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Original Research

Patient knowledge of medicines dispensed from Ghanaian community pharmacies

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ABSTRACT*

Background: One vital requirement for patient adherence to medicines is good patient knowledge of the medicines dispensed and this will invariably be linked to good labelling and counselling.

Objective: The aim of this study was to evaluate the quality of labelling of medicines and determine patient knowledge of the administration of medicines dispensed from a community pharmacy in Ghana.

Methods: From 6th to 29th January, 2010, dispensed prescriptions of 280 clients were purposely sampled to evaluate the quality of labelling. These clients were also interviewed about their knowledge of the last medicine received immediately after dispensing. A scoring system was employed by awarding a point for each attribute written on the package and each attribute stated by the patient. The dispensing attributes noted were name, dosage, frequency, duration, quantity and route of administration.

Results: Of the 280 patients interviewed, 157 (56%) were males. Thirty one (11%) had no education and 99(35%) were secondary school graduates. Antimalarials comprised 17.9% and analgesics, 15.4% of medicines dispensed. The name, quantity, dosage, frequency, duration of therapy and route of administration were written on the label in 98%, 99%, 55%, 54%, 6% and 2% respectively of the dispensed medicines. The mean labelling score was 3.096 (SD=1.05) out of 6. The corresponding patient knowledge values were 63%, 80%, 80%, 75%, 57% and 86%. The mean knowledge score was 4.375 (SD; 1.38) out of 6. The chi square test p-value for the effect of demographic characteristics (sex, educational background, location) on patient knowledge of medicines dispensed were p=0.454; p=0.000, and p=0.138 respectively

Conclusion: Patient knowledge of the administration of dispensed medicines was rated good; and this largely corresponded with the quality of labelling, except that the duration of therapy and route of administration was not frequently written and so labelling was rated just above average.

Keywords: Drug Labeling; Comprehension; Health Knowledge, Attitudes, Practice; Pharmacies; Ghana

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CONOCIMIENTO DE LOS PACIENTES SOBRE MEDICAMENTOS DISPENSADOS EN LAS FARMACIAS COMUNITARIAS DE GHANA

RESUMEN

Antecedentes: Un requisito básico para la adherencia del paciente a la medicación es el buen conocimiento de los medicamentos dispensados, lo que estará invariablemente ligado a un buen etiquetado y asesoramiento.

Objetivo: El objetivo de este estudio fue evaluar la calidad del etiquetado de los medicamentos y determinar el conocimiento de los pacientes sobre la administración de los medicamentos dispensados en farmacia comunitaria en Ghana.

Métodos: Para evaluar la calidad del etiquetado, entre 6 y 29 de enero de 2010, se muestrearon propositivamente los medicamentos dispensados. También se entrevistó a estos clientes sobre su conocimiento de la última medicina recibida en la dispensación. Se utilizó un sistema de puntuación que asignaba un punto a cada atributo que aparecía escrito en el embalaje y a cada atributo respondido por el paciente. Estos atributos eran; nombre, dosis, frecuencia, duración, cantidad y vía de administración.

Resultados: De los 280 pacientes entrevistados, 157 (56%) eran hombres. 31 (11%) no tenía educación y 99 (35%) eran graduados en escuela secundaria. Los antimaláricos supusieron el 17,9% de las medicinas dispensadas y los analgésicos el 15,4%. El nombre, cantidad, dosis, frecuencia, duración del tratamiento y vía de administración estaban escritos en el 98%, 99%, 55%, 54%, 6% y 2% de los medicamentos dispensados. La media de la puntuación del etiquetado fue de 3,096 (SD=1.05) sobre 6. Los valores equivalentes del conocimiento de los pacientes fueron 63%, 80%, 80%, 75%, 57% y 86%. La puntuación promedio del conocimiento fue de 4,375 (SD=1,38) sobre 6. El valor de los p en la prueba chi-cuadrado para el efecto de las características demográficas (sexo, educación, localidad) sobre el conocimiento del paciente fueron p=0.454; p=0.000, and p=0.138 respectivamente.

