

## **EVALUATION OF THE IMPACT OF PHARMACOVIGILANCE MEDIA CAMPAIGN ON PUBLIC AWARENESS OF ADVERSE DRUGS REACTIONS AMONG RESIDENTS OF ONDO STATE**

**ABUBAKRI, RAMAN OLANIYAN**

*Department of Mass Communication,  
Rufus Giwa Polytechnic,  
Owo, Ondo State, Nigeria*  
[abubakriramanintegrity@gmail.com](mailto:abubakriramanintegrity@gmail.com),  
+2347034204919 +2348033819060

**OLALEYE, FRANKLYN AKINOLA,**

*Department of Mass Communication,  
Rufus Giwa Polytechnic,  
Owo, Ondo State, Nigeria*  
[olaleyefranklin@gmail.com](mailto:olaleyefranklin@gmail.com),  
+234 806 674 0097

**AJAYI, OLUTAYO JAMES**

*Department of Mass Communication,  
Rufus Giwa Polytechnic,  
Owo, Ondo State, Nigeria*  
[oasisnevadry@gmail.com](mailto:oasisnevadry@gmail.com),  
[olutayoajayi@rugipo.edu.ng](mailto:olutayoajayi@rugipo.edu.ng)  
+234703 132 5330

### **Abstract**

This study evaluated the impact of pharmacovigilance media campaigns on public awareness of adverse drug reactions (ADRs) among academic staff in tertiary institutions in Ondo State, Nigeria. The study was anchored on Social Marketing Theory and the Health Belief Model. The population comprised 2,926 academic staff across seven tertiary institutions in Ondo State. Using the Taro Yamane formula at a 5% margin of error, a minimum sample size of 352 was determined. To account for possible non-response and incomplete questionnaires, the number of questionnaires administered was increased to 460, representing an additional 30.7%. A multi-stage sampling technique involving clustering, proportional allocation, and purposive selection was adopted. Data were collected using a structured questionnaire administered face-to-face and a semi-structured interview guide. Forty-five academic staff members were purposively selected for in-depth interviews. Quantitative data were analyzed using frequencies, percentages, and mean scores, while interview responses were subjected to thematic analysis.

Findings revealed moderate exposure to pharmacovigilance media campaigns and relatively high awareness of adverse drug reactions. However, knowledge of ADR reporting channels was low, indicating a gap between general awareness and actionable reporting knowledge. The campaigns were perceived as moderately effective in increasing awareness but had limited influence on behavioural change. Poor message repetition, inadequate understanding of technical content, limited awareness of reporting procedures, and low public trust in regulatory institutions were identified as major challenges. The study concluded that pharmacovigilance media campaigns have contributed to public awareness of drug safety but remain constrained by communication and structural barriers. It recommended sustained campaign dissemination, simplified messages, clearer information on ADR reporting procedures, stronger stakeholder collaboration, and regular evaluation of campaign effectiveness.

**Keywords:** Pharmacovigilance, Media Campaign, Adverse Drug Reactions, Public Awareness, NAFDAC

## **Introduction**

Pharmacovigilance is defined as the science and activities relating to the detection, assessment, understanding, and prevention of adverse drug reactions and other medicine-related problems (World Health Organization [WHO], 2019). The field emerged globally following the Thalidomide disaster of the early 1960s, which resulted in severe congenital abnormalities and exposed critical weaknesses in drug safety monitoring systems. This event led to the establishment of international drug monitoring frameworks coordinated by the WHO and the Uppsala Monitoring Centre (WHO, 2019). Globally, adverse drug reactions (ADRs) remain a significant public health challenge. Systematic reviews have shown that ADRs contribute substantially to hospital admissions and mortality, particularly in low- and middle-income countries where *pharmacovigilance* systems are still developing (Aagaard et al., 2021; Hazell & Shakir, 2018). Underreporting of ADRs remains a persistent challenge due to inadequate awareness, poor reporting culture, and limited integration of *pharmacovigilance* into routine healthcare practice (Bate & Evans, 2020).

In Nigeria, *pharmacovigilance* activities are coordinated by the National *Pharmacovigilance* Centre (NPC) under the National Agency for Food and Drug Administration and Control (NAFDAC). The centre became more formally structured following Nigeria's participation in the WHO Programme for International Drug Monitoring in 2004, strengthening national capacity for adverse drug reaction reporting and medicine safety surveillance (NAFDAC, 2021). The NPC collects, evaluates, and reports ADRs while collaborating with international regulatory bodies to enhance drug safety systems. To improve public participation in *pharmacovigilance*, NAFDAC has implemented sustained media campaigns aimed at increasing awareness of adverse drug reactions and discouraging the consumption of counterfeit or substandard medicines. These campaigns utilize mass media platforms such as radio, television, print, and digital communication channels to disseminate health safety messages to the public (Salama, 2016; Asemah, 2011). Evidence from health communication research shows that mass media campaigns can significantly influence health behavior when messages are repeated, accessible, and culturally relevant (Wakefield et al., 2019).

Despite these interventions, empirical evidence suggests that public awareness and reporting of ADRs in Nigeria remain inadequate. Studies have shown that many individuals are either unaware of *pharmacovigilance* reporting systems or fail to recognize adverse drug reactions when they occur (Yusuf, 2022; Nicholas, 2013). Similarly, underreporting remains widespread due to low health literacy and weak engagement between regulatory agencies and the public (Hazell & Shakir, 2018). Furthermore, the persistence of counterfeit and substandard medicines in Nigeria continues to undermine *pharmacovigilance* efforts. This has been linked to systemic corruption, weak regulatory enforcement, and socio-economic vulnerabilities that influence drug purchasing behavior (Farogbe, 2023; Olujimi, 2007). These factors collectively limit the effectiveness of

pharmacovigilance campaigns despite continuous governmental efforts.

From a communication perspective, the effectiveness of pharmacovigilance media campaigns depends not only on exposure but also on audience interpretation, credibility of messages, and accessibility of communication channels. Mass communication theory suggests that audience heterogeneity, media fragmentation, and trust in message sources significantly influence the effectiveness of health campaigns (McQuail, 2010; Wakefield et al., 2019).

Given these challenges, it is important to empirically assess the effectiveness of pharmacovigilance media campaigns in improving public awareness of adverse drug reactions. Ondo State provides a suitable context for this study due to its socio-demographic diversity and exposure to multiple media platforms. Therefore, this study evaluates the impact of pharmacovigilance media campaigns on public awareness of adverse drug reactions among residents of Ondo State, Nigeria.

