

## Original Research

# Itinerant vending of medicines inside buses in Nigeria: vending strategies, dominant themes and medicine-related information provided

Kazeem B. YUSUFF, Abd' WASSI SANNI.

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### ABSTRACT\*

**Objective:** To determine vending strategies and marketing themes employed by itinerant bus vendors, and assess the accuracy and completeness of information provided on medicines being sold in an urban setting in Nigeria

**Methods:** Cross-sectional study and content analysis of itinerant vending of medicines inside buses recorded with a mobile telephone on purposively selected routes in a mega city with an estimated 18 million residents in southwestern Nigeria over a 2-month period. Two coders independently assessed 192 vending episodes by 56 vendors for 147 OTC and prescription medicines. Inter-rater reliability (Gwet AC1 =0.924;  $p < 0.0001$ ).

**Results:** Fourteen thousands and four hundred potential consumers encountered 192 recorded episodes of vending of medicines inside 192 buses within the study periods. Forty-four (78.5%) of the 56 vendors were females in the 30-45 years age bracket, were mostly (75%) attired in the local 'Iro and Buba' Ankara fabric and showed laminated identity cards (97.5%) issued by the local association for 'marketers' of medicines inside buses, markets, and motor parks. Of the 14400 consumers encountered inside buses during the study period, between 6.7% and 48.3% purchased the medicines promoted. Prayers against death from road traffic accidents and diseases of physical and / or meta-physical origins were the most frequently used (76.8%) ice-breaking opening statement / strategy to gain consumers' attention. Hematinics, multi-vitamins, simple analgesic, NSAIDs and corticosteroids were the most frequently vended medicines. Consumers' enquiries were related to dosing for children (51.8%), elderly (28.6%), and pregnancy (52.7%); and contra-indications during pregnancy (8.9%). Factual medicines information such as dose, frequency, potential side effects and contra-indications were not provided in majority of vending episodes.

**Conclusion:** Itinerant vending of medicines and the use of misleading and melodramatic themes to secure high consumer patronage appear considerable in Nigeria. Majority of the vendors did not correctly respond to consumers medicine-

related enquiries, or provide detailed factual medicines information to guide appropriate use. These misleading promotional activities could potentially encourage inappropriate purchase and probable self-medication by consumers.

**Keywords:** Self Medication. Nonprescription Drugs. Propaganda. Advertising as Topic .Nigeria.

### VENTA ITINERANTE DE MEDICAMENTOS EN AUTOBUSES EN NIGERIA: ESTRATEGIAS DE VENTA, TEMAS DOMINANTES Y E INFORMACIÓN SOBRE MEDICAMENTOS PROPORCIONADA

### RESUMEN

**Objetivo:** Determinar las estrategias de venta y los temas de marketing empleados por los vendedores en autobuses itinerantes y evaluar la precisión y completación de la información sobre medicamentos proporcionada durante la venta en un área urbana de Nigeria.

**Métodos:** Estudio transversal y análisis de contenido de la venta itinerante de medicamentos en autobuses grabadas con un teléfono móvil en rutas seleccionadas a propósito en una mega-ciudad de 18 millones de habitantes en el suroeste de Nigeria durante un periodo de dos meses. Dos codificadores evaluaron independientemente 192 episodios de venta de 56 vendedores para 147 medicamentos OTC y de prescripción. Fiabilidad inter-evaluador (K de Cohen)=0.89 [IC95% 0.76-0.92].

