

Original Research

Patients' perception of pharmaceutical services available in a community pharmacy among patients living in a rural area of the United Kingdom

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ABSTRACT*

Objective: Patients' opinion about prevalence of pharmaceutical services available in a community pharmacy among patients living in a rural area of the United Kingdom. The secondary objective was to identify appropriate action(s) to enhance patients' awareness of pharmaceutical services in rural areas.

Methods: A self-administered, anonymous questionnaire was distributed to patients visiting a community pharmacy in Eye, Suffolk, United Kingdom between July and August, 2015. The main inclusion criterion was living in a rural area. Comparisons were performed using chi-square tests and logistic regression.

Results: The study included 103 respondents: 70 women (69.0%) and 33 men (32.0%), aged 16–85 years. Most respondents declared the primary tasks of a community pharmacy were dispensing medicines (86.4% of respondents) and repeat dispensing (72.8% of respondents). Additionally, 23.3% of respondents treated minor ailments at the pharmacy, including bacterial/viral infections, minor injuries, stomach problems, and allergies. The Medicines Use Review service was the only advanced service used in this pharmacy (12.6% of respondents), primarily by men. Younger patients were more familiar with the term of pharmaceutical care ($p < 0.05$; $OR = 0.33$).

Conclusions: Only a few pharmaceutical services are utilized by people living in rural areas in the UK, namely prescription dispensing, repeat dispensing, and sale of medications that support self-care for minor ailments. We found an overall poor awareness of the expanded variety of pharmaceutical services encouraged by the community pharmacy contract introduced in the UK in 2005. Therefore, politicians, pharmacists, and pharmacy experts should actively promote these advanced pharmaceutical services in rural areas.

Keywords: Health Knowledge, Attitudes, Practice; Community Pharmacy Services; Pharmacies; Pharmacists; Rural Health Services; Surveys and Questionnaires; Great Britain

INTRODUCTION

Community pharmacy has been traditionally associated with dispensing drugs and providing patients with medicines of that meet regulatory quality standards. However, in recent years, we have seen a change in the role of community pharmacies, with a steady and consistent increase in the number of pharmacists involved in the more clinical aspects of patient care.¹ Moreover, the number of publications relating to “pharmaceutical services” has grown exponentially since the 1960s (2,490 articles published in 2014 in PubMed), highlighting the importance of the development of social and practical pharmacy. Such pharmaceutical services improve health-related quality of life (QoL), generating savings for the health system, and facilitating interprofessional collaboration.^{2,3}

In the modern model of health care provision, the role of the pharmacist is to: (i) explain how to use medications; (ii) provide advice on potential side effects of medications; (iii) advise patients on how to use medical or drug-administering devices; and (iv) prepare printed information about medications.^{4,5} However, pharmacies now offer a wide range of services, which will only continue to rise with the progress of new technologies and pharmaceutical practice.^{6,7} Experts in pharmaceutical services agree that the role of the community pharmacy is increasing, and pharmacists must adapt in order to remain current and provide appropriate levels of care.^{8,9} Indeed, a new contractual framework for community pharmacy was introduced in the United Kingdom in 2005, outlining a number of new pharmaceutical services to be offered by community pharmacies.¹⁰

Since the rural population is characterized by worse general clinical condition vs. general patient's cohort, pharmaceutical care and advanced services are strongly needed. Indeed, the rate of mortality or co-morbidities is substantially higher than among urban residents. Moreover, in the rural area, we still observe healthcare professionals shortage. Due to these facts, the proliferation of pharmaceutical care in rural areas remains particularly beneficial in the context of patients' needs and healthcare policy.¹¹

The aim of this study was to evaluate the pharmaceutical services provided in a community pharmacy, and determine patients' awareness of these services, in a rural setting in the United Kingdom. This study is the first step towards

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understanding how citizens view pharmaceutical care services beyond urbanized areas.