Conclusión: El conocimiento de los pacientes sobre los medicamentos dispensados fue calificado de bueno, y se corresponde con la calidad del etiquetado, excepto para la duración del tratamiento y vía de administración, que no estaban escritas normalmente, lo que provocó que el etiquetado fuese calificado solo como sobre la media.

Palabras clave: Etiquetado de Medicamentos; Comprensión; Conocimientos, Actitudes y Práctica en Salud; Farmacias; Ghana

INTRODUCTION

Inadequate knowledge of medication use may directly lead to overuse of, or patient noncompliance with a drug regimen, and result in serious outcomes. For example, early self-discontinuation of antibiotics, a common practice in Ghana, often leads to microbial resistance and/or treatment failure.¹ In 2002 more than 50% of all medicines prescribed worldwide were dispensed or sold inappropriately; while 50% of patients failed to take them correctly.² Findings on patient knowledge of medicines dispensed in developing countries are diverse, probably because the number of dispensing attributes noted and literacy levels varied from study to study. Research findings in Western Nepal, India and Cambodia have shown that patient knowledge of drug dosage were 81%, 64.5% and 55% respectively.³⁻⁵ In these studies the dispensing attributes noted were patients' knowledge of when (frequency) and how much (dosage) medicines to take. In Iran and Egypt, patients' knowledge scores of medicines dispensed were 3.18 out of 5 dispensing attributes (name, dosage, duration, side effects and reasons for the medication use) and 2.45 out of four dispensing attributes (name, dosage, duration and current reason for medicines) respectively.^{6,7} Ideally, each medicine label should include the name of the medicine, route of administration, dosage, name of patient, date of prescription, name of the clinic or the hospital and special instructions, if any. The purpose of providing such information is to ensure that the prescribed medicine can be described and identified and can contribute to optimal therapeutic outcomes.⁸ It is also to help individuals know about their medicines in order for these to be used appropriately. However, studies in some developing countries have shown that often that the quality of labelling of medicines dispensed is inadequate. In a study conducted in Botswana's primary health care facilities to assess the quality of labelling of dispensed medicines, the dosage, name, strength, and volume of the drug was written on the label in 4950 (77%), 4707 (73%), 3262 (50%) and 2053 (32%) cases respectively, and the name of the patient in 2829 (44%).⁹ Moreover 1.4% (n=4231) and 43.8% (n=312) of prescriptions dispensed in Western Nepal and India were inadequately labeled.^{3,4}

In a developing country like Ghana, about 40% of the population is not literate, and hence it is essential that medicines are appropriately labelled and appropriate instructions given to suit the needs of such patients.¹⁰ A literature search revealed that data on the quality of labelling and patient knowledge of medicines dispensed from Ghanaian community pharmacies were not available. Therefore the aim of this study was to assess the quality of labelling and patient knowledge of the administration of medicines dispensed, for the

purposes of policy initiation and planning in order to upgrade the care offered to patients who visit Ghanaian community pharmacies.

METHODS

The study was carried out in two community pharmacies in the Ejisu and Ayiga suburbs of the Ashanti Region. These suburbs were selected because the literacy level of the population sampled could be graded as low to moderate.¹¹ Participants were selected through a two-step sampling process: cluster randomized for pharmacies and systematic sampling for participants.

At the community pharmacy level all the names of the pharmacies in the two suburbs were placed in respective boxes and one name was picked from each box. The WHO recommends that for studies carried out in communities, a minimum sample size of 100 respondents should be used.¹² Based on this a sample size of 280 adults (18 years and above) was chosen. These were people presenting with a prescription and without, but purchasing an item defined as a drug in the Ghana food and drugs law 1992, PNDCL 305B.

A semi structured questionnaire was used for the study. This was designed by the researchers based on literature on instructions on safe administration of medicines and labelling of prescriptions as per International Pharmaceutical Federation (FIP) specifications.⁵ The semi structured questionnaire was designed to capture the sex and educational background of the patient, quality of labelling and patient's ability to recall the name, dosage, frequency, duration, quantity and route of administration of medicines dispensed. Clients were also asked if they knew any precaution to observe while taking their medicines. The questionnaire was further face validated by a community pharmacist and a client, and a pilot survey was conducted from 14th - 17th December 2009.

