Inflammatory Drugs among Households in Alimosho LGA, Lagos State, Nigeria

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Abstract

The purpose of this study is to determine the knowledge, attitude, and practice of self-medication of NSAIDs among adults in Alimosho Local Government Area (LGA) of Lagos State. The study is descriptive inferential form cross-sectional study that involved collection of data from adults in the LGA. The data collected from questionnaires administered to adults who were randomly selected across the LGA was analyzed to evaluate the association between demographic characteristics and knowledge, attitude, and practice of self-medication. The respondents who participated in the research were adults who were 18 years and above. Of the 652 respondents 50.8% were males and while 49.2% were females. Demographic profile and Information sources were tested for association with self-medication. Among respondents, 80.6% admitted that they are self-medicated, and a binary logistic regression was performed to ascertain the effect of gender, age, marital status, and educational attainment on the likelihood of respondents engaging in self-medication. The overall logistic regression was statistically significant, $\chi^2(1) = 24.824, p < 0.005$. The model explained 10.2% (Nagelkerke R^2) of the variance in self-medication and correctly classified 80.4% of cases.

Keywords: Alimosho, Attitude, Knowledge, Lagos State, NAFDAC, NSAID, Perception, Self-medication.

Introduction

Non-Steroidal Anti-inflammatory Drugs (NSAIDs) are a class of drugs approved by NAFDAC in Nigeria for use as analgesics, antipyretic and anti-inflammatory agents and for the treatment of pyrexia, gout, arthritis, dysmenorrhea migraines and muscular pain [1]. The chemical structure and the selectivity properties are the basis for the typical division of NSAIDs. The various classes of NSAIDs in use in Nigeria is based on their non-selective nature and structure such as the acetic acids made up of indomethacin, diclofenac, propionic acids made up of ibuprofen, ketoprofen and naproxen, enolic acids made up of meloxicam and piroxicam, acetylated salicylates such as aspirin, anthranilic acids

made up of mefenamic acid and meclofenamate. Others are classified based on their selectivity such as Celecoxib and etoricoxib [2]. NSAIDs therapeutic action comes from the inhibition of the cyclooxygenase (COX) enzyme which is required for the conversion of arachidonic acid into eicosanoids such as prostaglandins, thromboxanes, and prostacyclins. The inhibition of COX by NSAIDs affects the platelet adhesion caused by thromboxanes, vasodilation caused by prostaglandins and temperature increase. NSAIDs are broadly classified into Non-selective and Selective NSAIDs, and this categorization is in the ability of NSAIDs to inhibit certain types of COX enzymes which are primarily COX-1 and COX-2.

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The Non-selective NSAIDs such as Diclofenac, Aspirin, Naproxen and Ibuprofen are able to inhibit the COX-1 and COX-2 enzymes while the selective NSAIDs such as lumiracoxib, Celecoxib selectively inhibit COX-2 enzymes found at inflammatory sites and COX-2 found in blood vessels, platelets and even the stomach [2].

The use of NSAIDs as single or combined dose in the relief of pain over an extended period is associated with the progressive development of certain kidney diseases. Studies have shown that diphenylamine which is found in NSAIDs decreases hepatic adenosine triphosphate (ATP) content, uncouples oxidative phosphorylation, and may cause hepatocyte injury. Inappropriate use of NSAIDs could also result in a broad spectrum of injuries and harms such as overdose, cardiotoxicity, hepatotoxicity, gastrototoxicity, nephrotoxicity and death thereby reducing quality of life and increasing burden on public healthcare systems in the country [2, 3]. The challenges associated with self-medication require increased patient and public health education, improved awareness among drug distributors, pharmacies, patent medicine dealers and attendants with regards to inappropriate use of NSAIDs [2, 3].

Several studies have highlighted the increasing trend of inappropriate use of NSAIDs, and this may be attributed to increasing accessibility to prescription only NSAIDs, availability of information for self-care, easy accessibility to online health information, advertisement, neighbors, friends and family advise, unaffordable cost of conventional healthcare, and advise from non-professionals on some of the NSAIDs [2, 4]. The ease of accessibility to prescription NSAIDs can lead to multiple drug use with the consequent adverse drug reaction and drug-drug interactions. For this reason, Section 16b of the NAFDAC Drug Labelling Regulation [5, 6] prohibits the inclusion of pictures on the packs of POMs as this may advertise the product to the patient thereby increasing the exposure of

prescription NSAIDs to the patient and lead to serious consequences resulting from Chronic use without doctors advise.

