

# Prevalence and Social Determinants of Non-medical use of prescription and Over-the-Counter Drugs among Secondary School Students

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## ABSTRACT

This study investigated the influence of gender and location on non-medical use of prescription and Over-the-counter (OTC) drugs among secondary school students in selected communities of Lagos and Adamawa states. A multi-stage sampling technique was adopted to select 196 participants from Lagos and 198 participants from Yola. 203 males and 191 females (mean  $\pm$  SD age of 16.1  $\pm$ 1.8 years) responded to the Prescription Medication Use Scale (PMUS) and a structured questionnaire. Prevalence of OTC drug use by categories was Analgesics 42.2%, Antibiotics 32.4% and dietary supplements 33.8%. Prevalence by individual OTC medications includes cough syrup 63.2%, Herbs 30.3%, Sleeping pills (tranquillizers) 22.1%, Slimming pills / Teas 20.6%, Indocid (indomethacin) 14.0%, Codeine 5.1%, and Tramadol 4.8%. Significant sex influence was observed on Analgesics ( $t = 2.52, p = .012$ ), and on Tramadol in particular ( $t = 2.99, p = .003$ ) with males manifesting higher mean scores. Sex has no significant influence on dietary supplements ( $t = 1.68, p = .104$ ), Antibiotics ( $t = 1.10, p = .271$ ) and Codeine ( $t = .825, p = .410$ ). Location had a significant influence on the use of Analgesics ( $t = 2.50, p = .013$ ) and Dietary supplements ( $t = 7.22, p = .000$ ) and antibiotics use ( $t = 3.20, p = .001$ ) with Lagos reporting higher mean scores. The location had no significant influence on Tramadol and Codeine use. Authors conclude that there is a high prevalence of non-medical use of prescription and OTC drugs among participants; sex, as well as location individually, has a significant influence on Prescription and OTC drugs among secondary school students.

**Keywords:** Gender, Location, Over the Counter drugs, secondary school Students.

## INTRODUCTION

Over-the-counter (OTC) medications are readily available to customers without a prescription. OTC medication plays an important role in the health care system and is seen as the most prevalent medium of treating the majority of common health problems (American College of Preventive Medicine (ACPM, 2011). According to the Food and Drug Administration (FDA) (2019), Over-the-counter drugs are substances intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease. They are regarded as safe and effective for use by the general public and can be assessed and used without a doctor's prescription.

A vast majority of people use OTC medications. As of 2010 over 35% of Americans use OTC medications on a regular basis (Deloitte Center for Health Solutions, 2010). The benefits of availability to the generality of people are enormous, including, but not limited to enabling people to have direct, rapid access to effective medicines,

wide availability, decreased healthcare system utilization (fewer physician visits, lower healthcare system costs) and allowing individuals to be in charge of their own health. There are however some risk factors associated with OTC such as incorrect self-diagnosis delaying diagnosis and treatment of serious illnesses i.e. delay in seeking advice from a healthcare professional, increased risk of drug-drug interactions, increased risk of adverse events when not used appropriately and potential for misuse and abuse (World Health Organization (WHO) 2011; Brass 2001). OTC medications have greatly enabled medical self-care empowering people to gain control over their health. In demonstrating the importance of OTC or prescription medications Slone survey (1999) reported that approximately 20% of the American population use OTC analgesics in a given week (Kaufman et al., 2002).

In a gender study on OTC use in the general population, Lorentzen et al., (2018) reported that females were more likely to use OTC medications. Also, in a 2020 study Orlando et al., found that women reported higher use of OTC pain medication compared to men. In an earlier study Vernacchio et al., (2009) reported that children within ages 12 and younger being administered Over the Counter medication in a given time is more than twice that of prescription medication. When compared to the general public Weisman (2007) observed that adolescents of 12 – 17 years of age use more OTC products for acne and less for allergies and pain relief. Research shows that more adolescents abuse OTC cough medicines containing dextromethorphan (Johnston, et al., 2011). Research also showed that adults aged 65 years and above usually have more medical problems and use more medications, both prescription and OTC, when compared to younger adults (Hajjar et al., 2007; Eng, 2008). A United States of America study reported that the most frequent users of OTC drugs were individuals aged between 20 and 40 years (US Pharmacist, 2023).

