Patients' Perception on Doctor –Pharmacist Collaborative Practice In Medical Care

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ABSTRACT

Patient care is a complex activity demanding cooperative work between health and social care professionals for optimal outcomes. Patient satisfaction is a yardstick for measuring quality of care and has become a standard part of evaluation of healthcare system. The study intends to find out the patients' level of satisfaction with care received and their perception of doctor-pharmacist collaboration. The study is a survey using questionnaires to determine the attitudes and expectations of patients that consented to take part in the research. The data obtained were computed and analyzed using a computer based analytical software. A descriptive statistics of the responses showed consensus decision amongst the respondents. From the one-way analysis of variance, there was no significant difference (p= 0.591) in the mean perception score across occupational status, educational status (P= 0.162) and age groups. An independent-samples t-test showed no significant difference (p=0.287) across gender. The Patients showed satisfaction with care received and expressed that doctor-pharmacist collaboration will reduce medication problems, mistakes/risks as well as improve the quality of care with an expectation that such collaboration is necessary and should be encouraged.

KEY WORDS: patients, perception, doctor-pharmacist, collaborative-practice, medical care.

INTRODUCTION

Evaluation of patient satisfaction has become a standard part of assessment of health care systems, and meeting patient expectations has become one of the main objectives of healthcare systems. Although patients' expectations are complex, insatiable and non-homogenous in clinical situations (Delgado *et al*, 2008), it is important and ethical to have their concerns addressed.

The increasing importance of the patient's opinion is revealed by high quality clinical outcome associated with compliance, which, in turn is dependent on patients' acceptance and satisfaction. Patient satisfaction is seen as a measure of the quality of care and helps legitimize the importance of the patient's perspective as against that of healthcare professionals who are primarily concerned with clinical outcome (Zebiene *et al*, 2004).

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In the evaluation of quality of care, patient satisfaction or the degree to which their expectations of healthcare are perceived as being fulfilled is highly emphasized (Greene *et al*, 1980). Patients seeking medical care have expectations and require information or services (care), the understanding of these expectations and attitude is important (Kravitz, 2001).

A truly collaborative healthcare team (with the patient as an integral member) is the optimal model of care. Although the micro culture of each healthcare team could be different, however a culture of continuous quality improvement pervades successful teams (Brennan *et al*, 2011). A healthcare system that supports effective teamwork will improve the quality of patient care, enhance patient safety, and reduce conflicts among healthcare professionals. Teamwork is most effective when there is clear purpose, good communication, co-ordination and active participation of all members with effective mechanisms to resolve conflict when it arises. Furthermore, recognizing the professional and personal contributions of all members promotes individual development and team interdependence. The need for interdependency in serving the patient demands an equal need for collaboration among team members where they recognize the benefits of working together and sees accountability as a collective responsibility (Eduardo *et al*, 2003; Holden *et al*, 2010; O'Leary *et al*, 2011).

A growing body of empirical studies on doctor-pharmacist collaboration has suggested that practice-based collaborative interventions improve healthcare processes and outcomes (Zwarenstein *et al*, 2009). Physician-pharmacist collaborative practices have been shown to improve and optimize the treatment outcomes of several medical conditions (Döhler *et al*, 2011; Jacobson et al, 2010; Kalisch *et al,* 2010; Lalonde *et al*, 2011). Also patients have shown preference for an innovative combined prescribing and dispensing role for pharmacists in the management of drug therapies compared to the traditional dispensing only role (Tinelli *et al*, 2009) with a positive perception on team-based clinical services involving pharmacist which revealed improved patient awareness of the pharmacists' role (Rosenthal *et al*, 2010).

Currently, several trends in the society advocate collaboration across a wide spectrum of stakeholders including the healthcare system (Audrey, 2003). This points to the need for increased collaboration among healthcare workers (pharmacists and physicians) considering the prevalence of drug-related morbidity and mortality. This study aim to find out Patients' trust and confidence in the doctors and pharmacists as well as their satisfaction with care received from them. It also intends to find out their perception on whether Doctor-Pharmacist collaboration is beneficial, necessary and should be encouraged.

