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Original Research

Adequacy of pharmacological information provided in pharmaceutical drug advertisements in African medical journals

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ABSTRACT*

Pharmaceutical advertisement of drugs is a means of advocating drug use and their selling but not a substitute for drug formulary to guide physicians in safe prescribing.

Objectives: To evaluate drug advertisements in Nigerian and other African medical journals for their adequacy of pharmacological information.

Methods: Twenty four issues from each of West African Journal of Medicine (WAJM), East African Medical Journal (EAMJ), South African Medical Journal (SAMJ), Nigerian Medical Practitioner (NMP), Nigerian Quarterly Journal of Hospital Medicine (NQJHM) and Nigerian Postgraduate Medical Journal (NPMJ) were reviewed. While EAMJ, SAMJ and NMP are published monthly, the WAJM, NQJHM and NPMJ are published quarterly. The monthly journals were reviewed between January 2005 and December 2006, and the quarterly journals between January 2001 and December 2006. The drug information with regards to brand/non-proprietary name, pharmacological data, clinical information, pharmaceutical information and legal aspects was evaluated as per World Health Organisation (WHO) criteria. Counts in all categories were collated for each advertiser. Results: Forty one pharmaceutical companies made 192 advertisements. 112 (58.3%) of these advertisements were made in the African medical journals. Pfizer (20.3%) and Swipha (12.5%) topped the list of the advertising companies. Four (2.1%) adverts mentioned generic names only, 157 (81.8%) mentioned clinical indications. Adults and children dosage (39.6%), use in special situations such as pregnancy and renal or liver problems (36.5%), adverse effects (30.2%), average duration of treatment (26.0%), and potential for interaction with other drugs (18.7%) were less discussed. Pharmaceutical information such as available dosage forms and product and package information {summary of the generic and proprietary names, the formulation strength, active ingredient, route of administration, batch number, manufactured and expiry dates, and the manufacturer on both the container and pack of the drug} were mentioned in

65.6% and 50% adverts, respectively. The product and package descriptions were provided in 57 (72.2%) Nigerian medical journals, which was significantly higher than in other African medical journals 39 (37.9%) ($P<0.001$).

Conclusions: None of the drug advertisements in the journals adequately provided the basic information required by the WHO for appropriate prescribing. More guidance and regulation is needed to ensure adequate information is provided.

Keywords: Advertisements. Periodicals as Topic. Nigeria. Africa.

IDONEIDAD DE LA INFORMACIÓN FARMACOLÓGICA PROPORCIONADA EN ANUNCIOS DE MEDICAMENTOS EN REVISTAS MÉDICAS AFRICANAS

RESUMEN

La propaganda de medicamentos es un medio de potenciar el uso de medicamentos y sus ventas pero no un sustituto de un compendio de información para médicos sobre prescripción segura.

Objetivos: Evaluar los anuncios de medicamentos en revistas nigerianas y de otros países africanos sobre su idoneidad en información sobre medicamentos.

Métodos: Se revisaron 24 números de West African Journal of Medicine (WAJM), East African Medical Journal (EAMJ), South African Medical Journal (SAMJ), Nigerian Medical Practitioner (NMP), Nigerian Quarterly Journal of Hospital Medicine (NQJHM) y Nigerian Postgraduate Medical Journal (NPMJ). Mientras que EAMJ, SAMJ y NMP se publican mensualmente, WAJM, NQJHM y NPMJ son trimestrales. Las revistas mensuales se revisaron desde enero 2005 a diciembre 2006, y las trimestrales desde enero 2001 a diciembre 2006. Siguiendo los criterios de la Organización Mundial de la Salud (OMS) se evaluó la información relativa a marca/denominación común internacional, datos farmacológicos, información clínica y aspectos legales. Las cuentas de cada categoría se agregaron por anunciante. Resultados: 41 laboratorios farmacéuticos realizaron 192 anuncios. 112 (58,3%) de esos anuncios fueron realizados en revistas médicas africanas. Pfizer (20,3%) y Swipha (12,5%) encabezaron la lista de laboratorios anunciantes. Cuatro (2,1%) anuncios mencionó solo nombres genéricos, 157 (81,8%) mencionó las indicaciones clínicas. Dosis en adultos y niños (39,6%), uso en

