

Mobile Authentication Service (MAS) Scheme and Public Engagements in Eradicating Fake Drugs in South-east Nigeria

Chinonye Faith Chinedu-Okeke^{1*}, Nnanyelugo Okoro², Ike Sylvester Ndolo³ and Ijeoma Obi⁴

Abstract

Background: The issue of fake drugs is a global threat, especially in developing countries like Nigeria. Thus, NAFDAC, among other strategies, launched a Mobile Authentication Service (MAS) scheme that enables the public to authenticate drugs at the point of purchase using scratch codes and Short Messaging Service (SMS).

Objective: The study examined the level of public awareness, knowledge, and use of MAS in eradicating fake drugs in South-east Nigeria.

Methods: The study adopted a mixed methods research of survey and Key Informant Interviews (KII). The data gathered from 400 respondents via a structured questionnaire were analyzed using descriptive and inferential analysis, while the transcripts from KII were thematically analysed.

Results: The analysed data reveals a low level of awareness, knowledge, and use of MAS among respondents, especially in rural areas. Some challenges faced by the respondents in the use of MAS include a low level of awareness and knowledge of MAS, poor network services, elitist nature of the campaign messages on MAS, and partial access to MAS among drug manufacturers. The data also reveal strategies towards enhancing the operations of MAS to ensure its efficiency in eradicating fake drugs in Nigeria.

Conclusion: The study, therefore, concludes that the level of public awareness, knowledge, and use of MAS is relatively low, especially in rural areas. The study found that the use of MAS if enhanced is an efficient scheme in eradicating fake drugs in Nigeria.

Keywords: Mobile Authentication Service (MAS); Public engagement; Eradicate; Fake drugs

¹Department of Mass Communication, Nnamdi Azikiwe University, Awka, Nigeria

²Department of Mass Communication, University of Nigeria, Nsukka, Nigeria

³Department of Mass Communication, Enugu State University of Science and Technology, Enugu, Nigeria

⁴Department of Mass Communication, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Nigeria

***Corresponding author:** Chinonye Faith Chinedu-Okeke, Department of Mass Communication, Nnamdi Azikiwe University, Awka, Nigeria, E-mail: cf.chinedu-okeke@unizik.edu.ng

Citation: Chinedu-Okeke CF, Okoro N, Ndolo IS, Obi I (2021) Mobile Authentication Service (MAS) Scheme and Public Engagements in Eradicating Fake Drugs in South-East Nigeria. J Health Commun Vol.6 No.4:11.

Received: April 23, 2021; **Accepted:** May 7, 2021; **Published:** May 14, 2021

Introduction

The issue of fake drugs has been acknowledged as a significant public health problem that has assumed global dimensions, with more cases recorded in developing countries including Nigeria [1]. The manufacturing, trading, and utilization of fake drugs in treating life-threatening conditions has been documented as one of the causes of treatment failure, disabilities, high morbidity, mortality, and loss of public confidence in the Nigerian health sector [2].

Fake or counterfeit drug is a medicine or pharmaceutical item, which is deliberately and fraudulently produced and sold with the intent to deceptively represent its originality, authenticity, or effectiveness. Drug counterfeiting can apply to pharmaceutical products with the correct or wrong ingredients, insufficient active ingredients, fake packaging, or without active ingredients [3,4].

Fake drugs are by their nature difficult to detect because they are often designed to appear identical to the genuine product and they often fail to properly treat the disease or condition for which they were intended to treat.

The high incidents of counterfeit drugs have ushered in recent years, the era of anti-counterfeiting regulatory agencies, which joins together in the fight against the menace [5]. Thus, the National Agency for Food and Drug Administration and Control (NAFDAC) was established by the federal government of Nigeria in 1993 with the mandate to safeguard the health of the nation through the provision of effective regulation of the food, drug, and chemical sector of the economy.

Over the years, the agency has engaged different strategies like NAFDAC registration number, Truscan, black eye, and Radio Frequency Identification (RFID) in the fight against fake drugs in Nigeria [6]. However, due to some challenges faced by NAFDAC in

the use of these technologies to fight against the production and sales of fake and substandard drugs, the agency on February 2, 2010, launched a Mobile Authentication Service (MAS) scheme that empowers the public in detecting counterfeit drugs using a communication medium (Mobile phone) [7]. The scheme uses scratch codes and Short Messaging Service (SMS) to empower consumers to verify the authenticity of medicines at the point of purchase [8].