METHODS

STUDY DESIGN

A prospective survey method using a structured questionnaire (Appendix 4) was employed for the study. The questionnaire was designed to seek for demographic information, patients' satisfaction and attitudes towards care received from doctors and pharmacists in the hospital as well as their confidence and trust in these professionals. It sought to determine patients' perception on the role and responsibility of the doctors and pharmacists in their management and whether the roles were complementary. It also sought to determine the patients' perception of doctor-pharmacist collaboration and benefits of such collaboration. The questionnaire response choice employed the 7-point Likert scale.

INCLUSION CRITERIA

Only adult patients (stable) on admission in the wards and adult patients visiting the out-patient department (OPD) of the hospital that consented to participate in the study were recruited

ETHICAL CLEARANCE

An application including the research protocol was submitted to the Plateau State Specialist Hospital Institutional Review Board (IRB) to obtain an ethical clearance. The research instrument (questionnaire) was administered to the patients that fulfill the inclusion criteria and consented to participate.

STUDY SITE

The Plateau State Specialist Hospital, Jos- Nigeria established in 1933 by British expatriate (tin miners) is now a tertiary Health institution and the State Government's apex hospital serving as a referral center for other General and cottage Hospitals within the state as well as a research center. The Hospital is one of the health institutions in the state approved by

the Nigerian Medical and Dental Council, Pharmacists Council of Nigeria and the Medical Laboratory Science and Technology Council of Nigeria for internship program for doctors, pharmacists and medical laboratory scientists respectively. It was approved by the Post-graduate Medical College of Nigeria in 1997 for the training of resident doctors in General Medical Practice. The hospital has a capacity of 176 (124 adult and 52 children) beds in eight (8) units (maternity, gynaecology, surgical & accidents, medical, paediatrics, amenity, intensive care and special care baby). It currently has total staff strength of 633 personnel consisting of pharmacists (23) and doctors (60). The doctors specialize in different areas of practice such as pediatrics, family medicine, surgery, obstetrics and gynaecology, psychiatry, ophthalmology e.t.c whereas the pharmacists are involved in general hospital pharmacy practice. The hospital has an average daily patient flow or visits of about 176 per day.

DATA ANALYSIS

The data obtained were analyzed using SPSS Statistics version 17.0., where probability (P-value) approach was utilized in comparing the data from the respondents for perception score. A descriptive statistics for all the questionnaire items was conducted and for making scientific decision, p-value of 0.05 was used as the level of significance. The One-way Analysis of Variance (ANOVA) and independent T-test were employed for testing hypotheses.

RESULTS

A total of 200 questionnaires were administered to patients that consented to respond in the study area with a response rate of 100%. The occupational frequency distribution of the patients was students (30.5%), unemployed (9.5%), private business (16.5%) and civil servants (43.5%).

Table 1.1 Patients' responses to the research questions

ITEM	SA (%)	MA (%)	sA (%)	N (%)	sD (%)	MD (%)	SD (%)
I trust and have confidence in the Doctors	52.5	30.0	7.0	4.5	1.5	2.5	2.0
I trust and have confidence in the Pharmacists	58.0	27.0	6.5	4.0	0.5	2.5	1.5
I am satisfied with care received from Doctors	45.5	31.0	9.0	6.0	2.5	3.5	2.5
I am satisfied with care received from Pharmacist	61.0	20.0	7.5	5.5	1.0	4.0	1.0
Doctors and Pharmacists have entirely separate roles	42.5	13.0	11.5	14.5	3.0	5.0	10.5
Doctors and Pharmacists roles are equally important	77.0	9.5	4.5	4.0	0.5	1.5	3.0
Doctors' and Pharmacists' roles are complementary	60.8	16.7	7.5	9.0	2.0	1.0	3.0
Doctors and Pharmacists work closely (collaborate)	64.0	17.0	7.5	4.5	1.0	4.5	1.5
Doctors and Pharmacists collaboration should be encouraged	84.5	7.0	1.5	2.5	0.0	1.5	3.0
Collaboration will reduce medication problems	65.5	15.5	3.0	4.5	1.5	3.5	6.5
Collaboration will reduce mistakes and risk	75.0	12.5	4.5	3.0	1.0	1.0	3.0
Collaboration will improve service quality and wellbeing	74.0	14.0	2.0	6.0	1.0	1.5	1.5
Collaboration will waste time and add to treatment cost	15.0	2.0	1.5	2.5	2.5	10.5	66.0

