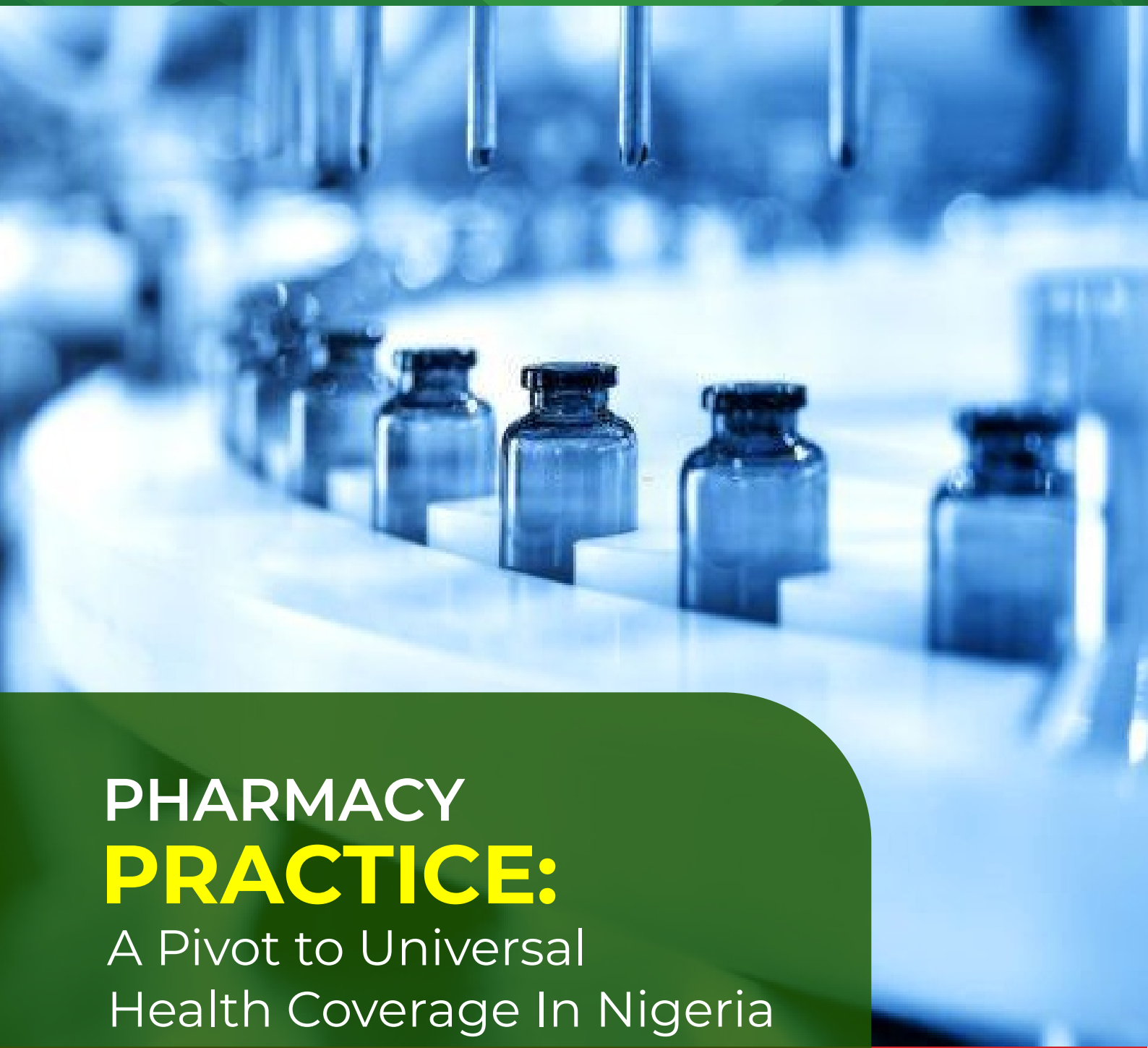
AS MEN OF HONOUR
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PHARMACY PRACTICE:

A Pivot to Universal Health Coverage In Nigeria

BOOK OF ABSTRACTS 2023

FOREWARD

Dear Delegates,

Welcome to the 96th Annual National Conference of the Pharmaceutical Society of Nigeria (PSN), Jewel City, 2023.

One of the pivotal contributions of this conference to the world, is this Book of Abstracts. It contains works of Scholars and Medical experts that provides answers to a plethora of thoughts and questions for efficient Pharmaceutical care.

A cross section of this Book is a pool of divergent views of authors from all aspects of Pharmacy practice in Nigeria ranging from the Academia to Community service practice, Industrial practice and Hospital and Administrative practice.

The Editor-in Chief of PSN, Dr Margaret Ilomuanya, the editorial team and all reviewers are appreciated for a job well done. All the authors who submitted their works and other salient contributors are equally appreciated.
Thank you.

Gideon Owoicho Okpanachi, (BPharm. PhD)
18/10/2023

ABSTRACTS PRESENTED AT THE 96TH ANNUAL NATIONAL CONFERENCE OF THE PHARMACEUTICAL SOCIETY OF NIGERIA 28TH OCTOBER – 4TH NOVEMBER 2023 HELD IN GOMBE, GOMBE STATE

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96TH ANNUAL NATIONAL CONFERENCE OF THE PHARMACEUTICAL SOCIETY OF NIGERIA 28TH OCTOBER – 4TH NOVEMBER 2023

CONFERENCE ABSTRACT

PSNJOS001

The Nigerian Journal of PHARMACY
AS MEN OF HONOUR WE JOIN HANDS
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Practice and Factors associated with open defecation among residents of Kalambaina Sokoto State North-western Nigeria

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Background: Open defecation is an act of defecating in open spaces (fields, bushes, or bodies of water), instead of using toilet or other sanitation facilities.

Objectives: The study was carried out to assess practice and factors associated with open defecation among residents of Kalambaina area in Wamakko local government area of Sokoto State.

Methods: The study was descriptive, and cross-sectional. A semi-structured questionnaire was developed and used to generate useful information that addressed variables of the subject matter of the study. Data were analyzed using GraphPad Prism 10.0.2 (232). The association between the dependent and independent variables were measured using $p < 0.05$ used to determine statistical significance.

Results: A total of 142 participants took part in the study. The age group 35 – 39 years has the highest respondents (28.9 %). Hausa tribe accounted for 101(71.1 %), while Igbo 4(2.8 %). Secondary school certificate holders were 68(47.9 %), tertiary education holders 14(9.9 %). At 95 % Confidence interval (CI), level of education was statistically significant to practice of open defecation. All respondents were aware that open defecation is practiced with 23.2 % practicing open defecation, and 64.8 % do not dispose feaces into nearby bushes, public refuse bins and canals. Relationship between awareness and practice of open defecation revealed that [$p < 0.0001$; *OR* = 6.078; CI = 3.557 to 10.20]. With *OR* of 6.078 for awareness on open defecation, the tendency for practice of open defecation increases. The respondents (80.3 %) acknowledged that open defecation is a threat to public health.

Conclusion: Open defecation is practiced in the study area, and respondents are aware of its threat and health implications. There is a need for enforcement of law and order to curb this public menace.