In the administration of OTC medications, therapeutic errors (an unintentional deviation from a proper therapeutic regimen that results in the wrong dose, incorrect route of administration, administration to the wrong person, or administration of the wrong substance) may occur (ACPM, 2011). Causes of therapeutic errors are attributed to inaccurate attitudes and wrong beliefs (ACPM, 2011) such as taking more than the recommended dose of OTC medicine with a belief that it will bring more relief more quickly, thinking it will help with severe symptoms, or because they did not obtain expected relief after taking recommended dose (Harris Interactive / National Council on Patient Information and Education (NCPPIE) 2002; Wilcox et al., 2005).

### **Prescriptions, OTC Drugs and Mental Health.**

Some prescription and OTC medications have psychoactive properties and as a result, are sometimes abused. According to National Institute on Drug Abuse (NIDA) (2013) next to marijuana and alcohol, OTC is the most commonly abused substance among Americans 14 years and older. According to NIDA, the most commonly abused prescription drugs are opioid pain relievers, stimulants for treating attention deficit hyperactive disorder (ADHD) and central nervous system (CNS) depressants for relieving anxiety, while the most commonly abused OTC drugs are cough and cold medicines containing dextromethorphan (NIDA, 2013).

Despite the benefits of prescription and OTC drugs, when abused they can be addictive, and can put the abuser at risk for other adverse health, especially when taken along with other drugs or alcohol (NIDA, 2013; *DrugXperts, 2017*). When taken as intended, prescription and OTC drugs safely treat specific mental and physical symptoms, however when abused (for instance, taken in different quantities, or when such symptoms for which they should be taken are not present, they may affect the brain in ways illicit drugs do. When abused all classes of drugs (stimulants, Opioids, depressants) directly or indirectly cause a pleasurable increase in the amount of dopamine in the brain's reward pathway. Repeated seeking to experience that feeling often leads to addiction (NIDA, 2013).

Abuse of Prescription and OTC drugs with stimulants has strong effects on the cardiovascular system, can dangerously raise body temperature and cause irregular heartbeats, heart failure or seizures. Repeated high doses can also lead to hostilities and feelings of paranoia (NIDA, 2013). Abuse of prescription and OTC medication containing Opioids can result in depression (*DrugXperts 2017; Legg, 2019*), drowsiness, constipation, and depressed breathing, which are more dangerous when combined with other drugs or alcohol. More people die from an overdose of prescription opioids than from all other drugs combined including heroin and cocaine (NIDA, 2013).

Prescription and OTC medications with Central Nervous System (CNS) depressants slow down brain activities causing insomnia and loss of coordination. Repeated use can lead to withdrawal symptoms if discontinued and physical dependence. Cough medications with Dextromethorphan when abused can cause numbness, impaired motor function, nausea or vomiting, and increased heart rate and blood pressure. According to NIDA (2013) abuse of prescription and OTC drugs can alter a person's judgment, and decision-making, and lead to dangerous behaviours such as unsafe sex and drugged driving. A high percentage of psychological distress is linked with substance abuse including self-medicating with prescription and OTC drugs (Gluck 2008, NIDA 2013). Some studies in Nigeria found strong correlations between some demographic variables and analgesic abuse (*Okpalugo et al., 2010; DrugXperts, 2017; Akinawo et al., 2020*).