### **Statement of the Problem**

Pharmacovigilance systems are designed to improve patient safety by ensuring the timely detection, reporting, and prevention of adverse drug reactions (ADRs). Despite the establishment of the National Pharmacovigilance Centre (NPC) under the National Agency for Food and Drug Administration and Control (NAFDAC) in Nigeria, the expected level of public awareness and participation in ADR reporting remains relatively low (NAFDAC, 2021; World Health Organization, 2019). In Nigeria, the circulation of counterfeit and substandard medicines continues to pose a serious public health threat, contributing to preventable treatment failures, drug toxicity, and in some cases, death (Farogbe, 2023; Yusuf, 2022). Although regulatory bodies such as NAFDAC have intensified pharmacovigilance media campaigns to educate the public on drug safety and encourage reporting of adverse reactions, evidence suggests that awareness does not always translate into behavioural change.

Empirical studies indicate that a significant proportion of the population still lacks adequate knowledge of pharmacovigilance reporting channels and the importance of reporting ADRs when they occur (Nicholas, 2013). Similarly, Hazell and Shakir (2018) observe that underreporting of adverse drug reactions remains a persistent global challenge, particularly in low- and middle-income countries where health communication systems are weak and fragmented. In Nigeria, this situation is further complicated by low health literacy, widespread reliance on informal drug vendors, and limited trust in regulatory institutions (Olujimi, 2007). As a result, many individuals either misinterpret adverse drug reactions as normal illness progression or fail to report them altogether, thereby weakening the effectiveness of pharmacovigilance systems.

Despite continuous investment in media-based pharmacovigilance campaigns through radio, television, print, and digital platforms, there is limited empirical evidence on the extent to which these campaigns have improved public awareness and reporting behaviour, particularly in specific regional contexts such as Ondo State. Furthermore, there is insufficient understanding of the communication gaps, audience interpretation issues, and structural barriers that may be limiting the effectiveness of these campaigns. This creates a critical knowledge gap regarding whether pharmacovigilance media campaigns are achieving their intended objectives of increasing public awareness and encouraging ADR reporting. Without such evidence, policy decisions and resource allocation by regulatory agencies like NAFDAC may not be optimally guided by empirical data.

Therefore, this study investigates the effectiveness of pharmacovigilance media campaigns on public awareness of adverse drug reactions among residents of Ondo State, Nigeria, in order to provide empirical evidence that can inform policy, improve campaign strategies, and strengthen pharmacovigilance communication outcomes.

### **Objectives of the Study**

The objectives of this study include:

- i. To ascertain the modes and methods NAFDAC adopted in delivering the campaign messages in the past.
- ii. To examine the effectiveness of pharmacovigilance media campaign in Ondo State, Nigeria.
- iii. To identify the challenges of the media campaign in relation to the audience in Ondo State, Nigeria.
- iv. To determine how the challenges can be eliminated in order to achieve optimum performance of the pharmacovigilance media crusade in the area under study.

### **Research Questions**

The study is guided by the following research questions:

1. What are the modes and methods adopted by NAFDAC in delivering pharmacovigilance campaign messages in the past?
2. How effective is the pharmacovigilance media campaign in Ondo State, Nigeria?
3. What are the challenges affecting the effectiveness of the pharmacovigilance media campaign among the audience in Ondo State, Nigeria?
4. How can the identified challenges be eliminated to achieve optimum performance of the pharmacovigilance media campaign in Ondo State, Nigeria?

### **Review of Related Literature**

#### **Pharmacovigilance**

Pharmacovigilance refers to the scientific and systematic process of detecting, assessing, understanding, and preventing adverse drug reactions (ADRs) and other medicine-related problems (World Health Organization [WHO], 2019). It is a core component of public health regulation aimed at ensuring that medicines used in human populations remain safe, effective,

and of acceptable quality. The concept gained global relevance following the Thalidomide tragedy of the 1960s, which revealed severe gaps in drug safety monitoring systems and led to the establishment of structured international pharmacovigilance frameworks under the WHO Programme for International Drug Monitoring (WHO, 2019). In developing countries, pharmacovigilance systems are often challenged by weak reporting structures, limited awareness among the public, and inadequate integration into routine healthcare delivery systems (Aagaard et al., 2021). In Nigeria, pharmacovigilance is coordinated by the National Pharmacovigilance Centre (NPC) under the National Agency for Food and Drug Administration and Control (NAFDAC), which collects and evaluates ADR reports while promoting medicine safety awareness through regulatory and communication strategies (NAFDAC, 2021).

However, despite institutional frameworks, studies have shown that pharmacovigilance activities in Nigeria are still largely underutilized due to low public awareness and poor reporting culture (Hazell & Shakir, 2018). Nicholas (2013) further notes that many Nigerians are either unaware of adverse drug reactions or lack knowledge of how and where to report them, thereby limiting the effectiveness of pharmacovigilance systems.

### **Media Campaign**

A media campaign refers to a planned and coordinated series of communication activities designed to disseminate specific messages to a target audience through various media channels over a period of time (Salama, 2016). Media campaigns are widely used in public health communication to influence knowledge, attitudes, and behaviours related to health issues such as drug use, disease prevention, and safety awareness (Wakefield et al., 2010; Noar, 2006; Salama, 2016). According to Wakefield, Loken, and Hornik (2019), mass media campaigns are effective when they combine message repetition, credible sources, audience targeting, and accessibility across multiple communication platforms. Similarly, McQuail

(2010) explains that media campaigns operate within a complex communication environment where audience interpretation, media exposure, and message credibility significantly influence outcomes.

In Nigeria, pharmacovigilance media campaigns are primarily conducted by NAFDAC through radio, television, print media, and increasingly digital platforms. These campaigns aim to sensitize the public on adverse drug reactions, encourage reporting, and discourage the consumption of counterfeit medicines (Asemah, 2011). However, studies suggest that despite high levels of message exposure, behavioural change remains limited due to factors such as low health literacy, weak message retention, and distrust in regulatory institutions (Yusuf, 2022; Nicholas, 2013). Adedokun (2019) observes that although NAFDAC has consistently used enlightenment campaigns as a strategy against counterfeit drugs and unsafe medicines, the effectiveness of such campaigns has not been adequately measured, particularly in terms of audience response and behavioural impact.