Keywords: Open defecation, Awareness, Practice, North-west, Nigeria

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Pharmacological Management of Upper Respiratory Tract Infections in Children: An Assessment of a Tertiary Institution Practice

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Background: Upper respiratory tract infections (URTIs) are the most common acute respiratory tract infections that occur in under-fives. Therapy addressing symptoms is recommended for most URTI management. The use of antibiotics to treat URTIs without carrying out culture and sensitivity tests is a risk factor for antimicrobial resistance.
Objectives: This study assessed the medications used in the management of URTIs in under-fives from a tertiary institution practice.
Methods: This study was conducted in Alex Ekwueme Federal University Teaching Hospital, Abakaliki (AEFUTHA) Ebonyi State. It was a retrospective review of 275 prescriptions for URTIs in under-fives, from January to December 2021. Systematic sampling technique was used to select the sampled prescriptions using an interval of five working days in each month. Data were entered into SPSS version 28.0 and descriptive analysis was done. Ethical approval was obtained from Health Research and Ethics Committee of AEFUTHA (AE-FUTHA/REC/VOL 3/2022/008).
Results: Majority (207; 75.3 %) of the cases were diagnosed as non-specific URTI. Other diagnoses include tonsillitis (46; 16.7 %), otitis media (8; 2.9 %) and rhinitis (6; 2.2 %) amongst others. Of the whole, 157 (57.1 %) prescriptions contained a total of two medications, 73 (26.5 %) contained three medications and 15 (5.5 %) contained four medications. Antibiotics were the most prescribed medications, (212; 77.1 %) followed by antihistamines, (110; 40.0 %), vitamins (75; 27.3 %), antimalarials (55; 20.0 %) minerals (38; 13.8 %), NSAIDS (37; 13.5 % and analgesics (35; 12.7 %). Other medications prescribed include antihypertensives, local anaesthetics and nasal drops. Majority (189; 68.7 %), of the prescriptions contained one antibiotic, 22 (8.0 %) had two and one prescription had three (0.4 %) antibiotics. Amoxicillin-clavulanic acid was the most prescribed antibiotics (79; 28.7 %). Out of the 275 sampled cases, laboratory test was not conducted for 265 (96.4 %) cases. There was no statistically significant association between age category of children and number of medicines prescribed, whether antibiotics was prescribed, and number of antibiotics prescribed ($p>0.05$).
Conclusion: The study revealed that antibiotics were the mainstay for the pharmacological management of URTIs. These are unnecessary and not indicated for the management of URTIs in under-fives as culture and sensitivity tests were not done before initiation of antibiotic therapy.
Keywords: Children, Upper Respiratory Tract Infection, Antibiotics.

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CONFERENCE ABSTRACT

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Identification and Assessment of prescription errors in a Tertiary Hospital in South-East, Nigeria.

Okonkwo, CA*[1]. Ogbo, PU[2]. Magbo, CC[1]. Ononugbo, CM[1]. Ofolebe, CC[1]. Okafor, NC[1]. Nwaobilor, CC[1]. Ugwuede, OI[1]. Nnaji, Cw[1].

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Background: Prescription errors are the most common type of medication errors that occur in healthcare settings, and they are risk factors to failure in therapeutic goals. There are two types of prescription errors: error of omission which occurs when essential information is missing in a prescription and is either related to the prescriber or related to the medication and error of commission which occurs when information is wrongly written in the prescription.

Objectives The study was designed to identify, classify and assess prescription errors in three units of a Federal University Teaching Hospital.

Methods This was a retrospective screening of prescriptions from patients' case folders in Ophthalmology, General Outpatient Department (GOPD) and National Health Insurance Authority (NHIA) units of Alex Ekwueme Federal University Teaching Hospital, Abakaliki. Prescriptions from the three units were conveniently selected from case folders in May 2022. Statistical Package for Social Science (SPSS) Version 23 was used for analysis. Prescription errors were classified into the different types and results were presented in frequencies and proportions and displayed as charts and tables. Ethical approval was obtained from the Health Research and Ethics Committee of AEFUTHA.

Results: Nine hundred and forty-one (941) case folders were screened from the three units and 840 (89.3 %) prescription errors were identified. Of these, there were 470 (56.0 %) errors of commission, 165 (19.6 %) errors of omission related to prescriber, and 205 (24.4 %) errors of omission related to medication. Illegible writing, absence of prescriber's name and signature and absence of diagnosis were the most common errors related to the prescriber. With regards to errors related to the medication, absence of dose/strength, duration and frequency were the most common. The most common error of commission was drug-drug interaction which occurred in 321 prescriptions. Per unit, NHIA had the highest prescription errors (429; 51.1 %) followed by GOPD (264; 31.4 %) and ophthalmology (147; 17.5 %).

Conclusion: This study showed presence of high prescribing errors in the study setting. There is need for an intervention in the study setting to reduce prescription errors and improve the achievement of therapeutic goals.

Keywords: Prescription errors, prescription, assessment, tertiary hospital

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Physicochemical and Microbiological Assessment of Levofloxacin tablets marketed in Enugu state Nigeria.

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Background: There is a widespread of distribution of substandard and counterfeit drugs in developing countries. Potency of antibiotic is estimated by comparing the inhibition of growth of sensitive microorganism produced by known concentration of antibiotic being examined with a reference substance. Levofloxacin is a widely used drug for treatment of acute bacterial sinusitis, pneumonia, chronic prostatitis and urinary tract infection.

Objectives: The study focused on evaluation of Physicochemical and microbiological properties of Levofloxacin tablet marketed in Enugu state. It compares *in vitro* susceptibility of isolates of micro-organism to the various brands.

Methods: Levofloxacin tablets labelled A–D were sourced from various Pharmacies. The drugs were evaluated for various physicochemical properties such as physical examination, weight uniformity and disintegration time. Microbiology assay was also conducted using agar cup-diffusion method. *Staphylococcus aureus* clinical isolates was used for seeding the agar plates. Parameters monitored were inhibition zone diameter (IZD) and percentage drug potency was determined from inhibition zone diameter for each brand.

Results: Physical properties of all the brands were satisfactory in terms of colour. Labelling guidelines were followed and no mistakes were detected in spellings for all the brands. The packaging materials of all the brands were neat. Weight uniformity tests of all the brands showed percentage deviation of less than ±10 %. Disintegration of all the brands was within 3 min. Microbiology results showed that all the brands had good potency. The percentage potency of all the brands lies from 94.8 % to 100 %.

Conclusion: All the brands passed physicochemical and microbiology parameters when compared to innovator product. Hence, they are satisfactory and will elicit therapeutic outcome on time which will also improve health related quality of life.

Key words: Levofloxacin, Substandard, Physicochemical, microbiology assay, potency

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Quality Assessment of Brands of Azithromycin tablets marketed in Enugu State Nigeria

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Background: Various generic drugs are marketed in Nigeria. However the generics are not of the same quality, efficacy, safety and bioequivalence as those applicable to the innovator product. Quality medicines are crucial in achieving desired therapeutic clinical outcome in patients. Potency of antibiotic is estimated by comparing the inhibition of growth of sensitive microorganism produced by known concentration of antibiotic being examined with a reference substance.

Objective: This study focused on quality assessment of brands of Azithromycin tablets marketed in Enugu, Nigeria.

Methods: Ten brands of Azithromycin tablets, labelled A-J were sourced from various Pharmacies. The drugs were evaluated for various physicochemical properties such as physical examination, weight uniformity and disintegration time. Investigation on antimicrobial effects of the brands was carried out using agar-diffusion method. *Staphylococcus aureus* clinical isolates was used for seeding the agar plates. Percentage potency was determined from inhibition zone diameter for each brand.

Results: Physical examination revealed that all the brands were white in colour without mottling. Weight uniformity tests of all the brands showed percentage deviation of less than ±10 %. Disintegration of all the brands was within 5 min. The percentage potency of all the brands was from 73.3 % to 123.0 %. Five out of ten brands failed the microbiology assay, having percentage potency of < 90.0 %. Brand E had lowest percentage potency (73.25 %). Brand J had the highest percentage potency of 123.0 % which is above British Pharmacopeia upper limit of 120.0 %.

