

Role of Community Pharmacist in Medication Monitoring: Review

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Abstract: *Pharmacists are fundamental in reducing adverse events and addressing inappropriate pain management through early identification, prescription monitoring and drug misuse education. Community pharmacists engage in a variety of activities, the most common is medication dispensing. Pharmacists are responsible for overseeing the preparation and dispensing of prescription medications for sale to their patients. One of the more observable activities in which pharmacists engage is prescription counseling. This can occur both for new prescription dispensing and for subsequent dispensing (refills) if the prescription permits. This review aimed to discuss different types of community pharmacist services and roles about chronic disease management.*

Keywords: community pharmacist, chronic disease, health care, medication monitoring, dispensing medication.

Introduction:

There are four levels of care in every health system: lay self-care, primary professional care, general specialist care, and super specialized care. Primary health care (PHC) is the initial level of professional engagement in the community within this system, and it serves as the cornerstone approach for achieving a level of health that allows for a socially and economically active existence.

Despite existing regulatory attempts to reduce the harm caused by the misuse of high-risk medications, more effort and focus on improving pharmaceutical use is required[1]. Pharmacists, according to the International Pharmaceutical Federation, are ideally positioned to address drug-related harm and should be "agents of change in their communities." By 2023, community pharmacies will provide the majority of pharmacy treatment, and pharmacists will use their medical knowledge to help patients stay safe [2]. Because of the complexity and severity of drug misuse, healthcare practitioners involved in patient care must intervene, and pharmacists are the only health profession trained specifically in the optimal and safe use of medicines, a competence that should be properly leveraged. Pharmacists play a critical role in decreasing adverse events and addressing inappropriate pain management by identifying problems early, monitoring prescriptions, and educating patients about medication misuse[3]. Community pharmacists engage in a variety of activities, the most common is medication dispensing. Pharmacists are responsible for overseeing the preparation and dispensing of prescription medications for sale to their patients. One of the more observable activities in which pharmacists engage is prescription counseling. This can occur both for new prescription dispensing and for subsequent dispensing (refills) if the prescription permits [4]. Community pharmacies, being one of the most accessible and widely dispersed health providers in the community, could be an essential part of this strategy.

The central location of community pharmacists allows them to play a more proactive role in filling gaps in programs such as health promotion and a variety of preventative services [5]. Many studies conducted in the globe demonstrate that pharmacist's involvement in diabetes management resulted in reduced cost burden to the patient and improved overall treatment outcome and patient satisfaction [6].

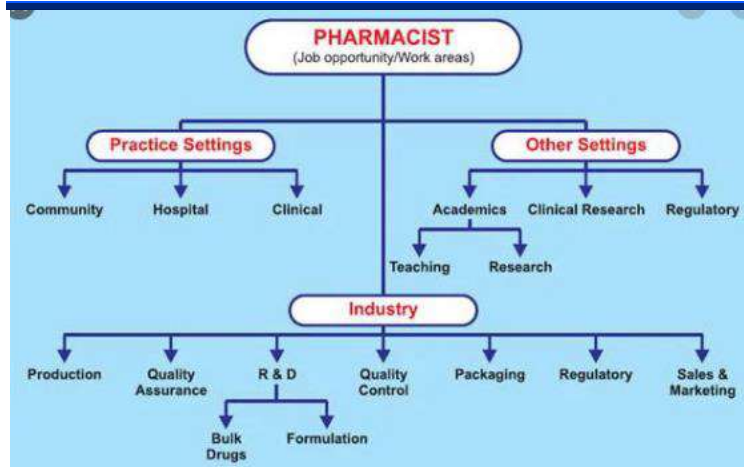


Figure 1: parts of pharmacy system.

However, there are a number of barriers that have hindered the provision of public health services in community pharmacy settings. Lack of knowledge and skills, lack of confidence and adequate training, lack of policies, poor recognition within the health care system, patients' reluctance to use pharmacy services, and presence of inadequate number of pharmacy staff are some of the factors that can contribute to the low level of pharmacy services uptake and public health initiatives [7].