Using the MAS scheme, the agency deployed the use of communication via the new media in authenticating drugs at the point of purchase, thereby enlisting the entire Nigerian public in the war against counterfeiting of drugs in Nigeria [9]. It became necessary therefore to assess the level of public awareness and the extent of their utilization of MAS to determine the effectiveness of the use of MAS in the fight against fake drugs in South-east Nigeria.

This study was anchored on Everett Rogers' diffusion of innovation theory as well as Blumler and Katz's uses and gratification theory, which are approaches towards understanding why, how, and at what rate people adopt a new idea or seek out specific media to satisfy specific needs [10].

The findings of this study would be relevant to drug manufacturers, the general public, health care service providers, NAFDAC, health communication and pharmaceutical scholars, and the Nigerian government. The study will add to the body of literature in new media, health communication, and pharmaceutical studies, as well as open up what might be a new argument in MAS research. This study will also help to achieve SDG3 that promotes good health and wellbeing.

Materials and Methods

The study adopted a sequential mixed methods (Descriptive design), combining survey method and Key Informant Interview (KII). The research methods were selected to complement each other to secure an in-depth understanding of the phenomenon in question [11].

All the people in the five states (Abia, Anambra, Ebonyi, Enugu, and Imo states) that make up the South-east Nigeria forms the population for the study. The estimated population as of 2019 was about 23,196,524.12 (Table 1).

S.No	States	Population as at 2006	Estimated population as at 2019
1.	Abia	2,833,999	4,012,941
2.	Anambra	4,182,032	5,921,754
3.	Ebonyi	2,173,501	3,077,674
4.	Enugu	3,257,298	4,612,338
5.	Imo	3,934,899	5,571,817
	TOTAL	16,381,729	23,196,524

Source: NPC, 2006; Population Council, 2007

Table 1: States distribution in South-East Nigeria.

Using the Creative System Research Calculator (CSRC) with a confidence level of 95% and a confidence interval of 5, a sample

size of 400 was decided upon.

A multistage sampling procedure was adopted for the study. In selecting the sample for the in-depth interview, the study adopted a theoretical sampling procedure that enables the researcher to choose participants who have experience or who are experiencing the phenomenon under study. Thus, two pharmacists were randomly selected to represent each of the 10 selected local government areas under study. Pharmacists were chosen because, majority of the medicines consumed by the public were purchased in retails and only the pharmacists have access to the packets of those medicines, thus the scratching of the panel lies in their hands.

In each study location, the customers in pharmacy shops as well as patent medicine stores were targeted. After the initial introduction/consent seeking, there was a brief administration of the questionnaire with a further request for an interview if such person shows interest to participate in further discussions about the subject.

Using Statistical Package for Social Sciences (SPSS), the descriptive and inferential analyses were used to analyze the quantitative data, while thematic analysis using N-vivo was adopted in analysing the qualitative data.

Results

Out of 400 copies of the questionnaire administered to the respondents, 398 copies were returned, which represents a 99 percent return rate.

Level of public awareness and knowledge on the use of MAS

To assess the level of public awareness and knowledge on the use of MAS in the fight against fake drugs, respondents were asked several questions and the data gathered were stated in table two below (Table 2).

Public awareness of MAS	Percentage (%)
Yes	58%
No	42%
Total	100% (N=398)
Nature of campaign messages on MAS	
	Percentage
Informative	46%
Educative	51%
Entertaining	0%
Influencing	2%
Persuasive	1%
Total	100% (N=398)
Level of knowledge on MAS	
	Percentage
Highly informed	24%
Partially informed	58%
Still not informed	18%
Total	100% (N=398)

Demographic variables determining the level of awareness and knowledge on MAS	Percentage (%)
Sex (Gender)	1%
Educational level	68%
Occupation	3%
Marital Status	1%
Residential location (urban or rural)	25%
Cultural/Religious background	2%
Total	100% (N=398)
Source: Field survey, 2020	4,612,338

Table 2: Respondents' awareness and knowledge on MAS.

The data in table two reveals that more than half of the respondents are aware of the use of MAS in detecting fake drugs in South-east Nigeria. The data in table two also shows that the majority of the respondents perceive the campaigns on MAS to be educative, followed by 46 percent of the respondents who perceived it to be informative.

The data in table two also show that more than one-half of the respondents are partially informed on the use of MAS, slightly below one-quarter of the respondents are highly informed, while below one-fifth of the respondents are still not informed on the use of MAS in identifying fake drugs in South-east Nigeria.