Conclusion: Based on the findings from investigation carried out, 50 % of brands can be used interchangeably with innovator product (B). Brands E–H with low percentage potency will cause delay in treatment of infectious disease resulting in waste of fund, health complication and finally lead to antimicrobial resistance.

Key words: Azithromycin, Physicochemical, Microbiology, Percentage potency

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Improving vaccination coverage through community pharmacy services; the COVID-19 experience and implications for policy review in Nigeria

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Background: Globally, the use of community pharmacies and pharmacists in the delivery of vaccination services has been hampered by several factors, laws and regulations that do not support pharmacists to participate in the delivery of vaccination services**.** Initiatives of the pharmacy association leaders include advocacy to policymakers to recognise community pharmacists (CPs) as PHC centres, continuous training of members, and establishment of Vaccine Advisory M&E Committee (VAMEC) for self-monitoring of members administering Covid-19 vaccine.

Objectives: This study described how the involvement of community pharmacies in vaccination services will improve vaccination coverage in Nigeria, using the COVID-19 experience; and how this can be adopted in advocating for policy review that would recognize CPs in immunization service delivery in Nigeria.

Methods: The study adopted a descriptive cross-sectional mixed-method survey design. Semi-structured questionnaire was administered to 474 CPs selected through purposive sampling while qualitative data were collected through FGDs, IDI and KI interviews. Data were analysed with both descriptive and inferential statistics and statistical significance at $p \leq 0.05$.

Results: Response rate was 86.7 %. Less than half of the respondents 165(40.1 %) had undergone vaccination training. Of the 129(31.4 %) that provide vaccination services, 72(55.8 %) administer vaccines in their pharmacies. Out of these 72 respondents; 45(62.5 %) were administering vaccines before their involvement in Covid-19 vaccine administration, 57(79.2 %) of the health personnel who administer vaccines were pharmacists, 60(83.3 %) administer vaccines on request, 22(30.6 %) administered Covid-19 vaccines only, and only 7(10 %) had administered over 500 doses of Covid-19 vaccine.

Conclusion: The study concluded that training of CPs by the pharmacy association had increased respondents' involvement in vaccination services, the involvement of the CPs in Covid-19 vaccination had increased number of clients' vaccinated, recognition of CPs as PHC providers will remove barriers to provide vaccination services while the policymakers need to support the inclusion of CPs as vaccinators through appropriate policy in Nigeria. Even though key informant interview revealed that no existing law gives CPs the approval to administer vaccine but having community pharmacies as vaccination centres after certification will promote access, improve coverage and eventually reduce disease burden, and the National Council of Health (NCH) needs to approve CP inclusion into the vaccine policy.

Keywords: Community pharmacies and pharmacists, Covid-19 vaccination, PHC centres

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Application of Aloe Vera and Silver Sulphadiazine Impregnated Foams in Burn Wound Treatment

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Background: Burn injuries have long been a persistent public health concern, capable of causing enduring physical and psychological consequences when not adequately managed. The primary goals of burn wound management encompass pain relief, infection prevention, trauma minimization, and scar and contracture reduction. Aloe vera gel (AVG) has been shown severally to be useful in the treatment of burn wounds, silver sulfadiazine (SSD) has stood as the gold standard antibiotic in burn injury management and foam dressings create and maintain a moist wound environment which is essential for the optimal wound healing process. In contrast, direct application of medications may dry out the wound, which can impede healing.

Objectives: This study investigated the effectiveness of SSD and AVG extract impregnated medical-grade polyurethane foam for managing second degree burn injuries in albino Wistar rats.

Methods: In this experimental study, standardized burn wounds were induced in a rat group and categorized into seven treatment groups using a randomized study method. Group A received 1% SSD, Group B received 80% AVG, Group C received 80% AVG and 0.5% SSD, Group D received 80% AVG and 1% SSD, Group E received 40% AVG and 1% SSD, Group F (positive control) received Allevyn® and Group G (negative control) received no treatment. The study assessed tissue healing after day 14 and day 21 through histological studies.

Results: The incorporation of AVG and SSD into medical-grade polyurethane foam (Groups C, D, and E) led to an accelerated wound healing rate compared to the control groups (Groups F and G) and the individual treatment groups (Groups A and B). Importantly, all groups containing AVG extract exhibited a higher re-epithelialization rate when compared to the individual SSD group and the control groups.

Conclusion: This study provides compelling evidence of the synergistic effect of AVG and SSD in the treatment of burn wounds. The integration of these two components into medical-grade polyurethane foam enhances wound healing, prevents infection, and improves re-epithelialization in burn injuries. These findings hold promise for the development of more effective burn wound management strategies, potentially minimizing the long-term physical and psychological consequences of burn injuries.

Keywords: Reepithelization, Burn wounds, Aloe vera, Silver sulphadiazine, synergistic effect, wound healing, Polyurethane foam, Allevyn®

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Evidence-Based Advocacy as a Tool for Policy Change: The Task Shifting, Task Sharing Policy in Nigeria.

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Background and Purpose: Task shifting is the process of delegation whereby tasks are moved, where appropriate, to less specialized healthcare workers while Task sharing enables low- and mid-level health professionals to perform tasks and procedures that would normally be restricted to higher-level health professionals, thereby freeing up time for these higher-level providers within a health system.

In 2014, Nigeria developed the first edition of the Task Shifting Task Sharing (TSTS) Policy for essential healthcare services. This 1st edition was focused on the public sector. In 2018 the policy was due for another review. Using evidence-based advocacy, the Pharmaceutical Society of Nigeria Foundation (PSNF) advocated for the inclusion of the private sector; Community Pharmacists (CPs), and Patent & Proprietary Medicines Vendors (PPMVs) into the TSTS Policy in the 2nd edition of the policy as key providers of specialized Family Planning and Primary Healthcare services. In 2022, the PSNF also supported the inclusion of the 3-Tier Accreditation System of the PPMVs and updated tasks for CPs in the 3rd Edition of the policy which was launched by the Honorable Minister of Health. It was necessary to show that evidence-based advocacy is an effective tool for policy change in Nigeria.

Summary: The policy review process involved six steps; Consultative engagement, Planning Meeting, First and Second stakeholders meeting, Finalization and Validation Meeting, and Launch and Dissemination. The PSNF has successfully supported the review of Two (2) TSTS Policies for the years 2018 and 2022 which has given rise to the following implementation results across some States whereby 734 CPs and 2226 PPMVs from 2018 to 2023, have been trained to provide expanded FP (contraceptive implants and injectables) and Primary Healthcare services.

Conclusion: Evidence-based Advocacy is a critical tool for effective policy change. The review of important country health policies to reflect global best practices is essential for the attainment of Universal Health Coverage.

Keywords: Expanded services, Evidence-based Advocacy, Task Shifting, Task Sharing

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Advancing *CYP2D6* Pharmacogenetics through a Pharmacoequity Lens

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Background and Purpose: Pharmacogenetics testing is a tool that predicts drug efficacy and adverse drug reaction based on individual's genetic make-up. Over 20 % of Food and Drug Administration (FDA)-approved drugs in the United States are processed by the hepatic enzyme cytochrome P450 2D6 (CYP2D6). The gene encoding CYP2D6 is highly polymorphic and genetic variation has been shown to impact drug efficacy and safety for commonly dispensed drugs.
Summary: It is important to understand an individual's metabolizer status to optimize treatment outcomes for patients taking medications that are metabolized by CYP2D6. Consequently, clinical *CYP2D6* pharmacogenetic testing is being implemented by a growing number of health centers. Furthermore, Clinical Pharmacogenetic Implementation Consortium (CPIC) guidelines currently recommend adapting therapeutic regimens for 16 drugs based on *CYP2D6* genotype-informed phenotype. However, *CYP2D6* genetic variation varies considerably across global populations. Many allelic variants, or star alleles, are predominantly found in certain ancestral populations. Although *CYP2D6* genetic variation has been extensively studied, there is still a paucity of information for many non-European populations. Studies have shown that pharmacogenes from European populations cannot simply be extrapolated to other groups such as the African ancestry.
Conclusion: Pharmacogenetic studies in broad and diverse study populations are urgently needed to determine the extent of *CYP2D6* genetic variation (e.g., ancestry-specific variants), as well as the clinical impact of population-specific variation on treatment outcome. This review highlights knowledge gaps, challenges, and future directions regarding studies that are necessary to address health inequities that hamper our ability to optimize drug therapy for improved health outcomes in Nigeria and globally.