**Resultados:** 14.400 potenciales consumidores visitaron los 192 episodios grabados de venta de medicamentos en el interior de 192 autobuses en el periodo de estudio. 44 (78.5%) de los 56 vendedores eran mujeres entre los 30-45 años, estaban mayoritariamente (75%) con tejidos tradicionales 'Iro and Buba' Ankara y mostraban tarjetas identificativas plastificadas (97.5%) emitidas por las autoridades locales para 'vendedores' de medicamentos en autobuses, mercados y aparcamientos. De los 14.400 consumidores que visitaron el interior de los buses durante el periodo de estudio, el 6.7% y el 48.3% compró los medicamentos promocionados. Oraciones contra la muerte en accidentes de tráfico y enfermedades de orígenes físicos o metafísicos eran los mensajes para romper el hielo / estrategias para ganar la atención de los clientes más frecuentemente utilizados (76.8%). Los medicamentos más frecuentemente vendidos eran los hematínicos, multivitamínicos, analgésicos

\*Kazeem B. YUSUFF. BPharm, MPharm, PhD .  
Department of Pharmacy Administration & Practice.  
Faculty of Pharmacy, Rhodes University. Grahamstown  
(South Africa).  
Abd' WASSI SANNI. BPharm. Hospital Pharmacist,  
Pharmacy Department, University College Hospital,  
Ibadan (Nigeria).

simples, AINE y corticoides. Las preguntas de los consumidores estaban relacionadas con las dosis para niños (51.8%), ancianos (28.6%) y embarazo (52.7%); y contraindicaciones durante el embarazo (8.9%). En la mayoría de los episodios de venta no se proporcionaba informaciones objetivas sobre los medicamentos, como dosis, frecuencia, efectos adversos potenciales y contraindicaciones.

**Conclusión:** La venta itinerante de medicamentos y el uso de temas engañosos y melodramáticos para asegurar el elevado consumo aparecen frecuentemente en Nigeria. La mayoría de los vendedores no respondió correctamente a las preguntas sobre medicamentos de los consumidores, ni proporcionó información objetiva detallada para guiar en el uso adecuado. Estas actividades promocionales engañosas probablemente podrían animar a la compra y a la automedicación de los consumidores.

**Palabras clave:** Auto-medicación. Medicamentos sin receta. Propaganda. Publicidad como tema. Nigeria.

## INTRODUCTION

Geographic and economic access to safe, efficacious and affordable essential medicines of good quality is predicated on a well structured and properly regulated medicines distribution system. This is particularly important in the public sector which caters for majority of the populace in developing and resource-limited setting. Such access will ultimately provide an opportunity to reduce the increasing morbidity and mortality from high disease burden.<sup>1,2</sup>

Health services have been severely hampered in Nigeria by acute shortage of essential medicines for many years. Hence, health care coverage is perennially low with less than 30% having regular access to essential medicines, particularly in the public sector.<sup>3,4</sup> The majority of Nigerians have been willy-nilly driven to the private sector to meet their medicines needs due to poor availability of essential medicines at public health facilities. However, this shift has worsened economic access, as payment for medicines' purchase is generally done out-of-pocket in the private sector in Nigeria. Indeed, out-of-pocket payment for medicines in the private sector constitutes a significant part of the pharmaceutical expenditure and a disproportionate share of household expenditure.<sup>5</sup> Hence, majority of Nigerian who live below the poverty line of less than 1 USD per day are experiencing financial difficulty in meeting their basic needs, including essential medicines.<sup>6-8</sup>

The Poison and Pharmacy Act (PPA) Cap 366 of 1990 regulates the supply, distribution and sale of medicines in static outlets that are duly registered by the Pharmacists Council of Nigeria. This Act clearly prohibits the display, distribution and sale of all categories of medicines in unregistered outlets. In addition, the Food and Drug Act Cap 150 of 1990 an the National Agency for Food and Drug

Administration and Control Cap 73 of 1990 also prohibit distribution and sale of any medicines in market, buses and on the streets.<sup>9-11</sup> Notwithstanding this plethora of laws, itinerant vending of medicines remain pervasive in Nigeria.<sup>12-</sup>

