

Factors Influencing Drug Use Information Received at Primary Healthcare Centre Pharmacies in Ghana

Edward Wilson Ansah¹  and Elias Kweshievi Menyau²

¹Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast, Ghana. ²Faculty of Health and Behavioural Sciences, University of Wollongong, Wollongong, NSW, Australia.

Health Services Insights
Volume 15: 1–6
© The Author(s) 2022
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/11786329221127140



ABSTRACT

BACKGROUND: Health literacy addresses environmental, political, and social factors that determine health. Drug dispensers play a major role in educating patients on drug use to increase effective and efficient drug utilisation, thereby promoting positive healthcare outcomes. From the patients' perspective, this study examined the communication quality between patients and drug dispensers at primary healthcare centres in the Cape Coast Metropolis of Ghana.

METHOD: We conveniently surveyed 269 patients seeking health care at primary healthcare facilities using a researcher-constructed 13-item instrument. In SPSS version 21 software, we analysed the data using percentages, chi-square analysis, and logistic regression.

RESULTS: Almost half of the participants (n = 132) reported low health literacy, with 81% (n = 218) reporting that drug side effects were not discussed with them at the pharmacies. The findings further indicated that health literacy and educational level predicted general communication quality between participants and drug dispensers; participants with secondary education were about 3 times more likely to report not being told of the side effects of prescribed drugs as compared with those who had completed only basic education.

CONCLUSIONS: There is still a high level of low health literacy among patients seeking healthcare at primary healthcare centres and a very high percentage of patients did not receive any education on side effects of dispensed drugs. Drug use directives from dispensers at primary healthcare facilities can make a difference between any 2 patients.

KEYWORDS: Health literacy, drug communication, dispensers, drug side effects, primary healthcare facility

RECEIVED: April 23, 2022. **ACCEPTED:** August 31, 2022.

TYPE: Original Research

FUNDING: The author(s) received no financial support for the research, authorship, and/or publication of this article.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Edward Wilson Ansah, Department of Health, Physical Education and Recreation, University of Cape Coast, Cape Coast, Ghana.
Email: edward.ansah@ucc.edu.gh

Introduction

Patient safety is one of the topmost priorities in healthcare systems globally.¹ Provision of safe primary healthcare is high on the agenda of the World Health Organisation (WHO) because primary health care strives to tackle the politically, socially and economically unacceptable health inequalities in all countries.² Primary healthcare services are becoming more prevalent globally with a focus on integrated people-centred health care. These services serve as an entry point into the healthcare system, provide continual care, and can reduce illness, injury, and death.² Thus, access to safe primary healthcare is critical to the achievement of universal health coverage and to supporting the United Nations Sustainable Development Goals.³

Medical errors constitute a huge setback to patient safety, cause considerable patient harm, and prolong recovery from illness.¹ The Global Patient Safety Challenge (GPSC) on medication safety aims to address the weaknesses in health systems that lead to medication errors and the severe harm that ensues.⁴ Evidence also indicated that 30% of patients affected by medical errors will die or be disabled for more than 6 months.⁵ Factors associated with medical errors include the provider's competence, the patient and work environment, number of medications, childhood and older age, and medications for certain

disease states.⁶ Given the growing demand for healthcare, substantial and increased medication administration is inevitable, raising concerns about a growing risk of errors.⁷ Medication errors are the most common sources of medical errors with adverse events such as increased length of hospitalisation, increased costs of hospitalisation, re-admission, disability and distrust in the healthcare system, and severe injury or death.⁸

Varying degrees of medication errors have been reported worldwide. It was estimated that in 44 000 to 98 000 deaths due to medical errors, 7000 occurred due to medication errors in 2004.⁶ Medication errors cost the United Kingdom £1.1 bn annually,⁹ while in Saudi Arabia such errors accounted for approximately one-fifth of all errors encountered in primary healthcare settings.¹⁰ The growing enormity of the problem and the harm caused by medication errors warranted the WHO to initiate the Global Patient Safety Challenge on Medication Safety in 2017.⁴ The aims include halving medication-related errors in all countries by 2022; essentially improving the way medicines are prescribed, distributed, and consumed, and increasing awareness among patients about the risks associated with the improper use of medication.¹¹

