Drug promotion in a Resource-constrained Nigerian Environment: A Cross-sectional Study of the Influence of Pharmaceutical Sales Representatives on the Prescribing Behaviors of Medical Practitioners in Abia State

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Abstract

Background: Pharmaceutical drug promotion is an important component of pharmaceutical care and is one of the factors that may lead to unethical drug prescriptions. As the impetus for rational drug use grows, emphasis should also be focused on prescribing behaviors of physicians, particularly in resource-poor settings. Aim: The study was aimed at describing the influence of drug promotion by pharmaceutical sales representatives (PSRs) on the prescribing behaviors of medical practitioners in Abia State, Nigeria. Materials and Methods: A descriptive study was carried out on a cross-section of 185 medical practitioners in Abia State, Nigeria. Data collection was done using a pretested, self-administered questionnaire that elicits information on practice and attitude to drug promotion, types of incentives, frequency of visits, drug promotion methods and information, sources of drug information, and awareness of code of regulation on drug promotion. Results: The age of the participants ranged from 28 to 71 years. There were 166 males and 19 females. The prescribing practices of 47.6% of the medical practitioners were influenced by drug promotion and 66.5% of them had positive attitude to drug promotion. One hundred and sixty-four (88.6%) were visited >12 times in the previous year. The most common incentive received was branded stationeries (100.0%); predominant drug promotional method and information were in-person clinic encounter (100.0%) and brand names of the drugs (100.0%), respectively. The most common source of drug information was calling a colleague/pharmacist (93.5%) while 84.9% of the respondents were aware of code of regulation on drug promotion. Conclusion: Drug promotion by PSRs influenced prescribing practices of medical practitioners with 66.5% of them having positive attitude to drug promotion. The most common incentive, drug promotion method, and information were branded stationeries, in-person clinic encounter, and brand names of products/drug indications, respectively. The most common source of drug information was calling a colleague/pharmacist, and awareness of code of regulation of drug promotion was inadequate.

Keywords: Abia State, drug promotion, medical practitioners, Nigeria, pharmaceutical sales representatives, prescribing behavior

Introduction

Globally, as new drugs are produced by pharmaceutical industries, pharmaceutical companies continue to influence the prescribing behaviors of medical practitioners, especially in resource-constrained environments.[1-4] As the trend of pharmaceutical care services is changing daily, the impetus for rational drug use is growing with focus on prescribing behaviors of medical professionals. The World Health Organization defines drug promotion as all informational and persuasive activities by manufacturers and distributors, the effect of which is to influence the prescription, supply, purchase, or use of medicinal drugs.[5]

The magnitude of the influence of pharmaceutical sales representatives (PSRs) on prescribing habits of medical...
professionals has been reported within and across global medical populations in Australia, Germany, Turkey, India, Saudi Arabia, Peru, United States of America (USA), Ethiopia, and Nigeria. However, factors that influence the prescription of pharmaceutical products worldwide have been reported in biomedical literature. Apart from scientific knowledge, other factors that influence prescription of drugs include incentivized gifts, sponsorships for conferences, and other lobbying pharmaceutical marketing practices. The incentives and enticements used by PSRs are variable ranging from drug samples, office stationeries, free meals/lunch, journal advertisements, and sponsorship for continuing professional development (CPD). The incentivized relationships between medical professionals and PSRs cut across all cadres of medical practitioners such as general practitioners, private practitioners, resident medical doctors, family physicians, emergency physicians, and other specialists. Other stakeholders in healthcare profession such as nurses and patients affirm that medical practitioners do receive incentives and inducements from PSRs, thus raising concerns about rational drug prescription, patient safety, and cost of medications.

Various methods of medicinal products promotion have been documented in biomedical literature such as face-to-face talks, conference presentations, exhibitions and materials, continuing medical education/CPD, drug launch, journal advertisements, pharmaceutical detailing, and academic drug detailing. Activities once independent of promotional intent like medical research have currently been used as a new marketing strategy for medicinal drugs including paying to publish articles on promoted drug products. In the USA, emergence of new media and technologies is quickly changing the landscape of pharmaceutical marketing tactics with increasing reliance on internet (social media) as a source of drug information since PSRs are finding it difficult for in-person face-to-face drug detailing. The e-detailing is widely used to reach “no see physicians” as a primary method of drug promotion. The emerging e-promotional activities include live video detailing, online events, and electronic drug sampling. Research studies have also shown that PSRs provide incomplete medical information to influence the prescribing habits of medical practitioners with implications for patient-centered pharmaceutical care. The drug information provided by PSRs, particularly in developing countries, is predominantly skewed toward brand names and drug indications with less emphasis on adverse effects, precautions, drug interactions, contra-indications, adverse drug reactions, and boxed warnings.