The data in table two also indicate that more than two-thirds of the respondent believe that their level of education influences them in receiving and understanding campaign messages on MAS, while one-quarter of the respondents believe that their residential location (Urban or rural) influences them in receiving and understanding campaign messages on MAS.

Level of use of MAS in the fight against fake drugs

To ascertain the level of public use of MAS in identifying fake drugs in South-east Nigeria, the data gathered were stated in **Table 3** below (**Table 3**).

Frequency of use of MAS	Percentage
Regularly	11%
Occasionally	27%
Not at all	58%
Don't Know	4%
Total	100% (N=398)
Challenges in the use of MAS	Percentage (%)
No time to use it	7%
The service (network) is very poor	9%
The Response from NAFDAC is most times delayed	8%
Do not know how to use it at all	20%
I do not have full information on how to use it	12%
Most drugs do not carry the MAS application	19%

Most customers buy drugs in retail which prevents them from seeing the package for authentication	25%
Total	100% (N=398)
Demographic characteristics that determines the acceptance or rejection of MAS	Percentage (%)
Sex (Gender)	2%
Educational level	52%
Occupation	6%
Marital Status	1%
Residential location (urban or rural)	38%
Cultural/Religious background	1%
Total	100% (N=398)
Level of effectiveness of MAS in the fight against fake drugs	Percentage (%)
Very effective	38%
Slightly effective	53%
Don't know	9%
Total	100% (N=398)
Source: Field survey, 2020	1%

Table 3: Respondents' use of MAS.

The data in table three indicates that the majority (58%) of the respondents have not used MAS at all, followed by one-quarter of the respondents who used it occasionally. Surprisingly, only 11 percent of the entire respondents use MAS regularly.

The data in table three also reveals the challenges faced by the public in the use of MAS in identifying fake drugs in South-east Nigeria. The data shows that one-quarter of the respondents buy drugs in retail which prevents them from seeing the packets for authentication, one-fifth of the respondents do not know how to use it, slightly below one-fifth of the respondents said that most drugs do not carry the MAS application, more than one-tenth of the respondents do not have full information on how to use MAS to identify fake drugs, while insignificant percentages of the respondents complained of poor network services, delayed responses from NAFDAC, and lack of time to use MAS.

The data in table three also portray that more than half of the respondents believed their level of education determines their adoption or rejection of MAS, followed by slightly above one-third of the respondents who believed their residential location (Rural/urban) determines their adoption or rejection of MAS. However, insignificant percentages of the respondents consider their occupation, marital status, sex, and cultural or religious belief as influencing factors for their adoption or rejection of MAS.

The data in table three also show that more than one-half of the respondents rate the use of MAS to be slightly effective in the fight against fake drugs, slightly above one-third believe the use of MAS is very effective, while less than one-tenth of the entire respondents do not know how to rate the level of effectiveness of MAS in the fight against fake drugs in South-east Nigeria.

Qualitative analysis

To find out factors affecting the level of public awareness, knowledge, and use of MAS, as well as suggestions on how to improve on MAS, the data gathered from 20 interviews via a 5-item interview guide were quantified and presented in tables four and five below (Table 4).

Challenges in the use of MAS	Percentage (%)
No time to use it	6%
Poor network services	7%
Delayed responses from NAFDAC	40%
Low level of information on how to use it	9%
Most drugs do not carry the MAS application	12%
Most customers buy drugs in retail which prevents them from seeing the package for authentication	15%
Poor electricity power supply to charge their mobile phones	1%
the elitist nature (choice of language and media) of NAFDAC's campaign messages on the use of MAS prevents the respondents from understanding how to use MAS in identifying fake drugs	10%
Total	100%(N=48)
Source: Quantified data from key informant interviews	20%

Table 4: Respondents' challenges in the use of MAS.

The data in table four reveal the challenges of the public in the use of MAS in identifying fake drugs in South-east Nigeria. The data show that two-fifth of the respondents complained of delayed response from NAFDAC in most occasions, below one-fifth of the respondents complained that they buy drugs in retail which prevents them from seeing the packet for authentication, more than one-tenth of the respondents complained that most drugs do not carry the MAS application, while one-tenth of the respondents complained that the elitist nature (Choice of language and media) of NAFDAC's campaign messages on MAS prevents them from understanding and utilizing MAS. Nevertheless, less than 10 percentages of the respondents complained that low level of information and knowledge of MAS, poor network services, lack of time to use MAS, and poor electricity supply affect their level of awareness, knowledge, and use of MAS in the fight against fake drugs in South-east Nigeria (Table 5).