Low and middle-income countries (LMICs) share the greatest burden of medication errors in terms of health



expenditure and years of healthy life lost.¹² A study that explored the current knowledge of patient safety and quality of care in LMICs in Southeast Asia identified medication errors as 1 of the 4 major inter-related safety and quality concerns.¹³ A systematic review conducted among countries in the Middle East reported a high medication error rate of 34.8%.¹⁴

Drug dispensing and related activities are critical to reducing medication errors. With regard to dispensing drugs, the effectiveness of the communication between healthcare providers and patients is of prime importance, as misinformation or miscommunication could be fatal, particularly in LMICs where comprehensive healthcare coverage is absent. Such interaction should produce mutual understanding and meaningful deliberation between healthcare providers and patients, which need to continue until both parties are satisfied.¹⁵ However, in the hospital setting, communication is mostly dominated by the healthcare professional who explains medical instructions to patients.¹⁶ This interaction is inspired by the biomedical model, wherein the healthcare provider assumes an authoritative role as the medical expert. Recently, there has been a paradigm shift to a more patient-centred model where patients are actively engaged in medical decision making.¹⁷ This was described as “care that is respectful of and responsive to individual patient preferences, needs, and values. . . that patient values guide all clinical decisions” (p. 781).¹⁸ With this model, providers present varied therapeutic options with their respective risks and benefits while the patients discuss their choices and preferences based on their values.¹⁹ Many benefits of the patient-centred approach have been advocated including, improvement in communication, ultimately ensuring medication adherence,²⁰ which has shown to improve the health status of patients.²¹

Investigating the extent of pharmacists’ involvement in medication education, it was found that both physicians and pharmacists explained the use of medication, but pharmacists provided much clearer instructions than did physicians. Accordingly, 90% of the patients who needed more information on their medicines did not receive it. Besides, 100% of the patients were not told about drug adverse effects, storage conditions (93%), important precautions (91%), drug-food interactions (90%), and preparation of suspensions (64%). Even worse, 51% of these patients reported making mistakes in the use of their medications, and in 16% this resulted in serious consequences.²²

While many studies have been conducted on the pharmacist’s role in enhancing medication adherence²³ and the effects of good physician-patient relationships and effective communication on clinical outcomes including medication adherence,²⁴ there is very little information on how effective communication between drug dispensers (including pharmacists, pharmacy technicians, dispensers, etc.) and patients might affect patients’ medication adherence and how they should act in the case that they experience drug adverse effects.¹² Furthermore, such studies in LMICs are scarce and cover general areas such as utilisation of healthcare services and health

literacy.²⁵ We, therefore, explored drug use communication and factors influencing such communication between patients and drug dispensers at primary healthcare facilities. In addition, we investigated the extent to which health literacy, gender, and educational level influenced the odds of perceived general drug use communication between patients and drug dispensers at these facilities in Cape Coast, Ghana.

Methods

We used a cross-sectional survey to study 269 patients who sought medical care at 2 primary healthcare facilities in the Cape Coast Metropolis of Ghana. It was not possible to determine a priori the sample size before data collection since there was no credible patients’ attendant data in the metropolis. However, it is believed that a sample size of 269 is large enough for reliable results with a cross-sectional survey.²⁶ Thus, we sought the views of the participants who had visited the pharmacy and interacted with the drug dispensers about their prescriptions as they received their medications. Minors and other patients who showed obvious signs of severe pain were excluded from the study. This was because such patients could not provide accurate answers to the questions, and they also were in a hurry to go home.

Instrument

We used a 13-item questionnaire instrument to collect data. The instrument was developed based on previous empirical literature.^{26,27} Two items (Q1-Q3) were adopted from pre-existing instruments to measure the health literacy of the patients.²⁷⁻²⁹ Patients answered questions on their ability to read and comprehend health or medical information without help, or have problems of interpreting such literature, either in pictures or written form. The participants responded on a five-point Likert scale ranging from 1 (=always have problems) to 5 (=never have problems). The instrument solicited participants’ information such as age, gender, and educational level. Moreover, the questionnaire collected data on drug communication between patients, and drug dispensers (Q4-Q13). Patients or participants also answered questions on whether dispensers interpreted to patients and gave directives on how drugs received at the dispensaries should be used. Participants also provided information on whether they were satisfied with the interaction between themselves and the dispensers. Or whether dispensers informed patients of the side effects of the drugs and what to do if patients experience any side effect. Patients were also asked whether they expected the dispensers to explain to them verbally how the drugs should be used and side effects likely to occur upon taking the drugs. Participant responded 1 = never, 2 = sometimes, 3 = always, which we later categorised as 0 = never/sometimes and 1 = always.