At present, the expenditure on drug promotion and marketing is more than the expenditure on pharmaceutical development and research with billions of dollars spent on drug sales representatives visits, distribution of gift items, and funding of physicians training, education, and development. The good, bad, and ugly aspects of physicians–PSRs interactions have been documented with implications for the best and evidence-based medical practice. The intricacies of the associations between medical professionals and pharmaceutical industries may hinder rational prescription and could engender unethical professional practices conflicts of interest and dysfunctional relationships. There are also arguments that medical practitioners–PSRs interactions can add values to pharmaceutical care and are beneficial for patients management, particularly keeping busy physicians abreast of cutting-edge information in pharmaceutical industries.

In Nigeria-African medical practice environment, pharmaceutical industries are relentlessly being approached by medical professionals for assistance in their intentions to hosting of association and professional annual general meetings and scientific conferences and seminars, CPD, and attendance to national and international conferences. In some cases, the PSRs of drug firms who do not comply with the physician’s demand are threatened with nonprescription of the products as well as boycott of other products by the drug company. However, these solicited sponsorships are often promotional and can undermine the ethics of professional practice as well as jeopardize therapeutic objectives and scientific legitimacy. In Nigeria, there is a paucity of research on the influence of PSRs on the prescribing behaviors of medical practitioners. However, anecdotal and current information in Nigeria suggests that prescribing practices of physicians are influenced by drug promotional and persuasive activities of PSRs. It is based on this background that the authors were motivated to study the influence of drug promotion by PSRs on the prescribing attitudes and practices of medical practitioners in Abia State, Nigeria.

**Materials and Methods**

This was a descriptive, cross-sectional study carried out on 185 private and public medical practitioners who participated in CPD program organized by the Directorate of Postgraduate Studies of Federal Medical Centre Umuahia, Nigeria, for medical practitioners in Abia State, on May 3 and 4, 2017, as well as during the General Meeting of Nigerian Medical Association, Abia State Branch, held on May 7, 2017.

The study was carried out in Abia State, Southeastern Nigeria. Abia State is endowed with luxuriant agricultural and mineral resources with a supply of professional, skilled, semi-skilled, and unskilled workforce. Until recently, the capital city has witnessed upsurge in the number of hotels, junk food restaurants and eateries, banks, markets, schools, and industries, in addition to the changing demographic geographical, nutritional, and social lifestyles. The formal sector healthcare delivery system in Nigeria and every Nigerian States is organized at three levels of care, namely, primary, secondary, and tertiary care with health facilities owned by federal and state governments, religious organizations,
medical and nonmedical private individuals. The public health facilities are owned by either federal or state government with public servants as their workforce. The private hospitals are individually owned by medical and nonmedical proprietors, while other private hospitals belong to religious bodies such as Roman Catholic Hospitals, Seventh Day Adventist Hospitals, and Anglican Hospitals. Healthcare is provided by medical officers of health, resident medical doctors, and consultants, physicians, and surgeons depending on the level of health delivery system. The tertiary hospitals provide highly specialized care, undergraduate and postgraduate medical education. The medical workforces of tertiary hospitals are predominantly made of consultants and resident doctors in various specialties of medicine and surgery. Abia State has one federal tertiary hospital, one state-owned tertiary hospital, and several religiously-owned and privately-owned hospitals.

The inclusion criteria were private and public medical practitioners in Abia State who participated in the CPD program and General Meeting of Nigerian Medical Association, Abia State Branch.

Sample size estimation was determined using the formula for estimating minimum sample size for descriptive studies\(^{20}\) using the formula: \(n = \frac{Z^2pq}{d^2} + \frac{n}{1 + n/N}\), where \(n\) = Desired sample size when population is >10,000; \(n_f\) = Desired sample size when population is <10,000; \(Z\) = Standard normal deviate set at 1.96 which corresponds to 95\% confidence limit; \(p\) = Since prescribing attitude and practice are multivariate concepts, authors assumed that 50\% (0.50) of the participants would have positive attitude and their practice influenced by drug promotional activities of PSRs; \(d\) = Desired level of precision set at 0.05. Using finite population correction formula when studying population <10,000 with an estimated population size of 200 medical practitioners based on the previous medical practitioners continuing professional development records at the Directorate of Postgraduate Studies, Federal Medical Centre, Umuahia. This gave a sample size estimate of 132 patients. However, a sample size of 185 medical practitioners was used to improve the precision of the study.

The eligible medical practitioners for the study were consecutively recruited for the study based on the inclusion criteria until the sample size of 185 was achieved.

The study instrument consisted of sections on sociodemographic data, information on practice and attitude to drug promotion, frequency of visits by PSRs in the previous 12 months, types of incentives received, drug promotion methods, drug promotion information, sources of drug information, and awareness of code of regulation on drug promotion.

The questionnaire was designed by the researchers through robust review of literature on previous studies on the influence of PSRs on the prescribing behaviors and habits of medical professionals.\(^{2-19,25-31}\) The questionnaire consisted of dichotomous, matrix, and open-ended questions which were structured in such a way that could elicit immediate answers from the respondents. The questionnaire was pretested using 10 postgraduate resident medical doctors in Federal Medical Centre, Umuahia. The pretesting was done to find out the understanding of the questions by the respondents and ensure that there were no ambiguities. However, no change was necessary after the pretesting as the questions were interpreted with the same meaning as intended. The questionnaire was self-administered since the participants are health literate.