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situaciones especiales como embarazo y problemas renales o hepáticos (36,5%), efectos adversos (30,2%), duración media del tratamiento (26,0%), y posibles interacciones con otros medicamentos (18,7%) fueron menos discutidas. La información farmacéutica como las formas disponibles, y la información del producto (resumen de nombres genérico y marca, potencia de la formulación, principio activo, vía de administración, número de lote, fechas de fabricación y caducidad, y el fabricante, tanto en el envase como en el embalaje) se mencionaron en el 65,6% y 50% respectivamente. Las descripciones de producto y embalaje aparecieron en 57 (72,2%) de las revistas médicas nigerianas, lo que es significativamente más alto que los 39 (37,9%) de las otras revistas africanas ($p < 0,001$).

Conclusiones: Ninguno de los anuncios de medicamentos de las revistas proporcionaba adecuadamente la información requerida por la OMS para la prescripción apropiada. Se necesita más control y regulación para asegurar que se proporciona la información adecuada.

Palabras clave: Anuncios. Revistas como asunto. Nigeria. África.

INTRODUCTION

Drug promotion as a source of drug information appears to be a global problem.¹⁻⁴ Misleading information from drug advertisement and offer of incentives from medical representatives have been reported to influence the prescribing practices of doctors in India², Pakistan³, America⁴ and Argentina.⁵ Promotions which exaggerate benefits and downplay risks of a drug, with poorly supported claims, failure to balance claims of efficacy with potential adverse effects of a drug, and slogans that attract prescribing a drug for groups of patients different from those assessed in a referenced study are likely to affect optimal treatment.⁶⁻⁸ A recent hospital based study has reported influences of drug promotion on the prescribing attitudes of doctors in Nigeria.⁹ Promoted drugs were often prescribed when there was no clear indication for their use; more expensive drugs were prescribed without clear advantage over other cheaper generics.⁹ Reliance on promotional information may not only endanger lives but places the prescribers at the risk of litigation.¹⁰

The amount of knowledge acquired by health professionals about the benefits and risk of treatment from medical journal drug advertisements, and the extent of their reliance on the information for prescribing depends on how often they read medical journal adverts. Two-third of physicians in developed countries reported weekly exposure to medical journal adverts.¹¹ Medical journals are rated by 80% of physicians¹² and primary care physicians¹³, respectively, in developed countries as an important source of prescribing information. The medical journals were also considered more

important than other sources of drug information. Contrarily, peer-reviewed research on the impact of medical journal drug advertisements on the prescribing practices of doctors in Africa is quite sparse.

Pharmaceutical advertisement of drugs is meant to advocate their use and to sell them but not to help physicians prescribe the drugs with discrimination and skill.¹⁴ Pharmacological information of a drug during advertisement, targeted at the healthcare providers, has been known to be more detailed than those targeted at the consumers¹⁵, yet drug advertisements in the medical journals have been found to be usually inadequate and substandard on the pharmacological information provided^{3,6,16} and far below the WHO's recommendation (Table 1).¹⁷

Table 1: World Health Organisation's ethical criteria for labelling of medically promoted drugs.

Brand/non-proprietary name.
Pharmacological data
▪ Indications for using the drug.
▪ Pharmacological effects and mode of action.
▪ Pharmacokinetics.
Clinical information
▪ Acceptable dosage in various age groups.
▪ Safety of the drug in peculiar situations.
▪ Possible adverse effects.
▪ Average duration of use.
▪ Potentials for interaction with other drugs.
Pharmaceutical information
▪ Types of dosage form available in the market.
▪ Description of the drug package.
▪ Route of administration.
▪ Addition of additives to the drug.
▪ Acceptable condition of storage.
▪ Shelf life.
▪ Expiration date.
Legal aspects
▪ Manufacturers' and marketers' information and addresses.
▪ Alternative sources of information about the drug.
▪ Approval of the food and drug regulatory authority.
▪ Summary of prescription information about the drug.

