

Original Article

MEDICATION SAFETY ACTIVITIES OF HOSPITAL PHARMACISTS IN GHANA; EXPERIENCES AND EXPECTATIONS OF DOCTORS AND NURSES

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ABSTRACT

**Objective:** This study explored the experiences and expectations of doctors and nurses with pharmacists' medication safety activities in the hospital to determine the barriers to effective collaboration and potential clinical roles that pharmacists need to undertake to promote patient safety

**Methods:** This was a cross sectional descriptive survey. Questionnaires were administered to a conveniently selected 200 doctors and 120 nurses working in a 2000 bed teaching hospital in Ghana.

**Results:** A total of 269 questionnaires were completed representing a response rate of 84.1%. The response rates for doctors and nurses were 86% and 80.8% respectively. Sixty percent of doctors and 59% of nurses were satisfied with the interactions they had with pharmacists. Only 39.9% and 31.4% of respondents agreed that pharmacists write refill prescriptions and treat common ailments respectively. Moreover just over half (53.8%) agreed that pharmacists reconstitute I. V preparations for administration. However 80% and 85.3% agreed that pharmacists provide drug information and report on medication errors respectively. Doctors were twice as much less likely to agree that pharmacists monitor effectiveness and side effects of medication (P=0.006). More than 90% of respondents expect pharmacists to provide medication education to patients while only 66.3% agreed that pharmacists use their knowledge and skills to alter drug regimes in the best interest of patients.

**Conclusion:** The experiences of doctors and nurses with pharmacists were considered positive though they were more likely to accept and recognize traditional pharmacy services. Increasing awareness of these new pharmacists' clinical skills will be important for enhancing medication safety activities in the hospital.

**Keywords:** Doctors, Nurses, Perceptions, Medication safety, Pharmacists, Teamwork.

INTRODUCTION

The safe use of Medicines is one of the fundamental indicators of patient safety because medication incidents are among the largest group of incidents reported [1]. Studies have shown that medication incidents can occur at any stage in the medication use process and may be perpetuated through subsequent stages of care if not prevented [1-3]. As a result the prevention and or detection of medication incidents requires the collaborative efforts of all professionals directly or indirectly involved in the medication use process. The need to improve patient care by coordinating the activities of health care providers is a topic of increasing concern [4]. Researchers have identified latent factors underpinning medication errors that relate to the relationships between doctors, nurses and pharmacists [5-7]. Reason's (2004; 2005) human theory of error causations emphasised teamwork and communications challenges as factors contributing most incidents [8-10].

In the last decade, significant changes have occurred within the profession of pharmacy. The roles of pharmacists have expanded beyond the traditional dispensing into supplementary prescribing, medicines use review, ward pharmacy and others; all aimed at improving patient care and promoting patient safety. In health systems where pharmacists have been integrated successfully into drug therapy management processes, patient outcomes have improved [4, 11-15]. Moreover pharmacists have become key members of a multidisciplinary team for guideline development, formulary management, intravenous-to-oral conversions, monitoring of drug usage, reviewing complex patients and attending ward rounds etc [16, 17].

Doctors and nurses are among the key players in the medication use process and their views are valuable for pharmacists in the creation of medication safety culture in hospitals. Consequently, Doctors' and nurses' acknowledgement and understanding of the skills and knowledge of pharmacists to take up and operationalize these shared patient safety activities is essential. This study explored the

experiences and expectations of doctors and nurses on pharmacists' medication safety activities in the hospital.

MATERIALS AND METHODS

This was a cross sectional descriptive study representing the experiences and expectations of doctors and nurses on the involvement of pharmacists in medication safety activities in a tertiary care setting. A questionnaire consisting of mainly closed-ended questions with two open-ended questions was used to collect data. The questionnaire was in four sections; demographics, experiences with pharmacists, views on what the pharmacists' roles are and expectation of their role in medication safety. Most of the parts contained structured statements that required selection. The open-ended questions sought to explore additional views on ways to enhance pharmacists' future roles and also other reasons for interacting with pharmacists. For most of the closed-ended questions, the answers were to be given on either a four point Likert scale ranging from 'always' to 'not at all' or a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. A letter outlining the purpose, confidentiality of study participants responses and consent request was added to the questionnaire.

The self-administered questionnaires were administered to 200 conveniently sampled doctors and 120 nurses. Doctors received questionnaires either at a clinical meeting or in their offices while nurses received the questionnaires at their respective wards. Questionnaires completed at the clinical meeting by doctors were sealed and collected the same day while uncompleted ones were collected at their offices at a later date. Nurses presented sealed completed questionnaires to the data collectors at their wards at a later date. The data were collected within September and November 2013.

Data analysis

Data was analysed using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois) software. Data

was described using frequency distribution. Chi-square tests were used to compare responses and  $p < 0.05$  was considered statistically significant. In the presentation of results, strongly agree and agree were collapsed into an overall agreement response, and strongly disagree and disagree were collapsed into an overall disagree response.