*In Nigeria drugs are freely displayed for sale in unauthorized places such as market shops, motor packs roadside stalls and other public places by individuals not being licensed Inyi, (2004). Hence majority of the population, including minors have access to prescription and OTC drugs with a high possibility of abuse. Studies on prescription drug use among Nigerians are well documented. There is however a gap in how gender and geopolitical location influence this phenomenon, especially among adolescents. Our study examined gender and geopolitical location influences on prescription drugs and psychological distress among secondary school adolescents in Lagos and Yola, Nigeria. This study's objectives include finding out the prevalence of OTC and prescription drugs among Nigerian adolescents, observing the influence of gender on analgesics, dietary supplements, antibiotics and codeine, ascertain the influence of geopolitical location on OTC and prescription drugs among the adolescents and to observe the influence of gender and geopolitical location on psychological distress. Thus, it is first hypothesized that significant sex influence will be observed on individual use of prescription /OTC drugs (Analgesics, Tramadol, Dietary Supplements, Antibiotics and Codeine) among adolescents. Secondly, that geopolitical location will significantly influence individual use of prescription /OTC drugs (Analgesics, Dietary supplements, Tramadol, Antibiotics, Codeine) among the participants.*

## **MATERIALS AND METHOD**

### **Participants**

A cross-sectional survey design was employed in the study. A multi-stage sampling technique was adopted for data collection. Secondary school adolescents from two geopolitical locations in Nigeria participated in this study. The purposive sampling method was used to select Lagos metropolis in southwestern Nigeria and Yola (Adamawa state) in Northeastern Nigeria. A total of 196 participants were purposively selected from five secondary schools in the Lagos metropolis and 198 participants from five secondary schools in the Yola metropolis. Put together, 394 participants made up of 203 males and 191 females (mean age  $16.1 \pm 1.8$  years) participated in this study.

### **Measures**

Data was collected using the Prescription Medication Use Scale (PMUS) developed by the authors. The scale measures the use of 19 prescription and OTC drugs on a 6-point Likert scale ranging from never (0) to daily (5). The scale has a Cronbach's alpha coefficient of .87.

### **Data Analysis**

Collected data was analyzed using the Statistical Package of Social Sciences (SPSS) 23. Descriptive statistic (frequency count and percentages) were used to organize, summarize and describe the demographic characteristics of respondents, while inferential statistic (Independent sample t-test) was employed to test the hypotheses.

## **RESULTS**

### **Demographic characteristics of participants**

The social demographic report in this study revealed that 203 (51.5%) of the participants were male while 191 (48.5%) were females. The mean  $\pm$  Standard Deviation of the age of the participants was  $16.1 \pm 1.8$  years old,

while distribution by locality showed that 196 (49.7%) were students in the Lagos metropolis while 198 (50.3%) were secondary school students in the Yola metropolis.

Table 1. Prevalence of prescription and OTC drug use by three categories

S/N	Drugs	Prevalence (%)
1	Analgesics	42.2
2	Antibiotics	32.4
3	Dietary supplements	33.8

Table 1 is a summary of prevalence of prescription and OTC drug use among the adolescents.

Table 2. Prevalence of individual prescription and OTC drug use among the adolescents

S/N	Prescription and OTC Drugs	Prevalence (%)
1	Paracetamol (acetaminophen)	84.7
2	Cough syrup	63.2
3	Pain relief	59.1
4	Blood tonic	56.5
5	Vitamin B complex	53.9
6	Antibiotics	46.1
7	Flagyl	39.1
8	Calcium	34.5
9	Piriton	33.2
10	Amixcillin	30.9
11	Herbs	30.3
12	Anti-diarrhoea	30.2
13	Asprin	25.1
14	Sleeping pills (tranquilizers)	22.1
15	Slimming pills and teas	20.6
16	Folic acid	19.3
17	Indocid (indomethacin)	14.0
18	Codeine	5.1
19	Tramadol	4.8

Table 2 is a summary of the prevalence of prescription and OTC drug use among adolescents. The observed prevalence of prescription and OTC drugs revealed a range of 84.7% of acetaminophen to 4.8% of Tramadol use among the participants.

**Test of Hypotheses**

The study employed an independent sample t-test to analyze the data and test the hypothesis; the level of significance is set at 0.05%. The analysis procedure involves comparing the mean score of male and female adolescents on their OTC drug type use (Analgesics, Tramadol, Dietary Supplements, Antibiotics and Codeine); a higher score in this domain indicates higher OTC drug use, the analysis result is presented in Table 3.

