Patients' Perspectives on Adverse Drug Reaction Reporting in a Developing Country

Sabblah, George Tsey; Darko, Delese Mimi; Mogtari, Hudu; Härmark, Linda; van Puijenbroek, Eugène

Published in:
Drug Safety

DOI:
10.1007/s40264-017-0563-9

Publication date:
2017

Drug Saf (2017) 40:911–921
DOI 10.1007/s40264-017-0563-9

ORIGINAL RESEARCH ARTICLE

Patients' Perspectives on Adverse Drug Reaction Reporting in a Developing Country: A Case Study from Ghana

George Tsey Sabblah[1] · Delese Mimi Darko[1] · Hudu Mogtari[1] · Linda Härmark[2] · Eugène van Puijenbroek[2,3]

Published online: 26 June 2017

Abstract

Introduction Recent efforts to introduce direct patient reporting into pharmacovigilance systems have proved that patient reports contribute significantly to medicine safety, but there is a paucity of information relating to patients' perspectives regarding adverse drug reaction reporting in developing countries.

Objective The objective of this study was to explore patients' knowledge, attitudes, behaviours and opinions on spontaneous adverse drug reaction reporting in Ghana.

Methods A cross-sectional study using questionnaires administered through face-to-face interviews was carried out from 25 August, 2016 to 20 September, 2016 with 442 patients aged 18 years and above selected by convenience sampling from two community pharmacies in urban and rural Ghana. Reasons and opinions on patients' reporting on adverse drug reactions were surveyed using a 5-point Likert scale. The Pearson chi-square test was used to determine associations between background variables and responses on knowledge of adverse drug reaction reporting.

Results Responses from 434 patients (86.7%) were included in the analysis. Among those interviewed, there was a high level of awareness regarding the existence of the National Pharmacovigilance Centre (81.6%). Approximately half of the respondents (49.5%) were aware that patients were able to report adverse drug reactions associated with medicinal products directly to the National Pharmacovigilance Centre. Of the respondents, 46.3% stated that they had an adverse drug reaction to their medicines in the past; of these, 53.2% reported to healthcare professionals and 36.9% failed to report because they stopped their medication. The three main reasons for patients' reporting were desire for extra information (92.4%), desire to share experiences with other people (91.7%) and expectation for the National Pharmacovigilance Centre to inform others about the possible adverse drug reactions (88.0%). Patients' opinions were to contribute to research/knowledge (96.5%) and improvements in drug safety (96.5%). Patients' behaviour towards adverse drug reaction reporting was affected by the likely consequences of reporting, influence of others and the ease of reporting.

Conclusion Patients have a positive attitude and good knowledge on adverse drug reaction reporting to the National Pharmacovigilance Centre and report because they expect extra information and to contribute to drug safety. Patients' positive attitude towards adverse drug reaction reporting could be sustained by hosting periodic public awareness campaigns addressing the importance of adverse drug reaction reporting and by providing timely feedback to patients on regulatory decisions taken as a result of the reports that they submitted.

✉ George Tsey Sabblah
georgesabblah@gmail.com

[1] Food and Drugs Authority, P. O. Box CT2783, Accra, Ghana

[2] Netherlands Pharmacovigilance Centre Lareb, WHO Collaborating Centre for Pharmacovigilance in Education and Patient Reporting, 's-Hertogenbosch, The Netherlands

[3] PharmacoTherapy, Epidemiology and Economics, Groningen Research Institute of Pharmacy, University of Groningen, Groningen, The Netherlands

Key Points

There is limited direct patient contribution to medicine safety in low- and middle-income countries owing to little or no information on patients' knowledge, attitudes and behaviours regarding adverse drug reaction reporting in these countries.

Patients prefer to report adverse drug reactions to the National Pharmacovigilance Centre through their healthcare professionals and their preference is influenced by the likely consequences of reporting, the influence of others and the ease of reporting.

The National Pharmacovigilance Centre can sustain the positive attitudes of patients' towards adverse drug reaction reporting by hosting periodic public awareness campaigns addressing the importance of adverse drug reaction reporting and by providing timely feedback to patients on regulatory decisions taken as a result of the reports that they submitted.

1 Introduction

Spontaneous reporting of adverse drug reactions (ADRs) is the most widely used and cost-effective pharmacovigilance method for collecting post-approval safety information on medicines and other health products. However, patients' involvement in spontaneous reporting is limited, and many countries do not have direct patient reporting schemes [1–5]. There have been debates about the value of direct patient reporting to pharmacovigilance systems. Over the past decade, a growing consensus has emerged regarding the value of direct patient reporting to pharmacovigilance systems [6–10].

Patient reporting was suggested as one of the strategies to increase the number of ADR reports received by National Pharmacovigilance Centres (NPvCs) [11, 12]. It has also been widely accepted that patients are often more motivated and better placed than healthcare professionals to observe the signs and symptoms of ADRs they may experience and record these with accuracy [13–16].

Patient reporting has been allowed in Australia, Canada, New Zealand and USA since the start of their pharmacovigilance systems. Recently, there has been an increase in the number of countries that allow patients to report ADRs directly to pharmacovigilance systems around the world [2, 4, 5].

The European Parliament has also recognised the significant role of patients in medicine safety and in response passed a legislative resolution on pharmacovigilance in September 2010. This resolution allows patients to report ADRs directly to the competent authorities in Europe [17–19]. To the best of our knowledge, there are few low- and middle-income countries who have officially introduced patient reporting into their pharmacovigilance systems [20].