Key: SA = strongly agree, **MA** = moderately agree, **sA** = slightly agree, **N** = neutral, **sD** = slightly disagree, **MD** = moderately disagree and **SD** = strongly disagree

Table 1.2 Descriptive statistics of patients' response to research questions

ITEM	N	Mean	Std. Deviation	Decision
I trust and have confidence in the Doctors in this hospital.	200	6.120	1.34336	Agreed
I trust and have confidence in the Pharmacists in this hospital.	200	6.245	1.25413	Agreed
I am satisfied with the care I receive from doctors in this hospital.	200	5.885	1.50769	Agreed
I am satisfied with the care I receive from Pharmacists in this hospital	200	6.185	1.36385	Agreed
Doctors and Pharmacists have entirely separate roles in my care or treatment.	200	5.205	2.05036	Agreed
The roles of Doctors and Pharmacists are equally important in my care or treatment	200	6.420	1.35750	Agreed
The roles of Doctors and Pharmacists are complementary in my care or treatment.	199	6.106	1.46126	Agreed
The Doctors and Pharmacists closely work together in my care or treatment.	200	6.190	1.43324	Agreed
The Doctors and Pharmacists should be encouraged to work closely in patient care	200	6.570	1.27799	Agreed
Doctor-Pharmacist collaboration will reduce my medication problems.	200	6.085	1.71829	Agreed
Doctor-Pharmacist collaboration will reduce mistakes and risk in my care or treatment	200	6.425	1.32026	Agreed
Doctor-Pharmacist collaboration will improve service quality and facilitate my wellbeing.	200	6.450	1.21444	Agreed
Doctor-Pharmacist collaboration will only waste time and add to my treatment cost.	200	2.320	2.24338	Disagreed
Valid N (list wise)	**199**			

Table 1.3 Patients' perception score across occupation

Group	N	Mean	Std. Deviation	Std. Error	P-value	Decision
Student	61	74.9180	12.89741	1.6513	0.591	NS
Unemployed	19	76.1579	9.34085	2.1429		
Private business	33	75.3939	13.37895	2.3290		
Civil servant	87	77.3563	9.05792	0.9711		
Total	200	76.1750	11.11224	0.7858		

*NS = Not Significant (P>0.05)

The distribution for educational status was primary education (2.0%), secondary education (28.5%), National diploma/national certificate of education (39.5%), graduate (28.5%) and postgraduate (1.5%) with gender distribution of male (49.0%) and female (51.0%). The frequency distribution for age (group) of the patients revealed ages 18 -24 years (16.5%), 25 – 30 years (30.5%), 31-35 years (20.5%), 36-40 years

(12.0%), 41-45 years (7.0%), 46-50 years (4.0%), 51-55 years (4.0%) and 56-60 years (5.5%). The patients' responses to the questionnaire items were summarized as percentages as shown in Table 1.1 below. The descriptive statistics of the responses to the questionnaire items (Table 1.2) indicates disagreement where mean value is less than 4.0 and agreement where mean value is greater than 4.0. From the one-way analysis of variance (ANOVA), the mean perception score for the respondents across occupation showed no significant difference (Table

1.3) with p-value of 0.591

There is no significant difference (P= 0.162) in the mean perception score of the respondents across their educational qualification or status as revealed by the one-way analysis of variance (Table 1.4). However there is significant difference (P = 0.02) in mean perception score between respondents with secondary education and OND / NCE education as further revealed in the multiple comparison analysis (Appendix 2).

Table 1.4 Patients' perception score across educational qualification

Group (Educational Qualification)	N	Mean	Std. Deviation	Std. Error	P-value	Decision
Primary	4	81.7500	3.40343	1.702	0.162	NS
Secondary	57	73.4035	17.39238	2.304		
OND/NCE	79	77.8987	7.09748	0.799		
Graduate	57	76.0702	7.10095	0.941		
Post graduate	3	78.0000	4.35890	2.517		
Total	200	76.1750	11.11224	0.786		