The instrument was administered using convenient sampling method. We administered the instrument to the participants at the point where participants had received their prescribed medications and exited the pharmacists. Participation in the study

was completely voluntary. Participants who agreed to participate signed informed consent statement or gave verbal consent. Participants who had no formal education (Illiterate participants) had the instrument interpreted to them in the local dialect by 2 field workers who were recruited from the locality and therefore could speak and understand the local dialect (Fante) of the participants. The field workers were further trained to administer the instrument. For instance, the instrument was translated and back-translated. Thus, with the help of a Language expert from the Department of Ghanaian Language, University of Cape Coast, the questionnaire was translated into the Fante Language and translated back into the English Language during the training. This was to help all the researchers to be able to interpret the questionnaire items with the same comprehension. It took 1 week to collect the data, March 2016.

To ensure the face and content validity of the instrument, the questionnaire was administered to 4 nurses, who were offering a Master of Philosophy (Health Education) degree, 2 drug dispensers (from a university hospital), and a professor in Health Education. We conducted a pilot test on the questionnaire using 40 patients from a different district but closer to the Cape Coast Metropolis. The pilot participants are also Fantes who speak and understand the same dialect and are considered to have very similar characteristics. The instrument yielded a Cronbach's alpha reliability value of .76 from the pilot data. The study was approved (ID: UCCIRB/CES/2016/099) by the Institutional Review Board of the University of Cape Coast, Ghana. The heads of administration of the 2 healthcare facilities also granted permission to use their facilities for the survey.

Data Analysis

The analysis was done using frequency counts, percentages, a Chi-Square test (χ^2), and regression models. In addition, we explored the extent to which gender, health literacy levels (a continuous variable), and educational level predicted the odds of reporting expectation of communication about drug side effects by dispensers during dispenser-patient interaction. Further, we investigated the extent to which health literacy, gender, and educational level predicted the odds of perceived general drug use communication between patients and the dispensers. Thus, the dependent variables, namely drug side effect communication and general drug use communication quality were dichotomised into low and high (items 4-13), from a composite score ranging from 1 to 10. These dependent variables were dichotomised to satisfy the requirement for conducting logistic regression analysis. Thus, $Y = a + bx$.

Results

Socio-demographic characteristics of the study participants (n = 269)

The ages of participants ranged between 18 and 78 years ($M = 36.39$; $SD = 1.56$). Using frequency and percentage analysis, the results revealed that out of 57.6% ($n = 155$) of patients who have basic education or lower, 10.8% ($n = 29$) were

first-time visitors to the health facilities, 37.9% ($n = 102$) had visited 2 to 5 times, and 8.9% ($n = 24$) visited 6 or more times in the period 6 months. Moreover, of 29% ($n = 77$) of patients with secondary education, 9.7% ($n = 26$) were first time visitors, 14.5% ($n = 39$) had visited the facilities 2 to 5 times, and 4.5% ($n = 12$) had 6 or more times within the 6 months prior to data collection. Again, out of 14% ($n = 37$) of patients who had completed tertiary education, 5.9% ($n = 16$) were first-time visitors, and 7.8% ($n = 21$) had visited the various healthcare facilities 2 to 5 times within the 6 months prior to data collection. The results indicated that about 49% ($n = 132$) of the participants reported low health literacy, while 81% ($n = 218$) reported that they were not told of the side effects of drugs they received at the pharmacies.

The results from the linear logistic regression showed that the model containing gender, educational level, and health literacy, as independent variables, was significant in predicting the interaction between patients and dispensers about communicating the side effects (dependent variable) of prescribed drugs ($\chi^2 = 17.98$, $P = .001$). After adjusting for health literacy and gender, education level significantly predicted expectations of patients about drug side effects communication between patients and the dispensers ($\chi^2 = 10.23$, $P = .02$). Thus, patients with secondary education were about 3 times more likely to report that they were not told (by the dispensers) of the side effects of dispensed drugs at the pharmacies ($OR = 3.15$, $\chi^2 = 6.57$, $P = .01$, 95% $CI = 1.31-7.57$) compared with those having no formal education (see Table 1).