Studies that evaluated patients knowledge/awareness about ADR reporting to NPvCs established that knowledge/awareness about the reporting system varies from 8.5 to 55.9% [21–25]. There appear to be substantial differences in ADR reporting to healthcare professionals in different settings; for instance, less than 1 and 85.5% of patients who experienced ADRs self-reported to their healthcare professionals in Portugal and UK, respectively [23, 24]. Three European studies explored patients' motives and opinions about ADR reporting and revealed the following: the severity of suspected ADRs, the desire for extra information, the need to share experiences with others, and contribution to research and knowledge are reasons for reporting to NPvCs [23, 24, 26].

Ghana joined the World Health Organization Programme for International Drug Monitoring in November 2001, and the primary sources of spontaneous reports are healthcare professionals and marketing authorisation holders [27]. Patient reporting was allowed from the start of the pharmacovigilance programme; however, it was officially launched in June 2016 [28]. The launch of the patient reporting programme was followed by a major media campaign to create awareness amongst the population on ADRs and how to report these to the NPvC. The NPvC also developed a patient reporting form (the Blue Form) to enable patients to submit ADR reports to the NPvC. The Blue Form contains information on reporter details, details of the individuals who experienced the ADR, the ADR details and the suspected product details. The form can be obtained from community pharmacies in Ghana and also completed online at http://adr.fdaghana.gov.gh/patient.php.

Of over 3000 spontaneous reports received by the Food and Drugs Authority (FDA), the NPvC between 2001 and 2014, direct patient reports constituted only 0.3% ($n = 8$). This statistic is in direct contrast to that obtained in countries where patient reporting has been implemented, where a much higher percentage of ADR reports is received directly from patients [4, 20, 29].

The lack of safety information from patients will first lead to the inability to detect important signals inherent in patient reports as revealed by earlier studies [7, 30]. Second, there are other areas in which patient reports contribute to pharmacovigilance, including providing rich narratives concerning the impact of ADRs on quality of life, identifying pharmaceutical product quality defects and

reporting medication errors [31]. However, there is little or no information regarding patients' knowledge, attitudes and behaviours regarding ADR reporting in low- and middle-income countries.

The theory of planned behaviour (TPB) explains human behaviour in decision making and presumes that a person's behaviour is determined by the person's underlying beliefs [32]. According to the theory, human behaviour is guided by three types of considerations, namely, anticipated consequences of the behaviour (behavioural beliefs), beliefs about the normative expectations of others (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behaviour (control beliefs) [33]. The TPB has been used to understand pharmacists' behaviours and attitudes towards ADR reporting but this has not been applied to patients' reporting [34, 35].

Following this theory, one can state that patients' behaviour towards ADR reporting may be influenced by the likely consequences of reporting (behavioural beliefs), such as the need for extra information, prevention of harm to other people, contribution to drug safety, research and knowledge, and the desire for regulatory action. Other factors that may affect patients' behaviours towards the decision to report ADRs are the influence of others such as healthcare professionals and family members (normative beliefs) and whether it was easy to report the ADR (control beliefs).

The reasons for using the TPB in this study are two fold. First, the TPB has been widely used to explain different health-related behaviours including healthcare professionals' intentions to report ADRs [34–37]. Second, the TBP adequately explained patients' behaviours in health decision making including safe sex, hand hygiene and adherence to anti-diabetic medication [38–40]. Application of the TPB enables us to generate testable hypotheses and to interpret study results in the context of an extant empirical literature. It also helps us to understand the mechanisms that influence patients' decision making on whether to report an ADR, thus helping us to identify factors that may be important to target in future interventions designed to increase patient ADR reporting.

The objective of this study was therefore to explore patients' knowledge regarding spontaneous reporting and the attitudes, behaviours and opinions that can influence ADR reporting by patients in Ghana. The study is exploratory research to determine knowledge, reasons and opinions on ADR reporting by patients.

The study hypotheses were: (1) patients have poor knowledge about the possibility of reporting ADRs to the NPvC; (2) the reasons for patients reporting ADRs are the need for additional information and action to protect others from similar ADRs; and (3) patients' decisions to report ADRs are influenced by the consequences of reporting and the expectations of others.

2 Methodology

A cross-sectional survey was carried out from 25 August, 2016 to 30 September, 2016 by administering a questionnaire to patients selected by convenience sampling.

2.1 Questionnaire Design

The questionnaire was adapted from earlier studies and pretested with 30 participants who were representative of the target population, but the results are not included in the analysis [13, 24, 26]. The questionnaire was divided into four sections (I–IV), namely demographic information, reporting knowledge, reporting ADRs, and reasons or opinions to report ADRs. Section I includes questions such as respondents' sex, age, level of education and employment status. Section II relates to respondents' knowledge about reporting ADRs including closed questions on preferences and suggestions for reporting and whose idea it was to report ADRs. Section III sought to find out what participants will do when they have ADRs and the reasons for not reporting. Finally, Section IV measures patients' reasons and opinions regarding ADR reporting on a 5-point Likert Scale. The scale is rated strongly agree to strongly disagree with a midpoint (neither agree nor disagree), which represents a neutral position and not the respondents' inability to answer the question.

To assess the three elements in the TPB on ADR reporting by patients, the under-listed questions were asked in Sections III and IV (the 5-point Likert Scale) about the three considerations that influence human behaviour.

Behavioural beliefs I expect extra information; Reporting can prevent harm to other people; Reporting contributes to drug safety; Reporting contributes to research and knowledge; I want FDA/NPvC to take regulatory action by imposing sanctions on the manufacturer of the drug and inform others about the possible side effects.

Normative beliefs Whose idea was it to report the possible side effect? Someone else pointed out the possibility for reporting the side effect.

Control beliefs Do you think it was easy to report? The possibility for reporting side effect exists (i.e. easy to report).