Operationally, prescribing practice referred to prescribing habits and response to practice-based question on the influence of drug promotion by PSRs on the prescribing practice of the medical practitioner in the previous 12 months. Attitude to drug promotion referred to the state of mind of the medical practitioner toward drug promotion by PSRs in the previous 12 months.

The ethical clearance was obtained from the Ethics Committee of the Federal Medical Centre, Umuahia, Nigeria. Informed written consent was also obtained from the respondents.

The data generated were analyzed using software International Business Machines Corporation, Statistical Package for the Social Sciences (IBM SPSS) version 21, New York, USA. Categorical variables were described by frequencies and percentages. Bivariate analysis involving Chi-square test was used to test for significance of association between categorical variables.

## Results

Of the 185 medical practitioners who participated in the study, 131 (70.8\%) were middle-aged adults (40–59 years), 46 (24.9\%) were young adults (18–39 years), and 8 (4.3\%) were aged 60 years and above. The age of the participants ranged from 28 to 71 years with a mean age of 34 ± 5.4 years. There were 166 males (89.7\%) with 19 females (10.3\%) with female-male ratio of 1:8.7 [Table 1].

| Variables                     | \(n\) (%) |
|-------------------------------|----------|
| **Age (years)**               |          |
| 18-39                         | 46 (24.9) |
| 40-59                         | 131 (70.8) |
| ≥60                           | 8 (4.3)   |
| **Sex**                       |          |
| Male                          | 166 (89.7) |
| Females                       | 19 (10.3)  |
| **Years of practice (years)** |          |
| ≤10                           | 47 (25.4)  |
| >10                           | 138 (74.6) |
| **Place of work (health facility)** |    |
| Public                        | 109 (58.9) |
| Private                       | 62 (33.5)  |
| Both                          | 14 (7.6)   |

[2-19,25-31]
Of the 185 respondents who participated in the study, 123 (66.5%) of them had positive attitude to drug promotion with 88 (47.6%) admitting that their prescription practices were influenced by drug promotion by PSRs. All the respondents 185 (100%) were visited by PSRs in the previous 12 months with 164 (88.6%) visited 12 times and above while 21 (11.4%) were visited 12 times and less in the previous 12 months [Tables 2].

Table 3 summarizes that the most common incentive received by the medical practitioners was branded office stationeries (pens, jotters, diaries, calendars) with all of the respondents 185 (100%) accepted the gifts; the most common drug promotion method used by PSRs was clinic in-person encounter (face-to-face); and the predominant drug information provided by PSRs was both brand name of the drugs and drug indications [Table 3].

Table 4 shows that most common source of drug information used by the respondents during clinical consultation was asking or calling a colleague or pharmacist with 173 (93.5%) of them employing this method when they have problems with drug information. One hundred and fifty-seven (84.9%) of the respondents were aware of the code of conduct regulating drug promotion by PSRs.

Bivariate Chi-square analysis of the sociodemographic characteristics of the study participants as related to attitude and prescribing practice showed that working in public health facilities was statistically significant for attitude ($\chi^2 = 2.75; P = 0.032$) and prescribing practice ($\chi^2 = 3.22; P = 0.041$) while other demographic characteristics were not statistically significant [Tables 5 and 6].

**DISCUSSION**

Eighty-eight (47.6%) of the study participants agreed that their prescribing practices were influenced by the drug promotional activities of PSRs. This finding is in consonance with high incentive-induced prescription rates reported in other studies from the USA, Germany, India, Iraq, Turkey, Ethiopia, and Nigeria. The high level of drug promotion-induced prescription practice among the study participants could be a reflection of the frequency of unsolicited visits and enthusiastic gifts by the PSRs to the medical practitioners in Nigeria. Although medical professionals in Nigeria and other parts of the world mostly deny that their prescribing practice is influenced by the activities of PSRs, anecdotal and current information in Nigeria and other parts of the world has demonstrated that prescribing practices of medical professionals are influenced by the drug promotional strategies of PSRs. Admittedly, medical professionals are privileged with the right and responsibilities of recognizing the medication needs of their patients and prescribe appropriate medications for their well-being devoid of persuasive activities by drug manufacturers, distributors, and PSRs, but the physician–patient relationships can be threatened by the persuasive influence of PSRs on the prescribing practices of medical practitioners, especially in resource-limited environments where there are poverty of appropriate resources for standard pharmaceutical care.
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Table 4: Sources of drug information during clinic consultations and awareness of code of regulations of drug promotion among the study participants

| Variables                        | n (%)         |
|----------------------------------|---------------|
| Prescribing resources            |               |
| Call a colleague/pharmacist      | 173 (93.5)    |
| Drug formulary (hard copies)     | 166 (89.7)    |
| Drug formulary (soft copies)     | 95 (51.4)     |
| Textbooks                        | 79 (42.7)     |
| Printed drug materials           | 38 (20.5)     |
| Micromedex formulary             | 3 (1.6)       |
| Awareness of code of regulations |               |
| Aware                            | 157 (84.9)    |
| Not aware                        | 28 (15.1)     |