Materials and Methods

The study was conducted in Alimosho Local Government Area (LGA) of Lagos State. Alimosho LGA is the largest LGA in Lagos State with coordinates of 6° 36'38" N 3° 17'45" E is made up of a population of 2,047,026 people (1,099,656 males and 947,370 females). It is majorly a sub-urban district in Lagos that occupies a 183 km² area and a population density of 14,812/km². The population in this LGA is a mix of various professionals, artisans, businesspersons, and students from various ethnic groups. Alimosho LGA is the Largest Local Government Area in Lagos State within the Ikeja Division. The Yoruba and English languages are the most spoken language while Islam and Christianity are the two major religions practiced in the area. Alimosho LGA is surrounded by Ogun State in the Northwest and Western area, Ifako-Ijaiye on the Northeast, Agege, Ikeja and Oshodi-Isolo on the East and Amuwo-Odofin and Ojo LGAs in the South. The LGA is sub-divided into six Local Community Development Areas (LCDA) namely Egbeda/Akowonjo LCDA; Ikotun/Igando LCDA; Egbe/Idimu LCDA; Ayobo/Ipaja LCDA; Mosan Okunola LCDA; Agbado/Oke-odo LCDA [7].

Study Design and Study Population

This study is a descriptive inferential cross-sectional study with a population comprising of residents selected randomly using convenient sampling from various Enumeration Areas within the six LCDAs in the LGA. The inclusion criterion for the selection of participants was that they had to be permanent residents of the local government for at least one year and are 18 years and above.

Inclusion and Exclusion Criteria

The inclusion criteria for the study would be:

1. Those who gave consent to participate.

2. Those who are 18 years and above.
3. Those who have resided within the area for one year and above.
4. Those who have used any type of NSAID.

The Exclusion Criteria:

1. Those who declined to participate.
2. Those who are below 18 years.
3. Those who have not resided in the area for up to one year.
4. Those who have not used NSAIDs.

Sample Size Determination

The primary data was derived from a sample size determined using the Kish Leslie formula as prescribed by the EpiInfo for descriptive studies which is $n = Z^2 Dp (1-p)/e^2$. This involved the use of the 95% Confidence Interval which falls within Z corresponding to 1.96 standard deviations for 5% alpha error and to produce a conservative sample size within a precision (e) of 5%. The estimated proportion or prevalence within the target population prevalence (p) was set at 0.5. A complex sampling design that is made of clusters of LCDAs was adopted and as such to correct for difference in design and loss of sampling efficiency, a design effect (D) of 1.5 was assumed [8, 9].

$$n = \frac{Z^2 Dp(1-p)}{e^2}$$

n = estimated sample size.

D = design effect.

p = the estimated proportion or prevalence within the target population at the time of the first survey, because of the nonavailability of such, 0.5 is used.

$Z_{1-\alpha}$ or Z = Describes the level of uncertainty in the sample mean or prevalence as an estimate of the population mean or prevalence. This is put at 1.96 (for 95% confidence level); and

e = precision at 0.05.

$$\begin{aligned} n &= \{(1.96)^2 \times 1.5 \times 0.5(1-0.5)\} / (0.05)^2 \\ &= \{(3.8416 \times 1.5 \times 0.25)\} / 0.0025. \\ &= 1.4406 / 0.0025. \\ &= 576.24. \end{aligned}$$

Sampling Technique

In this study, a probability sampling technique was used that considered equal allocation across the six LCDAs that constitute Alimosho LGA. The National Population Commission (NPC) was contacted to provide the list of Enumeration Areas (EAs) which was based on 2006 National Population Census conducted by the NPC. The list of EAs obtained was used in determining the various communities/enumeration areas from which select EAs would be visited. LCDAs were paired in twos depending on proximity and each of the pairs were broken down into fifteen EAs each. A total of 45 EAs were purposively sampled with a sample size per EA as 15 per EA. Adult listing per LCDA were used by trained Research Assistants disaggregating the list by Gender and Enumeration Areas (EAs). Respondents at EA levels were selected based on the inclusion and exclusion Criteria.