2.2 Study Population and Exclusion Criteria

Participants were aged 18 years and above and selected by convenience sampling from clients who were dispensed with prescription, pharmacist-initiated or over-the-counter

medicines in two community pharmacies in the Greater Accra and Ashanti regions of Ghana and were willing to participate in the study. Healthcare professionals were excluded from this study to avoid bias. The two community pharmacies were selected such that the Greater Accra region represented an urban population; Ga East Municipal District and the Ashanti region rural population; Agona Sekyere South District. Participants who agreed to take part in the study signed a consent form. The questionnaire was administered through a face-to-face interview by two research assistants trained by the principal investigator.

2.3 Data Analysis

Descriptive statistics was used to describe the demographic characteristics of the participants, knowledge of the NPvC, and reasons and opinions for reporting ADRs. Pearson chi-square (χ^2) or Fishers exact test was used to determine associations between background variables such as age, sex, level of education, employment status and responses about knowledge on ADR reporting. Fishers exact test was used when the number of counts in the contingency table was less than 5. Significance level was set at $p \leq 0.05$. Responses on the Likert Scale regarding the reasons and opinions for reporting were coded as ordinal scale; 1, 2, 3, 4 and 5 (representing strongly agree, agree, neither agree nor disagree, disagree and strongly disagree, respectively). Data collected during the study were analysed using Stata, Version 13 (StataCorp, College Station, TX, USA).

2.4 Ethical Consideration

Ethical approval for the study was granted by the Committee on Human Research, Publications and Ethics, Kwame Nkrumah University of Science and Technology, School of Medical Sciences and Komfo Anokye Teaching Hospital. No identifiers of the participants were provided on the questionnaire except signatures or initials, which showed their consent to participate in the research. To ensure that participants were not interviewed more than once, the names were entered on a separate MS Excel Sheet by the research assistants and deleted after checking for possible duplicates. There was minimal or no risk associated with participation in this study except the delay in providing the services in the community pharmacy and no compensation was paid to the participants.

3 Results

A total of 510 participants were approached in the two study locations and 442 agreed to take part in the interview, representing a response rate of 86.7%. Of the completed questionnaires, eight were excluded from the analysis because of missing information. The characteristics of the 434 patients are given in Table 1.

3.1 Patients' Knowledge and Attitudes

Three hundred and fifty-four (81.6%) of those interviewed had knowledge of the NPvC, and 215 (49.5%) were aware that it was possible for patients to report ADRs of their medicines directly to the NPvC. Of the 215 who were aware that it was possible for patients to report ADRs to the NPvC, 52.1% were from the Greater Accra region and 47.9% were from the Ashanti region. The greatest source of information on ADR reporting to the NPvC was from the television/radio at 173 (62.9%) and the smallest source was the NPvC's website at 7 (2.6%). Only 15 (6.9%) of those who had knowledge about reporting to the NPvC also knew that it was possible to report using the patient reporting form (the Blue Form). There was a significant relationship between education and knowledge of ADR reporting, with those who attained higher education (senior secondary school and university and above) more aware of ADR reporting than those who had little or no education [none, primary and junior secondary school] ($\chi^2 = 66.5$, $p < 0.0001$). Employment status also had a significant relationship with the knowledge of ADR reporting to the NPvC ($\chi^2 = 23.6$, $p < 0.0001$) with private sector employees and the self-employed having the greatest knowledge about ADR reporting. Other background variables with significant relationship to knowledge of ADR reporting were age and sex, with the younger age group and male sex as the major determinants to knowledge on ADR reporting. Participants' region (rural or urban residents) was not a predictor of knowledge on ADR reporting ($\chi^2 = 0.01$, $p = 0.918$).

Two hundred and one (46.3%) of the respondents stated that they had an ADR to their medicines in the past, and of these, 108 (53.7%) reported these ADRs to their healthcare professionals. The most preferred method for reporting ADRs was indirectly through their healthcare professionals (61.1%). Other methods for reporting ADRs were through a telephone call (26.9%) to the NPvC or the healthcare professional, mobile Short Message Service (6.1%), online reporting (2.8%) and by using the patient reporting form [the Blue Form] (2.8%). When asked whose idea was it to report the ADR, 76.5% stated they reported on their own, 14.3% were advised by healthcare professionals and the remaining 9.2% by a family member or friend. Those who reported their ADRs were asked whether it was easy to report; 80% agreed it was, whilst the remaining thought it was not. For those who had ADRs but did not report, the reasons for the failure to report are provided in Fig. 1.

Table 1 Characteristics of respondents

Variable	Frequency (%)	Characteristics of adult Ghanaian[a] (%)
Sex		
Male	210 (48.4)	47.9
Female	224 (51.6)	52.1
Age (years)[b]		
18–29	180 (41.5)	23.1
30–39	103 (23.7)	12.1
40–49	64 (14.8)	8.9
50–59	45 (10.4)	6.9
60+	42 (9.7)	7.6
Level of education		
None	18 (4.2)	22.1
Primary	44 (10.1)	36.7
Middle/junior secondary	130 (30.0)	44.3
Senior secondary school	127 (29.3)	45.6
University and above	115 (26.5)	3.7
Region		
Greater Accra	225 (51.8)	
Ashanti	209 (48.2)	
Employment status		
Unemployed	57 (13.11)	48.6
Student	54 (12.4)	
Self-employed	169 (38.9)	
Government employee	42 (9.7)	
Private sector	97 (22.4)	
Retired	15 (3.5)	

[a] Source: Ghana Demographic and Health Survey [41]

[b] Median age of the respondents in this study was 36.4 years (range 18–76 years)