*Multiple responses were recorded by participants

Table 5: Association between demographic variables and attitude to drug promotion

| Variables                      | Attitude to drug promotion | χ² | P    |
|--------------------------------|-----------------------------|----|------|
| Age (years)                    |                            |    |      |
| 18-39                          | Positive, n (%)            | 27 (21.9) | 19 (30.6) | 5.22 | 0.137 |
| 40-59                          | Positive, n (%)            | 90 (73.2) | 41 (66.1) |     |      |
| ≥60                            | Positive, n (%)            | 6 (4.9) | 2 (3.3) |     |      |
| Sex                            |                            |    |      |
| Male                           | Positive, n (%)            | 112 (91.1) | 54 (87.1) | 2.10 | 0.202 |
| Female                         | Positive, n (%)            | 11 (8.9) | 8 (12.9) |     |      |
| Years of practice (years)      |                            |    |      |
| ≤10                            | Positive, n (%)            | 18 (14.6) | 29 (46.8) | 7.05 | 0.443 |
| >10                            | Positive, n (%)            | 105 (85.4) | 33 (53.2) |     |      |
| Place of work                  |                            |    |      |
| Public                         | Positive, n (%)            | 72 (58.5) | 37 (59.7) | 2.75 | 0.032 |
| Private                        | Positive, n (%)            | 43 (35.0) | 19 (30.6) |     |      |
| Both                           | Positive, n (%)            | 8 (6.5) | 6 (9.7) |     |      |

To the pharmaceutical industries, drug promotion is designed to enthrone the physicians, allay fears about safety profile, and encourage maximum use of medications, while to the medical practitioner, drug promotion is meant to provide succinct and sufficient information to make appropriate therapeutic choices and shared decisions to prevent attendant adverse consequences. However, it is only a balance between pharmaceutical industry perception and expectation and physicians perception and expectation that will enable rational patient-centered therapeutic decisions to be made. It is therefore quintessential for medical practitioners and pharmaceutical industries to develop mutually and ethically acceptable limits of drug marketing and promotional activities. The internationally and nationally available codes of practice for drug promotion should be embraced for appropriate prescriptions and pharmaceutical care.

One hundred and twenty-three (66.5%) of the study participants had positive attitude to drug promotion by PSRs.

Research studies have demonstrated that whenever a medical practitioner accepts a gift, there is an unalloyed disposition to reciprocate the gesture by prescribing the medical products even less expensive gifts can create a feeling of obligation. Although medical practitioners have the referent power to prescribe medicinal drugs which are available on prescriptions, the drug promotion activities by PSRs have been largely blamed for attitudinal change in pharmaceutical care, resulting in medication errors and its attendant challenges. The consequences of such inappropriate prescriptions are treatment failures from use of wrong medications, exposure of patients to unnecessary adverse effects of the drug, and waste of patients monetary resources. Medical professionals should therefore be required to change their prescribing attitude by writing only generic names of drug during prescription order as well as disclosure of interest in the medical products and the drug companies. These will invariably help to promote healthy and ethical relationships between the medical practice, the patients, and the pharmaceutical companies.

All the participants have been visited by PSRs in the previous year with 88.6% of the respondents being visited > 12 times. The finding of this study has shown that medical practitioners in Nigeria allow a free and unrestricted access of PSRs to the medical doctors during clinical consultations with the patients. The doctors consulting clinics have become a booming market arena for physician–PSRs interactions for persuasive prescription of drugs. Due to widespread and extensive competition and unethical drug promotion activities among PSRs, it is ethically imperative to restrict visits of PSRs to medical doctors individually. PSRs can present and promote their pharmaceutical products to group of medical doctors during a fixed time period with adequate drug detailing. Although the borderline between genuine drug detailing and profit-oriented persuasion is narrow but marketing of branded medical products is not the only aim of drug detailing. Drug detailing is also meant to provide busy medical practitioners with up-to-date information on the promoted drugs and keep them abreast with cutting-edge advances in pharmaceutical industries. While legitimate prescription is useful to patient care, profit-oriented incentives create an opportunity for misuse and violation of medical ethics and code of marketing of pharmaceutical products. Closer cooperation between the national medical association and pharmaceutical regulatory authorities is a necessity in ensuring internationally accepted ethical drug promotional practices. This will help in improving patient-related pharmaceutical outcomes and limit the negative effects of drug promotion activities on patients, healthcare profession, and the public.