## RESULTS

Of the 320 total questionnaires administered, a total of 269 were retrieved representing a total response rate of 84.1%. The response rates were 86% and 80.8% for doctors and nurses respectively. Demographics and other relevant characteristics are presented in Table 1.

Doctors' and nurses' interaction with pharmacists occurred sometimes during their routine hospital duties. More than two thirds of sampled doctors (82.6%) and nurses (78.4%) stated that they interacted with pharmacists. Sixty percent of doctors and 59% of nurses stated they were satisfied with the interactions they had with pharmacists.

The main reasons for the interactions related to seeking drug information (62.6%) and drug availability challenges (60.8%) as showed in Table 2.

**Table 1: Characteristics of study participants (N=269)**

Characteristic	n (%)
Doctors(n=172)	
Gender	
Male	113(65.7)
Female	59(34.3)
Current position	
House officer	41(23.8)
Medical officer	9(5.2)
Senior medical officer	3(1.7)
Resident	69(40.1)
Senior resident	15(8.7)
Specialist	17(9.9)
Consultant	18(10.5)
Nurses (n=97)	
Gender	
Male	8(7.3)
Female	89(92.7)
Current position	
Staff nurse	35(37.2)
Senior staff nurse	14(14.9)
Nursing officer	17(18.1)
Senior nursing officer	7(7.4)
Principal nursing officer	20(21.3)
Deputy director of nursing services	1(1.1)
Current area of practice of doctors & nurses	
Internal medicine	48(17.9)
Surgery	76(28.4)
Obstetrics & gynaecology	34(12.7)
Paediatric	46(17.2)
Emergency	32(11.9)
Orthopaedic	9(3.4)
Others*	23(8.6)
Experience of doctors & nurses(years)	
Mean ( $\pm$ S. D.)	6.9( $\pm$ 6.96)
Median (range)	5(1-34)

\*others: ENT, EYE, Maxillofacial, radiotherapy, anaesthesia, central OPD, cardiothoracic unit, dental)

**Table 2: Reasons and the frequency of interactions between respondents (doctors & nurses) and pharmacists**

Frequency of interaction	n (%)
Always	57(21.5)
Sometimes	161(60.8)
Rarely	40(15.1)
Not at all	7(2.6)
<i>Reasons for interactions*</i>	
Seek for drug information	166(62.6)
Drug availability challenges	161(60.8)
Patient drug therapy queries	95(35.8)
Side effects & adverse drug reactions reports	71(26.8)
Discuss patients' medication use	89(33.6)

\*More than one choice was applied to the sampled respondents, 7.6% doctors and 22.1% nurses indicated that they always had pharmacists to contribute to medication use. However, a third of doctors (37%) and nurses (33%) thought that the collaboration with pharmacists had always enhanced drug related patient safety (see Table 3&4).

Table 5 describes the level of agreement of doctors and nurses to what the roles of pharmacists in the hospital should be. Only 39.9% and 31.4% of respondents agreed that pharmacists write refill prescriptions and treat common ailments respectively. Just more than half (53.8%) agreed that pharmacists reconstitute I. V preparations for administration. Eighty percent and 85.3% agreed that pharmacists provide drug information and report on medication errors respectively.

Participants who had spent more than 3 years in practice were twice as much in agreement to pharmacists designing and monitoring pharmacotherapeutic regimens ( $P=0.046$ ). Doctors were twice as much less likely to agree that pharmacists monitor effectiveness and side effects of medication ( $P=0.006$ ). However, twice as many doctors agreed that pharmacists write refill prescriptions for existing therapies ( $P=0.038$ ).

More nurses than doctors agreed that pharmacists intervene to prevent prescribing and administration errors from reaching patients ( $P < 0.001$ ), provide discharge counseling ( $P=0.015$ ), treat ailments of common occurrence ( $P < 0.001$ ), and report on medication errors and adverse drug reactions ( $P < 0.001$ ). Residents were more likely to disagree that pharmacists intervene to prevent medication errors ( $P=0.036$ ) but less likely to disagree that pharmacists treat common ailments ( $P=0.001$ ).

The responses to the open-ended questions that solicited for additional ways pharmacists could enhance their medication safety roles were grouped into categories. Most of the responses related to the active participation on ward rounds, organization of regular medication-safety-update meetings and deployment of specially trained safety officers. Doctors wanted pharmacists to obtain additional training in safety measures while nurses expect pharmacists to increase their presence at the wards and actively provide drug updates on a regular basis.