Providing adequate pharmacological information for advertised drugs is likely to promote safe prescribing and improve rational drug use. Advertising drugs by their generic names, rather than brand names, gives flexibility to drug prescription and may be economical to the patient. Drugs with potentials for adverse drug interactions can interact with other medications to cause a significant change in their pharmacokinetics and pharmacodynamic properties, thus altering their efficacy or toxicity.¹⁸ Drug interactions have been reported to account for 20-30% of all adverse drug reactions.¹⁹ The incidence of adverse drug interactions increases among the elderly, children and patients on two or more medications.¹⁸ Knowing the correct dosage of drugs to be administered, especially for children, are of considerable importance. While over-dosage could result in drug toxicity, under-dosage could result in treatment failure, re-treatment and early resistance to antimicrobial and antimalarial medications.²⁰ Renal failure, liver failure, malnutrition and pregnancy are special situations that require drug dosing modifications because of altered drug metabolism in

the patients and fetotoxicity in pregnancy.²¹ Information regarding dose adjustment in these special situations is essential when advertising drugs so as to avert drug toxicity. Adverse effect of a drug is a major determinant of its compliance. Non-compliance with many antihypertensive medications was as a result of their adverse effects.²² This is a serious matter, given the consequences of uncontrolled hypertension.

Regulations in developed countries mandate that journal advertisements of drugs must provide sufficient and reliable information for physicians to prescribe medications appropriately^{23,24}, in spite of these; inadequate prescribing information has been reported for advertised drugs in some American medical journals.¹⁶ The situation is even worse in developing countries with limited regulatory infrastructure, weak government regulations, and scarce scientific information. In Russia²⁵ and India¹⁶, it was reported that the basic information required for appropriate prescribing was lacking on the advertised drugs in their local medical journals.

The South African Medicines Control Council has drug advertisement policies as contained in the South African National Drug Policy²⁶ which does not totally conform to the WHO's recommendations on drug advertisement. Drug policy in Nigeria was very weak until 1989 when legislation was passed to make effective a list of essential drugs in the country. The regulation was also meant to limit the manufacture and import of fake or sub-standard drug and to curtail false advertising.²⁷ The National Agency for Food and Drug Administration and Control (NAFDAC) is charged with the responsibilities of regulating local manufacturing, importation, exportation, advertisement, sales and distribution of processed foods and drugs in Nigeria. These processes are done in accordance with Decree 19 of 1993 as amended by food, drugs and related products (registration) Decree No. 20 of 1999.²⁸ Drug policy in Nigeria requires that locally manufactured, imported and advertised drugs should be clearly labelled. The labelling should be informative and accurate. The minimum requirements, recommended by NAFDAC, on the package label are listed in Table 2. The implementation of this policy with regards to drug promotion and advertisement is however weak since there was no mechanism on ground to monitor these activities.

Drug promotion is primarily controlled in the USA by the Food and Drug Administration (FDA).²⁹ However, a study of drug advertisements in American medical journals⁶ has shown that the adverts did not totally conform to FDA standards.

Information is lacking on the adequacy of pharmacological information on advertised drugs in many of the Nigerian and other African medical journals available in Nigeria to guide physicians on appropriate prescribing. The focus of this study was therefore to analyse the drug information provided in pharmaceutical advertisements in some Nigerian and other African medical journals.

Table 2. The minimum requirements recommended on the package label of advertised drugs in Nigeria by the National Agency for Food and Drug Administration and Control (NAFDAC).

- Product name should be brand and generic where applicable.
- The generic name must be in similar characters with the brand name.
- Manufacturer's address.
- Batch number.
- Date of manufacture and best before/expiry date.
- Dosage regimen on the package and leaflet insert.
- Indications, frequency, route and conditions of administration.
- Quantitative listing of all the active ingredients per unit dose.
- Adequate warnings where necessary.
- Where a brand name is used, there must be the generic name which should be conspicuous in character, written directly under the brand name.
- Any drug product which is labelled in a foreign language should not be considered for registration unless an English translation is included on the label and package insert (where applicable).
- Information on indication carried on packages and leaflet insert of imported drug product should not differ from that in other countries and in particular the country of origin of the product.

