A Review On Role Of Pharmacist In Managing Of Chronic Diseases

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❖ ABSTRACT

Chronic conditions require consistent care and management even though patients do not visit the clinic/hospital or any other healthcare setting. The important chronic diseases include heart diseases, stroke, cancer, chronic respiratory diseases and diabetes. The increasing burden of chronic diseases especially in the low-income countries, has made the prevention and management of chronic diseases a global priority. In the management of chronic diseases, there should be continuous monitoring on medications, lifestyle management, and health behavior. As no healthcare professional can specifically contribute in this area, pharmacist can fill this void by offering these services. Pharmacists can contribute by improving medication use through individual patient assessments and population-based interventions, and by implementing systematic intervention. Medication Therapy Management is a multi-component intervention that includes medication therapy review, patient medication education, medication monitoring, immunizations, disease self-care and support in association with physician. In this review outcome of pharmacist implemented medication therapy management in cardiovascular disease, diabetes, cancer and asthma has been discussed. This specialized service by pharmacist had a positive impact on health care utilization, disease outcomes from improved medication adherence, fewer drug related adverse events, and better or more efficient coordination of care. [1]

❖ KEYWORDS

Chronic disease, pharmacist, medication therapy management, cardiovascular disease, diabetes, cancer and asthma.[1], pharmacist, interprofessional care, chronic diseases, health care.[10], Keywords: Chronic Disease Management, Pharmacists, Medication Therapy Management, Collaborative Care.[6]

❖ INTRODUCTION

Chronic illnesses, known as non-communicable diseases (NCDs), are the primary contributors to death and disability worldwide. The World Health Organization (WHO) defines a chronic illness as a “disease of long duration and generally slow progression”, often necessitating lifetime disease treatment, diminished quality of life, and compromised mental health in affected individuals. Approximately one in five individuals have many chronic diseases, and the effective treatment of these conditions is a significant burden for healthcare systems. Inflammatory bowel disease (IBD) encompasses a collection of chronic conditions, notably Crohn's disease (CD) and ulcerative colitis (UC). Inflammatory Bowel Disease (IBD) is often diagnosed in early adulthood and is characterized by persistent discomfort and a steadily deteriorating condition [2].

Approximately 80% of patients necessitate at least one surgical procedure during their lifetime, particularly in cases of Crohn's disease, accompanied by various modifications to treatment protocols, variable symptoms, and extra-intestinal manifestations, all of which significantly impair quality of life. The multidisciplinary care of inflammatory bowel disease (IBD) is demonstrably beneficial. The significant morbidity linked to chronic illnesses profoundly affects people, their families and caregivers, communities, healthcare providers, and the healthcare system. Effective care of chronic diseases requires a comprehensive, patient-centered strategy aimed at reducing premature mortality and morbidity via multidisciplinary cooperation across primary, secondary, and tertiary sectors. Type 2 diabetes and asthma are effectively controlled in Australia, New Zealand, Canada, and the United Kingdom by primary care pharmacists collaborating within multidisciplinary healthcare systems. While all chronic illnesses need a comparable treatment strategy of life, and compromised mental health in affected individuals.[2]

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❖ MATERIALS AND METHODS

A systematic search of international peer-reviewed literature in Medline was carried out on chronic disease management roles of the community pharmacist. Grey literature such as conference proceedings, abstracts, presentations, technical reports were identified on these topics using generic search engines (e.g. Google, Yahoo, etc.) The search terms used were "community pharmacists", "community pharmacies", "public health" "disease prevention", "disease management", "interventions" and "roles". Boolean operators were used to combine the search terms and the search was limited to English language manuscripts because it was the language of proficiency of our research team. Reference lists of retrieved studies were reviewed for relevant articles. Studies were assessed for relevance based on the abstracts. Relevance was judged by health improvement, and the role of community pharmacist. Manuscripts in which the role of the community pharmacist was not a major heading were excluded. The findings are presented as a narrative summary. The search covered the period from 1 January 1991 to 30 July 2009. The limits were to ensure manageable yield and to filter out old publications. [3]