Predictors of drug side effect communication between patients and drug dispensers

The second regression model was built to predict general communication quality between participants and dispensers. After adjusting for health literacy and educational level, gender did not predict general communication quality between the patients and the dispensers ($OR = 1.05$, $P = .89$); but educational level ($\chi^2 = 19.75$, $P = .001$) and health literacy ($\chi^2 = 17.41$, $P = .001$) did. Specifically, patients who attained no formal education ($OR = 8$, $\chi^2 = 7.95$, $P = .001$, 95% $CI = 2.71-23.36$) and those with basic education ($OR = 6$, $\chi^2 = 5.89$, $P = .001$, 95% $CI = 2.29-15.12$) were more likely to report poor communication between themselves and dispensers than those with tertiary education (see Table 2). Hence, educational level and health literacy are significant predictors of drug use communication between patients and dispensers at primary healthcare facilities.

Predictors of drug use communication quality between patients and drug dispensers

Discussion. The aim of this study was to examine drug use communication quality between patients and drug dispensers at primary healthcare centres in the Cape Coast Metropolis of Ghana. We observed poor drug use communication quality at the primary care centres, and that patients' education

Table 1. Odds of predicting drug side effect not communicated by dispensers to patients.

VARIABLES	WALD	DF	SIG.	ODDS RATIO	95% CI
Male	<i>ref.</i>				
Female	2.33	1	.13	1.88	0.84-4.21
Educational level					
No formal edu.	<i>ref.</i>				
Basic	3.83	1	.04	2.31	0.99-5.34
Secondary	6.57	1	.01	3.15	1.31-7.57
Tertiary	0.009	1	.92	0.95	0.29-3.05
Health literacy	0.91	1	.34	1.32	0.74-2.35
Constant	17.98	1	.001		

Table 2. Predictors of drug use communication quality between patients and drug dispensers.

VARIABLES	WALD	DF	SIG.	ODDS RATIO	95% CI
Gender					
Male	<i>ref.</i>				
Female	0.02	1	.89	1.05	0.50-2.21
Educational level					
Tertiary edu.	<i>ref.</i>				
Secondary	2.47	1	.116	2.02	0.84-4.87
Basic	13.57	1	.001	5.89	2.29-5.12
No formal education	14.19	1	.001	7.95	2.71-3.36
Health literacy	17.41	1	.001	4.18	2.14-8.19
Constant	3.57	1	.04		

independently determined their expectation of interactions between themselves and dispensers about drug side effects. In addition, the level of education and health literacy determined the extent of general communication quality between the patients and drug dispensers at primary healthcare facilities. Moreover, patients who had attained secondary education or higher expected that the dispensers would educate them on the side effects of the drugs administered at the dispensaries. On the contrary, communication about the side effects of the drugs was not expected by those patients with lower levels of education. Also, patients with secondary education or higher, who have appreciable health literacy, reported better quality communication between themselves and the drug dispensers.

Communication between participants and dispensers

Functional health literacy is closely tied to patients' level of formal education.²⁹ Hence, patients in this study who had higher

educational levels may also have had high numeracy skills and appreciable reading ability. The poor communication quality found between the patients and drug dispensers demands that dispensers need to do more verbal explanations of drug usage as patients receive their drugs. Such interactions may make patients understand that drugs have side effects and that dispensers have the duty and are knowledgeable enough to explain the side effects of the prescribed drugs administered at the pharmacies.³⁰ This may reduce the occurrence of drug use errors and may increase medication adherence, but the opposite is possible if dispensers fail to educate patients on how to properly use these drugs. However, educationally disadvantaged patients may have limited capacity to interact with the dispensers about the side effects of prescribed drugs. This is because such patients may possess limited knowledge and confidence to ask relevant questions and demand appropriate medication use directives from the dispensers.³¹ If this happens, medication use errors including drug abuse and misuse would be prevalent, posing serious health complications.