METHODS

Nigerian and other African medical journals available on the journal shelf of the medical library, Lagos State University College of Medicine, were studied for frequency of drug advertisement. The journals cover all aspects of clinical medicine; ranging from medicine, surgery, obstetrics and gynaecology, and paediatrics. They were all published in English. A total of 10 medical journals (5 Nigerian and 5 other African journals), produced between January and December 2007 were used for the preliminary study to enable us to define the advert type (single, multiple or repeat) and determine frequency of drug advertisement in the journals. The selection criterion was a journal with drug advertisement in at least 50% of the 2007 issues. Six of the 10 medical journals (3 Nigerian and 3 African) used for the preliminary study met the inclusion criterion. These journals were therefore selected for the main study.

It was observed from the preliminary study that most of the advertisements in the Nigerian medical journals were made by local indigenous pharmaceutical companies and those in other African medical journals were made by multinational pharmaceutical companies, we therefore hypothesised that pharmacological information in the adverts from the two sets of journals were likely to be different.

The African medical journals that met the selection criterion are South African Medical Journal (SAMJ), West African Journal of Medicine (WAJM), and East African Medical Journal (EAMJ). The Nigerian Medical Practitioner (NMP), Nigerian Quarterly Journal of Hospital Medicine (NQJHM), and the Nigerian Postgraduate Medical Journal (NPMJ) were the local journals studied. While each of the

SAMJ, EAMJ and NMP is published every month (12 issues/ year), the WAJM, NQJHM and NPMJ are published every three month (4 issues/ year). The monthly journals were reviewed from January 2005 to December 2006, and the quarterly journals from January 2001 to December 2006.

The journals were classified as Nigerian and other African medical journals based on their objectives, differences in their impact factors, and on our hypothesis that the quality of information on advertised drugs in Nigerian medical journals would likely differ from those in other African medical journals. While the Nigerian medical journals particularly aimed at disseminating scientific research information to readers in Nigeria, the African medical journals aimed at disseminating such information to readers from their immediate environment where they were published and to other African countries. Impact factor (IF) is used by the World Association of Medical Editors to assess the status of a journal and the quality of its scientific content. It is also a useful instrument for positioning journals on the basis of number of citations.³⁰ The IFs of the African medical journals (SAMJ: 0.794, EAMJ: 0.081 and WAJM: 0.012) were quite higher than those of each of the Nigerian medical journals (NMP: 0.000, NQJHM: 0.000 and NPMJ: 0.000).³¹ In view of the low IFs of the journals, their circulation figures were sought from African Journals Online (AJOL), a subsidiary of the International Network for the Availability of Scientific Publications (INASP).³² AJOL programme was formulated by INASP in order to raise the visibility of African journals, and create a greater awareness of research carried out in Africa. The actual circulation figures were not available from AJOL; however it was gathered that the journals were well circulated in their countries of origin. International circulation of African medical journals was handled by AJOL through their document delivery services³², whereby individual users can order copies of single articles. The total document delivered by AJOL, between 2003 and 2005, for international use is EAMJ (311), SAMJ (121), WAJM (54), NMJ (13), NQJHM (12) and NPMJ (0).

All the adverts, except repeat adverts, in all the issues of the selected journals were evaluated for information using the format of drug information sheets suggested by the WHO's ethical criteria for medical drug promotion⁶ as listed in Table 1. Among the information sourced about the drugs from the adverts were clinical information (those related to situations where the drugs should be avoided, age specific dosages, duration of use, potential adverse effects and interactions with other drugs), pharmaceutical information (those related to the available formulations and strength of the drug, packaging information, storage conditions and expiration time) and legal information (summary of the manufacturer and its contact, the marketer and its contact, approval for marketing and alternative sources of information about the drug). Repeat adverts, in the context of this study, are adverts that are identical to previous ones in all respects.