Keywords: CYP, Ethnicity, Genetics, Global Health, Pharmacogenetics, Pharmacogenomics, Population, Precision Medicine, Race, Translational Medicine

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Comparative in-silico analysis of the toxicity profile and binding affinity of curcumin and dasatinib to lyn protein

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Background: Lyn kinase's discovery as a catalyst for aggressive behaviour in triple-negative breast cancer (TNBC) continues to be a major concern for both researchers and those living with breast cancer. Several biological processes relies on protein-ligand interactions. It is therefore vital to assess a ligand's binding affinity for its transmembrane receptor as this reveals the effectiveness of the ligand. Molecular docking has emerged a key technique in drug development due to its relatively low cost implication and its apparent ease of use. Medicinal plants have been considered the corner stone of health maintenance and care worldwide.

Objectives: This study compared in-silico analysis of the toxicity profile and binding affinity of curcumin and dasatinib to lyn protein.

Method: The molecular docking techniques as well as in-silico methods of toxicity testing was employed to comparatively study the binding affinity and toxicity of curcumin as compared to the native ligand respectively.

Results: It was found that that curcumin binds similarly as dasatinib to the lyn protein but with lesser toxicity profile.

Conclusion: Results obtained from this study revealed the anticancer potential of curcumin. This could make it easier to create bioactive molecules using structure-based drug design and ultimately cure triple-negative breast cancer.

Keywords: Curcumin, dasatinib, lyn, molecular docking, triple-negative breast cancer (TNBC)

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In-vivo Antiplasmodial activity of the alkaloid fraction of the methanol root extract of Andropogon schirensis Hochst (Poacea) in Plasmodium berghei infected mice

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Background: Malaria is one of the major health problems in Nigeria and the increasing number of drug-resistant Plasmodium species continue to be a major concern. *Andropogon schirensis* is a perennial plant that is used traditionally in the treatment of malaria and dysentery.
Objectives: This study evaluated the *in-vivo* antiplasmodial activity of the alkaloid fraction of methanol root extract of *Andropogon schirensis* in *Plasmodium berghi* infected mice.
Methods: GC-MS analysis was carried out to identify the compounds present in the alkaloid fraction of *Andropogon schirensis.* Acute oral toxicity was conducted using OECD 425 guideline (2001). The alkaloid fraction at tested doses of 250, 500 and 1000 mg/kg was evaluated for *in-vivo* antiplasmodial activity using suppressive (early infection), curative (established infection) and prophylactic tests in *Plasmodium berghi* infected mice.
Results: The GC-MS analysis revealed the presence of 17 bioactive compounds which include: 9-Octadecenoic acid (Z)-, methyl ester; Pentadecanoic acid, 14-methyl-, methyl ester and Pentanoic acid. The oral median lethal dose (LD_{50}) of the alkaloid fraction was estimated to be greater than 5000 mg/kg. In the suppressive test, the alkaloid fraction at the tested doses of 250, 500 and 1000 mg/kg showed good parasitemia suppression of 50.07, 71.06 and 72.86 % respectively which was statistically significant (P<0.001) when compared with the negative control (treated with distilled water) group. The fraction (250, 500 and 1000 mg/kg) in the curative test showed good parasitemia suppression of 61.64, 67.57 and 70.51 % respectively which was statistically significant (P<0.001) when compared to the negative control group. The mean survival time of the fraction at all the tested doses after the curative test was over 28 days and it prevented malaria induced changes in PCV. The prophylactic test showed moderate parasitemia suppression of 43.14, 49.45 and 65.5 7% respectively which was statistically significant (P<0.001) compared with the negative control group.
Conclusion: The study showed that the alkaloid fraction has good suppressive and curative antiplasmodial activity with moderate prophylactic activity which may be due to the presence of the identified bioactive compounds.
Key words: *Andropogon schirensis,* Antipasmodial, Parasitemia, *in-vivo*, *Plasmodium berghi*

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Antiretroviral Therapy Outcome among Adults in Federal Teaching Hospital, Gombe Nigeria

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Background: Highly Active Antiretroviral therapy (HAART) has become a mainstay in the management of people living with HIV. A strong association has been established among socio-demographics of participants, Antiretroviral Therapy (ART) regimens, base line anemia, base-line CD4 cell count and WHO- clinical stages have been linked to treatment outcomes.

Objective: This study assessed the impact of ART outcomes among adults receiving care at Federal Teaching Hospital Gombe, Nigeria.

Methods: A retrospective cohort of 324 patients who initiated ART from January 2017 – December 2019 were assessed. Pertinent data were collected on a pre-designed data collection form and analyzed using relevant statistical tools.

Results: The patients were 227 (70%) females and 70 (30%) males. A significant increase in weight from 57kg to 58kg and 62kg after six and twelve months of therapy (p=0.001) was observed. Hemoglobin decreased from 13g/dL to 12g/dL and 12g/dL at the same time frame (p=0.36). Baseline anemia was 16 % which dropped to 11 % at twelve months. At baseline, those with CD4cell count > 350 cells per mm^3 were 44.7 % which increased to 53.4 % and 72.3 % at six and twelve months respectively (p=0.087). The regimen mostly associated with anemia was Zidovudine/Lamivudine/Nevirapine while the least was Tenofovir/Lamivodine/Dolutegravir. Baseline CD4 and anemia were linked to immunological failure. Only employment status was linked to virological failure among the patient demographics, $p = 0.03$.

Conclusion: The study established that Tenofovir/Lamivudine/Efavirenz regimen was the most utilized drug by the patients and a significant improvement in clinical outcomes was observed with its use. It could be recommended that, further researched need to be done related to weight gained by most patients as this is known to cause an increase in the risk of developing diabetes mellitus and cardiovascular diseases.

Key words: Highly Active Antiretroviral therapy (HAART), anemia, CD4 cell

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Assessment of dose adjustment of drugs in patients with renal insufficiency in a Nigerian tertiary healthcare facility

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Background: Many drugs are eliminated by the kidneys and patients with renal insufficiency are at the risk of drug accumulation. Therefore, there is need to adjust the doses of such drugs in patients with renal insufficiency.
Objectives: This study assessed dose adjustment of drugs in patients with renal insufficiency in Ahmadu Bello University Teaching Hospital (ABUTH), Zaria Nigeria.
Methods: A cross-sectional retrospective study was carried out on a sample of 160 patients' case folders who attended the Nephrology Clinic of the Medical Out Patient Department in the facility between January, 2006 and January, 2016. Pertinent data were collected in a pre-designed data collection form and analysed using descriptive statistics.
Results: The incidence of renal insufficiency among male and female gender was 88 (55 %) and 72 (45 %) respectively with an overall mean age of 42±1.8 years, while 86 % of the patients presented with co-morbidities and 67 % were at End-Stage Renal Disease (ESRD). A total of 468 drugs were reviewed, but only 41.2 % of the 182 drugs requiring dose adjustment were actually adjusted in such patients.
Conclusion: Dose adjustment in patients with renal insufficiency is not being fully implemented in ABUTH. It is therefore recommended that physicians should adjust the dose of drugs that are eliminated via the kidneys according to the Glomerular Filtration Rate (GFR) of an individual patient with renal insufficiency in this facility.