<sup>14</sup> This phenomenon is probably fueled by inadequate drug regulatory capacity, ineffectual enforcement of the pharmaceutical laws regulating the distribution and sales of medicines.<sup>13</sup> poorly organized and chaotic drug distribution systems Furthermore, itinerant vending of medicines could have dire public health consequences in a developing setting like Nigeria where irrational self medication with prescription-only medicines, over-the-counter medicines (OTC) and herbal remedies of both known and unknown contents.<sup>15,16</sup> Poorly guided self medication practices have been shown to provoke adverse drug reactions, delay or mask diagnosis of a serious underlying medical problem and increase the risk of potentially harmful drug-drug or drug-disease interactions.<sup>17,18</sup> This unbridled drug use habit among Nigerians has been linked to factors such as the peculiar health-seeking behavior which favours self-medication as the first response to perceived health problems, and uncontrolled access patients have to both orthodox and herbal medicines in Nigeria.<sup>8,15,19</sup> Furthermore, the extensive direct-to-consumer advertising of over-the-counter medicines (OTC) which is focused on positive emotional appeals but contained insufficient educational information and thus may be misleading have been reported by previous studies in Nigeria.<sup>20,21</sup>

Studies of the sale of medicines in developing countries have been focused on mainly static outlets such as pharmacies and patent medicines stores.<sup>22-27</sup> Pharmacies are usually owned and / or superintended by registered graduate pharmacists who have undergone the requisite training prescribed by the Pharmacists Council of Nigeria. In addition, the patent medicine stores are manned by authorized persons who have been licensed under the relevant sections of the PPA to sell the listed patents and proprietary medicines.<sup>9,25,27</sup> There is very little attention on the activities of ambulant vendors and this is probably due to its illegal nature. Furthermore, very little is known about the activities of itinerant vendors of medicines with regards to strategies being used in securing patronage from consumers. Yet, itinerant vending of medicines have been identified as a probable key driver of chaos in the medicines distribution channels, inappropriate self-medication practices, and circulation of counterfeit / substandard medicines in Nigeria.<sup>13,14</sup> Hence, an investigation to ambulant vending of medicines is warranted since an insight into the activities of ambulant vendors may prove valuable in identifying appropriate interventions to mitigate their activities. The objectives of the study were: 1) To identify the vending strategies and marketing themes of itinerant vendors of medicines; 2) To assess the accuracy and completeness of medicines-related information provided on the medicines being sold inside buses in an urban setting in Nigeria.

## METHODS

### Study setting

A prospective cross sectional study of itinerant vending of medicines in commercial buses along selected major routes was conducted between 2<sup>nd</sup> March, 2009 and 30<sup>th</sup> April, 2009 in Lagos, a mega city in southwestern Nigeria with an estimated 18 million residents. Formal ethical approval was obtained from the office of the Chairman, Ethics Review Committee of the Ministry of Health.

Two of the busiest major routes in Lagos were purposively selected based on the heavy human and vehicular traffic that they carry. These include Oshodi-Sango Otta route located on the Lagos-Abeokuta expressway, a major interstate highway which serves as a get-away to the northern part of Lagos. This highway ranks among the busiest with heavy traffic inflow to Lagos in the morning and corresponding outflow in the evening. Sango Otta and its environs also housed mostly low and some middle income earners who cannot afford the high cost accommodation in Lagos. Majority of these people are thus resident in Sango Otta but work in Lagos; thereby contributing to the heavy migratory pattern and traffic congestion experienced in the morning (due to inflow) and evening (due to outflow). The second route is Oshodi-Idumota axis, a major commercial highway linking the mainland with Lagos Island. Idumota is a central business district containing many large markets, financial, commercial and industrial outfits in Lagos. It is therefore a major commercial nerve centre which contributes to the heavy migratory and traffic inflows and outflows.

### Sampling strategy

The first phase of the study involved recordings of all episodes of vending of medicines encountered within one month inside commercial buses known as "molue and "mass transit". These commercial buses are usually used for mass movement of people [80 persons (sitting + standing)] along the purposively selected routes. The buses were targeted because they are preferred by majority of the populace who reside along the selected routes due to their relatively cheap fares. The buses were boarded daily in the morning and evening to capture medicines vending episodes encountered by commuters who were going or returning along the selected routes. It was ensured that at every points of boarding, a specific seat was secured at the frontal section of the buses by the data collectors who were disguised as passengers. This was done to ensure proximity to the vendors, assure clarity of audio recordings and a good opportunity to jot down other relevant data of interest on a note pad. The two data collectors made two different trips per day between morning and evening periods. These periods were specifically chosen to capture the inflow and outflow of traffic. Four vending episodes were recorded per each onward and return trip from Sango Otta – Oshodi- Idumota routes by each of the data collector. Data collection was done on three different alternating days per week for four weeks. The three data collection days were

randomly selected by simple lottery. The three alternating data collections days were further alternated in-between the four weeks study period.