Table 1.5 Perception score between male and female respondents

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff.	Std. Error Diff.	95% Confidence Interval of the Difference		
									Lower	Upper	
Patient Perception Score	Equal variances assumed	0.6	0.445	-1.068	198	0.287	-1.68	1.5713	-4.78	1.421	
	Equal variances not assumed			-1.070	197	0.286	-1.68	1.5676	-4.77	1.414	

An independent-samples t-test showed that there is no significant difference (p=0.287) in the mean perception score between male and female respondents (Table 1.5)

From the one-way analysis of variance (ANOVA), there is no significant difference in the mean

perception score across the age groups (Table 1.6). However the multiple comparisons (Appendix 3) revealed significant difference (p=0.029) in mean perception score between age groups 25 – 30 years and 56 – 60 years

Table 1.6 Perception score across the age groups of respondents

Group	N	Mean	Std. Deviation	Std. Error	P-value	Decision
18 - 24	33	76.3939	7.49558	1.30481		NS
25 - 30	61	73.9180	15.48902	1.98317		
31 - 35	41	76.5366	10.03518	1.56723		
36 - 40	24	78.8750	6.99262	1.42736	0.378	
41 - 45	14	74.1429	8.78685	2.34839		
46 - 50	8	76.8750	8.96720	3.17038		
51 - 55	8	77.5000	10.02853	3.54562		
56 - 60	11	81.9091	1.64040	0.49460		
Total	200	76.1750	11.11224	0.78575		

DISCUSSION

The demographic distribution for the respondents reflects the picture of the general population with a representation of gender, occupation, educational status and age distributions. This satisfies the purpose of a sample which reflects properties of the broader population (Rowe, 2007). Patients enlisted in the study showed more confidence and trust in pharmacists than doctors, this corroborates the recent reader's survey calling pharmacists "the most trusted" professionals (Ratiopharm, 2004) and the rating of pharmacists at position 6 with doctors at position 9 in the list of Australia's most trusted professionals (Reader's Digest, 2011). The patients also expressed more satisfaction with care received from pharmacists compared to care received from doctors. Trust and confidence is known to be influenced by satisfaction. However the overall level of trust and confidence expressed by the respondents in doctors and pharmacists as well as the level of satisfaction is not outstanding. Though the concept of satisfaction is understood to be complicated since there is rarely any theoretical or conceptual development of patient satisfaction (Gill & White, 2009), this could provide an insight or explanation for the patients' expression. The findings of this study, however contradicts the report that patients perceive a better quality of relationship with their physicians compared to relationship with their pharmacists (Keshishian, Colodny & Boone, 2008). This shows the complexity of the concept of patient satisfaction. Nevertheless majority of patients expressed trust and confidence in their doctors and

pharmacist as well as satisfaction in the care they received.

The patients portrayed an understanding of the roles of doctors and pharmacists in their care based on their response by strongly agreeing that doctors' and pharmacists' roles in their management are entirely separate. They agreed that these roles are equally important and complementary, which is indicative of their appreciation of the difference in the roles of doctors and pharmacists. This understanding of role specification noted as a key factor that affects collaborative care and supports collaborative working relationship (Liu & Doucette, 2011) is very important and goes a long way in influencing the quality of responses on the subject matter.

The degree to which the respondents agree that doctors and pharmacists work closely together in their care implies that there is collaboration between the doctors and pharmacists in the study area. This is supported by the patients' understanding of the roles of doctors and pharmacists in their care or management giving them the basis to appreciate when there is close working relationship (collaboration), though the nature and aspects of collaboration was not within the scope of this study. As it has been noted that understanding the expectations and attitudes of patients is important (Kravitz, 2001), the respondents strongly believe that doctor-pharmacist collaboration will reduce their medication problems as well as reduce mistakes and risk in their care or treatment, thus they highly support the encouragement of doctor-pharmacist collaboration. Patients' understanding influence their

knowledge and behaviour. Their involvement and active participation in the collaborative problem-solving will help in the management of health problems and enable them to take greater control of the determinants of their own health.