Keywords: Dose adjustment, End-Stage Renal Disease, Glomerular Filtration Rate and Renal Insufficiency

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Assessing interventions made by Pharmacist to improve adherence and outcome of Antiretroviral therapy in Hajiya Gambo Sawaba General Hospital, Zaria-Nigeria

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Background: Poor adherence is a major challenge to antiretroviral therapy. Recently, it is recommended that patients should have not less than 95 % adherence in order to maintain sufficient suppression of viraemia (viral load) and prevent the emergence of resistance. It is therefore of paramount importance to device methods of improving patient's adherence.
Objectives: This study explored the types of interventions provided by pharmacist and the effect of patient counseling and mobile phone text messages in improving adherence.
Methods: A total of 132 patients were allocated into an intervention and control groups. Both groups were given additional adherence counseling at the beginning of the study and on every clinic visit. The intervention group was also sent reminder text messages for a period of 24 weeks. Patients in the intervention group were given phone number which they called if they had any issues concerning their drug therapy. The different interventions provided by the pharmacist both through telephone communication and during the counseling sessions were recorded. Patients' self-report of adherence were compared between the two groups. Patients with 95% and above adherence were classified as adherent, while those with less than 95% non-adherent. The two groups were compared for statistical significant difference. The reasons for missing the doses by the patients were determined using qualitative inquiry. Patients self-report of adherence were compared between the two groups. Patients with 95% and above adherence were classified as adherent, while those with below 95% were classified as non-adherent. The reasons for missing doses were determined using qualitative inquiry.
Results: Patients self-report of adherence showed no statistical significant difference between the two groups. However, the total number of adherent patients was 98(69.7%) while the total number of non-adherent patients was 34(30.3%). The difference was found to be statistically significant. (X^2 = 51.2). Reasons for missed doses include; forgetfulness, busy schedules, worry, hospitalization, travels, stigma, drug finish, etc.
Conclusion: The study revealed that pharmacist intervention solved patients' therapy problems thereby improving adherence to antiretroviral therapy.
Keywords: Antiretroviral therapy, interventions, Pharmacist, Poor adherence

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Type 2 Diabetes Mellitus in Adolescents and Young Adults and Glycaemic Control at State Specialist Hospital, Gombe, Nigeria

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Background: The rising burden of Type 2 diabetes mellitus among young people represents an emerging public health challenge worldwide**.** Information on this future epidemic is scarcely reported in Nigeria, including Gombe state.
Objectives: This study estimated the prevalence of Type 2 Diabetes mellitus in adolescents and young adults, assessed glycaemic control and associated factors among diabetic patients receiving care at State Specialist Hospital, Gombe Nigeria.
Methods: This study was a retrospective cross sectional case folder audit of patients with Type 2 diabetes who received care at the state specialist hospital, Gombe between January, 2017 and December, 2022. The folders were selected in line with pre-stated inclusion criteria for the study and 186 (98.9%) of the estimated sample size was obtained. A researcher-designed data collection form was used to retrieve patients' socio-demographic data (age, gender, marital status, educational status, occupation) and clinical/biomedical characteristics including blood glucose, family history of diabetes, duration of disease and blood pressure readings. The data was entered into an excel spreadsheet, exported and analysed using statistical package for social sciences (SPSS) version 25.0. The outcomes were reported as descriptive and inferential statistics. Patients' characteristics were expressed in proportions and frequencies, while Chi square test and fishers' exact test were conducted to assess factors associated with glycaemic control.
Results: The mean age of the study population was 53.17 (SD ±10.81) years, with more females (67.7 %), married (97.3 %) and self-employed (75.8 %) patients. Slightly more than half (51.6 %) did not receive formal education and 60.2 % had family history of diabetes. The prevalence of type 2 diabetes in adolescent and young adults was 13.4 % while 72.0 % had poor glycaemic control. Factors associated with poor glycaemic control include no formal education ($p = 0.028$) and use of sulfonylureas ($p = 0.001$) and other medications ($p = 0.01$).
Conclusion: The prevalence of Type 2 diabetes mellitus in adolescents and young adults at state specialist hospital was 13.4 %, while level of education and medications used were significantly associated with poor glycaemic control
Keywords: Adolescents, Young Adults, Type 2 Diabetes Mellitus, Glycaemic Control, North-East, Nigeria

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Quantifying the Economic Burden of Malaria in Mushin Local Government using the Willingness-to-pay approach

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Background: Malaria is a major public health issue in Nigeria, particularly in Lagos, where it places a significant economic burden on households. Nigeria has the highest number of malaria cases globally, resulting in substantial direct and indirect costs for treatment and prevention. Despite extensive investments and interventions, the disease continues to impact healthcare systems and impede economic growth.

Objectives: This study assessed the current economic burden of malaria on households in the Mushin Local Government, Lagos, using the willingness-to-pay approach and explored potential financing options to combat the disease.

Method: This cross-sectional study was conducted in Mushin Local Government Area, Lagos, Nigeria, with 414 participants. A structured questionnaire was administered through face-to-face interviews to gather data on the economic burden of malaria on households and the willingness of participants to contribute towards malaria treatment and eradication efforts. Data analysis was performed using Microsoft Excel and IBM Statistical Package for the Social Sciences (SPSS) version 22 software. The analysis involved descriptive measures like mean and distribution, as well as regression analysis and chi-square tests to draw insights from the data.

Results: The result showed that 59.4 % of respondents were male, and 40.3 % were female. The average economic burden per malaria case was ₦11,672.26 ($15.36), including both direct and indirect costs. The direct costs comprised expenses on drugs and diagnostics (₦7,034.76 / $9.37), while indirect costs included loss of productivity (₦4,637.50 / $6.10). About 63 % of households were willing to subscribe to a malaria-focused health insurance scheme, allocating an average of ₦2,637.28 ($3.46) monthly per household for the program. The economic burden observed in Mushin Local Government is higher than previous findings in other regions of Nigeria, underscoring the urgency of addressing this issue.

Conclusion: The results showed there is a high economic burden of uncomplicated malaria on households in Mushin Local government. Findings from the study suggests the potential value of promoting health insurance schemes and community-based efforts to tackle malaria effectively.

Keywords: Malaria, economic burden, households, willingness-to-pay, health insurance.

