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Antibiotics Knowledge and Dispense Practice among Patent and Proprietary Medicine Vendors in Niger State, North Central Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background: Inadequate knowledge and irrational dispense practice are serious Public Health challenges in Nigeria. This may increase financial burdens, risk of infection relapse and accelerate emergence and spread of the antibiotics resistance. Thus this may lead to complicated disease outcomes among individuals and families. There is no documented evidence on the Antibiotics knowledge and dispense practices among patent and proprietary medicine vendors (PPMVs) in Niger State. This study therefore evaluated Antibiotics knowledge and dispense practices among PPMVs in the area.

Materials and Methods: A descriptive cross-sectional design was employed in this study. The study population comprises PPMVs in Niger State. A minimum sample size of 110 was calculated using Cochran's formula $n = Z^2pq/d^2$. Respondents were selected using simple random sampling techniques. A pretested structured interviewer administered questionnaire was used for data collection. Statistical Package for Social Sciences (SPSS) version 20 was used for data analysis.

Results: The Mean age of respondents is 35±2.4 years. Respondents had fair knowledge of antibiotics. About 70.9% of the PPMVs dispensed antibiotics wrongly for common cold, catarrh and flu while 60.9% used antibiotics to treat cough and sore throat. The majority of the PPMVs (73.6%)

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dispensed antibiotics without prescriptions while 58.2% indicated that patient request incomplete course of antibiotics over the counter.

Conclusions: There were fair knowledge on Antibiotics and some bad dispensing practices among PPMVs. To change the practice of antibiotics dispensing without prescription and indiscriminate use of antibiotics requires continue medical education of PPMVs on antibiotics rational use and enforcement of regulations.

Keywords: Antibiotics; knowledge; dispensing practices; PPMVs.

1. INTRODUCTION

Antibiotics are one of the most commonly used, misused as well as abused drugs. Irrational use includes the use of antibiotics to treat viral infections, negligent use, or the wrong drug or inappropriate dosage or duration for treatment [1]. This irrational use accelerates the emergence of antibiotic resistance [2] which occurs as a natural process at low rates [3,4]. Patent and proprietary medicine vendors (PPMVs) are persons without formal training in pharmacy who sell orthodox pharmaceutical products on a retail basis for profit, provide the main source of medicine for many common illnesses [5]. They form significant part of the primary care level of the national health system and are always available and accessible, as there is usually no need to book an appointment and shorter waiting time is experienced than at other healthcare provider settings [5,6]. The law that established PPMVs permits them to sell a limited number of pre-packaged, over-the-counter (OTC) medicines but prohibits them from selling prescription only medications (POMs) (antibiotics) without a valid prescription or conducting invasive medical procedures (including injections and tests) [7].

Report shows that antibiotics are readily available or dispensed without prescription and in some cases up to 100% availability without prescription [8]. Antibiotics dispensed in India pharmacies were, most of the time, dispensed without consideration for dose and duration [9]. Nigeria is facing crisis on access to healthcare and gaps in rational prescription of antibiotics and use [10].

Other studies may have centered on the roles of PPMVs in malaria. However, available evidence showed that PPMVs' limited knowledge of proper treatment practices with antibiotics contributes to sales of inappropriate, ineffective, and incorrect drugs for many infectious diseases leading to antibiotics resistance. There is no documented evidence on the Antibiotics knowledge and dispense practice among patent and proprietary medicine vendors (PPMVs) in Niger State. This study therefore evaluated Antibiotics knowledge and dispense practice among PPMVs in the area.

2. MATERIALS AND METHODS

A descriptive cross-sectional design was employed in this study. The study population comprises PPMVs in Niger State.

A minimum sample size of 110 was calculated using Cochran's formula $n = Z^2pq/d^2$. Respondents were selected using simple random sampling techniques. That was done during a state wide association meeting in which numbers were allocated to them for the purpose of selection. A pretested structured interviewer administered questionnaire was used for data collection which lasted for three months. Statistical Package for Social Sciences (SPSS) version 20 was used for data analysis. Frequencies and proportions were tabulated accordingly and also in pie chart.

3. RESULTS

Table 1 showed the socio-demographic profile of the respondents. The mean age of respondents is 35±2.4 years. The majority (81.8%) were males and thirty eight years and above. About 63.6% of the PPMVs were trained as apprentice by senior PPMV before establishing theirs.