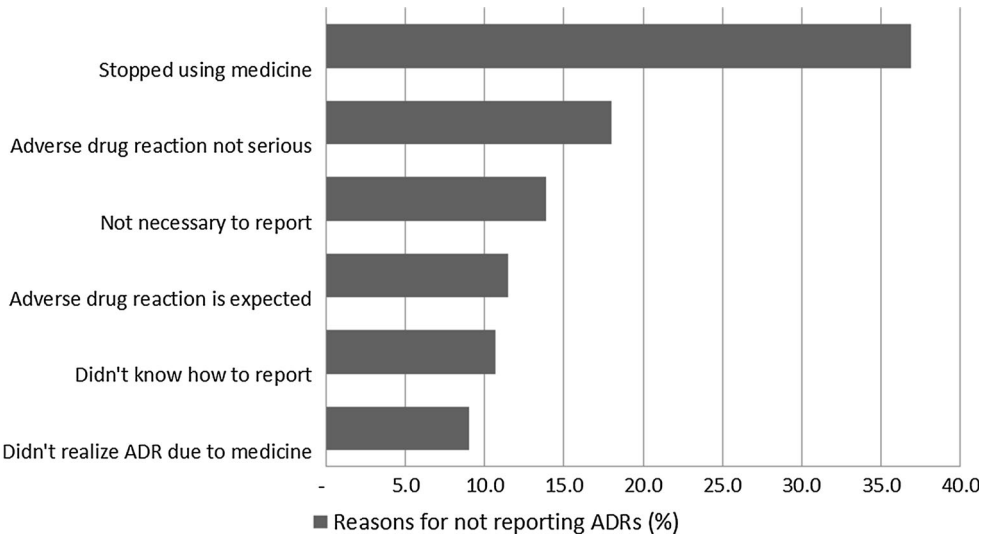

Fig. 1 Patients' reasons for not reporting adverse drug reactions (ADRs)

Age is the only determinant for reporting ADRs, with older patients more likely to report compared with younger patients ($\chi^2 = 13.51, p = 0.009$). When the 233 who never had ADRs in the past were asked whether they would report in the future, 97.1% responded in the affirmative. Patients' age was a major determinant of having experienced ADRs in the past, with older participants more likely to have ADRs ($\chi^2 = 19.6$, $p < 0.001$). There was a weak relationship between male and

female individuals with regard to ever having suspected ADRs to their medicines ($\chi^2 = 3.91, p = 0.048$), with more female individuals believing they had ADRs in the past compared with male individuals, 56.7 and 43.3%, respectively.

When all the participants were asked about who they will report to when they had ADRs, 36.4, 28.7 and 4.7% stated that they would report to their doctor, pharmacist and nurse, respectively. Only 1.6% stated that they will report directly to the NPvC, with 28.7% stating they will stop their medication.

3.2 Reasons and Opinions

The motives for patients reporting ADRs are listed in Table 2. The three main reasons for patient reporting were desire for extra information, 92.4% (strongly agree and agree); desire to share experiences with other people, 91.7% (strongly agree and agree); and expectation for the NPvC to inform others about the possible ADRs, 88.0% (strongly agree and agree). Patient opinions for reporting ADRs are listed in Table 3. Opinions of patients on ADR reporting (strongly agree and agree) were to contribute to the improvement of drug safety (96.5%), to contribute to research and knowledge (96.5%), responsibility for reporting the side effects (95.2%) and to prevent harm to other people (90.1%).

4 Discussion

The response rate of 86.7% is higher than what was obtained in similar studies in Europe [24, 26]. The percentage of male and female individuals in this study was 48.4 and 51.6%, respectively, which is similar to what pertains in the general Ghanaian population. However, differences were noted between the study sample and the broader Ghanaian adult population with respect to age, level of education and employment status. These differences may be owing to the fact that the study sample was obtained from patients who visited the community pharmacies and not from the entire adult population.

A high proportion of participants (81.6%) knew about the FDA, and about half (49.5%) were aware of the possibility of patients to report ADRs directly to the FDA (the NPvC). The high knowledge of the FDA is expected because the agency has been involved in media activities on the radio and television, particularly on counterfeit medicines, food safety and, recently, patient reporting. Participants in the urban area have more knowledge about the FDA compared with those in the rural area representing 57.6 and 42.4%, respectively. This result is also not surprising because most of the FDA's activities are concentrated in the urban areas of Ghana. Of those who knew it was possible to report ADRs directly to the NPvC, 52.1% were from the urban area with the remaining 47.9% from the rural area.

Our study results did not support Hypothesis #1. Specifically, we found that a relatively high percentage (49.5%) of study respondents were aware that they could report ADRs directly to the NPvC. Similar studies conducted in low- and middle-income settings have reported awareness levels of approximately 40% [21, 22]. The one exception to this was a study conducted in Europe showing that 53.4% of patients were aware that they could directly report ADRs to the NPvC [24]. The results obtained in our

Table 2 Motives for reporting adverse drug reactions[a]

Reasons	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I expect extra information	253 (58.3)	148 (34.1)	19 (4.4)	9 (2.0)	5 (1.2)
I want to be heard	113 (26.0)	90 (20.8)	34 (7.80)	106 (24.4)	91 (21.0)
I am angry about the situation	96 (22.1)	47 (10.8)	53 (12.2)	91 (21.0)	147 (33.9)
I want to share my experiences	210 (48.4)	188 (43.3)	16 (3.7)	13 (3.0)	7 (1.6)
I am worried about my situation	263 (60.6)	98 (22.6)	26 (6.0)	29 (6.7)	18 (4.2)
I want FDA to take action by withdrawing the medicine from the market	72 (16.6)	56 (12.9)	173 (39.9)	71 (16.4)	62 (14.3)
I want FDA to take action by informing others about the possible side effect(s)	217 (50.0)	165 (38.0)	29 (6.7)	17 (3.9)	6 (1.4)
I want FDA to take action by imposing sanctions on the manufacturer of the medicine	68 (15.7)	64 (14.8)	161 (37.1)	98 (22.6)	43 (9.9)
The possibility for reporting the side effect exists (i.e. easy to report)	138 (31.8)	176 (40.6)	29 (6.7)	57 (13.1)	34 (7.8)
Someone else pointed out the possibility for reporting the side effect	35 (8.1)	71 (16.4)	32 (7.4)	121 (27.9)	175 (40.3)