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Antifungal activity of Allium sativum and Zingiber officinale against Tinea capitis among Primary school pupils in Balanga, Gombe State Nigeria

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Background: *Allium sativum and Zingiber officinale* are known to have antifungal activity. Fungal infection (dermatophytosis) of the scalp is a prevalent infection that constitutes a public health challenge among children,
Objectives: This study evaluated *in vitro* antifungal activity of *Allium sativum and Zingiber officinale* against *Tinea capitis.*
Methods: New surgical blades were used to collect specimen from Sixty (60) children by scraping affected spots into clean sheets of paper, transferred into well labelled sterile containers. Each specimen was divided into two parts – one part was used for direct microscopy and the other was used for culture. For microscopy, a wet mount of each specimen was prepared and thereafter were examined under low (10x) and high (40x) magnifications. And for the culture, each specimen was inoculated into a pair of MycoselR agar plates by placing some of scrapings centrally on the surface of the medium by means of a sterile straight wire. For each specimen, one plate was incubated at room temperature (25-30°C) and the other at between 35- 37°C (incubator). The culture plates were then examined every other day for evidence of growth. Cultures were not considered negative for growth until after four weeks of incubation. After the growth of a dermatophyte was established, a subculture was made on to plain SDA for further identification and susceptibility testing. The anti-dermatophytic activity of aqueous, ethanolic and methanolic extracts of *Allium sativum and Zingiber officinale* was carried out using well-in-agar method. Each was filled with 0.2 mL of the extract. Griseofulvin was used as control for cultures at a concentration of 1 mg/mL. The plates were incubated at 28 °C for 24 hours and results taken.
Results: The pupils infected with *Tinea capitis* and *Aspergillus niger* were 58 (96.33 %) and 2 (3.33 %) respectively. Eight (8) organisms were isolated: *Trichophyton mentagrophyte* (25 %), *Mricrosporum canis* (20 %), *Trichophyton rubrum* (14 %), *Microsporum gypseum* (12 %), *Trichophyton schoenleinii* (8 %), *Trichophyton verrucusum* (10 %), *Trichophyton tonsurans* (8 %) *and Aspergillus niger* (8 %). The aqueous, methanolic and ethanolic extracts of *Allium sativum* and *Zingiber officinale* inhibited the fungi with zones ranging from 12.93 to 25.87 mm and 12.00 to 24.6 mm respectively.
Conclusion: The extracts of *Allium sativum and Zingiber officinale* had a marked inhibitory effect on the isolated organisms.
Keywords: *Allium sativum, Zingiber officinale*, *Tinea capitis*, aqueous, methanolic, ethanolic extracts

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Occurrence of Drug Resistant Escherichia coli on Door Handles of Faculty of Pharmaceutical Sciences, Gombe State University, Gombe: An Alarming Public Health Threat.

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Background: Antimicrobial resistance represents a significant global concern, posing grave threats to public health, food security, and overall development. Its reach knows no boundaries, affecting individuals of all ages, regardless of geographic location. The repercussions include escalated healthcare expenses, extended hospital stays, and heightened rates of illness and death. Addressing this perilous challenge, wrought by antimicrobial-resistant superbugs, necessitates comprehensive surveillance data encompassing not only human populations but also animals and the environment.

Objectives: This study was undertaken to ascertain the prevalence and antibiotic susceptibility profile of *Escherichia coli* present on door handles within the Faculty of Pharmaceutical Sciences at Gombe State University.

Methods: We collected a total of 63 swab samples from door handles within the faculty premises. These samples underwent a series of laboratory procedures, beginning with culturing on Nutrient Broth (NB), followed by sub-culturing on Nutrient Agar (NA), and then subsequent culturing on Eosin Methylene Blue (EMB) agar. Gram staining was employed to delineate the morphological characteristics of the isolates, and biochemical tests were conducted to identify *E. coli.* Antibiotic susceptibility testing was carried out utilizing the modified Kirby-Bauer disc diffusion method.

Results: Out of the 63 samples, 17 were identified as *Escherichia coli*, indicating a prevalence rate of 26.98 %. Antibiotic susceptibility testing revealed that these isolates exhibited high resistance rates, with complete resistance to Erythromycin, 94.11 % resistance to Trimethoprim/Sulfamethoxazole, 92.12 % resistance to Clindamycin, 52.94 % resistance to Tetracycline, and 5.88 % resistance to Imipenem. Analysis of the Multiple Antibiotic Resistant Index (MARI) revealed that 64.7 % of the isolates had a MARI value of 0.3 or higher, indicating likely origins in environments where antibiotics were used indiscriminately.

Conclusion: This research unveiled a disturbing contamination rate of the door handles within the Faculty of Pharmaceutical Sciences at Gombe State University harbouring *E. coli.* The prevalence of antibiotics resistance of this pathogen underscores the urgent need for increased awareness regarding the importance of personal hygiene among Faculty members and students.

Keywords: Antimicrobial resistance, *Escherichia coli,* door handles, Faculty of Pharmaceutical Sciences Gombe

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Viral Suppression and Medication-related Burden Among HIV-infected Adults in a Secondary Care Facility

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Background: People living with HIV/AIDS (PLHIV) are prone to other health issues that may result from the disease or antiretroviral medicines. These persons experience other psychosocial aspects of the illness, which may negatively impact their quality of life and overall treatment outcomes.
Objectives: This study assessed the virologic response and medication-related burden of adult PLHIV.
Methods: This cross-sectional study involved 417 HIV-positive adults. Patient medication experience was measured using the Living with Medication Questionnaire version 3 (LMQ-3). While viral suppression was assessed at viral loads < 1000 copies/mL and 20 copies/mL for undetectable HIV RNA levels.
Results: Of the 417 PLHIV included in this study, 93.8 % achieved viral suppression with more than two-thirds (69.5 %) whom were females. The majority of patients (91.6 %) were on a dolutegravir-based regimen, had no tuberculosis diagnosis at antiretroviral (ART) initiation (82.5 %), were on stage 1 WHO classification (65 %) and were 6-10 years on ART (46.3 %). Only 67.6 % of the population had a moderate medication-related burden. Female sex (p<0.0005), unsuppressed viral load (p=0.01), second-line ART (p=0.03), Tuberculosis at ART initiation (p=0.02), and employment (p=0.003) were significantly associated with medication-related burden. The predictors of viral suppression were ages 36-45 years (AOR 6.6; 95 % CI, 1.19 – 36.51) and 46 – 55 years (AOR 12.69; 95 % CI, 1.36 – 118.40) and a high degree of medication-related burden (AOR, 0.15; 95 % CI, 0.02 –0.82). While unsuppressed viral load (p=0.01) and female gender (p=0.002) were independent predictors of medication related burden.
Conclusion: The findings from this study revealed that majority of the patients have achieved viral suppression with moderate degree of medication-related burden. Targeted interventions should be geared toward younger patients, females and patients with unsuppressed viral loads.
Keywords: HIV; Viral Suppression; Medication-related burden; Antiretroviral drugs

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Evaluation of Anti-Malarial Drug Utilization among Pregnant Women in a Secondary Care Facility

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Background: Malaria is associated with higher morbidity and mortality in pregnant women than in non-pregnant women. Lack of adherence to standard clinical guidelines in prescribing antimalarial agents can have deleterious adverse effects on the mother and the fetus.

Objectives: This study assessed the prescription patterns and utilization of antimalarial drugs among pregnant women.

Methods: This was a prospective cross-sectional study among women attending antenatal care at a Secondary Health Center. W.H.O. and the international network of rational use of drugs core drug prescribing indicators were adopted, while systematic random sampling was employed in this study. Mann-Whitney or Kruskal-Wallis tests were used to determine the association between patient variables and the type of antimalarial, while linear regression was employed to determine predictors for antimalarial prescription.

Results: The results of the study were based on 400 sampled outpatient prescriptions. Of the sampled prescription, majority of the study population were aged 15-25 (176, 44.0 %), in their second trimester (226, 56.5%), and hypertensive (27, 6.8%). More than half (201, 50.2%) of the antimalarial prescriptions were definitive and constituted Artemisinin based combination therapy (94, 23.5%), prescribed in generic form (263, 65.8%), antibiotics (25, 6.3%), and included in the essential medicines list (149, 37.3%). Nearly half of the population was on intermittent preventive treatment (IPt) (185, 46.3%) and on their second dose (229, 57.3%). The type of antimalarial ($p<0.0005$), inclusion in the essential medicine list ($p<0.005$), and prescription with an injection were significant factors associated with antimalarial utilization while type of antimalarial drug ($p<0.0001$), generic prescription ($p<0.0005$), and inclusion in the list of essential medicines ($p<0.005$) were independent predictors of antimalarial utilization.