The respondents disagree that doctor-pharmacist collaboration will only waste time and add to the cost of their treatment or care indicating appreciation of such collaboration in line with other findings that doctor-pharmacist collaboration improves patient treatment outcome and help address the complexities of drug therapy (Eduardo *et al*, 2003; Isetts *et al*, 2006; Keshishian *et al,* 2008; Locca *et al*, 2009; Rigby, 2010). Communication issues have been frequently associated as contributors to serious medical errors (Brennan, 2011) and effective communication between the healthcare providers is essential as it ensures sharing of relevant information by way of collaboration. There was expression of consensus in perception of the respondents with mean perception score across occupation, educational status, gender and age group showing no significant statistical difference, although multiple comparisons revealed some statistical difference but the difference is not enough to affect the overall mean perception score of the groups.

CONCLUSION

The study revealed that patients in the study area have trust and confidence in the doctors and pharmacists. They expressed that doctors and pharmacists have separate roles in healthcare delivery which are equally important and complementary, indicative that the doctors and pharmacists in the study area collaborate in their care. The respondents endorsed the encouragement of collaboration of doctors and pharmacists as being necessary; anticipating that such relationship will reduce treatment and medication errors, improve the care received and ultimately facilitate quick recovery.

I confirm all patient identifiers have been removed so the patients described are not identifiable and cannot be identified through the details of the study.

REFERENCES

Audrey L (2003); Interprofessional collaboration: from policy to practice in health and social care. Taylor & Francis group. Pp 44-55.

Brennan C, Donnelly K and Somani S (2011); Needs and Opportunities for Achieving Optimal Outcomes from the Use of Medicines in Hospitals and Health Systems: *American Journal of Health-System Pharmacy*. 68 (12) 1086-1096.

Delgado A, Andrés L, López-Fernández, Luna JD, Gil N, Jiménez M, and Puga A. (2008); Patient expectations are not always the same: *Journal of Epidemiology and Community Health*. 62: 427-434.

Döhler N, Krolop L, Ringsdorf S, Meier K, Ko YD, Kuhn W, Schwalbe O and Jaehde U (2011); Task allocation in cancer medication management - Integrating the pharmacist: *Patient Education and Counseling*. 83 (3): 367-374.

Eduardo S, Dana ES, Cameron K and Shawn CB (2003); Can team work enhance patient safety? : Risk management foundation, Harvard medical institutions. *Forum*. 5-10

Gill L and White L (2009); A critical review of patient satisfaction: *Leadership in health services*. 22 (1): 8 – 9.

Greene JY, Weinberger M, and Mamlin JJ (1980); Patient attitudes toward health care: Expectations of primary care in a clinic setting. *Social Science and Medicine. Part A: Medical Psychology & Medical Sociology*. 14 (2): 133-138.

Holden LM, Watts DD and Walker PH (2010); Communication and collaboration: it's about the Pharmacists, as well as the physicians and nurses: *Quality and safety in health care Institute for Healthcare Improvement*. 19: 169-172.

Isetts BJ, Schondelmeyer SW, Heaton AH, Wadd WB, Hardie NA, Artz MB (2006); Effects of collaborative drug therapy management on patients' perceptions of care and health-related quality of life: *Research in Social and Administrative Pharmacy*. 2 (1):129-142.

Jacobson Vann JC, Christofferson S, Humble CG, Wegner SE, Feaganes JR and Trygstad TK (2010); Pharmacist and physician satisfaction and rates of switching to preferred medications associated with an instant prior authorization program for proton pump inhibitors in the North Carolina Medicaid program: *Journal of Managed Care Pharmacy*. 16 (4): 250-263.

Kalisch LM, Roughead EE and Gilbert AL (2010); Improving heart failure outcomes with pharmacist-physician collaboration: how close are we? : *Future Cardiology*. 6(2):255-268.

Keshishian F, Colodny N and Boone RT (2008); Physician-patient and pharmacist-patient communication: geriatrics' perceptions and opinions: *Patient Education and Counseling*. 71 (2): 265-284.

Kravitz RL (2001); The physician-patient relationship measuring patients' expectations and request: *Annals of internal medicine*. 134(9): 881-888.

Lalonde L, Hudon E, Goudreau J, Bélanger D, Villeneuve J, Perreault S, Blais L, and Lamarre D (2011); Physician-pharmacist collaborative care in dyslipidemia management: The perception of clinicians and patients: *Research in Social and Administrative Pharmacy*. 7 (3): 233–245

Liu Y and Doucette WR (2011); Exploring stages of pharmacist-physician collaboration using the model of collaborative working relationship: *Journal of the American Pharmacists Association*. 51 (3) 412-417

Locca JF, Niquille A, Krähenbühl JM, Figueiredo H and Bugnon O (2009); Physician-pharmacist collaboration: a way to improve the quality of drug prescribing: *Revue medicale suisse*. 5 (227): 2382-2384, 2386-2387.