### Data collection and content analysis

We adopted a disguised but innovative data collection technique with the use of mobile phone that did not interfere with the vending activities or modification of behaviours of the vendors. This prevented the occurrence of researcher-subject interaction (Hawthorne effect). The audio recording of vending episodes was done with a mobile telephone (Nokia 3500C) with a memory card capacity of 1 giga byte, and a phone memory of 8.5 mega bytes. An audio format incorporating an audio data compression scheme optimized for speech coding called Adaptive Multi-Rate (AMR) was used. The recordings were then converted into a digital audio encoding format (MPEG-1 audio layer 3) using total video converter software installed on a desktop computer (Pentium IV), burnt into compact disks and played for data extraction and coding. Samples of the medicines vended were also bought. The data that were jotted on note pad include vendor's gender, age range (estimated), appearance (dresses worn by vendors), means of identifications used by vendors, percentage of commuters who purchased the medicines sold. The data that were extracted from the audio recordings include language used in vending, opening statements / strategies (Ice breakers) used by vendors, types and classes of medicines vended, dominant themes used by vendors, types of information requested by buyers, types of information provided by vendors on medicines sold, including but not limited to indication, dose, regimen, duration, contra-indication, expiry date.

Data extraction from audio recordings were done independently by two researchers with data collection forms that had been pre-tested with 10 vending episodes conducted by 5 vendors encountered during an initial visit to the study site. Relevant modifications were made to ensure clarity and completeness of data capture. The Data collected during pre-test were excluded in the final results. The medicines-related information provided during the sampled vending episodes was assessed with relevant references through checking for the accuracy and completeness of information on indication, dosage, frequency, side effects, contra-indications and expiry date.<sup>28,29</sup>

Following the pre-test visit, the analytic codes developed for the assessment of the opening statement / strategies used by vendors were 3: Prayers against loss of life from road traffic accident; Prayers against diseases of physical and or metaphysical origin; Humour / Jokes. The dominant themes used in the vending episodes were identified with 8 analytic codes: Good substitute for unaffordable balanced diet, Good supplement for inadequate diet (mainly carbohydrate and fats), Purifier and Cleanser of blood, Killer of worms that makes you lose weight, Killer of muscle, stomach / joint pains caused by rigour of commuting and working in Lagos, Increased weight and light smooth skin, and

Components	Analytic Codes
Ice breaking opening tactic / statement (n = 3)	"Prayers against consumer's death from RTA," "Prayers against consumer's death from diseases," "Humour / Jokes"
Dominant themes (n = 8)	"Good substitute for unaffordable balanced diet," "Good supplement for inadequate diet," "Purifier and cleanser of blood," "Killer of worms that make you lose weight," "Killer of muscle, stomach and joint pains," "Increase in body weight and light smooth skin," "Cheapest and best price for vended medicines," "Medicines is original because of NAFDAC number and expiry dates"

Cheapest and best price for vended medicines since vendors do not incur operating costs which are associated with the regular static medicines outlets, Medicines sold is 'original' as it carries NAFDAC number and Expiry dates (Table 1). Inter-rater reliability for agreement between the two data extractors was determined with Gwet's Alternative chance-adjusted coefficient where value 0 means no agreement while value 1 means perfect agreement beyond chance [Gwet AC1: 0.924 (p<0.0001)] Consensus was used to resolve coding disagreements.