METHODS

Study design and participants

A self-administered, anonymous questionnaire was distributed to patients during their visit to a community pharmacy (Eye Pharmacy) in the village of Eye, Suffolk, UK, between July and August 2015. English pharmacy model remains one of the best in the world, so our survey just confirmed that pharmaceutical care is the professional term and that a very similar response was delivered by the UK patients but to this extent that the UK citizens have an access to a variety of services in the UK. We decided to perform a study based on the citizens living outside settlements with more than 10,000 resident population, defined by the Department for Environment, Food & Rural Affairs (UK) as a rural area. We used this area since we noticed the fact of a great respect for the pharmacist in that town, and it was still maintained as traditional UK pharmacy. Indeed, by this maneuver we sought to fill the gap in the literature investigating the importance of pharmaceutical services in the community pharmacy and knowledge in the non-urbanized areas. The main criterion for inclusion in the study was living in a rural area, i.e. outside settlements with more than 10,000 resident populations.¹² Patients who returned incomplete questionnaires were considered non-responders. All participants were informed about the study's anonymity, purpose, and design, and were advised that by returning completed questionnaires, they gave their consent to participate in the study. The study was approved by the Research Ethical Committee in the United Kingdom. The questionnaire was distributed by the pharmacists employed in the community pharmacy where the research was conducted. The enrollment had been performed by the pharmacist after a careful check of the inclusion criteria.

Questionnaire and data collection

An especially dedicated, authorial questionnaire consisted of 14 questions divided into two parts. The first part (13 questions) related to demographic information (gender, age, marital status, education, occupation, and place of residence) and the current profile of patients' use of pharmacy services (frequency of visits, reasons for visits, the number of filled prescriptions per month, and whether they visited the same pharmacy). The second part of the questionnaire contained the information about respondents' opinion in the context of proliferation of the pharmaceutical services in the rural area. The questionnaire was English. Face and content validity, reliability, applicability, and practicality of the questionnaires were tested by two focus groups, with 10 participants in each group.

Statistical analysis

Statistical analyses were performed using the SPSS statistical software, version 20 (IBM Corporation, Armonk, NY, USA). Relationships between

variables were examined using the Fisher's exact test and the chi-square test. A p-value of <0.05 indicated statistical significance. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated using multivariate stepwise forward logistic and linear regression analyses. Methods of descriptive statistics were also applied in the analysis.

RESULTS

The study group included 103 respondents: 70 women (69.0%) and 33 men (32.0%), aged 16–85 years. The majority of respondents were pensioners (24.3%), people working in the small and medium business sector (16.5%), or people in the education sector (18.4%). The majority of respondents (n=77.7%) declared that they use the services of the same community pharmacy. In addition, most patients visited pharmacies often, once or twice a week (respectively n=25.2% and 32.1%). A summary of the demographic characteristics of the study population is presented in Table 1.

Most respondents declared that the primary role of community pharmacists is to dispense medicines (86.4% of respondents) and for repeat dispensing (72.8% of respondents). Almost half of the respondents (45.6%) thought community pharmacies provide information on medicines. More than a quarter (28.2%) of respondents indicated that pharmacies offer opportunities for disposal of unwanted or out-of-date medicines. Some respondents (23.3%) were treated at the community pharmacy for minor ailments, including bacterial and viral infections, minor injuries, stomach problems, women's and children's health concerns, skin conditions, and allergies. Only 12.6% respondents used the medicines use review (MUR) service administered by pharmacists. Six respondents (5.8%) reported that blood pressure checks are performed at the community pharmacy. Very few

Demographic	n (%)
Gender	
Male	33 (32.0%)
Female	70 (68.0%)
Age (range, years)	
15–29	11 (10.7%)
20–29	25 (24.3%)
30–39	16 (15.5%)
40–49	13 (12.6%)
50–59	9 (8.7%)
>60	29 (28.2%)
Occupation	
Health service	18 (17.5%)
Education	19 (18.4%)
Business	17 (16.5%)
Physical	11 (10.7%)
Pupil	13 (12.6%)
Pensioner	25 (24.3%)
Do you always visit the same pharmacy?	
Yes	80 (77.7%)
Mostly	1 (0.01%)
No	22 (22.2%)
How often do you visit the pharmacy?	
Once a week	26 (25.2%)
Twice a week	33 (32.1%)
Rarely	44 (42.7%)

Table 2. Pharmaceutical services offered by community pharmacies based on respondents' opinion.