### **Empirical Review**

Empirical research on pharmacovigilance has generally focused on three closely related concerns: awareness and knowledge of adverse drug reactions (ADRs), actual reporting practices, and the effectiveness of systems and communication mechanisms designed to encourage safer medicine use. Across these areas, a recurring finding is that the existence of pharmacovigilance structures does not automatically translate into adequate public knowledge or reporting behaviour. This distinction is important to the present study because the effectiveness of a pharmacovigilance media campaign should not be judged solely by whether campaign messages are disseminated, but also by whether the intended audience is exposed to, understands, remembers, and can act upon the information provided.

International evidence provides an important basis for understanding this problem. Hazell and Shakir (2006), in a systematic review of 37 studies

from 12 countries, found a median ADR under-reporting rate of 94%, demonstrating that under-reporting is a persistent international problem even where formal pharmacovigilance systems exist. The authors identified improved education and training, internet reporting, and direct patient reporting among the approaches that could potentially improve reporting. Although this study establishes the magnitude of the reporting problem, it primarily examines spontaneous reporting systems rather than the effectiveness of media campaigns in creating public awareness. The present study therefore extends this line of inquiry by examining the communication dimension of pharmacovigilance.

Research in developing-country settings further demonstrates the importance of audience awareness. Sabblah et al. (2017), studying patients' perspectives on ADR reporting in Ghana, found that patients' knowledge, attitudes, and reporting behaviour were important considerations in strengthening direct patient reporting. The study demonstrated the relevance of involving medicine users rather than treating pharmacovigilance exclusively as a professional responsibility. Similarly, a later Ghanaian study involving 572 participants found that only 3% of respondents were aware of the country's formal patient reporting system, despite a substantial proportion having experienced an ADR. The qualitative component further identified several obstacles to reporting. These studies are particularly relevant to the present research because they demonstrate that awareness of ADRs and awareness of the mechanism for reporting ADRs are not necessarily the same thing. However, the Ghanaian studies concentrated on patients and direct reporting systems rather than media campaigns directed at a defined educated audience.

Evidence from India also reveals a similar awareness–practice gap. A study of Indian pharmacists found that although 95% of respondents were aware of ADRs, only 37% had reported an ADR to the national pharmacovigilance centre. The researchers consequently recommended

additional pharmacovigilance training to strengthen participation in ADR reporting. The implication for the present study is that high general awareness does not necessarily produce corresponding action. Consequently, the current research examines not only whether academic staff in Ondo State are aware of pharmacovigilance but also whether the media campaign provides sufficient practical information to facilitate appropriate responses to ADRs.

Another important body of international research concerns the role of communication channels in health behaviour change. Wakefield, Loken, and Hornik (2010), in a major review of mass-media health campaigns, found that mass-media campaigns can produce positive changes in health-related behaviours, particularly when adequate population exposure is achieved and campaigns are supported by appropriate services, community programmes, and enabling policies. This finding provides empirical support for examining the modes and methods through which NAFDAC communicates pharmacovigilance messages. However, the review covered a broad range of health behaviours rather than pharmacovigilance specifically. The present study addresses this gap by applying the campaign-effectiveness question specifically to pharmacovigilance communication in Ondo State.

The African literature indicates that the problem is compounded by limitations in reporting infrastructure and public participation. A review of direct consumer reporting in Africa found that only a small proportion of African countries had formally introduced direct consumer ADR reporting and identified low awareness, poor infrastructure, and weak reporting culture as major challenges. At the same time, the review identified the availability of multiple reporting methods, including telephone, text messaging, web applications, and paper forms, as opportunities for improving participation. The significance of this finding for the present study is that an effective media campaign should not merely tell people that ADRs should be reported; it should also communicate where, when, and how reporting can be

undertaken.

Nigerian evidence presents a similar pattern. Oshikoya and Awobusuyi (2009), in a study of doctors in a Lagos teaching hospital, investigated knowledge and attitudes towards spontaneous ADR reporting. The study demonstrated the continuing importance of improving professional knowledge and attitudes towards reporting. However, its focus was on doctors within a hospital environment, whereas the present study investigates academic staff as an audience for mass-mediated pharmacovigilance communication. This distinction is important because the current study is concerned primarily with the communication reach and perceived effectiveness of NAFDAC's campaign, rather than only with professional reporting competence.

Adisa and Omitogun (2019) provide more recent evidence from southwestern Nigeria. Their cross-sectional study involved 80 health workers and 360 patients in 10 primary healthcare centres in Ibadan. Although 72.5% of health workers had heard of pharmacovigilance, only 5.2% correctly understood the concept, while only 37.5% had encountered an ADR reporting form. Among patients, only 8.6% had heard of pharmacovigilance and 18.6% had reported a previously experienced ADR. The authors consequently recommended regular education of health workers and continuous public enlightenment on ADR reporting. This study is particularly relevant to the present research because it directly establishes an awareness–knowledge–practice gap in southwestern Nigeria. Nevertheless, it was conducted in primary healthcare centres in Ibadan and focused on health workers and patients rather than academic staff in tertiary institutions in Ondo State. More importantly, it examined ADR reporting awareness rather than specifically evaluating the effectiveness of NAFDAC's media campaign.

Further evidence from southwestern Nigeria comes from a study of community health extension workers. The study found that 61.6% of

respondents had encountered patients with ADRs, but only 12.6% had reported them using the appropriate yellow forms. Although 50.8% demonstrated a positive attitude, 57.4% had inadequate knowledge of ADR reporting, while previous training was significantly associated with reporting. The study therefore shows that favourable attitudes alone may not translate into reporting when respondents lack practical knowledge and training. Its population, however, consisted of community health extension workers in public health facilities. The present study differs by examining academic staff who are not primarily responsible for clinical care but constitute a highly literate media audience capable of evaluating health communication messages.

More recent Nigerian evidence reinforces the persistence of these gaps. Rotimi et al. (2024) examined awareness, knowledge, attitudes, and practices concerning ADR reporting among health workers involved in Nigeria's seasonal malaria chemoprevention programme. The study identified continuing pharmacovigilance gaps among health workers and highlighted deficiencies in knowledge and reporting practice during a large-scale public health intervention. This recent evidence is significant because it demonstrates that pharmacovigilance communication and reporting challenges remain relevant in Nigeria despite continuing public health interventions. Nevertheless, Rotimi et al. examined health workers participating in a specific malaria campaign rather than the general effectiveness of NAFDAC's broader media campaign.