Every drug has side effects, and first line or prescribed drugs more often carried severe side effects compared with over-the-counter drugs.³² For instance, a direct association between reported knowledge of medication side effects and hospital length of stay was found among patients in Nigeria, with patients who had some knowledge about the side effects having a shorter stay.³³ Therefore, it is imperative that the side effects of drugs given at the health facilities are explained to the patients at the point of drug collection. This type of communication is most important for patients with low educational levels and limited functional health literacy because such patients are likely to make medication errors and act inappropriately in response to the side effects of the drugs.³⁴ Such quality communication helps to meet therapeutic goals, eventually promoting recovery from illness and achieving a better quality of life. In this regard, a meta-analytic review concluded that health professionals who adopt a warm and act friendly are more effective than those who keep consultations formal and do not offer reassurance to their clients.³⁵ Accordingly, healthcare atmosphere where positive interactions occur between providers and clients, there is a promotion of trust and mutual satisfaction. This quality interaction may positively contribute to improving health outcomes for patients, especially those with low education and functional health literacy, who are more found at primary care facilities in developing countries.

Most patients seeking healthcare at primary healthcare facilities in developing countries are likely to report poor interactions between themselves and their care providers. The reasons are that these patients usually have low formal education and low health literacy, are from poor socio-economic background, and have large family sizes.³⁶ These adverse variables influence patients' health seeking behaviours including how to interact with the healthcare system. In many instances, these patients feel embarrassed to ask questions, express their views appropriately, and seek directions about their medications.³³ Thus, a concerted effort is needed to improve patients' understanding of the primary healthcare system, especially medication utilisation. In that case, communication by health professionals, such as dispensers, considering patients' characteristics is appropriate to increase medication adherence, minimise medication errors, improve patients' overall health outcomes, and reduce the ever-increasing burden of care on healthcare facilities.³⁷

Our analytical model may not be applicable to patients with higher education levels because they are group of patients considered to be enlightened, confident, and may ask the necessary questions concerning medication use during interactions with dispensers.³⁸ For instance, Biresaw et al. found among a sub-population of Ethiopian patients that higher education level was not predictive of the patients' satisfaction with interactions with healthcare professionals.³⁹ Perhaps, such patients are rational users of the care system and possess the ability of self-direction that may contribute to a reduction in the overuse, underuse, and/or misuse of medicines.⁴⁰ Therefore, dispensers

need to contribute more to improving medicines usage via good communication, especially among less educated patients. It is worth noting that such good drug use communication is a key factor in improving patients' adherence and appropriate use of medicines, ultimately promoting positive health outcomes.²³

The strength of this study is its novelty, particularly, it is of prime importance to drug communication quality and drug side effects communication between patients and dispensers, but which seems to have been neglected. However, the study involved patients who were surveyed from only primary health-care centres. Thus, caution is required in applying the findings to the general population outside the primary healthcare system. Secondly, we did not properly test the psychometric properties of the instrument used in this study.

Conclusions

There is poor drug use communication quality between patients and drug dispensers at primary care facilities in Cape Coast Metropolis. Moreover, many of the participants or patients recorded low level of health literacy. And that, patients who attained secondary education or higher expected the dispensers to provide better drug use education to them, specifically, about the side effects of the drugs administered at the dispensaries. Besides, the educational attainment and health literacy of patients determine the drug use communication between patients and the dispensers at the primary healthcare facilities in Cape Coast Metropolis. Therefore, educational attainment, health literacy, and drug utilisation education provision by the dispensers become major concerns in primary healthcare facilities in Cape Coast Metropolis. Thus, promoting patients drug use education via dispensers will enhance knowledge, particularly on medication usage, which may improve patients' safety, recovery, and overall health outcomes.