Pharmaceutical service	Yes, n (%)	No, n (%)
Dispensing medicines	89 (86.4%)	14 (13.6%)
Repeat dispensing	75 (72.8%)	28 (27.2%)
Medicines information	47 (45.6%)	56 (54.4%)
Disposal of unwanted or out-of-date medicines	29 (28.2%)	74 (71.8%)
Prescription collection from local GP surgeries on behalf of patients	25 (24.3%)	78 (75.7%)
Medicines Use Review	13 (12.6%)	90 (87.3%)
Electronic prescription service	1 (0.9%)	102 (99.1%)
Allergy screenings	3 (2.9%)	100 (97.1%)
Flu vaccinations	4 (3.9%)	99 (96.1%)
Health checks	11 (10.7%)	92 (89.3%)
Emergency contraception	9 (8.7%)	94 (91.3%)
Truss fittings	0 (0.0%)	103 (100.0%)
Incontinence supplies	2 (1.9%)	101 (98.1%)
Needle exchange, supervised drug administration	0 (0.0%)	103 (100.0%)
Pregnancy testing	5 (4.9%)	98 (95.1%)
Stop smoking services	2 (1.9%)	101 (98.1%)
Weight management	2 (1.9%)	101 (98.1%)
Supplementary and independent prescribing - some pharmacists can now prescribe prescription medicines for certain medical conditions	4 (3.8%)	99 (96.2%)
Treatment of minor ailments, including bacterial and viral infections, minor injuries, stomach problems, women's and children's health concerns, skin conditions, and allergies	24 (23.3%)	79 (76.7%)
New medicine service	13 (12.6%)	90 (87.3%)
Erectile dysfunction	3 (2.9%)	100 (97.1%)
Asthma check	2 (1.9%)	101 (98.1%)
Diabetes check	0 (0.0%)	103 (100.0%)
Chlamydia check	0 (0.0%)	103 (100.0%)
Cholesterol check	0 (0.0%)	103 (100.0%)
Blood pressure check	6 (5.8%)	97 (94.2%)
Emergency contraception	3 (2.9%)	100 (97.1%)
Travel vaccination/travel clinic	0 (0.0%)	103 (100.0%)
Urgent medication supply	3 (2.9%)	100 (97.1%)
Health check	0 (0.0%)	103 (100.0%)

patients were aware of other services, such as flu vaccinations (3.9%), stop smoking services (1.9%), asthma checks (1.9%), or the electronic prescription service (0.9%). None of the respondents reported an awareness of advanced services, such as diabetes or other health check programs, or travel vaccinations. The detailed scope of the responses to the awareness of pharmaceutical services is presented in Table 2.

A patient diagnosed with a chronic disease visited the same pharmacy significantly more often ($p=0.04$; $OR=0.49$). Patients taking one to two medicines also showed frequent commitment to a specific pharmacy ($p<0.05$; $OR=1.39$). In addition, men were significantly more likely to ask the pharmacist for advice concerning treatment of minor ailments ($p=0.03$; $OR=4.14$). Men were also more interested in advanced pharmaceutical services, such as MUR, health checks, or a new medicine service ($p<0.01$; $OR=6.41$). Men suffering disease required regular medicine dispensing significantly more often ($p=0.00024$; $OR=2.28$). Younger patients (under 25 years old) declared familiarity with the term of pharmaceutical care ($p<0.05$; $OR=0.33$). However, no statistical significance was demonstrated between understanding the term pharmaceutical care and using the advanced pharmaceutical services. Other analyzed factors (i.e., level of education, profession, and marital status) were not statistically significant among the analyzed parameters ($p<0.05$).

DISCUSSION

In this study, we found that only a few pharmaceutical services are recognized by patients of a community pharmacy in a rural area in the UK. The main services recognized were prescription dispensing, repeat dispensing, and sale of medicines that support self-care for minor ailments. There was an overall poor awareness of the more advanced variety of pharmaceutical services encouraged by the community pharmacy contract in rural areas. We also found that men used the advanced pharmaceutical services (such as the MUR service) more often than women. The most fundamental finding of our work suggested that prevalence advanced pharmaceutical services is not well-established in the rural area. Firstly, based on the assumption that elderly patients living in the rural area strongly need the optimizing pharmacotherapy, the proliferation of MUR service is not sufficient. Moreover, such services like blood pressure, asthma checks or flu vaccination, not insufficiently used by the patients, or remain not available for patients in our observation. The term 'pharmaceutical care' is identified by the younger respondents. Interestingly men are more interested in advanced pharmaceutical services. However, the explanation of these findings remains unfamiliar. The distribution of responses indicated that patients are awareness that community pharmacy settings is the place where they can receive medical-related information for instance in the context of minor ailments services.