Another Nigerian mixed-methods study examined the involvement of community pharmacists and the awareness of pharmacy clients concerning ADR reporting. The study involved 780 pharmacy clients and used both questionnaire and mystery-client approaches across community pharmacies in Ibadan. Its mixed-method approach is particularly relevant to the present study because it demonstrates the value of combining quantitative evidence with qualitative information when investigating

medicine-safety communication. However, its focus was the pharmacy environment and client–pharmacist interaction rather than exposure to a national regulatory agency's media campaign.

Studies specifically addressing NAFDAC's communication activities also reveal important gaps. Ono and Chiaghana (2020) investigated consumers' awareness and exposure to NAFDAC media campaigns in South-East Nigeria. Their study was premised on the continued existence and consumption of counterfeit and substandard products despite NAFDAC's long-standing campaigns. This study is closely related to the present research because it directly examines NAFDAC media campaign exposure. Nevertheless, its geographical focus was South-East Nigeria and its emphasis was on consumers' awareness and exposure to campaigns against counterfeit and substandard products. The present study focuses specifically on pharmacovigilance and ADR awareness in Ondo State, thereby providing evidence from a different geopolitical setting and a different audience.

Iwokwagh (2013) examined the use of new media in the fight against counterfeit medicines in Nigeria and identified the potential of emerging media platforms for communicating medicine-safety information. This is relevant to the present study because pharmacovigilance campaigns increasingly operate within a media environment that extends beyond conventional radio, television, posters, and print communication. Nevertheless, the study did not provide a direct evaluation of the effectiveness of NAFDAC's pharmacovigilance media campaign among academic staff in Ondo State. The current study therefore considers both traditional and newer communication channels in assessing campaign exposure and effectiveness.

The literature supplied by Adedokun (2019), Farogbe (2023), Nicholas (2013), and Yusuf (2022) provides additional Nigerian contextual evidence concerning NAFDAC, counterfeit medicines, and the broader

drug-safety environment. Adedokun (2019) examined NAFDAC's strategies for combating fake drugs and foods and identified public enlightenment as an important component of the agency's intervention. However, the study did not sufficiently evaluate the extent to which such enlightenment translated into audience-level campaign effectiveness. Farogbe (2023) examined the history and functions of NAFDAC in relation to combating counterfeit drugs, thereby providing institutional context, but did not focus specifically on the media campaign as a communication intervention. Nicholas (2013) examined factors associated with medicine counterfeiting in Nigeria, while Yusuf (2022) focused on the menace of counterfeit medicines. These studies help establish the drug-safety environment within which pharmacovigilance communication operates, but they do not directly answer whether NAFDAC's media messages are reaching, informing, and influencing their intended audiences.

The studies collectively demonstrate an important distinction between the existence of pharmacovigilance interventions and their communication effectiveness. Research by Oshikoya and Awobusuyi (2009), Adisa and Omitogun (2019), community health extension worker studies, and Rotimi et al. (2024) consistently identifies deficiencies in ADR knowledge and reporting practice among health-related populations. Studies involving patients in Ghana and pharmacy clients in Nigeria similarly show that awareness of ADRs does not necessarily mean awareness of formal reporting mechanisms. Meanwhile, research on mass-media campaigns demonstrates that exposure, repetition, message design, supporting services, and audience characteristics influence whether communication produces behavioural outcomes.

The foregoing review establishes four major gaps that justify the present study. First, most Nigerian pharmacovigilance studies have concentrated on healthcare professionals, patients, pharmacists, community health workers, or counterfeit-medicine problems, with considerably less

attention given to academic staff as a distinct media audience. Second, many studies have examined awareness, knowledge, attitudes, or reporting practices independently, rather than evaluating the effectiveness of the media campaign that is expected to produce these outcomes. Third, studies of NAFDAC's media activities, such as Ono and Chiaghana (2020), have provided useful evidence of campaign exposure but have not adequately established whether exposure translates into practical knowledge of ADR reporting and behavioural response. Fourth, there is limited empirical evidence specifically evaluating the modes and methods of NAFDAC's pharmacovigilance media campaign, its perceived effectiveness, audience-related challenges, and possible strategies for improving its performance within Ondo State.

The present study addresses these gaps by evaluating pharmacovigilance media campaigns from the perspective of academic staff across seven tertiary institutions in Ondo State. Rather than examining ADR reporting as a purely clinical or regulatory issue, the study treats pharmacovigilance communication as a media campaign whose effectiveness can be evaluated through audience exposure, awareness, understanding, perceived effectiveness, challenges, and suggested improvements. The inclusion of interviews alongside questionnaire data also enables the study to go beyond numerical measures of awareness by obtaining respondents' explanations of how campaign messages are received, understood, remembered, and acted upon. Consequently, the study contributes geographically specific and audience-specific evidence to the existing Nigerian literature while linking pharmacovigilance research with empirical scholarship on health communication and media campaign effectiveness.

### **Theoretical Framework**

This study was anchored on two complementary theories: the Social Marketing Theory and the Health Belief Model (HBM). The combination of

these theories provides a strong explanatory base for understanding how pharmacovigilance media campaigns influence public awareness and behavioural response to adverse drug reactions (ADRs).

### **Social Marketing Theory**

Social Marketing Theory explains how marketing principles are applied to influence voluntary behavioural change for social good rather than commercial profit (Andreasen, 1995). The theory proposes that health communication campaigns can be designed using marketing tools such as audience segmentation, message positioning, and strategic communication channels to promote desirable behaviours, including health-seeking actions and safety practices. Central to this theory is the “marketing mix” often referred to as the 4Ps (Product, Price, Place, and Promotion), and in expanded models, the 5Ps (adding People). In the context of pharmacovigilance campaigns, the product represents awareness and knowledge of adverse drug reactions; price refers to the perceived effort or inconvenience involved in reporting ADRs; place involves the communication channels used by NAFDAC such as radio, television, and digital media; while promotion refers to the strategic dissemination of pharmacovigilance messages (Salama, 2016; Wakefield et al., 2019). The relevance of Social Marketing Theory to this study lies in its ability to explain how structured communication campaigns can influence public awareness and behavioural intention. According to Wakefield et al. (2019), mass media campaigns are most effective when they are sustained, credible, and reinforced across multiple channels. However, McQuail (2010) argues that media effects are often moderated by audience interpretation, socio-cultural context, and trust in message sources, which may limit campaign effectiveness.

In Nigeria, despite extensive pharmacovigilance campaigns by NAFDAC, behavioural change remains inconsistent, suggesting possible weaknesses in message design, audience targeting, and communication

strategy application (Adedokun, 2019; Yusuf, 2022). This theory therefore provides a framework for assessing whether NAFDAC's campaigns are effectively structured to achieve their intended behavioural outcomes.