In the information evaluation, we made no attempt to determine if the information provided in the advert was accurate. Counts in all categories were collated for each advertiser. Throughout the study, data were extracted by one of the researchers (AS). During the preliminary study, 21 adverts were made by 5 pharmaceutical companies in the 10 medical journals reviewed. The evaluations of AS were rechecked by another member of the researchers (KAO), and where there was a disagreement, the opinion of the third researcher (IOS) prevailed. However, there was a substantial agreement between AS and KAO (e.g, for brand and generic names, $\kappa=0.87$; for clinical indications, $\kappa=0.84$; for adverse effects, $\kappa=0.95$; for route of administration, $\kappa=0.78$; and for name and address of the manufacturer, $\kappa=0.88$). For the main study, KAO blindly checked 20 of the evaluations, and the rates of agreement in most of the data collected ranged from $\kappa=0.81$ to 0.96.

Data was recorded using SPSS version 13. The percentages of drug information in the Nigerian and other African medical journals, as well as drug information provided by different pharmaceutical companies, were compared using Chi square test at a significance level of $P<0.05$.

RESULTS

Pharmaceutical companies and their rates of advertisement in medical journals

It was observed that not all the journal issues had drug advertisement. Of the 144 issues of the medical journals reviewed, 52 (Nigerian: 23 and other African: 29) issues have no drug advertisement. Of those with adverts, 192 advertisements were made by 41 pharmaceutical companies. 112 (58.3%) of these advertisements were made in other African medical journals. Pfizer and Swipha were the leading advertising companies; the top 4 advertising companies placed 90 (48.7%) advertisements and the other 37 companies contributed the rest. Pfizer, Swipha, Roche and Emzor pharmaceutical companies were the leading companies that advertised in the medical journals. While Pfizer was the most frequent advertiser in other African medical journals, Swipha advertised most frequently in the Nigerian medical journals. Both Pfizer and Roche are multinational pharmaceutical companies, and Emzor is an indigenous pharmaceutical company in Nigeria. Swipha, on the other hand, is a subsidiary of a multinational, Roche pharmaceutical, based in Nigeria.

Advertisements from the multinational companies (Pfizer and Roche) provided pharmacological information 4/6 (66.7%) in Nigerian- and 31/50 (62%) in other African- medical journals; clinical information 3/6 (50%) in Nigerian- and 39/50 (78%) other African- medical journals; pharmaceutical information 2/6 (33.3%) in Nigerian- and 21/50 (42%) other African- medical journals; and legal information 4/6 (66.7%) in Nigerian- and 35/50 (70%) other African- medical journals. There were no significant differences in the pharmacological,

clinical, pharmaceutical and legal information provided by adverts from the two multinational companies in the Nigerian and other African medical journals ($P=0.99-0.16$).

Type of advertisement

Majority of the advertisements 141 (73.4%) were for a single drug while 15 advertisements mentioned multiple drugs. In 12 cases, the pharmaceutical products mentioned together had nothing in common except the manufacturer. Information on clinical indications, pharmacologic effects and types of dosage form was provided in 8 cases. When this information was compared between advertisements that mentioned multiple and single drugs, there was no significance difference in the information provided on clinical indications ($P=0.09$), pharmacologic effects ($P=0.57$) and dosage forms ($P=0.10$).

Pharmacologic Information provided

The results of information provided for the advertised drugs are shown in Table 3. Of the 192 advertisements that were studied, 4 (2.1%) mentioned only the generic name (only in the

Nigerian medical journals) and 157 (81.8%) mentioned the clinical indications. The clinical information of the advertised drugs was provided scantily: Adults and children dosage (39.6%), use in special situations (36.5%), adverse effects (30.2%), average duration of treatment (26.0%), and potential for interaction with other drugs (18.7%). Pharmaceutical information was not adequately provided except the available dosage forms (65.6%), and product and package description (50.0%). Product and package descriptions were provided for 57 (72.2%) and 39 (37.9%) adverts in Nigerian and other African medical journals, respectively. Name and address of the manufacturers were provided in 121 (63.8%) advertisements in all the journals while other information relating to legal aspects of the advertised drugs were scantily mentioned. None of the adverts from all the journals met all the WHO criteria (Table 1) for drug advertisement. Similarly, none of the adverts in the Nigerian medical journals conform totally to the NAFDAC recommendations for drug promotion (Table 2). In all the adverts, expiry dates of the drugs were not mentioned at all.

Table 3: Information provided in drug advertisements in Nigerian and other African medical journals.