Recommendations

It is important to note that the less educated patients formed the majority of health seekers at the primary healthcare facilities in Cape Coast. Therefore, drug dispensers at primary health facilities must ensure that their patients are adequately informed about the side effects of the prescribed drugs, thus putting the patient at the centre of care. Dispensers need to promote drug use among the patients by educating them properly about the use of given drugs and how to react if there is an observable side effect. Healthcare facilities, and the Ministry of Health at large, need to put in place appropriate programmes that promote health literacy among patients. Training drug dispensers in the local language is needed to facilitate their medication interactions with the patients. The Regional Health Directorate needs to recruit and post dispensers who have a high level of competency in the local languages to primary healthcare facilities. It is also important that the patients and general population are surveyed on the prevalence of the side effects of drugs they use.⁴¹

Acknowledgements

We acknowledge our patients who made this research possible, the hospital managers who gave access to the facilities. We equally appreciate Ms. Ernestina Segbedzi for language editing the paper for smooth reading.

Author Contributions

EWA, EKM conceived the study, study design, and conducted the onset data collection. EWA handled initial management, analysis, and interpretation. EWA, EKM did the initial write up of the manuscript. All the authors proof read the final version for intellectual content and approved the manuscript for publication.

ORCID iD

Edward Wilson Ansah  <https://orcid.org/0000-0001-9450-7774>

Supplemental Material

Supplemental material for this article is available online.