### **Health Belief Model (HBM)**

The Health Belief Model is a psychological framework that explains health-related behaviours based on individual perceptions and beliefs (Rosenstock, 1974; Champion & Skinner, 2008). The model posits that individuals are more likely to take preventive health actions if they perceive themselves to be susceptible to a condition, believe the condition has serious consequences, believe that taking action would reduce their susceptibility or severity, and perceive fewer barriers to taking action. The key constructs of HBM include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. In the context of pharmacovigilance, perceived susceptibility refers to an individual's belief that they may experience adverse drug reactions. Perceived severity relates to how serious they consider ADRs to be. Perceived benefits involve the belief that reporting ADRs can improve drug safety, while perceived barriers may include lack of knowledge about reporting procedures or fear of consequences.

Cues to action in this study include exposure to pharmacovigilance media campaigns through radio, television, posters, and social media platforms. Self-efficacy refers to the confidence individuals have in their ability to recognize and report adverse drug reactions effectively. Empirical studies have shown that health communication interventions based on HBM constructs are effective in improving preventive health behaviours, particularly when individuals are adequately informed and motivated (Jones et al., 2015). However, in low-literacy settings such as parts of Nigeria, barriers such as misinformation, cultural beliefs, and limited access to healthcare services may weaken the impact of health communication messages (Olujimi, 2007). Applying HBM to this study helps explain why

exposure to pharmacovigilance campaigns does not always translate into reporting behaviour or increased awareness. Even when individuals are exposed to messages, low perceived risk or high perceived barriers may reduce the likelihood of behavioural response.

The integration of Social Marketing Theory and the Health Belief Model provides a comprehensive framework for this study. While Social Marketing Theory focuses on how messages are designed and delivered through media systems, the Health Belief Model explains how individuals interpret these messages and decide whether to act on them. Together, the theories suggest that the effectiveness of pharmacovigilance media campaigns depends on both message design (external communication factors) and individual perception (internal psychological factors). This dual-theory approach is particularly relevant for evaluating NAFDAC's campaigns in Ondo State, as it allows for analysis of both structural communication effectiveness and audience behavioural response.

## **Methodology**

### **Research Design**

This study adopted a survey research design. Survey research is appropriate for systematically collecting data from a defined population in order to describe patterns of awareness, perception, and exposure to communication messages (Creswell & Creswell, 2018). It is widely applied in health communication research to evaluate the effectiveness of media campaigns and public awareness programmes (Kothari, 2004).

### **Area of the Study**

The study is conducted in Ondo State, Nigeria. The state is characterized by a mix of urban, semi-urban, and rural communities, as well as diverse media exposure levels and healthcare-seeking behaviours. This diversity makes it suitable for assessing pharmacovigilance media campaign effectiveness across different socio-demographic contexts.

### **Population of the Study**

The population of the study comprises academic staff in seven tertiary institutions in Ondo State, estimated at 2926. Academic staff were selected because of their high literacy level, access to media platforms, and ability to critically evaluate health communication messages such as pharmacovigilance campaigns (Asemah, 2011). The population of seven institutions included in the study are: Federal University of Technology, Akure (933); Adekunle Ajasin University, Akungba-Akoko (504); Olusegun Agagu University of Science and Technology, Okitipupa (335); University of Medical Sciences, Ondo (107); Adeyemi Federal University of Education, Ondo (455); Rufus Giwa Polytechnic, Owo (446); and Federal Polytechnic, Ile-Oluji (146).

### **Sample Size Determination**

The sample size for the study is determined using the Taro Yamane formula at a 5% level of significance. From the population of 2926, a sample size of 352 is obtained. To account for non-response and incomplete questionnaires, the researchers increased the number of copies of questionnaire to 460, representing an additional 30.7%

### **Sampling Technique and Institutional Distribution**

A multi-stage sampling technique is adopted. In the first stage, the seven tertiary institutions in Ondo State are treated as clusters. In the second stage, proportional allocation is used to distribute the sample size across the institutions based on estimated staff strength. In the final stage, respondents are selected purposively based on availability and willingness to participate. The sample distribution is as follows: Federal University of Technology, Akure (147), Adekunle Ajasin University, Akungba-Akoko (79), Olusegun Agagu University of Science and Technology, Okitipupa (53), University of Medical Sciences, Ondo (17), Adeyemi Federal University of Education, Ondo (71), Rufus Giwa Polytechnic, Owo (70), and Federal Polytechnic, Ile-Oluji (23), giving a total of 460 respondents.

## **Research Instruments**

The study employed a structured questionnaire and a semi-structured interview guide. The questionnaire is used to collect quantitative data on exposure to pharmacovigilance media campaigns, awareness of adverse drug reactions, knowledge of reporting mechanisms, and perception of campaign effectiveness. The interview guide is used to obtain qualitative insights that explain and complement the quantitative findings.

## **Validity and Reliability of Instruments**

The instruments are validated through face and content validation by experts in Mass Communication and Public Health to ensure clarity, relevance, and alignment with the research objectives. Reliability is tested through a pilot study conducted at the Federal University of Technology, Akure, and internal consistency is measured using Cronbach's Alpha coefficient, with a benchmark of 0.70 considered acceptable (George & Mallery, 2003).

## **Method of Data Collection**

Data are collected primarily through face-to-face administration of questionnaires to respondents across the selected institutions in Ondo State. This approach is adopted to enhance response rate, ensure clarity of questions, and reduce misunderstanding of items. In addition to the survey, qualitative data are collected through semi-structured interviews conducted with forty-five (45) academic staff members selected purposively from the seven institutions. The selection is based on participants' experience, exposure to media campaigns, and willingness to provide in-depth responses. The number represents approximately ten percent of the total questionnaire respondents, which is consistent with mixed-method survey research practice (Creswell & Creswell, 2018).

## **Method of Data Analysis**

Quantitative data collected through the questionnaire are analyzed using descriptive statistics, including frequencies, percentages, mean scores,

and standard deviation, using the Statistical Package for Social Sciences (SPSS). Results are presented in tables for interpretation in line with the study objectives. Qualitative data obtained from the interviews are analyzed using thematic content analysis. This involves systematic identification, coding, and categorization of recurring themes related to respondents' perceptions of pharmacovigilance media campaigns, awareness of adverse drug reactions, and identified challenges. The themes are used to complement and explain the quantitative findings, thereby providing deeper insight into the effectiveness of the campaigns.