## RESULTS

A total of 192 vending episodes of 147 brands of OTC, prescriptions and herbal medicines conducted by 56 vendors and encountered by 14,400 [75 SD=10.2, Minimum-67, Maximum-88] potential customers were recorded during the study period. All the 56 medicines vendors were allowed by the drivers / conductors of the 192 buses to conduct their vending activities. The majority (78.5%) of the vendors were female and were mostly (96.4) in the

30-50 years age bracket (estimate). Seventy five percent of the vendors were attired in the local 'Iro and Buba' Ankara fabric, while only about 5% appeared in the more formal attire such as skirt and blouse. Almost all the vendors (98%) showed laminated identity cards which they claimed were issued by the local association for 'marketers' of medicines inside buses, markets and motor parks in Lagos state. The vendor who did not showed any identification card was mostly vending local herbs. Yoruba was the primary language used by majority of the vendors (82.1%), followed by combinations of Yoruba and English language (12.5%). The profile of the ice-breaking opening statement / strategies used by the vendors showed that prayers against death of the passengers from road traffic accidents, and against contracting diseases of the physical and / or meta-physical origins were the most frequently used (76.8%), followed by humour / jokes (7.1%) to attract the attention of the passengers (Table 2).

Hematinics, multi-vitamins and simple analgesics were the most frequently vended classes of

Components	%
Gender (n = 56) <sup>a</sup>	
Male	21.4
Female	78.6
Age range (estimated) (n = 56) <sup>a</sup>	
50 + years	3.6
30 – 50 years	96.4
20 – 30 years	0
0 – 20 years	0
Language used during vending (n=192) <sup>b</sup>	
Yoruba	82.1
English and Yoruba	12.5
English	3.6
"Pidgin English"	1.8
Dress type worn during vending (n=192) <sup>b</sup>	
Local 'Iro and Buba' Ankara fabric	75.0
Skirt and Blouse	5.4
Local 'Buba and Sokoto'	8.9
Shirt and Trouser	10.7
Ice breaking tactic / opening statement (n=192) <sup>b</sup>	
Prayers against consumer's death from RTA	46.1
Prayers against consumer's death from diseases	30.7
Humour / Jokes	7.1
Prayers and Jokes	16.1
Dominant themes used (n=192) <sup>b</sup>	
Good substitute for unaffordable balanced diet	90.1
Good supplement for inadequate diet	90.1
Purifier and cleanser of blood	90.1
Killer of worms that make you lose weight	69.8
Killer of muscle, stomach and joint pains	90.0
Increase in body weight and light smooth skin	65.1
Cheapest and best price	100.0
Medicines is original	100.0

a: Vendors; b: Vending episodes.

Item	%
Classes of medicines vended (n = 147)	
Over-the-counter	
Hematinics	15.0
Multivitamins	12.0
Simple analgesics	17.1
Anti-helminthic	12.2
Topical Anti-fungal	2.7
Antacid	2.7
Prescription	
Corticosteroid [Prednisolone (tablet), Clobetazole, Bethametazone (Topical)]	8.1
NSAID [Piroxicam, Diclofenac, Ibuprofen (Capsule)]	9.6
Herbal	
Herbal antibacterial for ophthalmic use	9.0
Other local herbs	11.6
Medicines information provided during vending (n = 147)	
Indication	98.6
Dosage	97.3
Frequency	0
Side effect	0
Contra-indication	0
Expiry date	9.5
Accuracy of the information provided in response to consumers' enquiries	
Indication (n = 145)	45.5
Dosage (n = 143)	36.6
Expiry date (n = 14)	100
Completeness of the information provided in response to consumers' enquiries	
Indication (n = 145)	24.8
Dosage (n = 143)	16.7
Expiry date (n = 14)	100