O'Leary KJ, Buck R, Fligiel HM, Haviley C, Slade ME, Landler MP, Kulkarni N, Hinami K, Lee J, Cohen SE, Williams MV and Wayne DB (2011); Structured Interdisciplinary Rounds in a Medical Teaching Unit Improving Patient Safety: *Archives of Internal Medicine*. 171 (7): 678-684.

Ratiopharm (2004); Consumers' perception of pharmacy: *The ratiopharm* CFP report on pharmacy services. www.ratiopharm.ca (accessed 06/07/13)

Reader's digest (2011); Australia's Most Trusted Professions: *Reader's digest Australia*. Number 32. http://www.readersdigest.com.au/australias-most-trusted-professions-2011

Rigby Debbie (2010); Collaboration between doctors and pharmacists in the community: *Australian Prescriber*. 33 (6): 191–193.

Rosenthal M, Makowsky MJ, Tsuyuki RT and Madill HM (2010); Patient's Perspectives on Team-Based Care by a Clinical Pharmacist: Case Report; *Canadian Journal of Hospital Pharmacy*. 63 (1): 38–40.

Rowe P (2007); Essential Statistics for the Pharmaceutical Sciences: John Wiley & Sons Ltd, England www.wileyeurope.com

Tinelli M, Ryan M and Bond C (2009); Patients' preferences for an increased pharmacist role in the management of drug therapy: *International Journal of Pharmacy Practice*. 17 (5): 275–282.

Zebiene E, Razgauskas E, Basys V, Baubiniene A, Gurevicius R, Padaiga Z and Svab I (2004); Meeting patient's expectations in primary care consultations in Lithuania. *International Journal for Quality in Health Care*. 16 (1): 83–89.

Zwarenstein M, Goldman J and Reeves S (2009); Interprofessional collaboration: effects of practice-based interventions on professional practice and healthcare outcomes: *Cochrane Database Systematic Reviews*. (3): CD000072. *http://www.ncbi.nlm.nih.gov/pubmed/19588316*

Appendix 1: Multiple comparison of mean perception score across respondents' occupation

(I). Occupation	(J). Occupation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Student	Unemployed	-1.23986	2.92746	0.672	-7.0132	4.5335
	Private business	-0.47591	2.40785	0.844	-5.2245	4.2727
	Civil servant	-2.43829	1.86077	0.192	-6.108	1.2314
Unemployed	Student	1.23986	2.92746	0.672	-4.5335	7.0132
	Private business	0.76396	3.20889	0.812	-5.5644	7.0923
	Civil servant	-1.19843	2.82165	0.672	-6.7631	4.3663
Private business	Student	0.47591	2.40785	0.844	-4.2727	5.2245
	Unemployed	-0.76396	3.20889	0.812	-7.0923	5.5644

	Civil servant	-1.96238	2.27804	0.390	-6.455	2.5302
Civil servant	**Student**	2.43829	1.86077	0.192	-1.2314	6.1080
	Unemployed	1.19843	2.82165	0.672	-4.3663	6.7631
	Private business	1.96238	2.27804	0.390	-2.5302	6.4550

Appendix 2: Multiple comparison of mean perception score across educational status