Suggestions on the improvement of MAS	Percentage (%)
The need to create more awareness on the use of MAS	35%
NAFDAC's use of multi-media and multi-languages in creating more awareness on the use of MAS	26%
A good network service to ensure an immediate response from NAFDAC as targeted	22%

Reducing the number of retail drugs which are counted and providing mini packets with MAS number.	10%
Manufacturers' charges to use MAS should be subsidized to carry all drug manufacturers along.	4%
The government should address the problem of poor infrastructure especially in the area of poor electricity supply.	3%
Total	100% (N=59)
Source: Quantified data from Key Informant Interviews	1%

Table 5: Respondents' suggestions on the improvement of MAS.

The data in table five shows that more than one-third of the respondents suggest the need to create more awareness on the use of MAS, more than one-quarter of the respondents suggest NAFDAC's use of multi-media and multi-languages (English and indigenous dialects) in creating awareness on the use of MAS, slightly above one-fifth of the respondents suggest the use of a good network services to ensure an immediate response from NAFDAC as targeted, while one-tenth of the respondents suggest that drug manufacturers should reduce the number of counted drugs by providing mini packets with MAS number. However, insignificant percentages of the respondents suggest the subsidization of charges associated with MAS to carry all drug manufacturers along and improving on the electricity supply to enable them to charge their mobile phones.

Discussion

In ascertaining the level of public awareness and knowledge on the use of MAS in eradicating fake drugs in South-east Nigeria, the analyzed data in Table 2 stated clearly that the level of public awareness and knowledge on the use of MAS in eradicating fake drugs is relatively low, especially in the rural areas. Thus, revealing the assertion by WHO that the business of fake drugs and drugs counterfeiting only come to limelight in the events of deaths [12]. The data in table two also suggest that majority of the respondents perceive the campaigns on MAS to be educative and informative. However, the majority of the respondents believed their level of knowledge on MAS is influenced by factors such as low level of awareness on MAS, elitist nature of the campaign messages on MAS, residential locations (Urban or rural), and the educational level of the respondents. The findings, therefore, conform to the findings of some previous studies that the level of public awareness on the use of MAS is low especially in the rural areas [13-15].

In assessing the level of utilization of MAS in identifying fake drugs in South-east Nigeria the analyzed data in table three shows that, there is a relatively low level of public use of MAS, especially in the rural areas of the studied locations. The findings, therefore, conform to the findings of previous studies that the level of awareness and use of MAS in identifying fake drugs is low in Edo state, Nigeria [13,14].

The analyzed data in **Tables 3 and 4** (Interview excerpts) show the respondents' challenges in the use of MAS. Some of the challenges include poor network services leading to a belated response to the text at the point of purchase, which more or less defeats the purpose of the MAS. Another revelation from the excerpts is the issue of the level of awareness on the use of MAS in identifying fake drugs. The study found that the awareness campaigns of the scheme are mainly for the urban populace where mass media are readily available. Consequently, most rural dwellers are cut off from the knowledge and usage of MAS even when some of them may have a desire to use the service. Again, the scratch-off panel is not in all drugs especially retailed/dispensed drugs in medicine stores, thus authenticating such drugs becomes an extremely difficult task even when the person is knowledgeable about the MAS. Also, the study identified attitudinal issue with most consumers who are always in haste and considered the use of MAS as a useless expenditure of time.

On the other hand, the study also discovered that demographic variables like educational level and residential locations greatly influence the public's level of awareness, knowledge, and use of MAS eradicating fake drugs in South-east Nigeria.

In assessing public perception on the efficiency of MAS and how MAS scheme would be improved on, the analyzed data in **Tables 3 and 5** (Interview excerpts) reveals that most respondents believe the operations of MAS would be an effective and efficient approach in identifying fake drugs if the following suggestions are considered: the use of multi-media and multi-languages approach in creating awareness on the use of MAS in identifying fake drugs, the use of improved network services to ensure an immediate response from NAFDAC as targeted, establishing a policy to make sure all drugs manufacturers develop strategies to key into MAS by reducing the number of dispensed drugs and providing mini packets with MAS number. Again, MAS charges should be subsidized to carry all drug manufacturers along. The findings agree with the findings of an existing study that the use of MAS if improved on, is an effective and efficient strategy in eradicating fake drugs in Nigeria [16].