Table 3: Independent sample t-test of prescription and OTC drug use by sex.

Variables		N		SD	t	p
Analgesics	Male	203	4.7350	3.03162	2.518	.012
	Female	191	3.9471	3.13480		
Tramadol	Male	203	.1683	.71333	2.915	.003
	Female	191	.0157	.12467		
Dietary supplements	Male	203	4.0199	3.83401	1.627	.104
	Female	191	3.4000	3.69298		
Antibiotics	Male	203	3.1667	3.56200	1.099	.271
	Female	191	2.7853	3.26561		
Codeine	Male	203	.1139	.51049	.825	.410
	Female	191	.0733	.46438		

The t-test scores showed that there were 203 male and 191 female participants. Table 3 revealed that sex had a significant difference in analgesics use ( $t = 2.52, p = .012$ ), and on Tramadol in particular ( $t = 2.99, p = .003$ ) with males manifesting higher mean  $\pm$  SD scores.

Table 3 also revealed that sex had no significant influence on Dietary supplements ( $t = 1.68, p = .104$ ), antibiotics ( $t = 1.10, p = .271$ ) and Codeine ( $t = .825, p = .410$ ) use among the adolescents.

Independent sample t-test was used to analyze the influence of geopolitical locations on OTC and prescription drug use (analgesics, dietary supplements, antibiotics, tramadol and codeine); the level of significance is set at 0.05%. The analysis procedure involves comparing the mean score of two geopolitical locations (Lagos and Yola metropolises) and their OTC drug type use (analgesics, tramadol Dietary Supplements antibiotics and codeine). Higher scores in this domain indicate higher OTC drug use; the analysis result is presented in Table 4.

Table 4: Independent sample t-test of prescription and OTC drug use by geopolitical locations.

Variables		N		SD	t	p
Analgesics	Lagos	196	4.739	2.983	2.49	.013
	Yola	193	3.958	3.180		

Tramadol	Lagos	196	.107	.602	.490	.624
	Yola	197	.081	.432		
Dietary supplements	Lagos	196	5.010	4.154	7.22	.000
	Yola	195	2.420	2.811		
Antibiotics	Lagos	196	1.132	1.278	3.20	.001
	Yola	197	.751	1.075		
Codeine	Lagos	196	.096	.569	.113	.910
	Yola	197	.091	.393		

The t-test scores showed that there were 196 and 193 participants from Lagos and Yola metropolises respectively. Table 4 revealed that geopolitical location had a significant influence on analgesics use ( $t = 2.49$ ,  $p = .013$ ), Dietary supplements use ( $t = 7.22$ ,  $p = .000$ ) and antibiotics use ( $t = 3.20$ ,  $p = .001$ ), with participants in Lagos metropolis consistently reporting higher mean  $\pm$  SD scores in the OTC drug use. Table 4 further revealed that no significant geopolitical location difference in tramadol ( $t = .490$ ,  $p = .624$ ) and Codeine ( $t = .113$ ,  $p = .910$ ) use among the adolescents.

## DISCUSSIONS

The findings of this study show a high prevalence of prescription and OTC drug misuse among the sampled adolescents. Literature shows that there is a gradual shift from ‘hard’ drugs such as marijuana, cocaine etc., to cheap and easy-to-get alternatives that are available as prescription and over-the-counter drugs (*DrugXperts; 2017; Pulse, 2018*). This finding is supported by previous literature (*Okpalugo, et al., 2010; DrugXperts, 2017; Akinnawo et al., 2021*). Among adolescents and young adults especially in the universities, Tramadol is reported as becoming one of the most abused drugs in Nigeria (*Drugxpert, 2017; Olasubomi et al., 2024*). In a study of misuse of some OTC analgesics in Abuja, Nigeria, *Okpalugo, et al., (2010) reported that 20.65% of the sampled population exceeded the maximum dose and 30.45% suffered adverse drug effects as a result of the overdose*. Other related studies reported a high prevalence of self-medication of prescription and OTC drugs (*Akinnawo et al., 2020*). In Sudan *Awad, et al., (2006) reported a 73.9% prevalence rate of self-medication, 92% in Kuwait (Abahussain et al., 2005), 72.1% in Hong Kong (Tse, Chung & Munro 1989), 85% outpatients in Ondo Nigeria (Omolase, et al., 2007) and 92.3% in Lagos Nigeria (Ayanwale et al., 2017)*. Similar reports were found in Pakistan (*Zafar et al., 2008*) and Brazil (*Corrêa et al., 2012*).