Instruments and Measures

An approved standardized questionnaire was used to elicit information from randomly selected respondents. The questionnaire was used to quantify the demographic characteristics, the knowledge, attitudes, and practices of use of NSAIDs, associated risks of self-medication and adverse reactions to NSAIDs. It was also used to elicit information on the information sources for patients, purchase, and use of NSAIDs and ascertain the sources of medication. This survey involved the use of smart phones that had CSPro downloaded and installed on them. The software called CSPro (Census and survey Processing system) for Laptop/desktop and an App CSEntry (Phone App) was developed by United States Census Bureau and ICF international. The CSEntry was downloaded as a user-friendly and easy to use free software for data entry, editing, manipulation, tabulation dissemination, thematic and Global Positioning System (GPS) mapping [10].

Data Collection and Analysis

The CSentry was used to elicit responses from eligible respondents randomly selected from the sampling frames in the LGA. Potential participants were screened to determine how eligible they were to participate in the study. Explanation was made to those who are not eligible on why they were not selected. The eligible respondents received information from the Participant Information Sheet on confidentiality and asked to sign the Informed Consent form which would then be retained by the researchers [11]. The RAs were divided into three groups of five assistants inclusive of a Team Leader to cover two LCDAs during the period. The LCDAs were divided into already existing communities using the National Population Commission Enumeration List. The RAs were instructed to spread across each town to collect data. They were made to randomly select households with a spread monitored by the GPS monitoring application on the CSPro.

The survey data obtained from field activities and stored in the cloud server (Dropbox) were cleaned and edited and then read into SPSS version 25.0 for analysis. Chi-squared tests and non-parametric descriptive analysis were employed for the evaluation of association between demographic characteristics and knowledge, attitude, and practice of self-medication. The study involved the use of univariate statistics to describe the study sample and medication information sources that were collected. Also, a binary logistic regression analysis was used to model relationships between respondents' demographic, literacy and socio-economic variables and medicine information sources [11].

Ethical Consideration

Necessary ethical approval(s) were obtained from the Institutional Review Board based in the Nigeria Institute of Medical Research for the study. Beneficence, informed consent, privacy and right to voluntary withdraw from

the study by participants was respected during the research. Respondents were given a Participant Information Sheet to read and properly informed and briefed on the nature of the study, their rights to confidentiality, Informed Consent, and completion of the questionnaire. Each respondent was given an Informed Consent Form before the administration of the questionnaire and high priority was given to respondents' confidentiality [11].

Results

The respondents who participated in the research were adults who were 18 years and above. Of the 652 respondents 50.8% were males and while 49.2% were females. Twenty seven percent (27%) of the respondents were between 18-25 years, 53.2% were between 26-49 years, 15.2% were between 50-64 years while 4.4% were above 64 years of age. Majority of the respondents were of the Christian Religion (72.9%), Islam made a 24.8%, Traditional religion were 1.1% and the remaining respondents made up 1.3% of the respondents. 55.8% of the respondents stated that they were married while 39.3% were singles while 5% of the respondents were either widowed, separated or co-habiting with sexual partners. Fifty seven percent (57%) of respondents had their highest educational attainment as secondary education while 27.5% had one form of tertiary education or the other. Eleven percent (11%) had primary education while 3.8% had no formal education. 54% were businesspersons, 21.6% were artisans, 15.5% were students, 6.4% were civil servants and 2.5% unemployed. Ninety-four percent (94%) of the respondents have stayed at least a year in the Local Government Area. Eighty six percent (86%) of respondents indicated that they knew what NSAIDs were with 81.7% stating that they took pain killers. Sixty-two percent of those who knew and took NSAIDs responded that they did not take NSAIDs based on a doctor's prescription. In this study, 59.5% of

the respondents are aware that NSAIDs can cause side effects with 62.3% experiencing side effects and 56.6% experiencing one level of side effect or the other.