medicines. However, prescription-only medicines and herbal powder for ophthalmic administration were also sold. The prescription medicines include prednisolone tablets, piroxicam capsules, and topical preparations containing clobetazole propionate, bethametazone dipropionate and gentamycin sulphate (Table 3). The dominant themes employed by the vendors are as shown in Table 3. Multivitamins were presented as good substitute for balanced diets which may not be affordable for the majority of consumers who appeared specifically targeted inside the 'molue and 'mass transit' buses. Hence, consumers were motivated to buy the multivitamins believing that their use will fill the dietary gap, and provide them with essential vitamins and minerals that their current diet may not be providing. Hematinics were promoted by vendors as purifiers and cleansers of the circulatory system that will remove 'dirt' and 'impurities'. The vendors also assured the buyers that this purification action will be evident by the passage of reddish brown coloured stool and yellowish frothy urine shortly after use. Paracetamol and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) were mainly promoted as powerful painkillers that will provide instant relief from musculo-skeletal and joint pains experienced especially by drivers, bus conductors, traders and artisans who regularly travel along the selected routes. The attainment of increased body weight and light smooth skin which are culturally perceived as sign of good living and well-being, were the dominant themes used for sales of prednisolone and other topical corticosteroids by the vendors. Furthermore, all (100%) the vendors presented the medicines being sold as genuine, and showed the expiry dates

and NAFDAC number (A number given by the National Agency for Food, Drug Administration and Control (NAFDAC) as evidence of registration). In addition, all (100%) the vendors used the claim of offering the cheapest / best price which consumers will not get from regular static medicines outlets such as pharmacies. They buttressed this claim with the fact that as mobile vendors, they are spared the added operating / overhead costs associated with the regular static pharmacies; and hence, can afford to sell with marginal mark-up.

Of the passengers targeted by the itinerant vendors of medicines inside buses, between 6.7% and 48.3% purchased the medicines during the study period. The main medicine information requested by consumers from the vendors were related to dosing for children (51.8%) [Worm expellers, NSAIDs, Multi-vitamins, Hematinics]; elderly (28.6%) [NSAIDs, Hematinics, Prednisolone]; pregnancy (52.7%) [Hematinics, Vitamins, NSAIDs]; and contra-indications during pregnancy (8.9%) [NSAIDs]. The most frequently provided medicine information by vendors was indications (98.6%) and dosing (97.3%); but most of these information were inaccurate. In addition, factual medicine information such as dosing frequency, potential side effects and contra-indications were not provided in majority of vending episodes (Table 3). In addition, assessment of the accuracy and completeness of the medicine-related information provided by itinerant vendors generally revealed overstatement of the efficacy of promoted medicines, inaccuracies, incompleteness and lack of information on dosage, contra-indications and potential side effects respectively.

## DISCUSSION

The high numbers of vending episodes recorded and potential consumers encountered during the study period suggests that itinerant vending of medicines remain pervasive despite its prohibition by relevant laws in Nigeria.<sup>9-11</sup> The free reign given to the vendors by drivers of buses inside which they operated and their continuing patronage by consumers suggest that despite government effort to discourage this illegal activity, the itinerant vendors may have successfully establish some sort of bonding with the population encountered inside these buses. The bonding appeared strong enough for consumers to patronize and trust the vendors for their medicines need without as much as ascertaining their capability to discharge the trust appropriately. The ease of access to, and the exaggerated promotional strategies employed may be contributory to the continuing patronage by consumers. This finding suggests a serious gap in the delivery of health care in Nigeria.

The overwhelming preference for local dresses such as 'Iro and Buba' Ankara which is the culturally acceptable mode of dressing at the study site by the majority of the vendors appeared targeted to bond with customers, gain their acceptance and enhance patronage. This is a strong possibility as the significant influence of social and cultural factors on medicines use have been reported by previous studies.<sup>30,31</sup> The itinerant vendors may therefore be using this foot-in-door technique to bond with targeted consumers. In addition, the use of identification cards, the predominant use of Yoruba by the vendors which is the primary language spoken by majority of consumers, and the generous use of strategies such as jokes and prayers against road traffic accident and diseases related deaths showed that vending are focused on establishing strong rapport with the consumers to gain trust, acceptance and enhance patronage.<sup>32</sup> Moreover, when the most frequently promoted medicines were those that are usually used for such conditions as anemia, malnutrition and aches / pains associated with possible bacterial / parasitic infections which are endemic in Nigeria. Given this scenario, there is a clear need for a well structured and sustained public enlightenment campaign to mitigate the potential negative impact of the activities of ambulant vendors through informing consumers of the potential risks inherent in the purchase and use of medicines inside buses and other unauthorized sources.