FDA Food and Drugs Authority

[a] Data on motives are given as the percentage of total responses with percentage of the responses given in parenthesis

Table 3 Opinions about reporting adverse drug reactions[a]

Opinions	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Reporting a side effect can prevent harm to other people	284 (65.4)	107 (24.7)	30 (6.9)	10 (2.3)	3 (0.7)
I felt responsible for reporting the side effect	273 (62.9)	140 (32.3)	12 (2.8)	8 (1.8)	1 (0.2)
Reporting a side effect contributes to improvement of drug safety	270 (62.2)	149 (34.3)	13 (3.0)	1 (0.2)	1 (0.2)
Reporting a side effect contributes to research and knowledge	251 (57.8)	168 (38.7)	14 (3.30)	0 (0.0)	1 (0.2)
I benefit from reporting the side effect	284 (65.4)	99 (22.8)	20 (4.6)	19 (4.4)	12 (2.8)
I want to be compensated	59 (13.6)	53 (12.2)	85 (19.6)	81 (18.7)	156 (35.9)
Reporting a side effect that is already mentioned in the patient information leaflet is useless	122 (28.1)	57 (13.1)	49 (11.3)	101 (23.3)	105 (24.2)
I report a side effect if it is not mentioned in the patient information leaflet	288 (66.4)	112 (25.4)	19 (4.4)	9 (2.1)	6 (1.4)
I report a side effect if it is unexpected	225 (51.9)	110 (24.7)	30 (6.9)	30 (6.9)	39 (9.0)
I only report a side effect if it is serious	142 (32.7)	71 (16.4)	18 (4.2)	73 (16.8)	130 (30.0)
In the future, I will report possible side effects	369 (85.0)	55 (12.7)	7 (1.6)	2 (0.5)	1 (0.2)

[a] Data on opinions are given as the percentage of total responses with percentage of the responses given in parenthesis

study could be owing to the launch of a media campaign by the NPvC in June 2016 to promote ADR reporting by patients. During this period, radio and television advertisements took place to enhance patients' participation in pharmacovigilance system in Ghana [21, 22, 28]. It was therefore not surprising that 62.9% received this information from the radio or television. The radio and television campaigns may have influenced the normative beliefs of the participants because the messages contained information on what is the acceptable behaviour when patients' experience an ADR.

The number of respondents in this study who had previously reported ADRs to their healthcare professional (53.2%) was greater than a Portuguese study, where less than 1% of those who had ADRs reported, but less than a British study, where 85.5% of patients who had ADRs reported to their healthcare professionals [23, 24]. However, it was clear that healthcare professionals did not submit patients' complaints as spontaneous reports to the NPvC because the NPvC received 809 ADR reports directly from healthcare professionals in 2015 [36]. Furthermore, Ghana has one of the lowest reporting rates amongst countries in the World Health Organization Programme for International Drug Monitoring [42, 43].

To ensure that ADRs reported by patients to healthcare professionals lead to the corresponding improvement in the reporting rate, there is the need to continuously sensitise healthcare professionals on the importance of submitting spontaneous ADR reports to the NPvC and also to make the reporting forms available to the healthcare professionals. This will be an important intervention to improve the ADR reporting rate, considering the fact that the preferred method for reporting by the participants in this study was through their healthcare professionals [doctor, pharmacist and nurse] (61.1%), with only 1.6% choosing to report directly to the NPvC. The preference for reporting ADRs could be the result of health-seeking behaviour of the study participants. Additionally, the failure by healthcare professionals to complete ADR reporting forms for patients' complaints could be because of their inability to acknowledge the problem or take it seriously as reported by van Hunsel et al. [26]. Other reasons why healthcare professionals may fail to make spontaneous reports for patients' complaints in Ghana are the unavailability of the reporting form, lack of knowledge of the reporting system and lack of time [44].

Although the NPvC launched a programme to promote direct patient reporting, the finding from this research reveals that it will take an extra effort, including patients' education and awareness creation to ensure patients report directly to the NPvC because only 1.6% prefer to submit their ADR reports directly to the NPvC. The number of participants who had ADRs in the past but failed to report because they stopped taking their medication (36.9%) is alarming and needs further investigation because this may lead to drug resistance and therapeutic failure. Counselling patients on the expected and possible ADRs and how to manage these can reduce this to the minimum.

The age of the study participants has been found to be a predictor for reporting ADRs and having experienced ADRs in the past. This is not surprising because a systematic review of literature by Alomar [45] revealed that age is a predisposing factor for the development of ADRs because of age-related physiological changes. In addition, older adults tend to have multiple health conditions and therefore are more likely to be involved in polypharmacy,

which makes them susceptible to the development of ADRs.

4.1 Reasons and Opinions on Adverse Drug Reaction Reporting

Several reasons and motives for reporting ADRs by patients have been suggested by earlier studies amongst which were altruism (prevent harm to other people and improve drug safety), improve research and knowledge, severity of the reaction and worried about the situation [24, 26, 46]. Five major themes under the reasons for reporting ADRs by patients in this study were desire for additional information; personal feelings and emotions (I want to be heard, I am angry about the situation, I want to share my experiences and I am worried about the situation); expectations for regulatory action (I want FDA to take action by withdrawing the medicine from the market, I want FDA to take action by informing others about the possible side effect(s), I want FDA to take action by imposing sanctions on the manufacturer of the medicine); and the existence of favourable conditions for reporting (The possibility for reporting side effect exists and Someone else pointed out the possibility for reporting the side effect).