Table 2 showed that 56.4% of the respondents use antibiotics to treat fever while 51.2% agreed that antibiotics should not be used to treat diarrhea. The respondents were seen to have lax knowledge on antibiotics. About 53.6% of the respondents thought that skipping one or two doses of Antibiotics does not contribute to antibiotics resistance. Similarly, 59.1% believed that mixing different antibiotics works faster and shortens the duration of treatment and illness

while 53.6% believed that antibiotics should not be stopped even if patient is getting well.

Table 3 showed the antibiotics dispensing practices of the PPMVs. All the PPMVs responded to dispensing practice questions. Significantly large proportion of respondents (70.9%) dispense Antibiotics for common cold, catarrh and influenza, 60.9% treat cough and sore throat with antibiotics. However, there was irrational use of Antibiotics as 89% of the respondents believed that combination of antibiotics and anti-malaria treatment makes patient to recover faster. However, 81% of the respondents indicated that patients always request for antibiotics without prescriptions while 58% of PPMVs will sell part or half card of antibiotics to patient upon request.

Fig. 1 showed suggested ways of improving knowledge on Antibiotics and dispensing practice among PPMVs. About 31.8% of the respondents agreed that continued medical education is one the ways to improve knowledge on Antibiotics and dispense practice while 25.5% went for strengthening of PHCs for essential healthcare needs. This entails compulsory and inclusive health insurance scheme and training of PPMVs on the needed Antibiotics knowledge and practice [6]. On antibiotics rational use, 19.1% wanted antibiotics

Table 1. Socio-demographic characteristics of respondents

Variable	Frequency (n =110)	Percentage (%)
Sex		
Male	90	81.8
Female	20	18.2
Total	**110**	**110**
Age (years)		
<18	8	7.3
18-27	14	12.7
28-37	35	31.8
38 and above	53	48.2
Total	**110**	**110**
Education		
Primary	18	16.4
Secondary	52	47.4
Tertiary	40	36.4
Total	**110**	**110**
Training		
Pharmacy technician	10	9.1
Nursing	6	5.5
JCHEW	8	7.3
Apprentice	70	63.6
Others	16	14.5
Total	**110**	**110**

JCHEW (Junior Community Health Extension Workers). Mean age of respondents is 35±2.4 years

Table 2. Frequency of response to antibiotics knowledge

S/n	Question	Yes (%)	No (%)	Total (%)
1.	Antibiotics are used to treat fever.	62(56.4)	48(43.6)	110(100)
2.	Antibiotics are best used to treat diarrhea.	53(48.2)	57(51.2)	110(100)
3.	Skipping one or more doses does not contribute to development of antibiotics resistance.	59(53.6)	51(46.4)	110(100)
4.	Mixing different antibiotics works faster and shortens the duration of treatment and illness.	65(59.1)	45(40.9)	110(100)
5.	Due to side effects, antibiotics can be stopped if patient is getting well.	51(46.4)	59(53.6)	110(100)

to be sold only by prescription. However, 16.4% suggested community awareness creation on the importance of prescription before antibiotic use while 7.3% thought of enforcing regulations on PPMVs irrational dispensing of antibiotics.

4. DISCUSSION

A recent systematic review of PPMV practices showed that they provide medicines and services for a wide variety of health needs, including malaria, respiratory infections, diarrhea, common cough, cold and tuberculosis. However, the quality of these services is low [7]. PPMVs generally have low health knowledge and poor health treatment practices, stock poor quality medicines [11], sub-standard formulations [12] as well as medicines and commodities that are prohibited from selling [13]. PPMVs interact with customers in order to dispense medications (including antibiotics) for those conditions [14]. This public health challenge could act as a drawback to the progress already achieved in health and development in the Sustainable Development Goals agenda [15].

Rational use of antibiotics remains the main strategy for the prevention of antibiotics resistance and this can be achieved by adequate and robust continuing education trainings and workshop to changing the existing antibiotics knowledge and dispense practice of PPMVs in Nigeria.