REFERENCES

- DiPiro JT, Talbert RL, Yee GC. Principles and practices of medication safety. In: DiPiro JT, Talbert RL, Yee GC, eds. *Pharmacotherapy: A Pathophysiologic Approach*. McGraw-Hill; 2011; 1-1066.
- WHO. World Health Report 2008. 2008. Accessed September 21, 2022 from <https://reliefweb.int/report/world/world-health-report-2008-primary-health-care-now-more-ever>
- Osborn D, Cutter A, Ullah F. Universal Sustainable Development Goals: Understanding the transformational challenge for developed countries. *Report of a study by stakeholder forum*. 2015. www.stakeholderforum.org
- World Health Organization. *Adherence to Long-Term Therapies-Evidence for Action*. WHO; 2003.
- Hughes RG, Ortiz E. Medication errors: why they happen, and how they can be prevented. *Am J Nur*. 2005;105:14-24.
- Grissinger MC, Kelly K. Reducing the risk of medication errors in women. *J Womens Health*. 2005;14:61-67.
- Torjesen I. Medication errors cost the NHS up to £2.5bn a year. *Pharm J*. 2014;293.
- Lu CY, Roughead E. Determinants of patient-reported medication errors: a comparison among seven countries. *Int J Clin Pract*. 2011;65:733-740.
- Duerden M, Avery AJ, Payne RA. *Polypharmacy and Medicines Optimisation: Making It Safe and Sound*. King's Fund; 2013.
- Khoja T, Neyaz Y, Qureshi NA, et al. Medication errors in primary care in Riyadh City, Saudi Arabia. *East Mediter Health J*. 2011;17:156-159.
- WHO. WHO global patient safety challenge medication without harm. Accessed August 10, 2019. <https://www.who.int/initiatives/medication-without-harm>
- Pharmaceutical Society of Australian. *Pharmaceutical Society of Australian Dispensing Practice Guideline*. Pharmaceutical Society of Australian; 2017.
- Harrison R, Cohen AWS, Walton M. Patient safety and quality of care in developing countries in Southeast Asia: a systematic literature review. *Int J Qual Health Care*. 2015;27:240-254.
- Alsulami Z, Conroy S, Choonara I. Medication errors in the Middle East countries: a systematic review of the literature. *Eur J Clin Pharmacol*. 2013;69:995-1008.
- O'Toole G. *Communication: Core Interpersonal Skills for Health Professionals*. Elsevier; 2012.
- Murad MS, Chatterley T, Guirguis LM. A meta-narrative review of recorded patient-pharmacist interactions: exploring biomedical or patient-centered communication? *Res Social Adm Pharm*. 2014;10:1-20.
- Wagner EH, Bennett SM, Austin BT, Greene SM, Schaefer JK, Vonkorff M. Finding common ground: patient-centeredness and evidence-based chronic illness care. *J Altern Complement Med*. 2005;11:S7-S15.
- Barry MJ, Edgman-Levitan S. Shared decision making-pinnacle of patient-centered care. *N Engl J Med*. 2012;366:780-781.
- Mohammed K, Nolan MB, Rajjo T, et al. Creating a patient-centered health care delivery system: a systematic review of health care quality from the patient perspective. *Am J Med Qual*. 2016;31:12-21.
- Ryan R, Santesso N, Lowe D, et al. Interventions to improve safe and effective medicines use by consumers: an overview of systematic reviews. *Cochrane Database Syst Rev*. 2014;4:CD007768.
- Pringle JL, Boyer A, Conklin MH, McCullough JW, Aldridge A. The Pennsylvania project: pharmacist intervention improved medication adherence and reduced health care costs. *Health Aff*. 2014;33:1444-1452.
- Hanson RL, Habibi M, Khamo N, Abdou S, Stubbings J. Integrated clinical and specialty pharmacy practice model for management of patients with multiple sclerosis. *Am J Health Syst Pharm*. 2014;71:463-469.
- Kaplan JE, Keeley RD, Engel M, Emsermann C, Brody D. Aspects of patient and clinician language predict adherence to antidepressant medication. *J Am Board Fam Med*. 2013;26:409-420.
- Ratanawongsa N, Karter AJ, Parker MM, et al. Communication and medication refill adherence: the diabetes study of Northern California. *JAMA Inter Med*. 2013;173:210-218.
- Bauer AM, Parker MM, Schillinger D, et al. Associations between antidepressant adherence and shared decision-making, patient-Provider Trust, and communication among adults with diabetes: Diabetes study of Northern California (DISTANCE). *J Gen Intern Med*. 2014;29:1139-1147.
- Fraenkel JR, Wallen NE. *How to Design and Evaluate Research in Education*. McGraw-Hill Inc; 2000.
- Bakeera SK, Wamala SP, Galea S, State A, Peterson S, Pariyo GW. Community perceptions and factors influencing utilization of health services in Uganda. *Int J Equity Health*. 2009;8:25.
- Rubin DL, Parmer J, Freimuth V, Kaley T, Okundaye M. Associations between older adults' spoken interactive health literacy and selected health care and health communication outcomes. *J Health Commun*. 2011;16:191-204.
- Wynia MK, Osborn CY. Health literacy and communication quality in health care organizations. *J Health Commun*. 2010;15:102-115.
- Tench R, Fawkes J. Barriers to obesity communication – power, habitus and hidden assumptions. *Int J Comm Heal*. 2011;3:1-9.
- Lenahan JL, McCarthy DM, Davis TC, Curtis LM, Serper M, Wolf MS. A drug by any other name: Patients' ability to identify medication regimens and its association with adherence and health outcomes. *J Health Commun*. 2013;18:31-39.
- Mohan A, Riley MB, Boyington D, et al. Development of a patient-centered bilingual prescription drug label. *J Health Commun*. 2013;18:49-61.
- Zivian MT, Salgado B. *Side Effects Revisited: Women's Experiences With Aromatase Inhibitors*. Our Bodies Ourselves Today; 2008.
- Adelufosi A, Fakorede K, Obasan A, Opeewe I, Ojo T. Patient and treatment related variables as predictors of length of stay in a Nigerian neuropsychiatric hospital. *J Behav Health*. 2014;3:117-121.
- Sahm LJ, Wolf MS, Curtis LM, McCarthy S. Prevalence of limited health literacy among Irish adults. *J Health Commun*. 2012;17:100-108.
- Di Blasi Z, Harkness E, Ernst E, Georgiou A, Kleijnen J. Influence of context effects on health outcomes: a systematic review. *Lancet*. 2001;357:757-762.
- Sriram A, Maheswari U. Integrated communication strategy for creating awareness on sanitation and hygiene behavior change. *The Intl J Comm Heal*. 2013;21:53-59.
- American College of Physicians. *Addressing the Increasing Burden of Health Insurance Cost Sharing*. American College of Physicians. Position Paper. American College of Physicians; 2016.
- Biresaw H, Mulugeta H, Endalamaw A, Yesuf NN, Alemu Y. Patient satisfaction towards health care services provided in Ethiopian health institutions: a systematic review and meta-analysis. *Health Services Insights* 2021;14:1178632 9211040689.
- Mullan J, Burns P, Weston K, et al. Health literacy amongst health professional university students: a study using the health literacy questionnaire. *Educ Sci*. 2017;7:54.
- World Health Organisation. *The Role of Education in the Rational Use of Medicines*. SEARO Technical Publication Series No. 45. WHO; 2006.