Drug information	Nigerian journal		Other African Journal		P-value
	n = 79	(%)	n = 103	(%)	
Drug name					
Brand and generic	69	87.3	74	78.6	0.789
Brand name only	6	7.6	29	28.2	<0.001*
Generic name only	4	5.1	0	0.0	0.034*
Pharmacological information					
Clinical indications	70	88.6	87	84.5	0.517
Pharmacological effects	47	59.5	35	33.9	<0.001*
Mode of action	14	17.7	13	12.6	0.402
Pharmacokinetics	3	3.8	4	3.9	0.999
Clinical information					
Adults and children dosage	37	46.8	39	37.9	0.230
Use in special situations	39	49.4	31	30.1	0.009*
Adverse effects	27	34.2	31	30.1	0.631
Average duration of treatment	20	25.3	35	33.9	0.255
Potential for interaction with other drugs	17	21.5	19	18.4	0.708
Pharmaceutical information					
Available dosage forms	58	73.4	68	66.0	0.332
Product and package description	57	72.2	39	37.9	<0.001*
Pack sizes	27	34.2	35	33.9	0.999
Route of administration	28	35.4	33	32.0	0.638
Addition of additives	1	1.3	18	17.5	<0.001*
Storage conditions	3	3.8	8	7.8	0.354
Content and quality of each route	4	5.1	5	4.8	0.999
Shelf life	0	0.0	1	0.9	0.999
Expiration date	0	0.0	0	0.0	1.000
Legal aspects					
Name and address of the manufacturer	53	67.1	68	66.0	0.999
Alternative sources of information about the drugs	35	44.3	25	24.3	0.004*
Presence of registration or NAFDAC number	21	26.6	34	33.0	0.416
Abridged prescription information	25	31.6	30	29.1	0.746
References	4	5.0	34	33.0	<0.001*
Name and address of the marketer	23	29.1	14	13.6	0.015*
Indicating if drug is prescription drug or not	12	15.2	10	9.7	0.359
Web address of the manufacturer	2	2.5	16	15.5	<0.005*

* Significant P values

DISCUSSION

This study has shown deficiencies in drug information of the advertised drugs in Nigerian and other African medical journals. The two multinational companies (Roche and Pfizer) made about a third of the total advertisements in both the Nigerian and other African medical journals. This percentage is quite significant and a substantial number of the adverts were lacking adequate information for safe prescribing. These multinational companies have been reprimanded many times by the FDA for inadequate information and misinformation on advertised drugs in the USA.³³⁻³⁵ The enormity of inappropriate drug advertisement is likely to be higher in developing countries, where policy on drug advertisement is weak and the appropriate structures to monitor advertisement are lacking.

The aim of this study was not to assess the accuracy and efficacy of the information provided in the advertisements. This is therefore a limitation of the study and may be addressed by future study on drug promotion in African medical journals.

Only very few of the drugs advertised in both the Nigerian and other African medical journals provided the basic information required for appropriate prescribing (Table 3). The incomplete information on the advertised drugs did not conform to the recommendations of the WHO as highlighted in Table 1. Similarly, many of the drug advertisements in the Nigerian medical journals did not conform to the NAFDAC recommendations (Table 2 and 3). The non-conformity to the WHO's guidelines might have resulted from the differences in drug policy in each of the African countries where the journals were published²⁶⁻²⁸ and, possibly, as a result of weaknesses in the editorial policies for drug advertisement in each of the journals. In Nigeria where drug advertisement guidelines are similar to those of WHO, deviation from the guidelines was quite obvious in this study. This deviation may have resulted from weakness in implementing drug advertisement policy in Nigeria by the NAFDAC and lack of mechanism to monitor drug promotional campaign by the pharmaceutical companies. Concentration of too much attention on combating manufacturing and sales of fake and substandard drugs, rather than fighting inappropriate drug advertisement and promotion, might have also played a contributory role.