To understand the attitude of respondents towards self-medication, several questions were asked the respondents and 78.2% of respondents agree it is always necessary to consult a medical professional before taking any medicines for ailments. When asked about awareness of the hazards of self-medication, 81.9% accepted that they knew that it was risky to practice self-medication.

Respondents who self-medicated NSAIDs were asked for the reasons why they self-medicated NSAID, 16.4% said that they did because it was a minor pain, 3.5% responded that there was no readily accessible doctor, 5.4% stated that non-medical personnel

informed them that the NSAIDs works. 15.4% stated that they had a previous experience of using the same NSAID to treat pain while 12.8% stated that the drug was effective after their previous experience of use. Among the respondents, 5.4% stated that the pain they were experiencing was too much to bear so they opted to self-medicate. Eighteen percent of the respondents claimed that it was cheaper to treat themselves than visit a medical facility. Five percent of those who responded stated that the pictorial representation on the medicine made them conclude that the drug will help treat their pain.

On the kind of NSAID that they self-medicate, Ibuprofen was the highest with 29% of respondents admitting the use of Ibuprofen for self-treatment while Diclofenac had a 27.3% use.

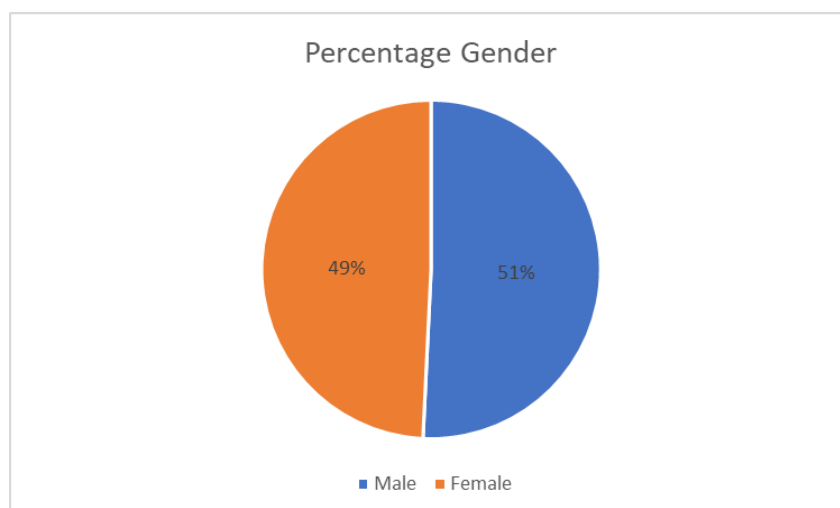


Figure 1. Gender Proportion of Respondents

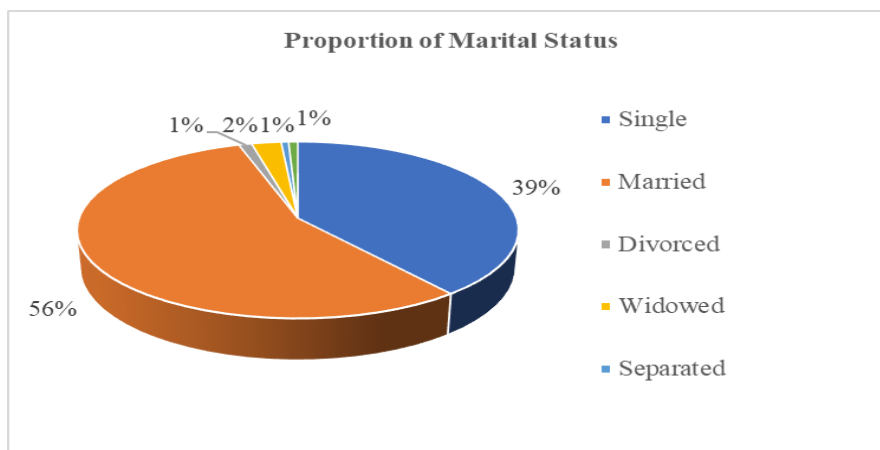


Figure 2. Marital Status Proportion of Respondents

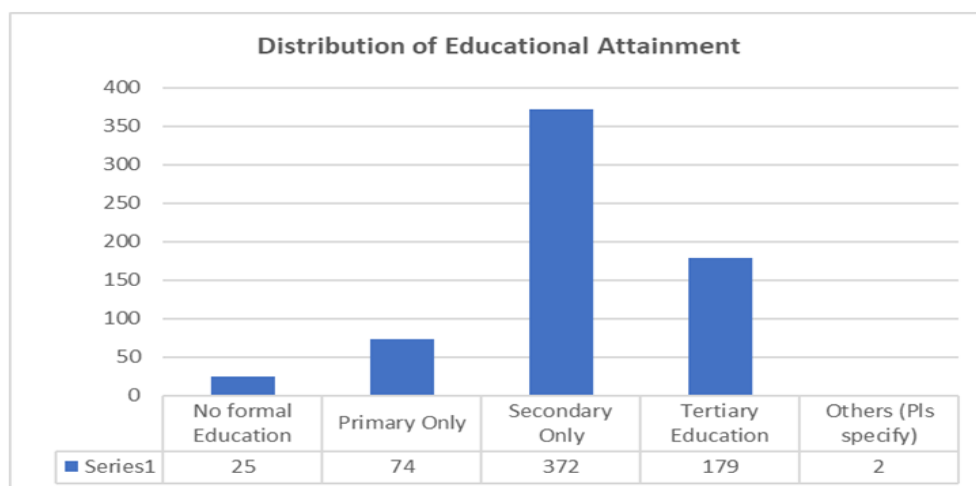


Figure 3. Level of Educational Attainment

Table 1. Demographic Characteristics of Respondents

Gender		
Variables	Frequency	Valid Percent
Male	331	50.8
Female	321	49.2
Total	652	100
Age		
Variables	Frequency	Valid Percent
18 - 25 years	177	27.1
26 - 49 years	347	53.2
50 - 64 years	99	15.2
65 and above	29	4.4
Total	652	100
Religion		
Variables	Frequency	Valid Percent
Christianity	475	72.9
Islam	162	24.8
Traditional religion	7	1.1
No religion	7	1.1