Data were collected by two trained undergraduate final year pharmacy students from 6th – 29th January 2010 between 5pm and 9pm each day. The 280 clients were chosen by each day selecting the first ten patients who were dispensed medicines from each pharmacy and who gave their consent to be interviewed, after the purpose of the interview had been explained to them. Each patient was face interviewed immediately after the patient-dispenser encounter using the semi structured questionnaire. In the interview, respondents were asked to recall the name, quantity, dosage, frequency, duration of therapy and route of administration of the last medicine dispensed to them. In addition respondents were asked if they knew of any precautions to be observed while taking their medicines. The selected medicine was then checked to find out if it had been labelled appropriately with the name, quantity, dosage, frequency, duration of therapy, and route of administration.

Table 1. Medicines dispensed from the community pharmacy.			
Class	Medicines	N	%
Antimalarials	Sulfadoxime + Pyrimethamine, Artemeter – Lumfantrine Artesunate + Amodiaquine	50	17.85
Analgesics	Paracetamol, Ibuprofen, Diclofenac Paracetamol +Diclofenac – Blopen Dihydrocodiene Paracetamol+Asprin + Caffiene	43	15.35
Antibiotics	Amoxicillin, Cefuroxime Amoxicillin + Clavulanic acid Metronidazole , Erythromycin, Co-trimoxazole	33	11.79
Haematinics	Folic acid, Ferrous sulphate, Multivitamin Zincofer, Zinel, Apetamin, Ferroglobin	31	11.07
Ulcer Healing Drug	Mist Magnesium Trisilicate, Martins Liver salt, loperamide Hydrochloride	22	7.85
Antitussive	Simple Linctus BPC, Mist Expect sed, Menthox Lozenges, Malin cough syrup	19	6.78
Ointments	Surfaz, KY jelly, Penicillin Ointment	16	5.71
Anthelmintic	Mebendazole, Albendazole	14	5
Anti-Hypertensive	Nifedipine, amlodipine, Bendrofluazide, Lisinopril	14	5
Anti-diabetic	Glibenclamide, Metformin, Glimepiride	12	4.28
Anti-fungal	Clotrimazole vaginal pess, Ketoconazole	12	4.28
Eye, ear, nasal Drops	Timol, Ephedrine nasal drops , Cool eyes	8	2.86
Others	Cetirizine, Salbutamol, Prednisolone, Vitamin C	6	2.14

Data Analysis

The data were analysed using SPSS 16.0 and Microsoft Excel 2007. In assessing the quality of labelling and patient knowledge of the administration of medicines, a scoring system was employed by awarding a point for each variable written and stated by the patient. These variables were: name, dosage, frequency, duration, quantity and route of administration. Hence a score of 6 (graded excellent) for patient knowledge on medicines indicated that the patient was able to recall all 6 attributes (the name, dosage, frequency, duration, quantity and route of administration of the medicines dispensed).

A score of 5 was graded good, 4 was graded above average, 3 was graded average, 2 was graded poor and one, very poor.

Furthermore the British National Formulary (BNF) was used as a reference to determine which medicines required cautionary and advisory labels since it one of the cores references used in training pharmacists in Ghana since we do not have a formulary.

RESULTS

The minimum age of patients was 18 and the maximum 81. One hundred and fifty patients (56%) were males, and 123(44%) were females. Thirty one patients (11%) had no education, 77(28%) had basic education, 99(35%) were secondary school graduates and 73(26%) had tertiary/higher education.

The common classes of medicines dispensed from the community pharmacy were antimalarials 50 (17.85%) and analgesics 43 (15.35%) [Table 1]. From a total of 280 labels examined, 254 (91%) of the medicines were required to have a cautionary/advisory label but only 88 (33%) of these had them (Table 2).