A similar study by Matos et al. amongst Portuguese consumers identified the principal reasons for ADR reporting by patients as the severity of the ADR, worried about the situation and wanted to be heard [24]. In this study, the dominant reasons for patients to report ADRs were personal feelings and emotions and the desire for additional information. The NPvC and healthcare professionals should therefore provide the additional information and feedback to patients on reports submitted to sustain their contribution to the pharmacovigilance system in general and to improve pharmacotherapy at the personal level.

Another important reason for reporting ADRs in this study was expectation for regulatory action; 88.0% of the respondents stated (agree or strongly agree) that they report because they will want the FDA/NPvC to take action by informing others about the possible ADR. Although they requested regulatory action, they do not believe withdrawing the medicine from the market and imposing sanctions on the manufacturer of the medicine are options for consideration because of ADRs (Table 2). This finding is important because it means patients interviewed in this study understood the benefit-risk aspects of medications and do not believe that medicines should be withdrawn because of an individual experience of an ADR.

Regarding opinions for patients to report ADRs; the two major themes were, benefit to others and society (altruism) and personal benefits. The responses on the Likert Scale revealed that the important opinion for patients to report ADRs was altruism. These responses on the Likert Scale are "Reporting a side effect contributes to research and knowledge" and "Reporting side effect contributes to improvement in drug safety"; 96.5% (agree or strongly agree) and 96.5% (agree or strongly agree), respectively. Altruism was reported by earlier studies as opinions for patients making spontaneous reports to NPvCs [24, 26, 46].

Under the theme, personal benefits, respondents stated that they benefit from reporting ADRs. However, it is not clear in this study the exact benefits derived by patients from reporting, this may need further investigation. Second, the reporting for altruism is confirmed when most patients stated that they do not want to be compensated for reporting ADRs.

The fact that the majority of patients interviewed in this study stated that the decision to report ADRs was influenced by healthcare professionals, family members and friends supported the a priori hypothesis that patients' reporting can be influenced by others. The influence of others (normative beliefs) has been reported in the literature, which used TPB to examine patients' behaviour in health decision making [38–40].

Patients' decision to report ADRs would significantly improve if reporting will result in consequences such as the provision of extra information to the reporter and the NPvC informing others about the possible ADRs. Our finding also revealed that an important facilitating factor for patients' decision to report ADRs to the NPvC is making the reporting forms readily available. The findings of this study are in line with the TPB proposed by Ajzen [32]. This therefore implies that the TPB may be useful in predicting patient behaviour regarding ADR reporting.

The findings from the study show that ADR reporting may be improved by ensuring that media campaigns concentrate on educating the general public that it is an acceptable behaviour to report ADRs. Second, to improve reporting and sustain patients' interest in the pharmacovigilance system, it will be important to focus on enhancing the behavioural beliefs of the patients such as the need for extra information and the desire for regulatory action. Given that the majority of the patients interviewed believed that reporting ADRs will result in outcomes such as the expectation that the FDA will take regulatory action by informing others about the possible side effect, the NPvC should therefore use patient reports for policy decisions, and seek to provide timely feedback to patients on the subsequent regulatory actions taken in regard to the reported ADR. Last, factors that make it easy for patients to report ADRs, such as making the patient reporting forms (the Blue Form) readily available in community pharmacies, outpatients departments and in electronic format, will enhance patients' participation in the process. It is also

promising to know that patients' beliefs about ADR reporting in this study are in line with the general objectives of pharmacovigilance, which are the prevention of harm due to medicines and a contribution to the maximisation of benefits, therefore improving drug safety [47].

5 Strengths and Limitations of the Study

The study has several strengths. First, there is limited information on consumer reporting of ADR reporting in low- and middle-income countries. This study is therefore the first to discuss patients' reasons and opinions on ADR reporting in such settings.

Second, the study applies a theoretical model (the TPB) to guide development of the questionnaire. To the best of our knowledge, there are no studies to date that have used the TPB to describe patients' decision making regarding ADR reporting. Third, the questionnaire was pretested in the study population to clarify the wording of questionnaire items, question sequencing and the feasibility of administering the questionnaire in the study setting.

A limitation of this study was the sampling technique used, convenience sampling, which could introduce the possibility of selection bias. Additionally, the method of administering the questionnaire in the pharmacy may not have given the participants enough time to think through and understand the questions before providing the appropriate responses. The best option is to leave the questionnaire with the patients for a few days so they are able to think through the answers to be provided. This however may be challenging considering the fact that 25.9% of the Ghanaian population are illiterate, which may be higher in rural areas [48].

Second, the two research assistants used for the face-to-face interviews may unintentionally influence responses by providing additional clarifications to the questions and through verbal and non-verbal cues. However, training provided by the principal investigator prior to the start of data collection was intended to minimise this possibility.

Third, the results of this study may not be generalisable to other African countries because of the sampling methodology used; studies with a more robust sampling technique such as random sampling may be more preferable if the results could apply to other African countries. This study, however, provides the preliminary information regarding patients' perspectives on ADR reporting in low- and middle-income countries particularly in Sub-Saharan Africa.

Last, the study may be affected by social desirability bias because responses by participants could not be verified. The effect of socially desirable responses was minimised by keeping the identities of the respondents anonymous.