Our results from the UK indicate that patients in rural areas do not use advanced pharmaceutical

services. This may be due to a lack of patients' knowledge or lack of availability of services in the community pharmacy. Our results are similar to those observed in other countries. For example, a study in the United Arab Emirates indicates that patients are still more supportive of using traditional pharmacy services (e.g., receiving information about medications, obtaining help for self-management or monitoring, and receiving advice about disease prevention) than they are of accessing more advanced primary care services, such as continual management of chronic disease.¹³ However, some other studies indicate that pharmaceutical services are popular and appreciated by patients, even in countries with low levels of health care. For example, the satisfaction with the overall quality of pharmaceutical services received by patients receiving antiretroviral therapy in an outpatient HIV treatment setting was positive in Nigeria.¹⁴

While only a few studies on pharmaceutical services have been conducted in rural areas, they all confirm its usefulness and effectiveness. For example, an observational study on the impact of a pharmaceutical care program in rural areas in Portugal confirmed that it was associated with significant improvements in blood pressure control in hypertensive patients.¹⁵ The study involved a random sample of 100 patients diagnosed with essential hypertension, who had been on drug treatment for less than 6 months. Patients were randomly assigned to an intervention (n=50) or a control (n=50) group. Patients in the intervention group underwent individualized health promotion by a research pharmacist involving monthly appointments for 6 months to monitor blood pressure; assess adherence to treatment; prevent, detect, and resolve drug-related problems; and encourage non-pharmacological measures for blood pressure control. Control patients received traditional care. After 6 months, prevalence of uncontrolled blood pressure decreased by 77.4% in the intervention group ($p < 0.0001$) and by only 10.3% in the control group. Therefore, in this rural community, the pharmaceutical care program was effective in improving clinical outcomes of hypertensive patients.¹³ A similar study indicated that the pharmaceutical care program was effective in improving the clinical outcome of diabetes patients in rural India, indicating that they should be widely implemented.¹⁶

Similarly, a systematic review and meta-analysis of MUR indicated that such services show positive benefits on patient outcomes.¹⁵ The MUR service significantly impacted on patient outcomes, including the attainment of target clinical biomarkers and reduced hospitalization.¹⁷ Another study provided evidence that pharmaceutical care services would be beneficial to progress the quality of outpatient cancer chemotherapy.¹⁸ Furthermore, the application of a pharmaceutical care program was shown to significantly improve health-related QoL in women with epilepsy aged over 18 years.¹⁹

The pharmacists' level of patient care competence and need for continuous professional development

in rural areas must also be considered. Indeed, one previous study revealed a significant difference in the level of knowledge and skills of pharmacists from rural areas compared to those in urban areas.²⁰ This difference is due to differences in the practice settings themselves, as well as the degree that was earned by the pharmacists (i.e., graduate certificate or a higher degree). In addition, most rural pharmacists reported a lower level of preparation on perceived patient care-related items than urban pharmacists.¹⁸ Pharmacists play a crucial role as pharmacy benefits managers and should be familiar with individual- and population-based ethical issues.²¹ Authorities aimed at promoting pharmaceutical care in rural areas should monitor these ethical issues, and relevant approval bodies should scrutinize the providers of pharmacy services in rural areas.

Non-adherence should also be considered a public health problem. Low adherence is related to, among other conditions, the level of education. The inhabitants of rural areas are generally less educated than urban dwellers. A prior study showed that an integrated pharmacy practice model (including an interdisciplinary team of physicians, nurses, and pharmacists) was essential for improving adherence in patients undergoing multiple sclerosis therapies²², while another study found that patients in rural India adhere poorly to cardiovascular medicines.²³ Therefore, strategies to detect the level of adherence, its barriers, and subsequent interventions, should be developed by policy makers to reduce disease-related morbidity and mortality. The elevated level of non-adherence observed in patients from rural settings further confirms the need to promote advanced pharmaceutical services these areas.²⁴ An interesting solution may be the involvement of the academic world in the promotion of pharmaceutical services in rural areas. Certainly, one study provided information that the clinical interventions by pharmacy students were generally well received by healthcare providers and resulted in significant cost savings.²⁵

There were some limitations to our study, such as its small sample size. Indeed, few prior studies have assessed the quality of pharmaceutical care in rural areas in the UK, primarily due to the reluctance of patients and pharmacists in rural areas to participate in such studies. While we fulfilled every possible effort to examine the quality of pharmacy services in a rural area (Eye, Suffolk, UK), we still only had a limited number of respondents to our survey in this study (n=103). Moreover, we have no information about additional pharmacists' qualifications for instance in the context of supplementary prescribing, which may have an impact on the proliferation of advanced pharmaceutical services. Therefore, our results are purely exploratory, providing a good starting point for further representative studies, in which professional public opinion research centers should be involved.