This study has shown that various incentivized items were accepted by the medical practitioners with the most common incentives being branded office stationeries. This finding is in tandem with reports from Ethiopia, India, Iraq, and Germany. Although this apparently innocuous practice is generally accepted as a norm, many medical practitioners...
Table 6: Association between demographic factors and the prescribing practices of study participants

| Variables                  | Influence of drug promotion on prescribing practices | χ² | P     |
|----------------------------|------------------------------------------------------|----|------|
|                            | Yes, n (%)                                           |    |      |
| Age (years)                |                                                      |    |      |
| 18-39                      | 22 (25.0)                                            | 4.13 | 0.198 |
| 40-59                      | 62 (70.5)                                            | 4.45 | 4.1  |
| ≥60                        | 4 (4.5)                                              |    |      |
| Sex                        |                                                      |    |      |
| Male                       | 82 (93.2)                                            | 3.03 | 0.098 |
| Female                     | 6 (6.8)                                              |    |      |
| Years of practice (years)  |                                                      |    |      |
| ≤10                        | 26 (29.5)                                            | 7.51 | 0.205 |
| >10                        | 62 (70.5)                                            | 76 (78.4) |
| Place of work              |                                                      |    |      |
| Public                     | 54 (61.4)                                            | 3.22 | 0.041 |
| Private                    | 28 (31.8)                                            | 34 (35.1) |
| Both                       | 6 (6.8)                                              | 8 (8.2) |

feel uncomfortable about its ethical implications. Of great interest is that gift items whether small or big cost money to the pharmaceutical companies and the cost is ultimately passed on to the patients without their overt knowledge. It is admitted by most physicians that whenever a medical doctor accepts a gift, an implicit relationship is established between the medical doctor and the PSRs with obligation to reciprocate for the gifts. The gifts embossed with the branded drug information also remind the medical practitioner about the brand name of the medicinal drugs which could result in product prescriptions. Regrettably, accepting gifts from PSRs can generate potential conflicts of interest and dysfunctional relationships, with ethical and financial quandary for standard patient care. This finding therefore calls for caveat emptor on physician–PSRs relationships. In addition, there is a professional call to considering whether the association between medical practitioners and PSRs is a dangerous liaison, beneficial or bait, or follow-up scripts. The intricacies of physicians–PSRs relationships raise concerns on whether a gift is ever a gift, how free is the free lunch, and a gift has a return on investment. These incentives invariably increase the cost of medications with no added value to patient care. In all gift items accepted by the medical professionals in the ecology of medical care, the medical practitioners, PSRs, and pharmaceutical companies are smiling while the consumers (patients) are overtly or covertly crying, thus necessitating the need for medical practitioners to open their eyes to the complexity of the relationships and act ethically and timely to safeguard the interest of the patients who bear the financial burden of drug promotional materials. It is therefore pertinent in Nigeria to define the acceptable norms for gifts particularly if the gift items are relevant to the clinical practice with substantial benefit for standard patient care. The implementation of approved code of conduct for pharmaceutical promotional activities needs to be enforced in Nigeria for patient-centered pharmaceutical care.

The most common drug information provided by the PSRs was the brand name of the pharmaceutical products. These findings are in consonance with the reports from Ethiopia, Iraq, India, and Libya. This is in contrast to the reports from Germany and the USA where PSRs provide all types of pharmaceutical product information. These disparities could be due to the differences in the strength of regulatory and legislative control of the activities of drug promoters among different countries. More so, PSRs have negative perception and attitude to other competitors' brand products, thus occasioning overemphasis on their companies' brand products with less emphasis on adverse effects and black box warnings which signify that the medicinal drug carries a significant risk of serious or even life-threatening adverse effects. Even though the World Health Organization has provided specifications on drug promotional practices, most pharmaceutical firms and their marketers fail to provide the essential information for medical practitioners during their encounter with tendency to providing incomplete information and manipulation of drug information. It is therefore pertinent that PSRs in Nigeria should have a high standard of ethical conduct in the discharge of their duties, especially providing product information that must be accurate and scientifically sound. The marketing message should be educative based on approved drug use and black box warnings should also be emphasized when indicated. None of the respondents was informed on the boxed warnings for specific medications which are available in Nigeria. Admittedly, there is a risk and benefit associated with taking medications, but the black box warning is to alert the physician of the potential harm in prescribing the medical products. Of great concern during physician–PSRs interactions in Nigeria is that physicians are often not informed about the risks included in boxed warnings for drugs such as rosiglitazone which is the strictest labeling required for certain prescription drugs.

The most drug promotion method employed by the PSRs in this study was in-person face-to-face encounter in the clinic. Globally, launching of new drugs and advertising a medicinal drug product have been among the earliest promotional strategies used by pharmaceutical firms with consequential effects reported in both developed and developing countries. However, today drug product advertisement is under scrutiny particularly in advanced nations. In Nigeria–Africa, the aggressiveness with which drug promotion activities by the PSRs occur in the clinics in Nigeria is better imagined than witnessed. This is attributed to the fact that increment in the salaries of PSRs, sponsorships for foreign tours, and other companies' incentives depend on the achievement of sales targets set by their managers and chief executive officers. It is therefore imperative to employ measures to improve the quality of promotional information on drug products. Every promotional material...
must have clear and complete information. Besides, the product should have canons of good manufacturing practice for the provision of cutting-edge care to the patients. Personal or anecdotal testimonies on the use of the drug product should be discouraged.