The route of administration and the duration of therapy were the variables least stated on the medicine label (Table 3). In assessing the quality of labelling, 8 (3%) labels had 5 attributes stated and were graded good; 137 (49%) had 4 attributes stated and were graded above average; 17 (6%) had three attributes stated and were graded average; 110 (39%) had two attributes stated and were graded poor, and 8(3%) had only one attribute stated and were graded very poor. None of the labels was graded excellent. Overall 58% of the medicines given to respondents had at least three attributes stated on the label.

One hundred and seventy seven patients (63%) knew the name of their medicines while 159(57%) knew the duration of their therapy (Table 3). In addition, 140 (50%) patients knew of precautions they needed to observe while taking their

Table 2. List of medicines and cautionary advice to be stated on the label

Medicine	Cautionary advice stated on label
Apetamin multivitamin syrup	May cause drowsiness
Artemether-lumefantrine	Keep out of reach of children
Cool eyes®	For external use only
Cefuroxime	Take after meals
Diclofenac	Do not exceed the given dosage Keep out of reach of children
Ferrous Sulphate	May darken stool
Mist expect sed	Shake the bottle Keep out of reach of children
Metronidazole	Avoid alcoholic beverages
Mist Mag Trisilicate	Shake the bottle
Penicillin Ointment	Store in a cool dry place
Timol eye drop	Store in a cool dry place. Use within 3 weeks after opening.
Sulfadoxime+Pyrimethamine,	Keep out of reach of children

Medicine Variable	Labelled N (%)	Patient Knowledge N (%)
Name	275 (98.2%)	177 (63.2%)
Quantity	277 (98.9%)	224 (80%)
Dosage	154 (55%)	223 (79.6%)
Frequency of administration	151 (53.9%)	210 (75%)
Duration of therapy	16 (5.7%)	159 (56.8%)
Route of administration	4 (1.4%)	242 (86.4%)

medications. With regard to the overall knowledge score, 64 (23%) patients were graded excellent as they were able to recall all the six attributes assessed; 87 (31%) were graded good; 64 (23%) were graded above average; 34 (12%) were graded above average; 17 (6%) were graded poor, and 14 (5%) were graded very poor. The chi square test values for the effect of sex, educational background and residence on patient knowledge were [4.697 (df=5; p=0.454)], [48.483 (df=15; p=0.000)] and [8.345 (df=5; p=0.138)], respectively.

DISCUSSION

Antimalarials 50 (17.85%) and analgesics 43 (15.35%) were the common classes of medicines dispensed in the community pharmacy. Our findings are similar to a study in Burkina Faso where antimalarial and antipyretics were the commonest drugs dispensed from rural community pharmacies, probably because both Ghana and Burkina Faso are West African countries and have similar disease patterns.¹³ However, findings in Western Nepal and Botswana indicated that antimicrobials and analgesics were the commonest medicines dispensed in the pharmacy.^{3,9} These results suggest that analgesics may be one of the commonest classes of medicines dispensed in community pharmacies.

Only 35% of examined labels that required cautions or advice had them. During patient counselling, the pharmacist should ensure that the patient understands how to follow the correct dosage schedule. Any effect of the medicine on driving or work, any foods that need to be avoided as well as other issues such as the possibility of staining of clothes or skin by the medicine ought to be given.¹⁴ One interesting finding in our study was that although 67% of medicines dispensed lacked cautionary/advisory labels, 50% of respondents knew of precautions that were to be observed while on therapy. This showed that although labelling was inadequate, patients were informed about some precautions. However cautions/ advice should be written on medicine labels because certain key information may easily be forgotten by the patient and there may be the need to refer to these labels.

In our study 98% and 55%, of medication labels had the name and dosage of therapy respectively (Table 3). In a similar study in Western Nepal 82.6% of the medication envelopes were labelled with the name of the medicine. In Botswana 73% and 77% of medicines dispensed had the names and dosages stated.^{9,15} The name of the medicine therefore appears to be the commonest variable written on labels.