Conclusion: Findings from this study suggest that the prescribing and utilization of antimalarial drugs were done according to the WHO recommendations with the exception of prescribing in generic where only 65.8% of antimalarial drugs were prescribed in generic form. We therefore recommend generic prescription of antimalarial drugs.

Keywords: Malaria, Anti-malaria, Pregnant women, Drug utilizatio

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Patients' Rights and negligence in Public Hospitals in Oyo State, Nigeria: Pharmacists' Role in Medication Therapy Management

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Background: Patient rights, covered by a legal declaration adopted by most healthcare personnel, include; access to care, patient respect, privacy, and consent to treatment. The "Five Rationality Rights" are familiar to pharmacists. The 12 rights the patients are entitled to are all-encompassing, from the right to relevant information to the right to lodge a complaint and voice dissatisfaction with services provided.

Objectives: This study examined the impact of Medication Therapy Management on Patients' rights and negligence in Public Hospitals in Oyo State, Nigeria.

Methods: The study triangulates qualitative and quantitative research techniques, using Social Action and Consumer Satisfaction Equity theories as the framework to check the existence of legal duty of care and breach, and damage suffered as a result of breach. Six public hospitals were randomly selected in Oyo state, involving 769 patients and their relatives. In-depth interviews were conducted with 24 patients and their relatives. Quantitative data were analyzed using Chi-square and multiple regression, while qualitative data were content-analyzed.

Results: The Pharmacists were perceived as not doing enough in Drug Information services in Medication Related Problems. On assessing patients' adherence to medication, most respondents were not satisfied with the Pharmacists' roles in this regard. Only very few were very satisfied with the level of confidentiality with the Pharmacists. The level of satisfaction was low with Pharmacists' inability to follow-up after dispensing drugs to In/Out-patients. Respondents expressed satisfaction with some Pharmacists' willingness to provide critical information to patients on chronic diseases. On drugs availability, the respondents were not satisfied with the level of availability of prescribed drugs.

Conclusion: The patients' identified their rights and limit of negligence. The Pharmacists should understand that in achieving Pharmaceutical care, Improved Medication Therapy Management services could solve negligence of duty, deviation from standard of care, reduce damages and results in better health outcomes

Keywords: Patients' Rights and Negligence, Public Hospitals, Medication Therapy, Management, Medication Related Problem, Confidentiality

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In-vitro comparative study of solvent effect on antioxidant properties of leaf extracts of Anthocleista djalonensis.

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Background: Globally, the use of herbal products as teas to maintain healthy living is on the increase due to high prevalence of chronic diseases and toxic effects of orthodox medicines. Most of the Pharmacological analysis of *Anthocleista djalonensis* has been done using laboratory solvents which are not used in processing these herbs for consumption. Traditionally, water and locally produced gin are used to prepare these herbs as teas or tinctures.

Objectives: The study compared the effect of different solvents on the antioxidant properties of *A. djalonensis* which is dependent on the nature and quantity of phytoconstituents extracted.

Methods: Water, locally produced gin and ethanol (90 %) were used to extract these constituents. The extracts were analysed for antioxidant properties using DPPH, nitric oxide, and hydrogen peroxide.

Results and Discussion: The 2,2-Diphenyl-1-picrylhydrazyl (DPPH) and hydrogen peroxide scavenging assays revealed concentration-dependent responses, increasing their scavenging activities as the concentration increased. In the DPPH scavenging assay, distilled water exhibited the lowest half maximal inhibitory concentration (IC_{50}) value of 0.079 mg/mL, signifying strong antioxidant potential. Similarly, local gin displayed potent hydrogen peroxide scavenging activity with an IC_{50} of 0.12 mg/mL, surpassing the standard ascorbic acid with an IC_{50} value of 0.31 mg/mL. In contrast, the nitric oxide scavenging assay showed a concentration-dependent increase in nitric oxide scavenging activity for both ethanol and local gin extracts. Ethanol extract displayed a maximum activity of 22.84 %, with an IC_{50} value of 17.93 mg/mL, while local gin extract exhibited an even higher activity of 46.29 %, with an IC_{50} value of 9.35 mg/mL. However, the nitric oxide scavenging assay of the extracts did not exhibit significant activity compared to the standard ascorbic acid, which demonstrated the highest inhibition of nitric oxide production at 57.10 % with an IC_{50} value of 7.17mg/mL.

Conclusion: The study gives valuable insights into the importance of solvent selection in herbal preparation for optimal health benefits especially regarding antioxidant activity. For prevention and treatment of chronic diseases, leaves of *A. djalonensis* prepared as tinctures to be diluted with water will offer the greatest health benefits to consumers.

Keywords: *Anthocleista djalonensis,* antioxidant properties, DPPH scavenging assay, IC_{50} value

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Exploring the use of Generative AI in Optimizing Community Pharmacy Practice in Nigeria.

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Background and Purpose: Generative Artificial Intelligence (GAI) is a technology that has been making waves and transforming approaches to solving traditional problems in some fields. It can produce texts, images, music, and other forms of content in a way that could pass as human-made. After the public acknowledgment of this technology seen in ChatGPT, Google Bard, and DALL-E 2, with ever-expanding innovative applications of these (other and similar) tools, many things thought impossible are now being achieved. This has prompted many different industries and businesses to dedicate resources to explore how they can adopt GAI technology.

Summary: In the medical field, GAI is being explored in developing new drugs and diagnostics tools. It has driven collaboration between the biotechnology and pharmaceutical industries and has powered several research in diseases and healthcare management. GAI is also used in medical imaging to enhance images for diagnosis and optimize early disease detection. Hospitals use it to automate clinical documentation, support clinical administration, and facilitate multidisciplinary collaboration among healthcare teams. The community pharmacy is the first point of care for the populace. GAI tools can help pharmacies manage traffic and optimize healthcare while catering to the business's administrative and management parts. They can help automate medication dispensing, bridge language barriers, generate personalized medication plans for patients based on their needs, and develop new educational resources for patients and pharmacists. They can also power the extension of services, such as virtual consultations and home delivery. Generative AI is a rapidly evolving technology with many potential applications. However, it has challenges like trust, safety, reliability, privacy, copyrights, and ownership. These challenges are not yet fully settled but are gradually being addressed as the technology matures.

Conclusion: Researchers believe that generative AI will play an increasingly important role in medicine and healthcare as it further evolves and gets better tailored to the unique settings and requirements of the medical domain.

Keywords: Generative Artificial Intelligence, pharmaceutical industries, ChatGPT, Google Bard, DALL-E 2

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Molecular Characterization and Evaluation of Phytochemical constituents of endophytic fungi derived from *Mitracarpus scaber* Zucc. (Rubiaceae)

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Background: In quest to ameliorate the issues of recurring incidences of multidrug-resistant organisms and over-exploration of plants, researchers have delved into research involving endosymbiotic microorganisms known as endophytes. These are microorganisms inhabiting the internal part of plants, which have been verified to possess great potentials of bioengineering novel products for therapeutic purposes.
Objectives: The study isolated and identified endophytic fungal species present in *Mitracarpus scaber,* molecularly characterized the pure isolates, and tested for phytochemical compounds present.
Methods: Freshly collected non-diseased leaves of *M. scaber* were subjected to a four-step surface sterilization. Hyphal tips of actively growing fungi from the plant material were harvested and further sub-cultured for purification and isolation. Four isolates obtained from the endophytic fungi (EDF), present in the leaf of *M. scaber* were subjected to molecular identification. The DNA extraction was done using Zr fungal/bacterial DNA miniprep. The extracted DNA was amplified through PCR, and sequenced. The resultant sequences were compared with GenBank database, using Basic Local Alignment Search Tool.
Results: The result of phytochemical screening of the extracts revealed the presence of flavonoids, tannins and phenols, in large amounts; terpenoids, alkaloids and cardiac glycosides, in moderate amounts; steroids, hydrogen cyanide and saponins in very low quantities, while that of molecular characterization identified four organisms: *Penicillium sclerotiorum, Clasporium cladosporiodies, Cryptococcus nemorosus,* and *Phyllosticta capitalensis*.
Conclusion: The molecular characterization identified four endophytic fungi from pure isolates from *Mitracarpus scaber.* These isolates high level of similarities with some known microorganisms after blasting. Phytochemical studies of the metabolic extracts of the endophytic fungi isolated from *Mitracarpus scaber* presented fascinating bioactive moieties such as flavonoids, tannins and phenol and more other, which when harnessed could serve as key sources of pharmaceutical API in formulation of drugs that could treat some of the emerging infectious diseases that are of much concern in healthcare system.