An Overview of Health Care and the Role of Community-Based Pharmacists:

Pharmacists work at the frontline of healthcare in cities, towns and villages across nation. They work from their own pharmacies or from local hospitals and doctors' offices. As a community pharmacist, your job would entail assisting the public, assessing their health, and deciding which medications they should take. They will be in charge of administering medicine as well as providing patient consultation and practical health advice. It's a very responsible job, and community pharmacists are generally well-liked members of their communities. There are major concerns related to public health including issues associated with health care inequities, aging populations, increasing levels of chronic disease and urbanization. There is a need to promote access to primary care services, control expenditures, and improve results in health care for patients notably in the management of chronic illnesses which places a pressure on health care systems worldwide. Pharmacists at community pharmacies are the third most numerous health-care professionals, trailing only physicians and nurses. Pharmacists in the community are an underappreciated health care provider that may help people get care when and when they want it. Fortunately, a trend is emerging for community-based pharmacists to serve as care extenders to address primary care provider shortages and the significant difficulties and costs associated with prescription misuse [8]. The cost of health care remains a large component of the US gross domestic product (GDP) and is expected to rise by 5.5 percent from 2018 to 2027. Due to the launch of new treatments and a concerted effort by patients with chronic diseases to stick to their medication regimen, prescription drug expenditures are predicted to rise by an average of 6.1 percent per year over the same period [9]. Pharmacists that work in community-based settings are crucial in improving drug adherence. As the US health-care system evolves, a main focus will be on outcomes and quality as means to effectively and economically manage expenditures. In times of financial constraint, healthcare services must demonstrate that they are still cost-effective, given the amount of money invested in their provision. A growing number of papers indicate pharmacists' expanding role in a range of practice contexts, and these are not confined to industrialized countries.

Pharmacists and Initial Medication Counseling:

Pharmacists and Initial Medication Counseling On average, community pharmacists report spending the majority of their time in the dispensing role with only about 10% of their time devoted to providing separate patient care services, such as medication therapy management [10]. A limited number of studies have been designed to describe how pharmacists spend their time while in the dispensing role. A work sampling study in grocery pharmacies found pharmacists spent approximately 20% of their time communicating with patients, but specifics about the type of prescription or the nature of the conversations were not collected. Medication counseling has become one of the defining professional characteristics demonstrating the value of pharmacists and has been mandated by law since the adoption of OBRA 90 [11]. While prescription charges usually include a small dispensing fee, pharmacists receive no compensation for spending additional time to identify and resolve medication-related problems.

Pharmacists have the professional discretion to decide how they will counsel patients on new prescriptions and patients retain the right to deny counseling. Laws vary by state, but in general, patients are expected to be offered counseling for all new prescriptions.

Some states compel pharmacists and patients to speak with each other verbally, and research demonstrates that stricter state counseling regulations are linked to pharmacists offering more counseling [12].

One of the primary research tools used to investigate pharmacist-provided counseling is to send a research confederate, commonly referred to as a “secret shopper,” to a pharmacy to fill a uniform prescription. The secret shopper then documents the experience using standardized data.

Pharmacists provided pharmaceutical information to patients in 41.6 percent of contacts, according to the most recent national secret shopper research [13]. Despite the fact that counseling rates were higher in states with stricter counseling laws, many patients still received no verbal counseling.

The pharmacy having a private counseling area and the pharmacist directly transferring the prescription to the patient were both significant predictors of the pharmacist providing medication information in this study.

Another secret shopper study conducted across eight states indicated that 63 percent of patients received guidance from pharmacists, and pharmacists asked at least one question in 48 percent of meetings [14].

Studies show the content of new prescription counseling tends to be limited, with pharmacists reiterating to the patient basic information from the prescription and some common side effects or technical information such as the number of refills remaining or a change in the manufacturer of a generic medication. Counseling has been shown to aid in the detection of medication-related problems as pharmacists discuss the medication with the patient [15].

In sum, the prescription counseling literature demonstrates variation in the extent to which pharmacists provide counseling to patients. The majority of this research focuses on new prescription counseling, an activity occurring significantly more often than counseling for refill prescriptions. Pharmacists generally take on the role of information-provider rather than question-asker and problem-evaluator. During this time, the pharmacy profession has attempted to move more toward a patient-centered role (Hepler & Strand, 1990), however, this has not been well adopted in the prescription dispensing process, in which community pharmacists spend the majority of their time [16].

Community pharmacy monitoring and dispensing medicines:

Medication monitoring is a process where a health care provider evaluates aspects of a patient’s medication use based on different information sources and takes appropriate action to improve outcomes. Community pharmacy provides a highly accessible network for the safe and effective dispensing of medicines to around 500 million citizens in the European Union. Community pharmacists provide free advice and pharmacy services across the Member States, their services and advice has the greatest accessibility for the general population, Pharmacists have a professional responsibility to provide sound and unbiased advice [17].