**Table 3: Experiences and perceptions of doctors on interacting with hospital pharmacists**

Experience	Always n (%)	Sometimes n (%)	Rarely n (%)	Not at all n (%)
Do you get pharmacist to contribute to medication use in your practice?	13(7.6)	107(60.6)	47(27.6)	7(4.1)
How often are you satisfied with their contribution?	51(30.7)	108(65.1)	6(3.6)	1(0.6)
Do you think collaboration with pharmacists has enhanced drug related patient safety?	61(37.2)	84(51.2)	19(11.6)	0(0.0)
Do you think pharmacists are a reliable source of clinical drug information?	67(39.4)	92(54.1)	10(5.9)	1(0.6)
Would you consider pharmacists actions as being very patient centered?	35(21.0)	106(63.5)	25(15.0)	1(0.6)

**Table 4: Experiences and perceptions of nurses on interacting with hospital pharmacists**

Experience	Always	Sometimes	Rarely	Not at all
	n (%)	n (%)	n (%)	n (%)
Do you get pharmacist to contribute to medication use in your practice?	21(22.1)	46(48.4)	19(20.0)	9(9.5)
How often are you satisfied with their contribution?	28(30.4)	42(45.7)	11(12.0)	11(12.0)
Do you think the collaboration with pharmacists has enhanced drug related patient safety?	31(33.0)	42(44.7)	11(11.7)	10(10.6)
Do you think pharmacists are a reliable source of clinical drug information?	53(55.8)	35(36.8)	2(2.1)	5(5.3)
Would you consider pharmacists actions as being very patient centered?	29(31.2)	44(47.3)	9(9.7)	11(11.8)

**Table 5: Degree of agreement with what hospital pharmacists' activities should be**

Activities	% in agreement		% not in agreement	
	Doctors	Nurses	Doctors	Nurses
Provide patient education on their medicines	85.9	78.1	14.1	21.9
Monitor effectiveness and side effects of patients' medication	78.1	62.5	21.9	37.5
Recommend drug therapies to doctors	74.9	71.6	25.1	28.4
Intervene to prevent prescribing and administration errors from reaching patients	93.0	75.8	7.0	24.2
Design and monitor patients pharmacotherapeutic regimes	70.8	64.6	29.2	35.4
Write refill prescriptions for existing therapies	35.3	48.4	64.7	51.6
Provide discharge counselling on medication use	75.9	61.7	24.1	38.3
Treat ailments of common occurrences	22.9	46.8	77.1	53.2
Participate constantly and effectively with doctor teams	86.5	70.8	13.5	29.2
Reconstitute I. V preparations for administration	57.9	46.3	42.1	53.7
Dispense medication	81.7	86.0	18.3	14.0
Report on medication errors and adverse drug reactions	92.4	72.6	7.6	27.4
Actively provide reliable drug information to other healthcare professionals	91.2	82.3	8.8	17.7

More than 90% of respondents expected pharmacists to provide medication education to patients. Doctors and nurses differed in their expectations on some of the future roles of pharmacists. Almost 42% of doctors did not agree that pharmacists should use their knowledge and skills to alter drug regimens to the best interest of patients while only 19% of nurses did not agree. However, slightly more doctors (88%) than nurses (84%) want pharmacists to take

responsibility for resolving drug-related problems. Expectations of respondents have been presented in Table 6.

The suggestions of doctors and nurses in response to the open-ended question related to pharmacists increasing their participation on ward rounds, organization of regular workshops on new drugs and intensifying side effect monitoring of drugs.

**Table 6: Doctors' and nurses' expectations of pharmacists' clinical role(s)**

Description of role	Agree (%)		Neutral (%)		Disagree (%)	
	Doctors	Nurses	Doctors	Nurses	Doctors	Nurses
Assist prescribers in selecting appropriate medications	88.8	91.7	10.0	3.1	1.2	5.2
Take responsibility for resolving drug-related problems	84.6	87.5	11.2	7.3	4.2	5.2
Become knowledgeable drug-therapy experts	91.7	90.6	7.7	4.2	0.6	4.2
Provide patient medication education	94.1	91.7	4.7	5.2	1.2	3.1
Use their knowledge and skills to alter drug regimens in the best interest of patients	58.0	80.2	25.4	9.4	16.6	9.4
More patient oriented professionals than just dispensers and compounders of medication	91.7	87.5	7.7	9.4	0.6	3.1
Assist in designing hospital-specific therapeutic protocols for various diseases	92.9	86.5	5.3	9.4	1.8	4.2
Assist in selecting cost effective drug therapies	93.5	84.4	5.3	11.5	1.2	4.2

## DISCUSSION

The results of the study did not deviate widely from previous studies on the interrelationships between pharmacists, doctors and nurses working in the hospital. A response rate of 84.1% was considered very high. This could be attributed to the involvement of departmental heads and also may be due to the fact that most of the questionnaires were administered at a clinical meeting.