Significantly high proportion of the respondents indicated that antibiotics can be sold without prescriptions. This is corroborates the finding that antibiotics are readily available or dispensed by PPMVs without prescription and in some cases up to 100% availability without prescription [8]. Similarly, large proportion of the respondents dispensed antibiotics for common cold, catarrh and flu while majority used antibiotics to treat

Table 3. Frequency of response to dispense practice

S/N	Question	Yes (%)	No (%)	Total (%)
1.	Do you dispense antibiotics for common cold, catarrh and influenza	78(70.9)	32(29.1)	110(100)
2.	Do you dispense antibiotics to treat cough and sore throat.	67(60.9)	43(39.1)	110(100)
3.	Do you add antibiotics to malaria treatment to make patient recovery faster.	89(80.9)	21(19.1)	110(100)
4.	Do you sell antibiotics to patient without prescription.	81(73.6)	29 (26.4)	110(100)
5.	Do you sell part or half card of antibiotics to Patient on their request.	64(58.2)	49(41.8)	110(100)

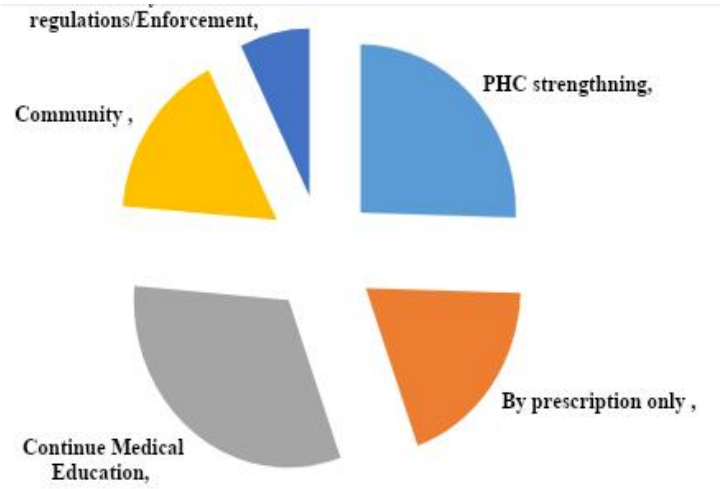

Fig. 1. Perceived solution to antibiotics knowledge and dispense practice

cough and sore throat. These infections may not be caused by bacterial infections and treatment with antibiotics may not be indicated resulting to indiscriminate use. Dispensing practice showed incomplete course of antibiotics. Majority of the respondents dispensed part or half card to patient on their request. However, sub-optimal doses may lead to antibiotics resistance. This is similar to the study which showed that antibiotics are not allowed to be altered or sold a portion from their package as this constitutes dispensing practice [11]. This dispense attitude found could be attributed to the retailing nature of the PPMVs for profits, poor awareness creation among the masses, socioeconomic status of the people and lack of access to basic health care services in the communities surveyed. This may lead to antibiotic resistance and increased financial burdens to individuals and families due to adverse drug events and community transmission of resistant strains of microorganisms. This is consistent with another study which demonstrated that irrational antibiotics use increased risk of infection relapse and accelerates the emergence and spread of the antibiotics resistance process resulting to complicated disease outcomes [2]. The fair knowledge on Antibiotics and some bad dispensing practices among PPMVs in this study may due to limited knowledge on the differences between the causative organisms of infectious diseases.

Fewer than average number of respondents recommended continued medical education on rational use of antibiotics since PPMVs are the main source of primary care in the rural and sub-urban areas. They also suggested need to strengthen PHCs to balance access to essential health needs and gap in rational dispensing of antibiotics, and as well recommended that antibiotics be sold only on valid prescription and community awareness and risk communications of the dangers associated with the indiscriminate use of antibiotics and irrational dispense practice by PPMVs. PPMVs are key stakeholders in the rational use of medicines, forming the third largest group of healthcare professionals after doctors and nurses globally [16]. They are predominantly responsible for the retailing and dispensing of antibiotics. So strict enforcement of regulations will limit access to antibiotics by patients.

5. CONCLUSIONS

There were fair knowledge on Antibiotics and some bad dispensing practices among PPMVs. To change the practice of antibiotics dispensing without prescription and indiscriminate use of antibiotics requires continuous medical education of PPMVs on antibiotics rational use and enforcement of regulations. The recommended ways of improving PPMVs' knowledge on Antibiotics and dispensing practices should be implemented and enforced by the regulatory bodies.

CONSENT

Consent was obtained from the respondents before questionnaire administration.

ETHICAL APPROVAL

Ethical approval was obtained from the Research and Ethics Committee (REC) of Niger State Ministry of Health.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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