Based on the results of our study, we make the following two recommendations to increase the use

of pharmaceutical services in rural areas. First, we recommend that an advertising campaign be implemented to promote the new services offered by community pharmacies to people, particularly women, living in rural areas. Second, we recommend that an educational campaign be developed and employed for people living in rural areas to promote pharmaceutical care. To successfully implement these recommendations the collaboration between the National Health Services and pharmacists co-working in the rural areas is needed. Moreover, the more sophisticated support of the role of community pharmacies in the rural area is needed, particularly by the physicians and nurses.

CONCLUSIONS

The results of our study indicate that advanced pharmaceutical services are not sufficiently utility at community pharmacies in the British countryside. Therefore, we propose that the relevant authorities should further promote pharmaceutical care in rural areas. Moreover, our results suggest that the approval bodies should enhance their scrutiny of providers of pharmacy services in rural areas. We

found that men used advanced pharmaceutical services more often than women, perhaps due to the fact that more men suffered from conditions requiring regular medication. Therefore, our results indicate that promotional and educational campaigns concerning pharmaceutical services should be directed towards women living in rural areas. Finally, we recommend that politicians, pharmacists, and pharmacy experts should all support positive laws and expanded services in community pharmacies in rural areas of the UK.

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CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest to disclose.

References

1. Hepler CD. Clinical pharmacy, pharmaceutical care, and the quality of drug therapy. *Pharmacotherapy*. 2004;24(11):1491-1498
2. Bajorek BV, Lemay KS, Magin PJ, Roberts C, Krass I, Armour CL. Preparing pharmacists to deliver a targeted service in hypertension management: evaluation of an interprofessional training program. *BMC Med Educ*. 2015;15:157. doi: [10.1186/s12909-015-0434-y](https://doi.org/10.1186/s12909-015-0434-y)
3. Kaboli PJ, Hoth AB, McClimon BJ, Schnipper JL. Clinical pharmacists and inpatient medical care: a systematic review. *Arch Intern Med*. 2006;166(9):955-964.
4. Mok G, Vaillancourt R, Irwin D, Wong A, Zemek R, Alqurashi W. Design and validation of pictograms in a pediatric anaphylaxis action plan. *Pediatr Allergy Immunol*. 2015;26(3):223-233. doi: [10.1111/pai.12349](https://doi.org/10.1111/pai.12349)
5. Rotta I, Salgado TM, Silva ML, Correr CJ, Fernandez-Llimos F. Effectiveness of clinical pharmacy services: an overview of systematic reviews (2000-2010). *Int J Clin Pharm*. 2015;37(5):687-697. doi: [10.1007/s11096-015-0137-9](https://doi.org/10.1007/s11096-015-0137-9)
6. Franklin BD, van Mil JW. Defining clinical pharmacy and pharmaceutical care. *Pharm World Sci*. 2005;27(3):137
7. van Mil JW, Schulz M, Tromp TF. Pharmaceutical care, European developments in concepts, implementation, teaching, and research: a review. *Pharm World Sci*. 2004;26(6):303-311.
8. Allemann SS, van Mil JW, Botermann L, Berger K, Griese N, Hersberger KE. Pharmaceutical care: the PCNE definition 2013. *Int J Clin Pharm*. 2014;36(3):544-555. doi: [10.1007/s11096-014-9933-x](https://doi.org/10.1007/s11096-014-9933-x)
9. Minarikova D, Malovecka I, Foltan V, Bielik J, Psenkova M. Valuation of patient satisfaction with pharmaceutical care as a tool for increasing quality management in community pharmacy and patient's quality of life. *Value Health*. 2015;18(7):A835. doi: [10.1016/j.jval.2015.09.342](https://doi.org/10.1016/j.jval.2015.09.342)
10. Noyce PR. Providing patient care through community pharmacies in the UK: policy, practice, and research. *Ann Pharmacother*. 2007;41(5):861-868
11. Ahmad A, Khan MU. Prescribing opportunities for pharmacists in rural areas. *Res Social Adm Pharm*. 2016;12(5):811-812. doi: [10.1016/j.sapharm.2016.04.003](https://doi.org/10.1016/j.sapharm.2016.04.003)
12. Department for Environment, Food & Rural Affairs, UK; <https://www.gov.uk/government/collections/rural-urban-classification> (access August 12, 2016).
13. Hasan S, Sulieman H, Stewart K, Chapman CB, Kong DC. Patient expectations and willingness to use primary care pharmacy services in the United Arab Emirates. *Int J Pharm Pract*. 2015;23(5):340-348. doi: [10.1111/ijpp.12176](https://doi.org/10.1111/ijpp.12176)
14. Agu KA, Oqua D, Agada P, Ohiaeri SI, Adesina A, Abdulkareem MH, King RC, Wutoh AK. Assessment of satisfaction with pharmaceutical services in patients receiving antiretroviral therapy in outpatient HIV treatment setting. *Int J Clin Pharm*. 2014;36(3):636-647. doi: [10.1007/s11096-014-9948-3](https://doi.org/10.1007/s11096-014-9948-3)
15. Garcao JA, Cabrita J. Evaluation of a pharmaceutical care program for hypertensive patients in rural Portugal. *J Am Pharm Assoc (Wash)*. 2002;42(6):858-864.
16. Arun KP, Murugan R, Kanna MR, Rajalakshmi S, Kalaiselvi R, Komathi V. The impact of pharmaceutical care on the clinical outcome of diabetes mellitus among a rural patient population. *Int J Diabetes Dev Ctries*. 2008;28(1):15-18. doi: [10.4103/0973-3930.41981](https://doi.org/10.4103/0973-3930.41981)
17. Hatah E, Braund R, Tordoff J, Duffull SB. A systematic review and meta-analysis of pharmacist-led fee-for-services medication review. *Br J Clin Pharmacol*. 2014;77(1):102-115. doi: [10.1111/bcp.12140](https://doi.org/10.1111/bcp.12140)