Pharmacists' interactions with doctors and nurses were frequent which confirms the fact that pharmacists' activities in the hospital were collaborative. The majority of doctors (60%) and nurses (59%) were satisfied with the interactions. The reasons for the interactions have not only included drug availability challenges but other more clinical services. However, doctors were reluctant to accept pharmacists' roles that included any aspect of prescribing as saw in other studies [18]. These included writing refill prescriptions and treating common ailments. Though several studies have evaluated pharmacist-doctor team management of drug therapy and have

reported improvements in blood pressure, diabetes outcomes, cholesterol levels and depression, there are barriers [4, 19, 20]. Moreover a study described the lack of confidence arising from the inadequacy of the interactions between pharmacists and doctors [21]. Liu and colleagues studied collaborative working relationship (CWR) model [22] and found that trustworthiness was a significant predictor of CWR as had been previously shown [4]. McDonough and colleague described that trustworthiness was an exchange variable that was vital in the development of collaborative relationships which grows if the pharmacist was able to demonstrate his/her competence. This consistent provision of useful information results in doctor trusting the expertise of the pharmacist. Each party then becomes willing to have open discussions about approaches relating to patient clinical management and about treating specific patients. A Cochrane review report had stated that the concept of collaboration, that is the process in which different professional groups work together, if successfully implemented, will have a positive impact on health care[23].

Doctors in the study were generally comfortable with pharmacist expanding their clinical roles like recommending drug therapies and monitoring effectiveness and side effects of medicines unlike a study done in the largest hospital in Jordan [24]. In the Jordan study, they attributed the lack of previous exposure to pharmacists' engagement as their reasons for non-agreement. This fact could explain why in this study junior doctors were more likely to disagree with pharmacists' clinical roles. In addition, the frequent change in where junior doctors work made it difficult to build professional relationships. The findings of this study, interestingly, compares with another study investigating the opinions of doctors and pharmacists toward pharmacists' professional duties; the results showed that over 80% of the sampled participants agreed that pharmacists should have an input in the patient's pharmacotherapeutic plan [25].

As in the study by Gillespie and colleagues [26], results of our study showed that the nurses saw the pharmacists as knowledgeable and informative and that they would like to continue the collaboration in the future. They also agreed with the expanded clinical roles of pharmacists but disagreed that pharmacists engaged in any aspects of prescribing as with doctors. All nurses as well as doctors, believed that their collaboration with pharmacists had resulted in enhanced patient care outcomes. Differences were noted in support of nurses for pharmacists' medication safety activities. As much as 80% wanted pharmacists to provide medication education to patients on admission while just above 60% approved pharmacists provision of discharge counselling. It is a possibility that some nurses might have confused the latter role with the general discharge counselling they performed which included patients' medications and might be protecting their territory. It was expected that nurses would have had more collaboration with pharmacists since their residence time at a unit was much stable [26]. Pharmacists need to forge trusting and close relationships when working in a team on a daily basis as this was favourable for inter-professional collaboration [4]. On the wards, pharmacists have the opportunity to talk to patients in addressing medication concerns in the presence of nurses. This should further enhance confidence and acceptability by nurses [27].

Nurses in the study did not perceive reconstitution of medicines as a responsibility of pharmacists. Traditionally in Ghana, with the exception of oncology drugs, nurses were solely responsible for reconstitution of parenteral medicines. Studies have described the challenges associated with nurses performing this activity [28-30] and hence proper awareness creation will be required for nurses to cede this role to pharmacists who by their training are more skilled [31, 32].

Doctors and nurses had high future expectations of pharmacists. With the exception of one, overwhelming proportions (90%) of respondents expect pharmacists to play more clinical roles in the future. They expressed indifference to the fact that pharmacists should use their knowledge and skills to alter drug regimens to the best interest of patients. Some doctors commented that pharmacists could undertake that activity with their express permission.

This study is among the very few that have used a single collection tool to compare the views of doctors and nurses and access aspects of their collaboration with pharmacists. This provides a comparative view which has implication for the development of joint strategies. However, the survey was cross sectional which accounts for information at a particular point. It thus provides limited information on temporal changes which can be well addressed by a longitudinal study. The influence of other characteristics of doctors and nurses on their perceptions was beyond the scope of this study. Also, the questionnaire consisted of many structured questions with only two open-ended questions. This restricted the respondents and limited the information provided. Future studies should also solicit from doctors and nurses the reasons for the low level of agreement to certain clinical roles of pharmacists.

## CONCLUSION

The experiences of doctors and nurses with pharmacists were considered positive though they were more likely to accept and recognize traditional pharmacy services. Roles for pharmacists

within the medication use process can involve multiple activities and these should be jointly determined to ensure proper collaboration. Moreover increasing awareness of these new pharmacists' clinical skills among the healthcare team will be important for enhancing medication safety activities in the hospital.

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## CONFLICT OF INTEREST

Authors declare no conflict of interest

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