Keywords: Endophytic fungi, Multidrug-resistance, *Mitrcarpus scaber*, Molecular characterization, DNA, Metabolites, Phytoconstituents.

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Development of a Mucoadhesive Co-Polymeric Oral Gel of Khaya senegalensis and Terminalia mentaly gums containing the leaf extracts of Azadirachta indica and Chrysophylum albidum

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Background: Microbial populations in the oral cavity significantly account for the global oral disease burden. Natural plants contain bioactive constituents with antimicrobial potentials. Natural polymers have found increasing use as excipients.

Objectives: This study developed a polymeric mucoadhesive oral gel of *Khaya senegalensis* (KSG) and *Terminalia mentaly* containing leaf extracts of *Azadirachta indica* (AZI) and *Chrysophylum albidum* (CYA).

Methods: Preformulation protocols and characterizations were undertaken for leaves of AZI and CYA, KSG and CYA. Optimized co-polymeric hydrogel carrier matrix systems of KSG and TMG were developed .The established optimal antimicrobial concentrations of AZI, CYA and AZI + CYA extracts against the oral clinical isolates (following Ethical approval) were gradually incorporated into the optimized KSG-TMG hydrogel carrier systems as oral gels. The gel formulations were characterized for pH, viscosity, and evaluated for antimicrobial activity and release profile of the bioactive constituents using standard methods. Data was statistically analysed using Students' T-test and ANOVA with significance set at $p\text{-}value \leq 0.05$.

Results: The plants and natural polymers had acceptable preformulation and compatibility profiles. The optimized co-polymeric hydrogel carrier systems contained ratio concentrations of KSG_{70}: TMG_{30}as (F6) and KSG_{100}:TMG_{0}as (F7). Plant extracts (singly and polyherbal) demonstrated antimicrobial activity against clinical isolates being AZI > CYA > AZI +CYA. Polyherbal gel formulation had pH of (6.8 ±0.05), viscosity (3250 ± 12 m Pa S), good syringeability and stability. Zones of inhibition against *Bacillus spp* were (19.67± 2.56 mm), *Pseudomonas aeruginosa* (18.67± 1.00 mm) and *Staphylococus aureus* (15.33± 0.38 mm). Release of bioactive constituents from formulation followed Higuchi's and Korsmeyer-Peppas models.

Conclusion: The formulated mucoadhesive co-polymeric polyherbal oral gel is suggested with potential usefulness in some oral infections

Keywords*:* Co-polymeric matrix carrier system, *Azadirachta indica, Chrysophylum albidum* Polyherbal, Oral gel.

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Evaluation of healthcare providers knowledge and perceptions of Pharmaceutical care in a public hospital in southern Nigeria

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Background: Pharmaceutical care (PC) continues to gain acceptance worldwide since its introduction in the 1990's. Its full implementation in Nigerian hospitals has sometimes met with stiff resistance from physicians and nurses, as a result of misconceptions. A right perception of PC will help remove impediments to acceptance and practice.

Objectives: This study evaluated knowledge and perceptions of pharmaceutical care among non-pharmacist healthcare providers at the Federal Medical Centre, Asaba.

Method: A four-part structured questionnaire was pretested and administered to one hundred and twenty healthcare professionals practicing at the Centre in July, 2018. It evaluated demographics of respondents, knowledge of and reasons for not supporting implementation of pharmaceutical care, and willingness to support practice if perceived barriers were removed. Data obtained were analyzed using SPSS Version 22. Descriptive and chi square statistics were obtained. P- value of less than 0.05 was considered statistically significant.

Results: Nearly half of respondents (43.8%) were aged 30-39 years, female (55.0%), married (53.5%), about a quarter (27.5%) were in practice for 6-10 years, half (45.0%) were nurses, physicians (38.8%), few (6.3%) had Master's degree. About two third (63.6%) had heard of pharmaceutical care (PC), few (26.9%) agreed that it originated from America, about two thirds (62.6%) agreed that Pharmacists take responsibility for resolving drug therapy problems, participate in dose adjustment (67.5%). Majority (82.1%) agreed that PC is concerned with achieving drug therapy outcomes, can be applied in all disease conditions (65.1%), will not curtail physicians authority (46.3%). Overall knowledge was average (61.4%). About half (56.3%) were of the opinion that their patients have not benefited from PC, that involvement of pharmacists in ward rounds was desirable (57.6%), that Pharmacists should also focus on patient care and not only drug products (63.8%), and that they will accept involvement of pharmacists in drug management of patients (68.8%). Overall perception was weak (64.3%).

Conclusion: This Study revealed average knowledge and weak perception of pharmaceutical care among healthcare providers in the Study Centre. Efforts should be made to educate them about PC via hospital clinical meetings, seminars and focus group discussions.

Key words: Healthcare providers, Knowledge, Perceptions, Pharmaceutical care

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ASSESSMENT OF KNOWLEDGE AND USE OF CONTRACEPTION AMONG FEMALE UNDERGRADUATE STUDENTS OF TERTIARY INSTITUTIONS IN BORNO AND ADAMAWA STATE, NORTH-EAST, NIGERIA.

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Background: In many settings, most people experience sexual debut during adolescence. Often time this activity is done with negligence to contraceptive use leading to unintended pregnancy, and unsafe abortions. This study assessed the knowledge and use of contraception among female undergraduate students of tertiary institutions in Borno and Adamawa, North-East, Nigeria.

Methodology: The study was a cross-sectional survey. A multistage sampling technique was used to recruit 299 Female undergraduate students in the University of Maiduguri and Adamawa State University, North-East, Nigeria. A structured self-administered questionnaire was used to elicit information on respondents' socio demographics, awareness about contraception, knowledge of contraception, contraception usage, and choice/source of contraceptives. Data collected were analyzed using SPSS version 26. The level of association was measured using Pearson's (Chi-square) correlation at 95% confidence interval and the level of significance was set at $p \leq 0.05$.

Results: The mean age of the study participant is 23.6±4.4 years. Two hundred and fifty-four (85%) of the students were aware of contraception. However, more than half 172 (57%) of the respondents had poor knowledge about contraception. While 60 percent of the students have experienced their sexual debut prior to this study only 56 percent used any form of contraceptives. The most common contraception method used was condom (59%). One hundred and eight (36%) have had to use emergency contraceptives. At 95% CI, age, institution, year of undergraduate study, and place of residence were statistically significant to current usage of contraception ($p < 0.001$).

Conclusion: There is high level of sexual activity among the students, but consistent contraceptive use is low. Low consistent use of contraception among sexually active students can result in negative consequences because of risky sexual behaviours if left unchecked. More reproductive health education as well as social and behavioral change activities tailored for young adult is recommended to improve sexual health.

Key words: Knowledge, Use, Contraception, North-East, Nigeria.

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