When advertisements in the Nigerian and other African medical journals were compared for adequacy of drug information for appropriate prescribing, it was found that except for brand and generic names, clinical indications, available dosage forms, and manufacturers' names/addresses, drug information was provided in fewer than 50% of adverts (Table 3). No information was provided on shelf life and expiration dates of drugs advertised in both journals. It is therefore obvious that inappropriate drug advertisement is a common problem in Africa. Most of the African countries are characterised by warm climate. Parents in some African countries are fond of keeping drugs, especially antibiotics and antimalarials, at home for

emergency use for their children with fever.³⁶ The shelf life and stability of drugs kept at home, especially on a warm climate, are known to decrease over time³⁶, thereby increasing treatment failure from loss of potency and possible toxicity. Metabolism of drugs is often time deranged in chronic illnesses such as renal failure, liver failure and malnutrition.²¹ Similarly, renal excretion of drugs is known to diminish in the elderly. In this group of patients, caution has to be exercised in prescribing drugs with potentials for hepatotoxicity or nephrotoxicity. Unfortunately, only 36.5% of the drug adverts provided information about how to use the drugs in special group of patients. However, we did not ascertain if all the advertised drugs were contraindicated in these special situations. Antibiotics and sulphadoxine/pyrimethamine antimalarial group of drugs are the leading cause of adverse drug reactions (ADRs) in children in Nigeria³⁷ and they constituted a substantial number of the advertised drugs, yet only 30.2% of the adverts provided information on their adverse effects. The use of two or more drugs with potential for adverse drug interactions has been reported as one of the causes of ADRs in Nigerian children.³⁷ Unfortunately, only 18.7% of the adverts provided information on the potential of the drugs for adverse interactions.

Inadequate drug information in medical journal advertisements, similar to our findings, had been reported in India¹⁶ and Russia.²⁵ This finding shows that inappropriate drug advertisement is as common in Africa as in other developing countries. Contrarily, the advertisement in international journals, especially from Europe and America, provided more complete pharmacological, clinical and pharmaceutical information for appropriate prescribing and in accordance with WHO's recommendation.^{16,17} Stricter controls and more availability of resources in developed countries to address the problem of inappropriate drug advertisements have been alluded as reasons for better drug advertisement in these countries. However, such resources may be lacking in African countries. In Nigeria, financial supports from both the NAFDAC and Federal Government to the local medical journals are lacking, thus making it financially unrealistic for them to appropriately monitor journal advertisement of drugs.

Drug advertisement with inadequate information for appropriate prescribing contradicts the policy of pharmaceutical companies.²⁵ The lack of training of physicians in evaluating drug adverts for appropriate prescribing information could lead to inappropriate prescribing. It is also not impossible that the penalties for violating marketing codes in African countries are as insufficiently stiff as reported in Russia²⁵ to discourage the companies from deviating from the standard practice. The lack of serious sanctions is a feature of self regulatory systems of advertising control.³⁸ The time needed for the individual doctor to critically appraise the advertised drug is usually not available and they may lack the skills required.³ Therefore, formal teaching of doctors in their undergraduate training in

pharmacology, in the art of critical appraisal of drug advertisement needs to be addressed.

In Nigeria where the economy is unstable, some medical journals are financially constrained and may willingly accept any advert that comes their ways, even if the advert is of poor quality.

Drug advertisements with inadequate information in medical journals appear to be a global problem, even though of less magnitude in developed countries^{6,16,39}, it is very necessary to institute an effective control, through medical journals, as a global pursuit. This can be achieved by concerted efforts. An international committee, similar to the International Committee of Medical Journal Editors, should be formed to define a uniform requirement for drug advertisements in biomedical journals. These uniform regulation and code should be followed to the latter, and be effectively supervised by the journal editorial staff. The proposed peer-review of drug advertisements for accuracy of the information provided, similar to the method used for submitted manuscripts⁸, should be followed by the editorial staff before publication and should be emulated by Nigerian and other African medical journals.

CONCLUSIONS

Drug advertisements are not reliable sources of knowledge to physicians but lack of time and other resources for reference may make them dependent on these sources of information. It is therefore pertinent that detailed prescribing information is given about drugs when advertised in medical journals. All pharmaceutical companies, editorial offices and publishers of various Nigerian and other African medical journals, and the governments of developing countries (especially African countries) should recognise this problem and ensure necessary actions guiding appropriate drug advertisements for the well being of their general population.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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