The most common prescribing resource used by medical practitioners in this study was calling or asking a colleague/pharmacist. This is particularly phenomenal in Nigerian environment where pharmaceutical companies do not provide printed package information (leaflets) for medical practitioners and the patients on every drug packet. Furthermore, in most drug products leaflets and other package inserts and embossments do not provide sufficient information for safe, effective, and efficient use of the medical products. The advertisement of drug products in lay press such as religious bulletins and newspapers in Nigeria could lead to omission of important contra-indications, warnings and precaution for the use of the medicinal drug products. With the wider availability of prescription-only-medicines without prescription in Nigeria,[35] the unwary and uninformed patients can buy the drug products for inappropriate use and may suffer undesirable consequences from the medications.

This study has shown that 84.9% of the study participants were aware of the regulation on drug promotion. While there is no need to increase the awareness of regulation on drug promotion among the study participants, this awareness should be translated to appropriate prescribing practice and positive attitude towards drug promotion. This will enable medical professionals to conduct their interactions with PSRs in a responsible, professional, and ethical manner devoid of unhealthy marketing tactics. Medical practitioners should not wait for the government to legislate morality, pervasive inducement, and medical ethics.

On bivariate Chi-square analyses, working in public health facilities was significantly associated with attitude and prescribing practices of the study participants. This could be a reflection of accessibility and frequency of visits by PSRs to medical practitioners working in public health facilities among other epidemiological variables. Public health facilities in Abia State are easily accessible to PSRs and the medical practitioners working in public health facilities are more likely to be exposed to the persuasive and lobbying activities of PSRs. The finding of this study signals the need more than ever before for increased awareness of code of regulation on drug promotion, especially for medical practitioners in public health facilities in Nigeria. This appears to be one of the ways Nigerian patients will benefit from satisfaction with patient-centered pharmaceutical care that is comparable to what is obtained in advanced countries.

Study limitations
The limitations of this study are recognized by the researchers. First and foremost, the study was carried out in Abia State, and the findings may not be generalized to other parts of Nigeria. Second, the attitudes to drug promotion by PSRs were based on respondents’ subjective experience and were not verified. However, there is a tendency to under-reporting the outcome of the interactions and relationships with PSRs. Finally, the details of specialties of the respondents and specific incentives received were not considered, and these are important areas that require further study.

Conclusion
This study has shown the influence of drug promotion on prescribing practices of medical practitioners with majority of the respondents having positive attitude to drug promotional activities of PSRs. The most common incentivized gift, drug promotion method, and drug information were branded office stationeries, in-person face-to-face encounter in the clinics, and brand names of the medicinal products respectively. The most common source of drug information was calling a colleague/pharmacist, and the awareness of code of regulation of drug promotion was inadequate.

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Conflicts of interest
There are no conflicts of interest.

References
1. Blumenthal D. Doctors and drug companies. N Engl J Med 2004;351:1885-90.
2. Mikhae EM, Alhilali DN. Gift acceptance and its effect on prescribing behavior among Iraqi specialist physicians. Pharmacol Pharm 2014;5:705-15.
3. Goyal RR, Pareek P. A review article on prescription behavior of doctors influenced by the medical representatives in Rajasthan, India. IOSR J Bus Manage 2013;8:56-60.
4. Ijoma U, Onwuekwe I, Onodugo O, Aguwa E, Ejim E, Onyedum C, et al. Effect of promotional strategies of pharmaceutical companies on doctors prescription pattern in South-east Nigeria. TAF Prev Med Bull 2010;9:1-6.
5. World Health Organization. Ethical Criteria for medicinal drug promotion. Geneva 13 May, 1988. p. 16. Available from: http://www. apps.who.int/medicinedocs/documents/whozip08e/whozip08e.pdf. [Last accessed on 2017 May 26].
6. McNeill PM, Kerridge IH, Henry DA, Stokes B, Hill SR, Newby D, et al. Giving and receiving of gifts between pharmaceutical companies and medical specialists in Australia. Intern Med J 2006;36:571-8.
7. Lieb K, Scheurich A. Contact between doctors and the pharmaceutical industry, their perceptions, and the effects on prescribing habits. PLoS One 2014;9:e110130.
8. Vancelik S, Beyhun NE, Acemoglu H, Calikoglu O. Impact of pharmaceutical promotion on prescribing decisions of general practitioners in Eastern Turkey. BMC Public Health 2007;7:122.
9. Handa M, Vohra A, Srivastava V. Perception of physicians towards pharmaceutical promotion in India. J Med Mar Device Diagn Pharm Mar 2013;13:82-92.
10. Alosaimi FD, Al Kaabba A, Qadi M, Albahial A, Alabdukarim Y, Alabduljabbar M, et al. Physicians’ attitudes towards interaction with the pharmaceutical industry. East Mediterr Health J 2015;20:812-9.
11. De Ferrari A, Gentille C, Davalos L, Huayanay L, Malaga G. Attitudes and relationship between physicians and the pharmaceutical industry in a public general hospital in Lima, Peru. PLoS One 2014;9:e100114.
12. Sufrin CB, Ross JS. Pharmaceutical industry marketing: Understanding its impact on women’s health. Obstet Gynecol Surv 2008;63:585-96.
13. Workneh BD, Gebrehiwot MG, Bayo TA, Gidey MT, Belay YB, Tesfaye DM, et al. Influence of medical representatives on prescribing.
practices in Mekelle, Northern Ethiopia. PLoS One 2016;11:e0156795.