In support of previous studies (*Lorentzen et al., 2018; Sánchez-Sánchez et al., 2021; Olasubomi et al., 2024*), our finding observed significant sex differences in the use of analgesics in general and Tramadol in particular with male reporting higher mean scores in both variables. There was however no significant sex influence on dietary supplements, codeine and antibiotics among the adolescents. Our findings showed that male adolescent used analgesics more than their female counterparts. This finding supports the report of *Agu, et al., (2013)* in their study among secondary school adolescents in Enugu Nigeria, which revealed that male students abused alcohol more than female adolescents. Although our study focused on prescription and OTC drugs, rather than on alcohol as was *Agu et al., (2013)*, most substances are abused along with alcohol. In a similar study, *Ebie and Obiora (2006)* reported that 81.5% of adolescent substance users were males as against 18.4 females. *Panda et al., (2017)* also reported that males with low income were more likely to use OTC drugs than females. *Mckenzie (2000)* reported similar drug use between boys and girls, which equally supports our finding on codeine dietary supplements and antibiotics use.

Further findings showed that geopolitical location had a significant influence on misuse of analgesics, dietary supplements and antibiotics. Previous studies revealed high incidences of use of prescription and OTC drugs ranging from 15% to 81.5% based on localities (*Ayanwale et al., 2017; Oyelola, et al., 2010; NIDA, 2018; Corrêa*

da Silva, et al., 2012). Lagos when compared with Yola is more heterogeneous, has a higher population, is more industrialized and tends to have a more educated population. According to Bellum (2013), environments influences drug use. In a similar study Agu et al., (2013) reported a significant locality influence on drug abuse among secondary school students in Enugu, Nigeria. Agu et al., observed that participants in the urban areas abused alcohol more than those in the rural areas. Environmental (locality) factors such as family, school and neighbourhood can increase a person's risk of drug abuse (NIDA, 2018). The risk factors of locality on drug misuse and addiction according to the Center on Addiction (2017), include such factors as exposure to physical sexual or emotional abuse or trauma, substance use in the family or among peers, access to addictive substances and popular culture references that encourage substance use. Hence despite the geopolitical areas, environments that expose adolescents to drugs will report a high prevalence of prescription and OTC drug abuse.

## CONCLUSIONS AND RECOMMENDATIONS

There is a high prevalence of prescription and OTC drug use and misuse among secondary school adolescents in Lagos and Yola metropolises. Sex and locality have a significant influence on the use of prescription and OTC drugs. Further studies on a wider scale are recommended. Also, medication with psychoactive properties should by law be classified under prescription-only Medication (POM). Finally, with the aid of social and mass media, more public enlightenment campaigns on the mental health risks of abuse of prescription and OTC medications should be sponsored by governmental and non-governmental organizations and other well-meaning individuals.

## Ethical Considerations

This study carried out investigations that involved human elements; hence the research was conducted based on the Helsinki Declaration. Also, the research intention and proposed procedures for carrying the research were subjected to scrutiny by the Internal Research Ethic Committee (IREC) of Redeemer's University, Ede, Osun State Nigeria, and approval was given by the research committees of the institutions of study before the research was embarked upon. Also, respondents were approached individually and an explanation of the purpose of the study was made known to them thereby securing participants' informed consent before the instruments were administered.