Community pharmacists have engaged in this role in certain situations such as with MTM, and there is potential for this role to expand. Evidence suggests pharmacists make positive contributions involving the identification and resolution of medication-related problems of chronic drug therapy [18].

Community pharmacies offer access to highly trained health professionals, Community pharmacies are open on average 60 hours per week when carrying out their dispensing function, and pharmacists use their professional judgement to assess the likelihood of drug interactions or contra indication for their patients. A community pharmacy is not just a retail business, healthcare providers should see the pharmacy as a key part of the primary healthcare team with frontline access to the public. In many countries pharmacists maintain an electronic patient medication record, which allows for detailed analysis of compliance, allergies, long term conditions and other patient safety benefits [19]. Pharmacists are part of a network of healthcare professionals with access to a full range of expertise on specific diseases and treatment areas.

Medication monitoring has not received as much attention as new prescription counseling in the dispensing process. A counseling model developed by the U.S. Indian Health Service offers “three prime questions” pharmacists can use when counseling patients with new prescriptions, and three used at the time of refill. The refill questions are: What do you take the medication for? How do you take it? And, What kinds of problems are you having? These questions, however, have not been tested empirically.

Guirguis requested a small group of motivated pharmacists to apply the Indian Health three main questions for new and refill prescriptions during the dispensing process, and gathered pharmacist thoughts on using these questions in practice through questionnaires and focus groups [20]. The author found these pharmacists were positive toward using the questions because they wanted to “matter”, although more for new prescriptions than for refills. The author also put forward a qualitative theme of “door opener” where the pharmacists perceived the questions led to more information being disclosed about patient medication use

experiences. Some of the questions, however, seemed awkward at times and the pharmacists made modifications to how they phrased the questions.

In an observational study of pharmacist-identified medication-related problems in Europe, pharmacists completed paper forms during the dispensing process to document problems they uncovered during a given week [21]. The forms were open-ended which gave pharmacists flexibility in describing each medication-related problem. These forms were collected and categorized by the researchers. Pharmacies reported between 1 and 72 problems per week. Of the documented problems, the most frequent type related to technical errors on the actual prescription, such as the wrong medication or dose. Drug interactions were relatively common at 7.7% and side effects comprised 2.1% of the reported problems. Overall, participating pharmacists encountered a large variety of problems (72 categories in all) and appeared to be gathering information from patients, suggesting pharmacists were engaging in a monitoring role in addition to providing medication information. Physicians were contacted for 60.5% of problems, but details about the nature of the intervention were not collected.

These studies suggest pharmacists can have a positive impact on patients through the identification and resolution of problems uncovered through various medication monitoring activities, although few details were provided.

Chronic Disease Management:

Globally, the prevalence of chronic diseases is rising, posing a severe challenge to emerging countries.

They have become a major health problem, accounting for 70-80% of all health-care costs.

Chronic diseases are linked, have common risk factors, and may be avoided in most cases.

However, just 3% of health-care expenditures are currently allocated to their prevention. Management of chronic diseases has been also pointed as a serious concern, with WHO's statement that approximately 50% of chronic patients do not adhere to therapy and re-ports on the economic magnitude of this problem, 194,500 deaths and estimated costs of €125bn annually in the EU due to overdosing and non-compliance with pre-scripted medication

As a result, an effective and long-term chronic illness management program necessitates a system-wide collaborative strategy that is both professional-directed and patient-centered. Among all healthcare professionals, the community pharmacist has the most frequent interaction with chronic disease patients. As a result, pharmacists can be quite helpful in disease management. There are clinical benefits and cost-effectiveness arguments for patients' management supported by pharmacists in a range of chronic diseases. There is minimal capital expenditure in rolling out chronic disease management programs and it therefore represents a cost-effective solution to a significant problem [22]. There is a requirement to provide conversion training and continuous accreditation for pharmacists in each of these chronic disease areas in order to attain consistently high levels of service delivery. Formal education in these new areas of practice is needed and should be incorporated into existing pharmacy undergraduate curricula [23].

Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia associated with abnormalities in carbohydrate, fat and protein metabolism and resulting in chronic complications including microvascular, macrovascular and neuropathic complications [24]. Diabetes is worldwide in distribution, and the prevalence of type 1 and type 2 diabetes varies considerably in different parts of the world. This is probably due to differences in genetic and environmental factors. It is the fourth leading cause of death in developed countries, affecting 3% of the population and 5–10% of those over 65 years old [25]. Diabetes can be managed by drug therapy and non-pharmacological therapy.