14. Schumock GT, Walton SM, Park HY, Nutescu EA, Blackburn IC, Finley JM, et al. Factors that influence prescribing decisions. Ann Pharmacother 2004;38:557-62.

15. Alssageer MA, Kowalski SR. A survey of pharmaceutical company representative interactions with doctors in Libya. Libyan J Med 2012;7:18556.

16. Wazana A. Physicians and the pharmaceutical industry: Is a gift ever just a gift? JAMA 2000;283:373-80.

17. Wolf BL. Drug samples: Benefit or bait? JAMA 1998;279:1698-9.

18. Granja M. Dangerous liaisons – Physicians and pharmaceutical sales representatives. Acta Med Port 2005;18:61-8.

19. Fugh-Berman A, Ahari S. Following the script: How drug reps make friends and influence doctors. PLoS Med 2007;4:e150.

20. Symm B, Averitt M, Forjoosh SN, Preece C. Effects of using free sample medications on the prescribing practices of family physicians. J Am Board Fam Med 2006;19:443-9.

21. DeJong C, Aguilar T, Tseng CW, Lin GA, Boscardin WJ, Dudley RA, et al. Pharmaceutical industry-sponsored meals and physician prescribing patterns for Medicare beneficiaries. JAMA Intern Med 2016;176:1114-22.

22. Othman N, Vitry A, Roughhead EE. Quality of pharmaceutical advertisements in medical journals: A systematic review. PLoS One 2009;4:e6350.

23. Villanueva P, Peiró S, Libero J, Pereiró I. Accuracy of pharmaceutical advertisements in medical journals. Lancet 2003;361:27-32.

24. Patwardhan AR. Physicians-pharmaceutical sales representatives interactions and conflict of interest: Challenges and solutions. Inquiry 2016;53: pii: 004695801667597.

25. Prosser H, Almond S, Walley T. Influences on GPs' decision to prescribe new drugs-the importance of who says what. Fam Pract 2003;20:61-8.

26. Lieb K, Brandtönies S. A survey of German physicians in private practice about contacts with pharmaceutical sales representatives. Dtsch Arztebl Int 2010;107:392-9.

27. Adair RF, Holmgren LR. Do drug samples influence resident prescribing behavior? A randomized trial. Am J Med 2005;118: 881-884.

28. Hall KB, Tett SE, Nissen LM. Perceptions of the influence of prescription medicine samples on prescribing by family physicians. Med Care 2006;44:383-7.

29. Keim SM, Mays MZ, Grant D. Interactions between emergency medicine programs and the pharmaceutical industry. Acad Emerg Med 2004;11:19-26.

30. Korenstein D, Keyhani S, Ross JS. Physician attitudes toward industry: A view across the specialties. Arch Surg 2010;145:570-7.

31. Katz D, Caplan AL, Merz JF. All gifts large and small: Toward an ethical view of pharmaceutical promotion. Perspect Biol Med 2003;46:254-72.

32. Jutel A, Menkes DB. “But doctors do it.” Nurses’ views of gifts and pharmaceutical industry – Self-regulation in the shadow of federal prosecution. N Engl J Med 2004;351:1891-900.

33. Fisher MA. Physicians and the pharmaceutical industry: A dysfunctional relationship. Perspect Biol Med 2003;46:254-72.

34. Fisher MA, Krouth ME, Baril JL, Saccoccio L, Mazor KM, Ladd E, et al. Prescribers and pharmaceutical representatives: Why are we still meeting? J Gen Intern Med 2009;24:795-801.

35. Keim SM, Mays MZ, Grant D. Interactions between emergency medicine programs and the pharmaceutical industry. Acad Emerg Med 2009;16:1057-63.

36. Gibbons RV, Landry FJ, Blouch DL, Jones DL, Williams FK, Lucey CR, et al. A comparison of physicians’ and patients’ attitudes toward pharmaceutical industry visits. J Gen Intern Med 1998;13:151-4.

37. Brett AS, Burr W, Moloo J. Are gifts from pharmaceutical companies ethically problematic? A survey of physicians. Arch Intern Med 2003;163:2213-8.