(I). Educational status	(J). Educational status	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	**Upper Bound**
Primary education	**Secondary education**	8.34649	5.71022	0.145	-2.915	19.608
	Under graduate (OND/NCE)	3.85127	5.65784	0.497	-7.307	15.010
	Graduate	5.67982	5.71022	0.321	-5.582	16.942
	Post graduate	3.75000	8.43167	0.657	-12.880	20.379
Secondary education	**Primary education**	-8.34649	5.71022	0.145	-19.610	2.915
	Under graduate (OND/NCE)	-4.49523(*)	1.91855	0.020	-8.279	-0.711
	Graduate	-2.66667	2.06791	0.199	-6.745	1.412
	Post graduate	-4.59649	6.53932	0.483	-17.490	8.300
Under graduate (OND/NCE)	**Primary education**	-3.85127	5.65784	0.497	-15.010	7.307
	Secondary education	4.49523(*)	1.91855	0.020	0.711	8.279
	Graduate	1.82856	1.91855	0.342	-1.955	5.612
	Post graduate	-0.10127	6.49363	0.988	-12.910	12.706
Graduate	**Primary education**	-5.67982	5.71022	0.321	-16.940	5.582
	Secondary education	2.66667	2.06791	0.199	-1.412	6.745
	Under graduate (OND/NCE)	-1.82856	1.91855	0.342	-5.612	1.955
	Post graduate	-1.92982	6.53932	0.768	-14.830	10.967
Post graduate	**Primary education**	-3.75000	8.43167	0.657	-20.380	12.879
	Secondary education	4.59649	6.53932	0.483	-8.300	17.493
	Under graduate (OND/NCE)	0.10127	6.49363	0.988	-12.710	12.908
	Graduate	1.92982	6.53932	0.768	-10.970	14.827

* The mean difference is significant at the 0.05 level.

Appendix 3: Multiple comparison of mean perception score across age groups

(I) Age group	(J) Age group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	**Upper Bound**
18 - 24	**25 - 30**	2.47591	2.39795	0.303	-2.254	7.2056
	31 - 35	-0.14265	2.59517	0.956	-5.261	4.9761

	36 - 40	-2.48106	2.97696	0.406	-8.353	3.3907
	41 - 45	2.25108	3.53938	0.526	-4.730	9.2321
	46 - 50	-0.48106	4.37309	0.913	-9.107	8.1444
	51 - 55	-1.10606	4.37309	0.801	-9.732	7.5194
	56 - 60	-5.51515	3.86342	0.155	-13.140	2.1050
25 - 30	18 - 24	-2.47591	2.39795	0.303	-7.206	2.2538
	31 - 35	-2.61855	2.241	0.244	-7.039	1.8016
	36 - 40	-4.95697	2.67385	0.065	-10.230	0.3169
	41 - 45	-0.22482	3.28852	0.946	-6.711	6.2614
	46 - 50	-2.95697	4.17266	0.479	-11.190	5.2732
	51 - 55	-3.58197	4.17266	0.392	-11.810	4.6482
	56 - 60	-7.99106(*)	3.63499	0.029	-15.160	-0.8210
31 - 35	18 - 24	0.14265	2.59517	0.956	-4.976	5.2613
	25 - 30	2.61855	2.241	0.244	-1.802	7.0387
	36 - 40	-2.33841	2.85205	0.413	-7.964	3.2870
	41 - 45	2.39373	3.43498	0.487	-4.381	9.1689
	46 - 50	-0.33841	4.28904	0.937	-8.798	8.1213
	51 - 55	-0.96341	4.28904	0.823	-9.423	7.4963
	56 - 60	-5.37251	3.76801	0.156	-12.800	2.0595
36 - 40	18 - 24	2.48106	2.97696	0.406	-3.391	8.3528
	25 - 30	4.95697	2.67385	0.065	-0.317	10.2310
	31 - 35	2.33841	2.85205	0.413	-3.287	7.9638
	41 - 45	4.73214	3.73182	0.206	-2.629	12.093
	46 - 50	2.00000	4.53026	0.659	-6.936	10.9360
	51 - 55	1.37500	4.53026	0.762	-7.561	10.3110
	56 - 60	-3.03409	4.04046	0.454	-11.000	4.9353
41 - 45	18 - 24	-2.25108	3.53938	0.526	-9.232	4.7300
	25 - 30	0.22482	3.28852	0.946	-6.261	6.7111
	31 - 35	-2.39373	3.43498	0.487	-9.169	4.3814
	36 - 40	-4.73214	3.73182	0.206	-12.090	2.6285
	46 - 50	-2.73214	4.91814	0.579	-12.430	6.9684
	51 - 55	-3.35714	4.91814	0.496	-13.060	6.3434
	56 - 60	-7.76623	4.47104	0.084	-16.580	1.0524
46 - 50	18 - 24	0.48106	4.37309	0.913	-8.144	9.1065
	25 - 30	2.95697	4.17266	0.479	-5.273	11.1870
	31 - 35	0.33841	4.28904	0.937	-8.121	8.7981
	36 - 40	-2.00000	4.53026	0.659	-10.940	6.9355