In our study the mean labelling score was 3.08 out of 6 while in Botswana similar findings showed a mean labelling score of 2.75 out of 5, indicating that in both studies the mean score was average. The route of administration and the duration of therapy were the attributes least stated on the prescription label. Inadequate labelling may lead to patient non-compliance due to lack of knowledge and thus result in administration errors and subsequent therapeutic failure. It is therefore necessary that medicines are labelled properly and patients are counselled appropriately.

To improve the quality of labelling, instructions for the administration of medicines including name of medicine, dosage, frequency, route of administration and duration of therapy should be printed on stickers and placed on the medicine, with space to write cautionary/advisory labels when necessary, because many errors may occur if instructions are hand written on paper or polythene envelopes as it is currently done in Ghanaian community pharmacies. To ensure that medicines are labelled appropriately, the Pharmacy Council and the Pharmaceutical Society of Ghana should outline appropriate guidelines. At the time the data were collected in the community pharmacy at Ejisu, there were two pharmacy assistants and one pharmacist (not present all days) on duty while at Ayigya there were two pharmacy assistants, one dispensing technician and one pharmacist. Most prescriptions were labelled by the pharmacy assistants. Even though dispensing staff may be qualified, or might have received on-the-job training, there is a need for periodic audits to be done to assess the dispensing procedure and adequate training offered when needed. This is because the quality of dispensing is likely to be affected by the level of training of the dispensing staff.⁹

The dosage, duration of treatment and name of medicines were recalled by 80%, 57% and 63% of respondents respectively (Table 3) and the mean patient score was 4.375 out of 6. In a similar study conducted in Botswana the dosage, duration of treatment, and name of the drug(s) was recalled by 83%, 44%, and 31% of patients respectively, and the mean patient knowledge score was 2.50 out of 5. Findings in Egypt and Western Nepal indicated that 69.3% and 53.8% of patients recalled the dosage of medicines dispensed respectively.^{7,9,15} Comparing this to our results, respondents in our study had a higher knowledge score of the administration of medicines even though in both studies the dosage of medicines was the commonest variable recalled.

The name of the medicine was stated on the label of 98% of these medicines but only 63% of respondents could state the name of their medicines, probably because the hand written name of the medicine was not legible or the patients were not literate. It is essential that patients know the name of their medicines as this would assist healthcare personnel when a medication history needs to be taken at any point of care. Although the route of administration and duration of therapy were the attributes least stated on the label (Table 1) 86% and 57% of respondents knew the route and duration of therapy of their dispensed medicines.

This indicates that patients were probably counselled on the administration of medicines. Since interviews were conducted immediately after the patient-dispenser encounter, it is likely that patients, including those with no education, could remember what they were told. From the chi test values obtained for the effect of education, location and sex on patient knowledge only the effect of educational background was significant (chi square=48.483, df=15, p=0.000). This shows that level of education strongly affected knowledge of drug administration. A similar study also concluded that age and sex did not influence patient knowledge of correct use of drugs.¹⁵ Ideally, every patient should know how to administer their medication and illiteracy should not be a barrier to this. One of the ways to ensure that illiterates have adequate knowledge of medicines administration is the use of pharmaceutical pictograms, which are standardized graphic images that help convey medication instructions, precautions, and/or warnings to patients and consumers.¹⁶ Currently there are United States pharmacopoeia pictograms and pictograms developed by the Military and Emergency Pharmacy Section (MEPS) of FIP. Ghana and other developing African countries with a moderate to high illiterate population can also adopt the MEPS pictograms which are culturally

friendly and sensitive and use them to improve patient care. These pictorial aids improve recall, comprehension, and adherence and are particularly useful for conveying timing of doses, instructions on when to take medicine, and the importance of completing a course of therapy.¹⁷ However, they need to be evaluated before use in a new setting and will require adequate fiscal and human resources.

CONCLUSIONS

The quality of labelling of dispensed medicines from community pharmacies was found to be average and similar to other findings in some developing countries, hence measures and policies should be put in place to improve it. Overall, patient knowledge of the administration of medicines was above average but it still needs to be improved to ensure that patients can recall all the information needed for the effective administration of their medicines.

CONFLICT OF INTEREST

None declared.

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