Others (Pls specify)	1	0.2
Total	652	100
Marital Status		
Variables	Frequency	Valid Percent
Single	256	39.3
Married	364	55.8
Divorced	7	1.1
Widowed	16	2.5
Separated	4	0.6
Cohabiting with sexual partners	5	0.8
Total	652	100

Table 2. Demographic Characteristics of Respondents

Monthly income		
Variables	Frequency	Valid Percent
N 0 - 100,000	422	64.7
N 101,000 - 500,000	122	18.7
N 501,000 - 1 million	4	0.6
N 1 million & above	2	0.3
Decline to say	102	15.6
Total	652	100
Educational Attainment		
Variables	Frequency	Valid Percent
No formal Education	25	3.8
Primary Only	74	11.3
Secondary Only	372	57.1
Tertiary Education	179	27.5
Others (Pls specify)	2	0.3
Total	652	100
Occupation		
Variables	Frequency	Valid Percent
Student	101	15.5
Artisan (Hand work like carpenter)	141	21.6
Civil Servant	42	6.4
Businessman/woman	352	54
Unemployed	16	2.5
Total	652	100
Length of stay		
Variables	Frequency	Valid Percent
less than 1 year	40	6.1
1-4 years	231	35.4
5-9 years	156	23.9
10-15 years	106	16.3
15 years & above	119	18.3
Total	652	100

Chi-square Test

All the demographic characteristics showed no significant relationship with self-medication at 5% significance level except for gender and profession.

The result of the Chi-square test showed that there was relationship at 5% significance level between gender and self-medication ($\chi^2 = 11.394$, $df=1$, $p=.001$) with the measure of the strength of association between the variables

Cramer V as small effect size ($d=0.174$). So, we can accept the alternative Hypothesis H_a : There is significant relationship between gender and the knowledge and attitudes of adults practicing self-medication of NSAIDs.

There was also relationship at 5% significance level between profession and self-medication ($\chi^2 = 9.992$, $df=4$, $p=.041$) with the measure of the strength of association between the variables Cramer V as medium effect size

(d=0.163). So, we can accept the alternative Hypothesis H_a: There is significant relationship between profession and the knowledge and attitudes of adults practicing self-medication of NSAIDs.