## **Results**

### **Quantitative Data Analysis**

#### **Response Rate**

A total of 460 copies of the questionnaire were administered to respondents across the seven selected tertiary institutions in Ondo State. 436 copies were successfully retrieved and found usable for analysis, representing a 94.7% response rate. This high response rate was achieved due to the face-to-face administration method adopted in the study.

#### **Demographic Characteristics of Respondents**

The demographic data of respondents are presented below using frequency and percentage distributions.

**Table 1: Gender Distribution of Respondents**

| <b>Gender</b> | <b>Frequency</b> | <b>Percentage (%)</b> |
|---------------|------------------|-----------------------|
| Male          | 246              | 56.5                  |
| Female        | 190              | 43.5                  |
| <b>Total</b>  | <b>436</b>       | <b>100</b>            |

**Source:** Field work, 2026

The table shows that male respondents constitute a slightly higher proportion (56.5%) compared to female respondents (43.5%), indicating a relatively balanced gender distribution.

**Table 2: Age Distribution of Respondents**

| Age Range    | Frequency  | Percentage (%) |
|--------------|------------|----------------|
| 20–29        | 77         | 17.4           |
| 30–39        | 142        | 32.6           |
| 40–49        | 114        | 26.1           |
| 50–59        | 66         | 15.2           |
| 60 and above | 37         | 8.7            |
| <b>Total</b> | <b>436</b> | <b>100</b>     |

**Source:** Field work, 2026

The table indicates that the majority of respondents (32.6%) fall within the 30–39 years age bracket, suggesting that most participants are in their active academic and professional years.

**Table 3: Academic Qualification of Respondents**

| Qualification | Frequency  | Percentage (%) |
|---------------|------------|----------------|
| B.Sc/B.A      | 114        | 26.1           |
| M.Sc/M.A      | 208        | 47.8           |
| Ph.D          | 95         | 21.7           |
| Others        | 19         | 4.4            |
| <b>Total</b>  | <b>436</b> | <b>100</b>     |

**Source:** Field work, 2026

The result shows that the majority of respondents (47.8%) possess Master's degrees, indicating a highly educated sample suitable for evaluating pharmacovigilance awareness.

#### **Respondents Response to Main data**

**Table 4: Exposure to Pharmacovigilance Media Campaigns**

| Statement                                                            | SA  | A   | D   | SD | Mean |
|----------------------------------------------------------------------|-----|-----|-----|----|------|
| I have been exposed to pharmacovigilance messages through the media. | 171 | 161 | 66  | 38 | 3.06 |
| I frequently encounter NAFDAC drug safety messages on radio/TV.      | 152 | 142 | 85  | 57 | 2.89 |
| I have seen pharmacovigilance messages on social media.              | 190 | 133 | 66  | 47 | 3.07 |
| I have read posters/flyers on drug safety.                           | 142 | 152 | 85  | 57 | 2.85 |
| Messages are repeated across different media channels.               | 133 | 142 | 104 | 57 | 2.72 |
| I clearly understand pharmacovigilance messages.                     | 161 | 142 | 76  | 57 | 2.92 |

**Source:** Field work, 2026

### Grand Mean = 2.92

The results show a moderate level of exposure to pharmacovigilance media campaigns among respondents. However, repetition and clarity of messages recorded relatively lower mean scores.

**Table 5: Awareness of ADR**

| Statement                                          | SA  | A   | D  | SD | Mean |
|----------------------------------------------------|-----|-----|----|----|------|
| I am aware that drugs can cause adverse reactions. | 228 | 142 | 47 | 19 | 3.33 |
| I understand the meaning of ADRs.                  | 190 | 152 | 66 | 28 | 3.15 |
| I can identify symptoms of ADRs.                   | 152 | 161 | 76 | 47 | 2.91 |
| I know ADRs can be reported.                       | 199 | 133 | 66 | 38 | 3.13 |
| I am aware of NAFDAC's role in drug safety.        | 218 | 142 | 47 | 29 | 3.26 |
| I know unsafe drugs can cause complications.       | 247 | 123 | 47 | 19 | 3.38 |

Source: Field work, 2026

### Grand Mean = 3.19

The findings indicate a relatively high level of awareness of adverse drug reactions among respondents.

**Table 6: Knowledge of Reporting Channels**

| Statement                                                  | SA  | A   | D   | SD | Mean |
|------------------------------------------------------------|-----|-----|-----|----|------|
| I know where to report ADRs.                               | 114 | 133 | 113 | 76 | 2.61 |
| I am aware of NAFDAC reporting channels.                   | 104 | 123 | 133 | 76 | 2.50 |
| I understand the reporting process.                        | 95  | 114 | 142 | 85 | 2.41 |
| Hospitals accept ADR reports.                              | 171 | 152 | 66  | 47 | 2.96 |
| I am aware of online reporting platforms.                  | 85  | 104 | 152 | 95 | 2.27 |
| I have received reporting information via media campaigns. | 133 | 142 | 95  | 66 | 2.70 |

Source: Field work, 2026

### Grand Mean = 2.57

The result reveals a low to moderate level of knowledge of ADR reporting channels among respondents.

**Table 7: Effectiveness of Campaigns**

| Statement                                   | SA  | A   | D   | SD | Mean |
|---------------------------------------------|-----|-----|-----|----|------|
| Campaigns improve awareness of drug safety. | 180 | 152 | 66  | 38 | 3.09 |
| Campaigns improve understanding of ADRs.    | 161 | 142 | 85  | 48 | 2.91 |
| Messages are clear and understandable.      | 142 | 133 | 104 | 57 | 2.76 |
| Frequency of campaigns is adequate.         | 123 | 133 | 114 | 66 | 2.64 |
| Campaigns influence drug usage behaviour.   | 152 | 142 | 85  | 57 | 2.85 |
| Overall campaigns are effective.            | 171 | 152 | 66  | 47 | 3.00 |

Source: Field work, 2026

### Grand Mean = 2.87

The findings suggest that respondents perceive pharmacovigilance campaigns as moderately effective.

### Qualitative Data Analysis

Data obtained from semi-structured interviews conducted with forty-five (45) academic staff members across the seven tertiary institutions in Ondo State were analyzed using thematic content analysis. Responses were transcribed, coded, and grouped into recurring themes based on the research objectives. Four major themes emerged: exposure to pharmacovigilance campaigns, awareness of adverse drug reactions, knowledge of reporting systems, and perceived challenges affecting campaign effectiveness.