Conclusion

Based on the research findings, this study concludes that the level of public awareness and knowledge of MAS is relatively low, especially in rural communities. The major factors affecting the level of public awareness and knowledge on the use of MAS are educational level and residential locations of the respondents. This low level of awareness on the use of MAS has in turn led to low utilization of the service in both urban and rural locations, even though there seems to be a higher incidence of the utilization of MAS in urban centres.

The study reveals that the use of MAS, if improved, is an effective and best strategy in eradicating fake drugs in South-eastern Nigeria, because it puts the power of detecting fake drugs into the hands of the public, thus, making the scheme a participatory strategy, where all hands must be on deck towards eradicating fake drugs in Nigeria.

The study recommends the following:

- Creating more awareness on MAS using multimedia and multi-language approach.
- Improved network services
- Inclusion of all drug manufacturers into the MAS scheme.
- Improved electricity supply.

The study, therefore, suggests the replication of this study in other parts of Nigeria, sub-Saharan Africa, and beyond, to consolidate the findings.

References

1. Factsheet (2013) Combating counterfeiting of medical products and similar crimes. Medicrime convention: Council of Europe p. 1-16.
2. Joda AE, Amadi C, Adebayo OI, Maji YI, Uchem C, et al. (2017) Fake drugs: A survey of healthcare providers in Lagos State, Nigeria. *Niger J Basic Clin Sci* 14: 137-142.
3. Ukaoha KC, Dim CN, Daodu SS, Odikayor-Ogbomo IF (2015) Towards a mobile drugs authentication system for Nigerian users. *Comput Info Systems, Deve Informatics and Allied Research Jour* 6: 35-40.
4. World Health Organization (2017) A study on the public health and socioeconomic impact of substandard and falsified medical products.
5. Akinyandenu O (2013) Counterfeit drugs in Nigeria: A threat to public health. *Afri Jour Pharm Pharmacology* 7: 2571-25776.
6. Ebenezer CJ (2015) Pharmaceutical quality and policy in Nigeria: Stakeholder perspectives and validation of the mobile authentication service. (E-Thesis (Doctoral)) London, UK: University College London School of Pharmacy p. 461.
7. Adegoke SP, Osokoya MM, Adegoke AO (2020) NAFDAC sensitization programme and level of consumers knowledge application in identifying counterfeit and substandard medicines. *Int'l Jour of Scientific Research in Edu*: 228-243.
8. NAFDAC (2018) Guidelines for procurement and the management of the Mobile Authentication Service (MAS) scheme in Nigeria.
9. Oyetunde OO, Ogidan O, Akinyemi MI, Ogunbameru AA, Asaolu OF (2019) Mobile authentication service in Nigeria: An assessment of community pharmacists' acceptance and providers' views of successes and challenges of deployment. *Pharm Pract (Granada)* 17:1449.
10. McQuail D (2010) Mass communication theory: An Introduction. 6th ed. London: Sage Publications 534p.
11. Dudu JE, Danjuma MN (2016) Awareness and use of the national agency for food and drug administration and control's mobile authentication service for detecting counterfeit drugs in Nigeria. *IOSR Jour of Hum Soc Sci* 21: 21-31.
12. Population Council (2007) Report of Nigeria's national population commission on the 2006 census. *Pop Deve Review* 33: 206-210.
13. Eronmhonsele JI (2015) Detecting counterfeit drugs through Mobile Authentication Service (MAS): Users' challenges in EDO south senatorial district. *Int'l Jour of Pharm Sci Invent* 4: 13-18.
14. Uzochukwu CE, Chinedu-Okeke CF (2017) audience awareness and use of Mobile Authentication Service (MAS) in identifying fake and substandard drugs in nigeria. *Mgbakoigba Jour of Afri Stu* 7: 46-66.

15. Wogu JO, Omaka-Amari LN, Ugwu UC, Ugwuoke JC, Agu MA (2019) Influence of NAFDAC mobile drugs authentication service on the use of fake drugs among consumers in southeast Nigeria. *Global Jour of Health Sci* 11: 87-93.
16. Chuks-Ugochukwu CM, Ndunagu JN, Wogu CG, Osuji RC, Ithem FC (2019) Improvement of the mobile authentication system towards the eradication of counterfeit products for Nigerian consumers. *Int'l Jour of Scientific Engr Res* 10: 1204-1211.