Logistic Regression Analysis

In analyzing the results, a binary logistic regression was performed to ascertain the effect of gender, age, marital status, and educational attainment on the likelihood of respondents engaging in self-medication. The overall

logistic regression was statistically significant, $\chi^2(1) = 24.824$, $p < 0.005$. The model explained 10.2% (Nagelkerke R²) of the variance in self-medication and correctly classified 80.4% of cases. The odds of males self-medicating is 0.6 times (i.e., 60 percent) lower than that of their female counterparts (OR=0.385; 95%CI: 0.218-0.680). It could also be deduced that gender significantly contributed to the model ($p < 0.05$) which predicts self-medication in the study.

Table 3. Logistic Regression on Demographic Characteristics and Self-medication

Variables	Odds ratio	95% C.I.	
		Lower	Upper
Gender			
Male	0.385	0.218	0.68
Female	1.000		
Age group			
18-25	1.904	0.312	11.624
26-49	1.432	0.288	7.131
50-64	1.916	0.365	10.055
65 & above (ref)	1.000		
Educational Attainment			
No Formal Education (ref)	1.000		
Primary	1.48	0.265	8.257
Secondary	0.553	0.105	2.925
Tertiary	0.84	0.154	4.592
Marital Status			
Singles	7.655	0.77	76.117
Married/cohabiting	6.266	0.735	53.443
Never married/widowed/ divorced (ref)	1.000		

Further regression analysis on socio-demographic variables such as age showed that age is not statistically significant. Although the odds of self-medicating for the other independent variables explored in this study are high, these odds are not statistically significant. For instance, with reference to Age group 65 and above, the odds for Age Group 18-25 (OR=1.904; 95%CI: 0.312-11.624), Age Group 26-49 (OR=1.432; 95%CI: 0.288-7.131) were found not to be significant. Similarly,

considering the reference category of Never married/Divorced/Separated, the odds for Singles (OR=7.655; 95%CI: 0.770-76.117), and reference category of No Formal Education for Tertiary education (OR=0.840; 95%CI: 0.154-4.592) revealed that they did not make significant contribution to predicting self-medication.

Discussion

This study was conducted in the largest local Government in Lagos State of Nigeria.

Alimosho Local Government Area is one of the seven hundred and seventy-four 774 local governments in Nigeria and a sub-urban metropolitan area. The Local Government Area has a population of people from various tribes in Nigeria but with the Yoruba language as the major language spoken in the area. The lingua franca is English which is generally spoken among the populace. An estimated sample size of 576 people was planned based on the sample size calculation. A total of 652 responses evenly spread across the LGA were received from administered questionnaires using the CSEntry App downloaded on smart phones. The study had responses from both gender and people from various professions, age, marital status with years of residence above one year. The research participants were slightly more of men than women and those who participated were informed of their rights to withdraw from participation at any time during the period of interview. All the participants who commenced the question session completed. There were no missed cases as all respondents cooperated adequately.

A set of 15 researchers were recruited to participate in this study. One of the major reasons for the use of NSAIDs is the management of pain as found in other studies [2]. The use of NSAIDs in the self-medication for pain has been implicated in many studies and with the use of NSAIDs comes its adverse effect. Of the 652 responses received, 80.6% admitted that they self-medicated with 57.6% as males and 42.4% as females. This is considerably high and similar to the study conducted by [12] which had a 75.5% prevalence rate. The gender prevalence contradicts other studies that reveal that women are more likely to self-medicate than men and that women are more prone to seeking health-related information [13-15].

The study revealed that Paracetamol was the most self-medicated pain killer although not an NSAID and followed by Ibuprofen and the Diclofenac. This confirms a study by [16] with

report that 75.1% of respondents in the study self-medicated Paracetamol, and 12.6% self-medicated ibuprofen. Five hundred and sixty-one (561) which is 86% of respondent indicated that they knew what NSAIDs are with 81.7% stating that they took pain killers [15]. Sixty-two percent (62%) of those who knew and took NSAIDs responded that they did not take NSAIDs based on a doctor's prescription. Certain studies conducted among various populations show that most respondents have knowledge that NSAIDs can cause side effects [3, 16]. The study revealed that most respondents had good knowledge of self-medication, its likelihood of side effects and hazards and the importance of seeking physician counsel before purchase and use of NSAIDs. A few of the respondents gave the inaccessibility of doctors led them to self-medicating NSAIDs. This is given in many studies including the WHO as one good reason to self-medicate and an advantage of self-medication [16].