## REFERENCES

1. Abahussain E, Motowe L. K, & Nicholls P. J. (2005). Self-report medication use among adolescents in Kuwait. *Medical principles and practice*. 2005;14(3):161–164
2. Agu S. A., Nwankwo, B.E., Obi T. C., Sydney-Agbor N., & Mgbenkemdi H. E. (2013). Effect of Gender and Locality on Alcohol Abuse among Secondary School Students. *International Journal of Humanity and Social Sciences* ISSN: 2231-3532 & E-ISSN: 2231-3540, 2(1) 049-053.
3. Akinnawo E. O, Onisile D. F, Alakija O A, & Akpunne B C . (2021). Self-Medication with Over-the-Counter and Prescription Drugs and Illness Behavior in Nigerian Artisans, *Int J High Risk Behav Addict*. doi: 10.5812/ijhrba.107221.
4. Akinnawo, E. O., Bello, I. B., Akpunne, B. C., & Ajibola, B. S. (2020). Self-Medication in Pregnancy and Associated Psychopathological Symptoms of Antenatal Nigerian Women. *Psychology*, 11, 2039-2054. <https://doi.org/10.4236/psych.2020.1112127>
5. Akpunne B. C & Akinnawo O.E. (2019). Internet Addiction, Problematic Smartphone Use and Psychological Health of Nigerian University Undergraduates; *International Neuropsychiatric Disease Journal*. 12(3): 1-13,
6. American College of Preventive Medicine. (ACPM) (2011). Over-the-counter medications: use in general and special populations, therapeutic errors, misuse, storage and disposal a resource from the American college of preventive medicine. file:///G:/otcmedsclinicalreference.pdf retrieved from [www.acpm.org](http://www.acpm.org)
7. Awad A, Eltayeb I, Matowe L, & Thalib L. (2005). Self-medication with antibiotics and anti-malarias in the Community of Khartoum State, Sudan. *J Pharm. Pharmaceut Sci*. 8(2):326–331
8. Awad A. I, Eltayeb I. B, & Capps P. A. (2006). Self-medication practices in Khartoum State, Sudan. *Eur J Clin. Pharmacol*. 62(4):317–324.
9. Ayanwale M. B, Okafor I. P, & Odukoya O. O. (2017) Self-medication among rural residents in Lagos,