The use of questionable promotional themes by vendors which emphasized exaggerated efficacy, cheapest price and other melodramatic claims, and overstate the benefits derivable from using the vended medicines may mislead consumers and prompt inappropriate purchase.<sup>33,34</sup> This position is supported by our finding which showed that up to about half of the consumers encountered by vendors purchased the vended medicines. Such misleading vending strategies could have potentially serious negative consequences on public health as inappropriate self medication with prescription medicines such as corticosteroid and NSAIDs may

delay or mask an otherwise serious chronic medical problem, provoke new chronic medical problems such as hypertension, diabetes, peptic ulcer and related complications, and / or increase the risk of potentially harmful adverse events. The probable contributions of this phenomenon to morbidity and mortality related to poorly guided self-medication practices remain unknown, and further research is warranted.

Rational and appropriate use of medicines is predicated on patients' access to accurate and detailed information. This will potentially guarantee positive outcomes and minimize the possibility of occurrence of harms. This underscores the significance our finding which showed that itinerant vendors' responses to information enquiries by consumers were mostly inaccurate, incomplete and may be misleading. This is unsurprising, as unqualified persons involved in distributions and sales of medicines lack the necessary training and technical capability to correctly respond to enquiries related to medicines use.<sup>35,36</sup> In addition, the majority of the vendors were unable to provide factual medicines information which can guide consumers in knowing the correct range of doses, the regimen and duration of use, potential adverse effect to watch out for and what should be done, and the contra-indications to avoid. Hence, the ambulant vendors appear incapable of appropriately guide consumers to make rational and appropriate choice concerning their medicine needs. The need for control and eventual eradication of itinerant vending of medicines especially inside buses by the regulatory agency saddled with this responsibility is clearly urgent. This could be followed with a structured programme to re-orientate, and educate the large pool of itinerant vendors of medicines encountered daily by consumers in Nigeria. Perhaps, they may yet prove useful as foot soldiers in the area of advocacy and public enlightenment on rational and appropriate use of medicines, particularly because of the dexterity in bonding with consumers. In addition, they could turned into a veritable human resource by government and its development partners for the dissemination of important medicine use-related and other health information to the general public particularly for priority diseases such as malaria, HIV/AIDS, Tuberculosis, vaccine-preventable and chronic non-communicable diseases.

The findings of this study should be interpreted in the light of the following limitations. Although the number of potential consumers who were exposed to vending of medicines inside buses was high, it was difficult to ascertain consumers who were encountered more than once. In addition, the purposively selected routes may not reflect patterns in other cities. However, the routes were the ones usually targeted during itinerant vending of medicines because they are located in a mega city with high population density and, were also among those with heavy human and vehicular traffics in Nigeria. Furthermore, we minimized the occurrence of researcher-subject interaction (Hawthorne effect) by using disguised data collection techniques with a mobile phone, a somewhat novel data collection

approach. In addition, there is a chance of interference by human errors with the processes of data collection and extraction. However, adequate precautions were taken to minimize these during pre-testing, and inter-rater reliability of agreements determined with Gwet AC1 was high.

## CONCLUSIONS

Itinerant vending of over-the counter and prescription medicines with the use of misleading and melodramatic promotional tactics to secure high consumer patronage inside buses is considerable in Nigeria. Majority of vendors could not respond correctly to consumers medicine-related enquiries, or provide accurate and complete factual medicines information to guide rational and appropriate use.

The promotional activities of medicine vendors may potentially mislead consumers to make poorly guided purchase and probable self-medication.

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## CONFLICT OF INTEREST

We declare that there is no conflict of interest on this research study. This research study did not receive fund or support from any source.

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