Merks P, Świeczkowski D, Jaguszewski MJ. Patients' perception of pharmaceutical services available in a community pharmacy among patients living in a rural area of the United Kingdom. *Pharmacy Practice* 2016 Jul-Sep;14(3):774. doi: [10.18549/PharmPract.2016.03.774](https://doi.org/10.18549/PharmPract.2016.03.774)

18. Yoshimi C, Yamada M, Fujii H, Nishigaki M, Iihara H, Kitaichi K, Takahashi M, Kurahashi S, Takahashi T, Yoshida K, Itoh Y. [Evaluation of the efforts of pharmaceutical care services before medical examination at an outpatient cancer chemotherapy clinic]. *Gan To Kagaku Ryoho*. 2013;40(3):349-354.
19. Losada-Camacho M, Guerrero-Pabon MF, Garcia-Delgado P, Martinez-Martinez F. Impact of a pharmaceutical care programme on health-related quality of life among women with epilepsy: a randomised controlled trial (IPHIIWWE study). *Health Qual Life Outcomes*. 2014;12:162. doi: [10.1186/s12955-014-0162-8](https://doi.org/10.1186/s12955-014-0162-8)
20. Scott DM. Assessment of pharmacists' perception of patient care competence and need for training in rural and urban areas in North Dakota. *J Rural Health*. 2010;26(1):90-96. doi: [10.1111/j.1748-0361.2009.00270.x](https://doi.org/10.1111/j.1748-0361.2009.00270.x)
21. Glassman PA, Schneider PL, Good CB. An ethical framework for pharmacy management: balancing autonomy and other principles. *J Manag Care Spec Pharm*. 2014;20(4):334-338.
22. 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(6):463-469. doi: [10.2146/ajhp130495](https://doi.org/10.2146/ajhp130495)
23. Santra G. Assessment of adherence to cardiovascular medicines in rural population: An observational study in patients attending a tertiary care hospital. *Indian J Pharmacol*. 2015;47(6):600-604. doi: [10.4103/0253-7613.169573](https://doi.org/10.4103/0253-7613.169573)
24. Ma C. A cross-sectional survey of medication adherence and associated factors for rural patients with hypertension. *Appl Nurs Res*. 2016;31:94-99. doi: [10.1016/j.apnr.2016.01.004](https://doi.org/10.1016/j.apnr.2016.01.004)
25. Ginzburg R. Impact of pharmacy student interventions in an urban family medicine clinic. *Am J Pharm Educ*. 2014;78(5):90. doi: [10.5688/ajpe78590](https://doi.org/10.5688/ajpe78590)