- Nigeria. *Journal of Medicine in the tropics* 19(1) 65-71. DOI: 10.4103/jomt.jomt\_51\_16
10. Badland, H., Turrell, G., & Giles-Corti, B. (2013). Who does well where? Exploring how self-rated health differs across diverse people and neighborhoods, *Health & Place*, 22, 82-89, <http://dx.doi.org/10.1016/j.healthplace.2013.03.006>.
  11. Bellum S. (2013). Your environment may influence drug use. Retrieved from Drug & health blog <https://teens.drugabuse.gov/blog/post/your-environment-may-influence-drug-use>
  12. Brass E. P. (2001). Changing the status of drugs from prescription to over-the-counter availability. *N Engl J Med.*;345(11):810-16.
  13. Center on Addiction (2017). Who develops addiction? Retrieved 30<sup>th</sup> September 2019 from <https://www.centeronaddiction.org/addiction/addiction-risk-factors>
  14. Choi, J.Y. (2009). Contextual Effects on Health Care Access among Immigrants: Lessons from Three Ethnic Communities in Hawaii. *Social Science & Medicine* 69(8), 1261–71. doi:10.1016/j.socscimed.2009.08.001.
  15. Corrêa da Silva M. G, Flores Soares M. C, & Muccillo-Baisch A. L. (2014). Self-medication in university students from the city of Rio Grande, Brazil. *BMC Public Health* 2012;12:339. Available from: <http://www.biomedcentral.com/1471-2458/12/339>.
  16. Deloitte Center for Health Solutions. 2010 Survey of Health Care Consumers: Key findings, strategic implications. [http://www.deloitte.com/assets/DcomUnitedStates/Local%20Assets/Documents/US\\_CHS\\_2010SurveyofHealthCareConsumers\\_050610.pdf](http://www.deloitte.com/assets/DcomUnitedStates/Local%20Assets/Documents/US_CHS_2010SurveyofHealthCareConsumers_050610.pdf).
  17. Drugxpert blog (2017). How Tramadol Abuse Is Silently Creeping Into Homes With Its Destructive Effects In Nigeria. Retrieved 29<sup>th</sup> September 2019 from <https://drugxpert.blogspot.com/2017/04/tramadol-came-to-nigeria-in-90s.html?m=0>
  18. Ebie C.T., & Obiora U.M. (2006) *Quarterly Journal of Studies on Alcohol*, 32, 136-147.
  19. Eng M. (2008). Potentially inappropriate OTC medications in older adults. *U.S. Pharmacist.*;33(6):29-36.
  20. Food and Drug Administration (FDA). Regulation of Nonprescription Products. <http://www.fda.gov/AboutFDA/CentersOffices/CDER/ucm093452.htm>.
  21. Gluck S. (2008). self-medication of a mental health problem. Healthy place. Retrieved September 30<sup>th</sup> 2019 from <https://www.healthyplace.com/addictions/articles/selfmedication-of-mental-health-problem>
  22. Goldberg, D. P., & Williams P. (1991). *A User's Guide to the General Health Questionnaire*. Great Britain: NFER-NELSON Publishing Company.
  23. Gureje. O., & Obikoya, B., (1990). The GHQ as a screening tool in primary care setting. *Social Psychology and Psychiatry Epidemiology*. 25(5):276-280
  24. Hagen E.H & Rosenström T (2016): Explaining the sex difference in depression with a unified bargaining model of anger and depression: *Evil Med Public Health*. (1):117-32.
  25. Hajjar E.R, Cafiero A.C, & Hanlon J.T. (2007). Polypharmacy in elderly patients. *Am J Geriatric Pharmacother.*;5:345-351.
  26. Harris Interactive / National Council on Patient Information and Education (NCPIE). (2002). Attitudes and beliefs about the use of over-the-counter medicines: A dose of reality. [http://www.bemedwise.org/survey/final\\_survey.pdf](http://www.bemedwise.org/survey/final_survey.pdf).
  27. Inyi, (2004) Realities and risks of self-medication. *Obafemi Awolowo Univ Bull* 2004;206:2
  28. Johnston L.D, O'Malley P.M, Bachman J.G, & Schulenberg J.E (2011). Monitoring the Future national results on adolescent drug use: Overview of key findings, 2010. Ann Arbor: Institute for Social Research, The University of Michigan.
  29. Kaufman D.W, Kelly J.P, Rosenberg L, Anderson T.E, & Mitchell A.A. (2002). Recent patterns of medication use in the ambulatory adult population of the United States. The Slone Survey. *JAMA.*;287(3):337-344.
  30. Legg T. J. (2019) recognizing forms of self-medication. Healthline. Retrieved August 28<sup>th</sup> 2024, from [healthline.com/health/depression/forms-self-medication#opioids](https://www.healthline.com/health/depression/forms-self-medication#opioids)
  31. Lorentzen, S., Lorentzen, B. & Wikström, B. (2018) Gender Differences in Usage of Over-the-Counter Analgesics among Norwegian Adolescents. *Open Journal of Nursing*, 8, 860-878. doi: 10.4236/ojn.2018.811065
  32. McKenzie D. (2000). Under the influence". The impact of alcohol advertising on youth, association to