6 Conclusion

Patients have a positive attitude and good knowledge about ADR reporting to the NPvC and report because they expect extra information and to contribute to drug safety. Their preference for reporting ADRs is indirectly through their healthcare professionals. To promote patient reporting and sustain their positive attitudes towards ADR reporting, the NPvC should create awareness on the importance of ADR reporting and also provide prompt feedback to patients on regulatory decisions taken based on the reports patients submitted. The reasons why only 1.6% of the respondents preferred to report ADRs directly to the NPvC need further investigation.

Compliance with Ethical Standards

Funding This study was funded by the authors and there were no external sources of funding.

Conflict of interest George Tsey Sabblah, Delese Darko, Hudu Mogtari, Linda Härmark and Eugène van Puijenbroek have no conflicts of interest directly relevant to the contents of this article.

Consent to participate Informed consent was obtained from all individual participants included in the study.

References

1. Strom BL, Kimmel SE, Hennessy S. Textbook of pharmacoepidemiology. New York: Wiley; 2013.
2. van Hunsel F, Härmark L, Pal S, Olsson S, van Grootheest K. Experiences with adverse drug reaction reporting by patients: an 11-country survey. Drug Saf. 2012;35(1):45–60.
3. Olsson S, Pal SN, Stergachis A, Couper M. Pharmacovigilance activities in 55 low- and middle-income countries: a questionnaire-based analysis. Drug Saf. 2010;33(8):689–703.
4. Herxheimer A, Crombag R, Alves TL. Direct patient reporting of adverse drug reactions a fifteen-country survey and literature review. Health Action International. 2010. http://consumers.cochrane.org/sites/consumers.cochrane.org/files/public/uploads/10%20May%202010%20Report%20Direct%20Patient%20Reporting%20of%20ADRs.pdf. Accessed 21 July 2016.
5. Margraff F, Bertram D. Adverse drug reaction reporting by patients: an overview of fifty countries. Drug Saf. 2014;37(6):409–19.
6. van Grootheest K, de Graaf L, de Jong-van den Berg LTW. Consumer adverse drug reaction reporting: a new step in pharmacovigilance? Drug Saf. 2003;26(4):211–7.
7. van Hunsel F, Talsma A, van Puijenbroek E, de Jong-van den Berg L, van Grootheest K. The proportion of patient reports of suspected ADRs to signal detection in the Netherlands: case–control study. Pharmacoepidemiol Drug Saf. 2011;20(3):286–91.
8. Rolfes L, van Hunsel F, Wilkes S, van Grootheest K, van Puijenbroek E. Adverse drug reaction reports of patients and