The cornerstone of non-pharmacologic therapy is lifestyle modifications, including nutritional therapy, physical activity and avoidance of smoking. Education of the patient in diabetes self-care, including self-monitoring of blood glucose levels, is also vital [26]. Pharmacists are critical in diabetes treatment because they identify patients, assess them, educate them, refer them, and keep track of their progress. Regular screening techniques can assist pharmacists detect individuals with diabetes. Patient education should be provided immediately after a diagnosis of diabetes or any other diseases. Later on, patient assessment can be performed, and the patient can be educated to reinforce concepts and provide a motivational boost [27] the role of the community pharmacists in monitoring and educating diabetic patients is not well defined.

According to Collins et al [28], HbA1c levels decreased by an average of 0.76 percent in 14 trials involving 2,073 subjects, and fasting blood glucose levels decreased by an average of 1.63 mmol/L in four trials involving 589 subjects when compared to control subjects.

Aguiar et al [29] conducted a meta-analysis of 22 studies that looked at the impact of pharmacist interventions on T2DM patients' glycemic control. This study found a 0.85 percent drop in HbA1c (95 percent confidence interval [CI]: 1.06 to 0.65, P 0.0001), which was statistically and clinically significant. The effect on HbA1c was similar when community pharmacy interventions were

compared to other outpatient settings (0.65% vs.0.98%, $P = 0.08$). Surprisingly, the studies with the greatest effect on HbA1c were those in which the patients' initial HbA1c was more than 9%. Furthermore, as the participants' ages climbed, the advantage received decreased. In the prevention of cardiovascular disease, hypertension remains a critical, controllable risk factor. However, many patients fail to meet their therapeutic objectives for a variety of reasons, including a lack of disease awareness and nonadherence. Given their drug knowledge and patient counseling skills, pharmacists can play a critical role in hypertension control, yet they are an underutilized resource in the management of chronic disease conditions. Various models exist that allow pharmacists to deliver direct patient-centered treatment, but because pharmacists are not recognized as healthcare practitioners nationally, practices vary from state to state [30]. More community pharmacists have begun to assist physicians with hypertension patient monitoring in recent years in order to enhance compliance, prevent adverse effects, and improve blood pressure control. Some community pharmacists check for new or poorly managed hypertension in patients and recommend them to their doctors. In Randomized controlled trial of 179 patients to receive pharmacist-physician collaborative management or usual care. Result showed Daytime SBP reduced 15.2 mmHg (tx) vs. 5.5 mmHg (control), Nighttime SBP reduced 12.1 mmHg vs. 3.4 mmHg, 24h SBP reduced 14.1 mmHg vs. 5.5 mmHg, BP control 75% vs 50.7% ($p < 0.001$) [31].

Studies have demonstrated that interventions provided by CPs can have a positive impact on BP reduction [32]. Within Africa, a study conducted in Ghana showed that CPs' interventions significantly improved diastolic blood pressure (DBP) and medication adherence [33]. At least two studies conducted in Nigeria demonstrated that CPs' interventions improved BP control, thereby lowering cardiovascular risk among members of the community [34]. Within Asia, a study conducted in Pakistan noted that pharmacists' interventions improved patient's levels of knowledge about hypertension, medication adherence, BP control, and HRQoL [35].

A systematic assessment of the role of pharmacists in improving the health outcomes of Jordanian patients indicated increased blood pressure and cholesterol control.

Other systematic studies have found that pharmacist-provided interventions enhance blood pressure control and medication adherence, indicating that pharmacist-provided interventions can help with hypertension management. Evidence from a meta-analysis of 39 randomized controlled trials (RCTs) with 14,224 patients showed significant reductions in systolic blood pressure (SBP) of 7.6 mmHg and DBP of 3.9 mmHg, supporting the benefits of pharmacist-provided interventions in hypertension management [36][37].

Role of community pharmacists and their impact in asthma/chronic obstructive pulmonary disease (COPD): Community pharmacists provide patient education about the disease conditions (symptoms, triggers, and early warnings) and medication counseling (medication selection, medication adherence, and proper inhaler device use and medication adherence). They aid in determining a patient's risk of disease aggravation, polypharmacy, medication interactions, and untreated underlying medical conditions. They can also help with self-management, smoking cessation, illness and therapy monitoring, and referring patients with issues back to their general practitioners (GPs) [38].