- reduce alcohol promo/in Ontoria, Policy and Program Analyst, ARAPO.
33. Merenstein D, Diener-West M, Halbower AC, Krist A, Rubin HR. (2006). The Trial of Infant Response to Diphenhydramine. The TIRED Study – A randomized, controlled, patient-oriented trial. *Arch Pediatr Adolesc Med.* 160:707-712
  34. National Institute on Drug Abuse (NIDA) (2013). Prescription and Over the Counter Medications [https://www.drugabuse.gov/sites/default/files/drugfacts\\_rx\\_otc\\_5\\_2\\_13\\_ew2\\_0.pdf](https://www.drugabuse.gov/sites/default/files/drugfacts_rx_otc_5_2_13_ew2_0.pdf)
  35. NIDA (2018) Drugs, Brain, and Behavior: the science of addiction retrieved September 30, 2019 from <https://www.drugabuse.gov/publications/drugs-brains-behavior-science-addiction/drug-misuse-addiction>
  36. Okpalugo, J.I, Inyang, U.S, Ibrahim, K, Ukwe, C.V & Aguwa N,C (2010). Misuse of some OTC analgesics in Abuja, Nigeria. *International Journal of Natural and Applied Sciences* 6(1)
  37. Olasubomi, O. H., Akpunne B. C & Alakija O. A (2024). Lifestyle and Academic Burnout as Predictors of Opioid Misuse among Selected University Undergraduates in Ogun State. *AIPGG Journal of Humanities and Peace Studies* Vol. 4. NO 3.2024
  38. Orlando, V., Mucherino, S., Guarino, I., Guerriero, F., Trama, U., & Menditto, E. (2020). Gender Differences in Medication Use: A Drug Utilization Study Based on Real World Data. *International journal of environmental research and public health*, 17(11), 3926. <https://doi.org/10.3390/ijerph17113926>
  39. Omolase C .O, Adeleke O.E, Afolabi A.O & Afoalbi O.T (2007).Self-medication amongst general outpatients in a Nigerian community hospital. *Ann Ib postgrad med.* 5(2) 64-67
  40. Sánchez-Sánchez, E., Fernández-Cerezo, F. L., Díaz-Jimenez, J., Rosety-Rodriguez, M., Díaz, A. J., Ordonez, F. J., Rosety, M. Á., & Rosety, I. (2021). Consumption of over-the-Counter Drugs: Prevalence and Type of Drugs. *International journal of environmental research and public health*, 18(11), 5530. <https://doi.org/10.3390/ijerph18115530>
  41. Tse M.H.W, Chung J.T.N, & Munro J.G.C. (1989) Self medication among secondary school pupils in Hong Kong: A descriptive study. *Fam. Pract.* 1989;12(6):303–306.
  42. Panda, A., Pradhan, S., Mohapatro, G., & Kshatri, J. S. (2017). Predictors of over-the-counter medication: A cross-sectional Indian study. *Perspectives in clinical research*, 8(2), 79–84. <https://doi.org/10.4103/2229-3485.203043>
  43. Pulse.ng (2018).This opioid painkiller is at the heart of Nigeria's drug problem. Retrieved 30<sup>th</sup> September 2019 from <https://www.pulse.ng/gist/tramadol-this-opioid-painkiller-is-at-the-heart-of-nigerias-drug-problem/qmg899v>
  44. US Pharmacist (2023). Most Commonly Used OTC Drugs and Consumer Impact. Retrieved from <https://www.uspharmacist.com/article/most-commonly-used-otc-drugs-and-consumer-impact>
  45. Vernacchio L, Kelly JP, Kaufman DW, Mitchell AA. (2009). Medication use among children < 12 years of age in the United States: Results from the Slone Survey. *Pediatrics.*;124:446-454.
  46. Weisman M. (2007). Household Survey Data on the Adolescent Use of OTC Medicines. Presented at: Adolescent Over-the-Counter (OTC) Drug Product Use: A Public Workshop; December 6 & 7,. [http://bpca.nichd.nih.gov/collaborativeefforts/upload/dec2007\\_minutes.pdf](http://bpca.nichd.nih.gov/collaborativeefforts/upload/dec2007_minutes.pdf).
  47. World Health Organization (WHO). (2000). Guidelines for Regulatory Assessment of Medicinal Products for Use in Self-Medication (Geneva 2000). <http://apps.who.int/medicinedocs/en/d/Js2218e/>.
  48. Zafar S.N, Syed R, Waqar S, Zubairi A.J, Waqar T, & Shaikh M et al. (2008). Self-medication amongst University Students of Karachi, Pakistan: Prevalence, knowledge and attitude. *J Pak Med Assoc* ;58:214-7