Accessibility to medical facilities is a serious issue with certain locations in developing countries like Nigeria. This corroborates studies by [17, 18] which gave reasons for self-medication to include proximity to health facilities and trained medical professionals, high cost of medical treatment, easy accessibility to Prescription Medicines, previous experience of treatment of the same pain, non-availability of medicines in public health facilities and lack of social accessibility of available public health facilities. Non consultation of medical personnel and self-medication may seem successful in the management of ailments that may look minor, but the temporal relief gained by self-medicating may outweigh the benefit of consulting medical personnel. This is evidenced in the consequence of self-medication which could be under and over-dosage, treatment failure, delay in care-seeking, masking of more serious health issues by NSAID used for self-medication and aggravating existing illnesses

and diseases [19, 20]. Access to affordable health services have created challenges in public health and as such there is need to improve accessibility and affordability of medical care to health seekers so that they do not resort to self-medication and medical information from unprofessional sources. [21, 22].

This descriptive cross-sectional study has certain limitations because collection of data was carried out in a single point in time, and this may result in the generation of different sets of results within different geo-political zones and time frame. The metropolitan and sub-urban nature of the setting for this study may affect the extrapolation and generalization of the results to other parts of the Nigeria due to differences in socio-cultural behaviour of residents [23].

Although efforts were made to reduce bias and false reporting, there is still possibility of insincere responses and social and recall bias [11]. The quantitative nature of this research limits the researcher in determining the causality of analysis. The structured questionnaire with closed-ended questions limits the options for responses and the outcomes of the research such that the results may not necessarily represent the actual outcome in generalizable form. This also limits the determination of causality of analysis and why the population self-medicate NSAIDs [11]. The study did not have the qualitative aspect that would have been more flexible in approach and make provision for further explanation of reasons for responses to question. [11, 23].

Conclusion

This descriptive study has revealed certain challenges with the self-medication of NSAIDs among adults in the Alimosho LGA. The research concludes that most respondents admitted that they self-medicated NSAIDs and the pattern of use shows inappropriateness with the risk of adverse side effects. Analysis of the association of demographic profile with self-

medication revealed that the overall logistic regression was statistically significant. Access to unreliable information can be reduced through proper health information dissemination that could help improve healthy behavior among the population [24].

Recommendations

1. There is need for the identification and prioritization of various factors that predispose the population to engage in self-medication. This would involve encouraging multi-component strategies that improve safe use of NSAIDs by the population that cuts across medicine control, regulation, distribution, and administration [25].
2. There is need to engage in aggressive health education and information among the population on the dangers and hazards of self-medication of NSAIDs and other medicines in general. This would help the population to exhibit better health behaviours that seek medical advice before the use of prescription medicines. This should cut across persons in all aspects of demographic profile of the population. This study showed that 65.3% of the respondents said that they would still self-medicate NSAIDs with pictorial representation when asked.
3. NAFDAC and the Pharmacist Council of Nigeria should collaboratively formulate strategies that would ensure compliance to non-dispensing and sale of prescription only medicines without written prescriptions. This should involve conducting unscheduled inspections to pharmacies, patent medicines outlets and even drug hawking locations for the purpose of enforcing compliance and penalties where applicable.
4. Government should put in place public health care services and personnel that are readily accessible and affordable to the

general populace so that access would be less time consuming and difficult.

5. Engaging mass media and public enlightenment avenues should be used in educating the populace on the need to patronize trained professionals and seek medical advice before use of prescription medicines.
6. NAFDAC should carry out further research on this work at a nationwide scale to understand the behavioural pattern of self-medication of NSAIDs and other medicines. This should cut across all socio-

economic and demographic profiles of various communities.

Conflict of Interest

The author declares no conflict of interest.

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