	41 - 45	2.73214	4.91814	0.579	-6.968	12.4330
	51 - 55	-0.62500	5.54841	0.910	-11.570	10.3190
	56 - 60	-5.03409	5.15625	0.330	-15.200	5.1361
	18 - 24	1.10606	4.37309	0.801	-7.519	9.7315
	25 - 30	3.58197	4.17266	0.392	-4.648	11.8120
	31 - 35	0.96341	4.28904	0.823	-7.496	9.4231
51 - 55	**36 - 40**	-1.37500	4.53026	0.762	-10.310	7.5605
	41 - 45	3.35714	4.91814	0.496	-6.343	13.0580
	46 - 50	0.62500	5.54841	0.910	-10.320	11.5690
	56 - 60	-4.40909	5.15625	0.394	-14.580	5.7611
	18 - 24	5.51515	3.86342	0.155	-2.105	13.1350
	25 - 30	7.99106(*)	3.63499	0.029	0.821	15.1610
	31 - 35	5.37251	3.76801	0.156	-2.060	12.8050
56 - 60	**36 - 40**	3.03409	4.04046	0.454	-4.935	11.0040
	41 - 45	7.76623	4.47104	0.084	-1.052	16.5850
	46 - 50	5.03409	5.15625	0.330	-5.136	15.2040
	51 - 55	4.40909	5.15625	0.394	-5.761	14.5790

* The mean difference is significant at the 0.05 level.

APPENDIX 4

QUESTIONNAIRE

Dear Respondent,

I am carrying out a research on "Doctor-Pharmacist collaborative role in Patient management: perception of Patients". This questionnaire is designed to find out perceptions of the respondents on Doctor-Pharmacist collaboration in the study area. Kindly make out time and feel free to answer the questions sincerely by ticking the appropriate options that apply to you. Your response will be treated with utmost confidentiality.

Occupation---------------------- Educational status ------------------- Sex ---------- Age ------ (years)

1. I trust and have confidence in the Doctors in this hospital.

☐Strongly agree ☐moderately agree ☐slightly agree ☐Neutral ☐slightly disagree ☐moderately disagree ☐trongly disagree

2. I trust and have confidence in the Pharmacists in this hospital.

☐Strongly agree ☐moderately agree ☐slightly agree ☐Neutral ☐slightly disagree ☐moderately disagree ☐ongly disagree

3. I am satisfied with the care I receive from doctors in this hospital.

☐Strongly agree ☐moderately agree ☐slightly agree ☐Neutral ☐slightly disagree ☐moderately disagree ☐strongly disagree

4. I am satisfied with the care I receive from Pharmacists in this hospital

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightly disagree ☐ moderately disagree
☐ ongly disagree

5. Doctors and Pharmacists have entirely separate roles in my care or treatment.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightly disagree ☐ moderately disagree
☐ strongly disagree

6. The roles of Doctors and Pharmacists are equally important in my care or treatment.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightly disagree ☐ moderately disagree
☐ strongly disagree

7. The roles of Doctors and Pharmacists are complementary in my care or treatment.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree
☐ ongly disagree

8. The Doctors and Pharmacists closely work together in my care or treatment.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree
☐ ongly disagree

9. The Doctors and Pharmacists should be encouraged to work closely in patient care.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree
☐ ongly disagree

10. Doctor-Pharmacist collaboration will reduce my medication problems.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree
☐ s ongly disagree

11. Doctor-Pharmacist collaboration will reduce mistakes and risk in my care or treatment

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree
☐ ongly disagree

12. Doctor-Pharmacist collaboration will improve service quality and facilitate my wellbeing

Strongly agree   moderately agree   slightly agree   Neutral   slightlydisagree   moderately disagree   strongly disagree

☐ ☐ ☐ ☐ ☐ ☐

13. Doctor-Pharmacist collaboration will only waste time and add to my treatment cost.

☐ Strongly agree ☐ moderately agree ☐ slightly agree ☐ Neutral ☐ slightlydisagree ☐ moderately disagree ☐
☐ s ngly disagree

THANK YOU FOR TIME TAKEN