38. Iloh GU, Chuku A, Amadi AN. Medical errors in Nigeria: A cross-sectional study of medical practitioners in Abia State. Arch Med Health Sci 2017;5:44-9.

39. Mintzes B, Leschin J, Sutherland JM, Beaulieu MD, Wilkes MS, Durrieu G, et al. Pharmaceutical sales representatives and patient safety: A comparative prospective study of information quality in Canada, France and the United States. J Gen Intern Med 2013;28:1368-75.

40. Spurling GK, Mansfield PR, Montgomery BD, Leschin J, Doust J, Othman N, et al. Information from pharmaceutical companies and the quality, quantity, and cost of physicians’ prescribing: A systematic review. PLoS Med 2010;7:e1000352.

41. Kondro W. Academic drug detailing: An evidence-based alternative. CMAJ 2007;176:429-31.

42. Yeoh HS, Van Hoof TJ, Fischer MA. Key features of academic detailing: Development of an expert consensus using the Delphi method. Am Health Drug Benefits 2016;9:42-50.

43. Majed IS, Hamaid M, Mohammed YM. Impact of drugs promotion on the decision of health professions and their effects on the patients health care. Int J Adv Sci Tech Res 2015;5:33.

44. Timmikirize WA, Ogwal-Okeng JW, Vernby A, Anokbonggo WW, Gustafsson LL, Lundborg CS, et al. Access to up-to-date drug information in developing countries continues to pose problems: The case of Uganda. Pharmacoepidemiol Drug Saf 2007;16:1177-9.

45. Othman N, Vitry AI, Roughhead EE, Ismail SB, Omar K. Medicines information provided by pharmaceutical representatives: A comparative study in Australia and Malaysia. BMC Public Health 2010;10:743.

46. Chimonas S, Rozario NM, Rothman DJ. Show us the money: Lessons in transparency from state pharmaceutical marketing disclosure laws. Health Serv Res 2010;45:98-114.

47. Narayanan S, Sirisur R, Chintagunta PK. Return on investment implications for pharmaceutical promotional expenditures: The role of marketing-mix interactions. J Mar 2004;68:90-105.

48. Chimonas S, Brennan TA, Rothman DJ. Physicians and drug representatives: Exploring the dynamics of the relationship. J Gen Intern Med 2007;22:184-90.

49. Fischer MA, Keough ME, Baril JL, Saccoccio L, Mazor KM, Ladd E, et al. Prescribers and pharmaceutical representatives: Why are we still meeting? J Gen Intern Med 2009;24:795-801.

50. Søndergaard J, Vach K, Kragstrup J, Andersen M. Impact of pharmaceutical company payments to physicians: Early experiences with disclosure laws in Vermont and Minnesota. JAMA 2007;297:1216-23.

51. Andersen M. Impact of pharmaceutical representative visits on GPs' drug preferences. Fam Pract 2009;26:204-9.

52. Groth J, Izquierdo JZ, Music T, Narski K, Nikidis C, Simmonds H, et al. Ethical pharmaceutical promotion and communications worldwide: Codes and regulations. Philos Ethics Humit Med 2014;9:7.

53. Ross JS, Lackner JE, Lurie P, Gross CP, Wolfe S, Krumholz HM, et al. Pharmaceutical company payments to physicians: Early experiences with disclosure laws in Vermont and Minnesota. JAMA 2007;297:1216-23.

54. Siow J, Vach K, Kragstrup J, Andersen M. Impact of pharmaceutical representative visits on GPs’ drug preferences. Fam Pract 2009;26:204-9.

55. Landefeld CS, Steinman MA. The Neurontin legacy-marketing via misinformation and manipulation. N Engl J Med 2009;360:103-6.

56. Mulini S. Unhealthy marketing of pharmaceutical products: An international public health concern. J Public Health Policy 2016;37:149-59.

57. Albersheim SG, Golan A. The physician’s relationship with the pharmaceutical industry: Caveat emptor/buyer beware! Isr Med Assoc J 2011;13:389-93.

58. Greenville CH, Hauser SL. Marketing and drug costs: Who is laughing and crying? Ann Neurol 2007;61:11A-12A.

59. Breen KJ. The medical profession and the pharmaceutical industry: When will we open our eyes? Med J Aust 2004;180:409-10.

60. Gilliland P. Time for the medical profession to act: New policies needed now on interactions between pharmaceutical companies and physicians. Arch Intern Med 2009;169:829-31.

61. Wager AK, Chan KA, Dashvsky I, Raebel MA, Andrade SE, Lafata JE, et al. FDA drug prescribing warnings: Is the black box half empty or half full? Pharmacoepidemiol Drug Saf 2006;15:369-86.

62. Shah ND, Montori VM, Krumholz HM, Tu K, Alexander GC, Jackevicius CA. Geographic variation in the response to FDA boxed warnings for rosiglitazone. N Engl J Med 2010;322:2081-4.