#### 1. Exposure to Pharmacovigilance Media Campaigns

Most respondents indicated that they had been exposed to pharmacovigilance messages, mainly through radio and television broadcasts. However, many noted that exposure was inconsistent and often incidental rather than intentional.

#### A respondent stated:

“I have heard NAFDAC messages on radio, but they are not very frequent. Sometimes you only hear them during health programmes or news breaks.”

#### Another participant noted:

“The messages are there, especially on TV, but they are not persistent enough to stay in memory.”

This suggests that while exposure exists, message repetition and visibility remain limited, reducing long-term recall and impact.

## **2. Awareness and Understanding of Adverse Drug Reactions (ADRs)**

Respondents demonstrated a generally good awareness of the concept of adverse drug reactions, although depth of understanding varied. Many associated ADRs with drug side effects, but lacked clarity on reporting procedures and severity classification.

### **A respondent explained:**

“I know drugs can cause side effects, but I don't really know when it becomes serious enough to report.”

### **Another added:**

“People usually think reactions are normal body responses, so they don't pay attention.”

This indicates that awareness is present but not always translated into accurate understanding of pharmacovigilance concepts.

## **3. Knowledge of ADR Reporting Channels**

A major recurring theme was the low awareness of formal reporting mechanisms. Most respondents were unsure of where and how to report adverse drug reactions.

### **One interviewee stated:**

“Honestly, I don't know the exact place to report drug reactions. I assume it is the hospital or NAFDAC, but I'm not sure of the process.”

### **Another respondent noted:**

“There should be a simpler way to report ADRs because many people don't even know the channels exist.”

This confirms a significant gap between awareness of ADRs and knowledge of reporting systems.

#### **4. Perceived Effectiveness of Pharmacovigilance Campaigns**

Respondents expressed mixed views on the effectiveness of pharmacovigilance media campaigns. While some acknowledged their importance, many believed the campaigns have not achieved optimal impact.

**A respondent remarked:**

“The campaigns are good, but they don't really change behaviour. People still buy drugs from unsafe sources.”

**Another stated:**

“If the campaigns were more consistent and practical, people would take them more seriously.”

This suggests that although campaigns are visible, their behavioural influence is limited.

#### **5. Challenges Affecting Pharmacovigilance Media Campaigns**

Several challenges were identified as limiting the effectiveness of pharmacovigilance campaigns. These include poor message repetition, lack of trust in government institutions, inadequate communication strategies, and low public engagement.

**A participant noted:**

“One major issue is trust. People don't always believe government messages.”

**Another stated:**

“The messages are too technical sometimes. They need to be simplified.”

Others highlighted infrastructural issues:

“Not everyone has constant access to TV or radio, especially in rural areas.”

These responses indicate structural and communication-related barriers affecting campaign effectiveness.

## **Discussion of Findings**

### **Research Question One: What are the modes and methods NAFDAC adopted in delivering pharmacovigilance campaign messages in the past?**

Findings from the study indicate that NAFDAC predominantly utilizes radio, television, social media platforms, posters, and health-related public enlightenment programmes to disseminate pharmacovigilance messages. Quantitative results showed moderate exposure to these media channels, while qualitative findings confirmed that radio and television remain the most commonly recalled sources of exposure.

This aligns with Salama (2016), who emphasized that public health campaigns rely on multi-channel dissemination to maximize reach. Similarly, Wakefield et al. (2019) argue that mass media campaigns are most effective when delivered repeatedly across multiple platforms to ensure message retention. However, findings from this study suggest that although multiple channels are used, message repetition and consistency remain weak, limiting effectiveness.

From a Social Marketing Theory perspective, the “promotion” component is present but not optimally executed, as audience recall and engagement remain moderate rather than strong.

### **Research Question Two: How effective is the pharmacovigilance media campaign in Ondo State, Nigeria?**

The study found that pharmacovigilance media campaigns in Ondo State are moderately effective. Quantitative results revealed a grand mean score below the threshold for strong effectiveness, while qualitative responses indicated that although awareness has improved, behavioural change remains limited. Respondents acknowledged increased awareness of drug safety issues and adverse drug reactions, but this awareness does not consistently translate into reporting behaviour or safe medication practices. This supports Hazell and Shakir (2018), who observed that awareness alone

does not eliminate underreporting of ADRs.

Similarly, Adedokun (2019) and Yusuf (2022) found that despite continuous media campaigns by NAFDAC, public behaviour regarding drug safety remains largely unchanged due to structural and communication barriers. Within the framework of the Health Belief Model, this gap suggests that while perceived susceptibility and awareness exist, perceived barriers such as lack of knowledge of reporting channels and low self-efficacy reduce behavioural response.

### **Research Question Three: What are the challenges of pharmacovigilance media campaigns in Ondo State?**

The findings reveal several challenges affecting the effectiveness of pharmacovigilance media campaigns. These include low message repetition, poor understanding of technical content, limited awareness of reporting channels, lack of trust in government institutions, and inadequate access to consistent media exposure. Quantitative findings showed low mean scores for knowledge of ADR reporting systems, while qualitative responses strongly emphasized confusion about where and how to report adverse drug reactions.

These findings are consistent with Nicholas (2013), who identified systemic and socio-economic barriers as key constraints to effective drug safety communication in Nigeria. They also align with Olujimi (2007), who observed that health communication effectiveness in Nigeria is often constrained by socio-economic and behavioural factors.

From a theoretical standpoint, Social Marketing Theory explains these challenges as weaknesses in the “place” and “promotion” components of the marketing mix, while the Health Belief Model highlights perceived barriers as a major determinant of non-action.

#### **Research Question Four: How can the challenges be eliminated to achieve optimum performance of pharmacovigilance media campaigns?**

The study findings suggest that improving pharmacovigilance campaign effectiveness requires enhanced message repetition, simplification of communication content, expansion of digital engagement, and improved public sensitization on ADR reporting channels.

Respondents recommended that messages should be made more relatable, less technical, and delivered in local languages where necessary. This supports Wakefield et al. (2019), who argue that effective health campaigns must be audience-centered and culturally sensitive.

Furthermore, strengthening trust in regulatory institutions such as NAFDAC is essential for improving compliance and participation. According to McQuail (2010), media effectiveness is significantly influenced by source credibility and audience perception. The integration of both Social Marketing Theory and the Health Belief Model suggests that addressing both structural communication gaps and individual behavioural perceptions is necessary to achieve improved pharmacovigilance outcomes.