In a research conducted in Turkey, CPs found 59 DTPs and 134 causes for issues in 44 asthma patients, with 54.2 percent of the DTPs being treated with the interventions provided. Similarly, 60 DTPs and 128 causes for the problems were identified among 37 patients with COPD with 95 interventions and a resolution rate of 63.3% [39]. Through medication review, CPs in Brazil detected 277 DTPs, of which 53.1% were resolved. A randomized controlled research in Bulgaria found that CP interventions reduced hospitalizations and length of stay, as well as improved inhaler technique, HRQoL, and patient satisfaction among asthma patients[40].

There was a 10% increase in FEV1, less interference with daily routine, and greater satisfaction with clinical pharmacy services at community pharmacies in a distinct Bulgarian study of COPD patients. In Columbia, CPs' asthma interventions resulted in a 50% reduction in symptom scores, an 11% rise in peak flow readings, a one-day reduction in days off work or school each month, and a 50% reduction in the usage of inhaled beta-agonists [41]. Other notable favorable outcomes were a 19 percent improvement in total HRQoL, improvements in specific categories of activity restrictions, symptoms, and emotional function, a doubling of beginning knowledge scores, a 75 percent reduction in emergency room and doctor visits, and a cost savings.

Pharmacist involvement in drug safety systems [42]:

Drug safety systems, such as medication error reduction and adverse drug reaction (ADR) reporting systems, require the use of electronic patient records. These systems can:

- Reduce inappropriate prescribing of medication to a large extent and reduce emergency admissions and associated healthcare costs related to adverse drug reactions.
- Improve rates of medication under-prescribing

- Improve patient adverse events associated with poly-pharmacy
- Improve discharge planning in the community
- Improve patient quality of life associated with better medicines management
- Provide statutory drug regulatory bodies with more accurate data on adverse drug reaction rates and pharmacovigilance, and establish better patient-centered safety procedures.

Healthcare screening services in pharmacies:

Services such as type 2 diabetes screening and vascular risk screening employing a combination of cholesterol, blood pressure, and body mass indexes are examples of screening services. People found to be at risk are referred to their doctor for further investigation. Those who are at increased risk can receive from the pharmacy intervention and management advice, which encourages these people to change their lifestyle habits and diet [43].

Pharmacies are the healthcare service with most frequent contact with high-risk chronic disease patients and are ideally placed to screen for disease development and progression. There is broad acceptance of healthcare screening in pharmacies, with 92% of the general populations in countries where it is available, agreeing that services such as diabetes screening should be available in this setting. Minimal capital expenditure is required to roll out programs in the existing pharmacy network. Medication databases provide access to identifier data for targeting high-risk patients [44].

These additional patient-centered improvements create a more competitive market, which leads to further innovation in both services and processes.

Awareness and use of pharmacy services:

A recurring result was a lack of public or patient knowledge of extended pharmacy services.

The pharmacy looked to be portrayed as a dispensary (medicines supply) and a place where people could buy medicines and get advice on minor ailments [45].

When asked how often they used pharmacies for specific purposes in a poll of public opinion, a large percentage of respondents said "always" for issuing prescriptions (85.1%) and purchasing pharmaceuticals (79.2%) [46]. Lack of awareness was coupled by a lack of exposure to pharmaceutical services, as well as a low utilization rate. Only 15.6 percent (24/155) of English participants in a study comparing pharmacy consumer experiences in Australia and England had experienced a pharmacy-based weight loss program, and few members of the public in another study had experienced any of the seven public health services investigated (2.1 % - 12.7%) [47].

Barriers:

Studies have frequently identified a perceived lack of privacy and confidentiality as a barrier to using extended pharmacy services, with the drugstore atmosphere being seen unsuitable for private conversations. Busyness and talks being overheard, particularly regarding private things, were major worries. Participants in multiple studies viewed the pharmacist's lack of access to medical records, inability to prescribe, and communication issues with other health-care practitioners as significant hurdles to pharmacists' expanded participation in the larger health-care system [47]. Patients in another survey complained about pharmacists' lack of authority to perform additional tasks. Due to their enormous workload, some people questioned if pharmacists had the time to perform new services, which could lead to a lack of service continuity. Another focus group study identified lack of continuity as a barrier, claiming that pharmacy services were not always provided by the same staff, reducing patient-pharmacist rapport and confidentiality [48].

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