healthcare professionals: differences in reported information. Pharmacoepidemiol Drug Saf. 2015;24(2):152–8.
9. Hammond IW, Rich DS, Gibbs TG. Effect of consumer reporting on signal detection: using disproportionality analysis. Expert Opin Drug Saf. 2007;6(6):705–12.
10. Weigmann K. Consumer reporting of adverse drug reactions: systems that allow patients to report side effects of the drugs they are taking have yielded valuable information for improving drugs safety and health care. EMBO Rep. 2016;17(7):949–52.
11. Fernandopulle RBM, Weerasuriya K. What can consumer adverse drug reaction reporting add to existing health professional-based systems? Focus on the developing world. Drug Saf. 2003;26(4):219–25.
12. Blenkinsopp A, Wilkie P, Wang M, Routledge PA. Patient reporting of suspected adverse drug reactions: a review of published literature and international experience. Br J Clin Pharmacol. 2007;63(2):148–56.
13. Anderson C, Krska J, Murphy E, Avery A. The importance of direct patient reporting of suspected adverse drug reactions: a patient perspective. Br J Clin Pharmacol. 2011;72(5):806–22.
14. Golomb BA, McGraw JJ, Evans MA, Dimsdale JE. Physician response to patient reports of adverse drug effects: implications for patient-targeted adverse effect surveillance. Drug Saf. 2007;30(8):669–75.
15. Tattersall RL. The expert patient: a new approach to chronic disease management for the twenty-first century. Clin Med. 2002;2(3):227–9.
16. Topol E. The patient will see you now: the future of medicine is in your hands. New York: Basic Books; 2015.
17. European Commission. Regulation (EU) No. 1235/2010 of the European Parliament and of the Council of 15 December 2010. http://ec.europa.eu/health//sites/health/files/files/eudralex/vol-1/reg_2010_1235/reg_2010_1235_en.pdf. Accessed 16 June 2016.
18. Watson R. New rules will allow EU patients to report drug concerns directly. BMJ. 2010;341:c5344.
19. Borg JJ, Aislaitner G, Pirozynski M, Mifsud S. Strengthening and rationalizing pharmacovigilance in the EU: where is Europe heading to? A review of the new EU legislation on pharmacovigilance. Drug Saf. 2011;34(3):187–97.
20. Matos C, Härmark L, van Hunsel F. Patient reporting of adverse drug reactions: an international survey of national competent authorities' views and needs. Drug Saf. 2016;39(11):1105–16.
21. Elkalmi R, Hassali MA, Al-Lela OQ, Jawad Awadh AI, Al-Shami AK, Jamshed SQ. Adverse drug reactions reporting: knowledge and opinion of general public in Penang, Malaysia. J Pharm Bioallied Sci. 2013;5(3):224–8.
22. Reis CD, Veiga CE, Martins JJ. Pharmacovigilance in Cabo Verde: measuring the awareness and knowledge of consumers. J Pharmacovigil. 2016;4:200. doi:10.4172/2329-6887.1000200.
23. Fortnum H, Lee AJ, Rupnik B, Avery A. Survey to assess public awareness of patient reporting of adverse drug reactions in Great Britain. J Clin Pharm Ther. 2012;37(2):161–5.
24. Matos C, van Hunsel F, Joaquim J. Are consumers ready to take part in the pharmacovigilance system? A Portuguese preliminary study concerning ADR reporting. Eur J Clin Pharmacol. 2015;71(7):883–90.
25. Robertson J, Newby DA. Low awareness of adverse drug reaction reporting systems: a consumer survey. Med J Aust. 2013;199(10):684–6.
26. van Hunsel F, van der Welle C, Passier A, van Puijenbroek E, van Grootheest K. Motives for reporting adverse drug reactions by patient-reporters in the Netherlands. Eur J Clin Pharmacol. 2010;66(11):1143–50.
27. WHO-UMC. Countries participating in the WHO Programme for International Drug Monitoring, with year of joining. 2016. http://www.who-umc.org/DynPage.aspx?id=100653&mn1=7347&mn2=7252&mn3=7322&mn4=7442. Accessed 30 July 2016.
28. Ayamgha B. FDA launches patients safety programme. 2016. http://www.ghananewsagency.org/health/fda-launches-patients-safety-programme-104704. Accessed 30 July 2016.
29. Santos A. Direct patient reporting in the European Union a snapshot of reporting systems in seven member states. 2015. http://apps.who.int/medicinedocs/documents/s22088en/s22088en.pdf. Accessed 30 July 2016.
30. Hazell L, Cornelius V, Hannaford P, Shakir S, Avery AJ. How do patients contribute to signal detection? Drug Saf. 2013;36(3):199–206.
31. Härmark L, Raine J, Leufkens H, Edwards IR, Moretti U, Sarinic VM, et al. Patient-reported safety information: a renaissance of pharmacovigilance? Drug Saf. 2016;39(10):883–90.
32. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991;50(2):179–211.
33. Ajzen I. Constructing a theory of planned behavior questionnaire. 2006. http://people.umass.edu/~aizen/pdf/tpb.measurement.pdf. Accessed 11 Dec 2016.
34. Gavaza P, Brown CM, Lawson KA, Rascati KL, Wilson JP, Steinhardt M. Influence of attitudes on pharmacists' intention to report serious adverse drug events to the Food and Drug Administration. Br J Clin Pharmacol. 2011;72(1):143–52.
35. Gavaza P, Brown CM, Lawson KA, Rascati KL, Wilson JP, Steinhardt M. Examination of pharmacists' intention to report serious adverse drug events (ADEs) to the FDA using the theory of planned behavior. Res Soc Adm Pharm. 2011;7(4):369–82.
36. Wakefield JG, McLaws M-L, Whitby M, Patton L. Patient safety culture: factors that influence clinician involvement in patient safety behaviours. BMJ Qual Saf. 2010;19(6):585–91.
37. Angelis A, Pancani L, Steca P, Colaceci S, Giusti A, Tibaldi L, Alvaro R, Ausili D, Vellone E. Testing an explanatory model of nurses' intention to report adverse drug reactions in hospital settings. J Nurs Manag. 2017;25(4):307–17. doi:10.1111/jonm.12467.
38. Mausbach BT, Semple SJ, Strathdee SA, Patterson TL. Predictors of safer sex intentions and protected sex among heterosexual HIV-negative methamphetamine users: an expanded model of the theory of planned behavior. AIDS Care. 2009;21(1):17–24.
39. Whitby M, Pessoa-Silva CL, McLaws ML, Allegranzi B, Sax H, Larson E, Seto WH, Donaldson L, Pittet D. Behavioural considerations for hand hygiene practices: the basic building blocks. J Hosp Infect. 2007;65(1):1–8.
40. Guénette L, Lauzier S, Guillaumie L, Giguère G, Grégoire J-P, Moisan J. Patients' beliefs about adherence to oral antidiabetic treatment: a qualitative study. Patient Prefer Adherence. 2015;9:413–20.
41. Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF International. 2015. Ghana Demographic and Health Survey 2014. http://dhsprogram.com/pubs/pdf/FR307/FR307.pdf. Accessed 13 Apr 2017.
42. Food and Drugs Authority. DrugLens. 2016. http://fdaghana.gov.gh/images/stories/pdfs/DrugLens/DrugLensissue4.pdf. Accessed 12 Nov 2016.
43. Ampadu HH, Hoekman J, de Bruin ML, Pal SN, Olsson S, Sartori D, Leufkens HG, Dodoo AN. Adverse drug reaction reporting in Africa and a comparison of individual case safety report characteristics between Africa and the rest of the world: analyses of spontaneous reports in VigiBase®. Drug Saf. 2016;39(4):335–45.
44. Sabblah GT, Akweongo P, Darko D, Dodoo ANO, Sulley AM. Adverse drug reaction reporting by doctors in a developing country: a case study from Ghana. Ghana Med J. 2014;48(4):189–93.
45. Alomar MJ. Factors affecting the development of adverse drug reactions (review article). Saudi Pharm J. 2014;22(2):83–94.
46. Avery AJ, Anderson C, Bond CM, Fortnum H, Gifford A, Hannaford PC, et al. Evaluation of patient reporting of adverse drug

reactions to the UK "Yellow Card Scheme": literature review, descriptive and qualitative analyses, and questionnaire surveys. Health Technol Assess. 2011;15(20):1–234.
47. World Health Organization. The safety of medicines in public health programmes: pharmacovigilance an essential tool. 2006. http://www.who.int/medicines/areas/quality_safety/safety_efficacy/Pharmacovigilance_B.pdf?ua=1. Accessed 21 Dec 2016.
48. Ghana Statistical Service. Summary report of final results. 2012. http://www.statsghana.gov.gh/docfiles/2010phc/Census2010_Summary_report_of_final_results.pdf. Accessed 16 Dec 2016.