#### **Conclusion**

This study examined the impact of pharmacovigilance media campaigns on public awareness of adverse drug reactions among academic staff in tertiary institutions in Ondo State, Nigeria. The findings from both quantitative and qualitative data indicate that pharmacovigilance media campaigns by NAFDAC have achieved a moderate level of success in creating awareness of adverse drug reactions and general drug safety issues. However, the study also reveals a significant gap between awareness and actionable knowledge, particularly in relation to ADR reporting channels and procedures. While respondents demonstrated relatively high awareness of drug safety issues, their knowledge of where and how to report adverse drug reactions remains low. This limits the overall effectiveness of the

pharmacovigilance system in Nigeria.

Furthermore, the study shows that although multiple media channels are used in disseminating pharmacovigilance messages, issues such as poor message repetition, technical language, limited trust in government institutions, and inadequate public engagement reduce the impact of the campaigns. Consequently, behavioural change remains limited despite exposure to campaign messages. In line with the theoretical frameworks guiding this study, it is evident that weaknesses in both social marketing implementation and health belief factors contribute to the limited effectiveness of the campaigns. Therefore, improving both communication strategies and public perception is essential for achieving optimal pharmacovigilance outcomes.

### **Recommendations**

Based on the findings of the study and in line with the objectives, the following recommendations are made:

1. NAFDAC should intensify and sustain pharmacovigilance media campaigns across radio, television and digital platforms to improve audience exposure and message recall.
2. Pharmacovigilance messages should be simplified and presented in clear, audience-friendly language, including relevant local languages, to improve understanding.
3. NAFDAC should provide clear and practical information on available channels and procedures for reporting adverse drug reactions to bridge the gap between awareness and action.
4. NAFDAC should strengthen collaboration with tertiary institutions, healthcare professionals and media organisations to improve campaign credibility, public trust and wider dissemination.
5. NAFDAC should regularly evaluate its media campaigns to identify weaknesses and improve strategies for achieving greater awareness and behavioural change.

## REFERENCES

- Abubakri, O. R., & Alabi, F. F. (2010). *Mass communication in a nutshell*. Prince Gbade Enterprises (Nigeria) Ltd.
- Adedokun, J. (2019). *An overview of NAFDAC's strategies for combating fake drugs and foods in Nigeria: A study of South-West Nigeria* [Bachelor's degree project, Ambrose Alli University].
- Adisa, R., & Omitogun, T. I. (2019). Awareness, knowledge, attitude and practice of adverse drug reaction reporting among health workers and patients in primary health care centres in Ibadan, southwestern Nigeria. *BMC Health Services Research*, 19, Article 926.
- Andreasen, A. R. (1995). *Marketing social change: Changing behavior to promote health, social development, and the environment*. Jossey-Bass.
- Asemah, E. S. (2011). *Principles and practice of mass communication* (2nd ed.). Great Future Press.
- Awodele, O., Ibrahim, A., & Orhii, P. (2016). Patterns of adverse drug reaction signals in NAFDAC pharmacovigilance activities from September to November, 2014. *International Journal of Risk & Safety in Medicine*, 28(1), 13–23.
- Awodele, O., Aliu, R., Ali, I., Oni, Y., & Adeyeye, C. M. (2018). Patterns of adverse drug reaction signals in NAFDAC pharmacovigilance activities from January to June 2015: Safety of drug use in Nigeria. *Pharmacology Research & Perspectives*, 6(5), Article e00427.
- Bolarinwa, O. A. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science research. *Nigerian Postgraduate Medical Journal*, 22(4), 195–201.
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 45–65). Jossey-Bass.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage.
- Daramola, I. (2003). *Introduction to mass communication* (2nd ed.). Rothan Press Ltd.
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Wiley.
- Farogbe, V. (2023). *Appraisal of history and functions of NAFDAC in relation to the crusade against counterfeit drugs in Nigeria* [Master's

- dissertation, Federal University of Agriculture, Abeokuta].
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage.
- George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference* (4th ed.). Allyn & Bacon.
- Hazell, L., & Shakir, S. A. W. (2006). Under-reporting of adverse drug reactions: A systematic review. *Drug Safety*, 29(5), 385–396.
- Israel, M., & Hay, I. (2006). *Research ethics for social scientists*. Sage.
- Iwokwagh, N. S. (2013). *Assessment of new media use in the fight against counterfeit medicines in Nigeria* [Research work, Federal University of Technology, Minna].
- Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The Health Belief Model as an explanatory framework in communication research: A systematic review of quantitative studies. *Health Communication*, 30(6), 566–576.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International.
- McQuail, D. (2010). *McQuail's mass communication theory* (6th ed.). Sage.
- Nicholas, B. (2013). *Prevalence and effects of counterfeiting medicines in Nigeria* [Master's dissertation, Olusegun Agagu University of Science and Technology].
- Noar, S. M. (2006). A 10-year retrospective of research in health mass media campaigns: Where do we go from here? *Journal of Health Communication*, 11(1), 21–42.
- Olujimi, J. (2007). Health seeking behaviour of rural dwellers in Nigeria: A case study of Owo region. *Nigerian Journal of Development Studies*, 6(1), 47–77.
- Ono, G. N., & Chiaghana, C. A. (2020). Assessment of consumers' awareness and exposure levels to NAFDAC media campaign in South East Nigeria. *Research on Humanities and Social Sciences*, 10(4), 21–27.
- Oshikoya, K. A., & Awobusuyi, J. O. (2009). Perceptions of barriers to reporting adverse drug reactions among healthcare workers in a teaching hospital in Lagos, Nigeria. *BMC Clinical Pharmacology*, 9, Article 14.
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, 2(4), 328–335.
- Salama, R. (2016). *Public communication campaigns*. Suez Canal University.
- Scaboro, S., Portelli, B., Chersoni, E., Santus, E., & Serra, G. (2022).

- Increasing adverse drug events extraction robustness on social media: Case study on negation and speculation. *Experimental Biology and Medicine*, 247(22), 2003–2014.
- Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet*, 376(9748), 1261–1271.
- World Health Organization. (2019). *Safety monitoring of medicinal products: Guidelines for setting up and running a pharmacovigilance centre*. World Health Organization.
- Yusuf, A. (2022). *Menace of counterfeit medicines in Northern Nigeria: A study of Kano State* [Master's dissertation, Bayero University Kano].