❖ METHODS

A peer-reviewed survey was distributed to physicians in person or via email. Survey questions included Likert scale, multiple choice, and open text, which were analyzed using descriptive analysis. A list of the top one hundred prescribers was generated by a retail pharmacy chain at thirteen of their locations in Vancouver, Olympia, and Seattle, Washington (WA) areas. The list of prescribers was filtered to only include physician

prescribers. Ten physicians were randomly selected from each pharmacy location and their office was contacted to participate in this voluntary and anonymous survey. Upon agreement to participate in the study a Qualtrics link was sent via email to the physician's office. Additionally, researchers partnered with an outpatient multi-specialty physician owned clinic in Vancouver, WA. At this location, paper copies of the survey were distributed to all physicians during a monthly all provider meeting. Completion of the survey was anonymous and voluntary. Those completed were collected at the conclusion of the meeting. All physicians practicing in the outpatient setting regardless of their specialty were included in this study. The duration of the study was December 2017 through February 2018. This study was reviewed and considered to be exempt by the Washington State University Institutional Review Board.[4]

❖ THE SCOPE OF CHRONIC DISEASES

Chronic diseases vary from heart disease to asthma. While they are sometimes known as persistent medical conditions, they can often lead to deterioration and impairment over time if not well handled. According to the World Health Organization (WHO), these diseases "occupy fifteen of the fifteen leading causes of death" and "contribute to about sixty percent of all deaths worldwide." Furthermore, chronic diseases are a significant burden on healthcare service providers across the world. Chronic patients may account for nearly 95% of pharmaceutical, nursing, and ambulatory care budgets. The prevalence of chronic diseases varies by country, with the rate of people with at least one recognized long-term disorder in the United States, European Union, and Australia usually in the range of 17 percent or higher. When categories are illustrated, the most common chronic disorder is cardiovascular disease or breathing problems. Such a situation necessitates attention and needs to be managed as effectively and efficiently as possible. At the moment, a substantial amount of the cost of medical delivery in high-income countries is directly or indirectly linked to the treatment of chronic disorders. Numerous strategies have been developed to offer professional treatment for such illnesses, with remedies and therapies described in medical guidelines and clinical pathways. A range of non-professional treatments have also been developed, addressing healthcare-related behaviors including sick days, compliant treatment behavior, and domestic self-care. Pharmacists are possibly the most common example of primary care professionals, with four out of five regular consultations in general practice. [5]

❖ DEFINITION AND TYPES OF CHRONIC DISEASES

The very first thing to consider when meeting patients with chronic diseases is to be aware of the definition of such ailments. According to the WHO, if an indicated disease will last for over three months, it can be defined as chronic (or long-term). When it comes to the adverse consequences connected to chronic diseases, they need to be diagnosed and treated in an early way, as chronic or long-term ailments generally have a gradual onset and may be saved in the early phases of the onset of significant structural, practical, or psychological deterioration. Concerning the causality of chronic diseases, these might have numerous causes and not only a single proven fact. The possible medications for chronic diseases include lifelong medications that minimize the risk of further disease progression or complications. Furthermore, long-term medications are not obligatory, but if terminated promptly, a rapid ascent to their previous state is likely. A set of chronic diseases have been addressed in this part, which are divided either by organs or causes of the diseases into the following: 1) respiratory diseases (such as upper or lower airway diseases); 2) heart diseases (e.g., diseases related to blood vessels); 3) psycho-neurological diseases and disorders (e.g., diseases of the brain and nerves, or psychological diseases); 4) digestive diseases; and 5) endocrine gland diseases, to name a few. [5]

❖ ROLES OF PHARMACISTS

There are over 70,000 registered pharmacists, pharmacy technicians and pharmacy premises in England, Scotland and Wales (General Pharmaceutical Council, 2013). Dispensing of prescriptions is one of the major activities of community pharmacists and there has been an increase in their dispensing workload in the recent

years (Hassell, Seston, Schaffhausen, Wagner & Eden, 2011). The number of prescription items dispensed by community pharmacies in England in 2012-13 was 914.3 million compared to 82.6 million items dispensed by GPs and 6.9 million by appliance contractors (Health and Social Care Information Centre UK, 2013). Besides dispensing prescriptions, pharmacists provide a wide range of public health services, including smoking cessation, NHS health checks, sexual health (e.g. contraception and Chlamydia screening), and weight management (Royal Pharmaceutical Society [RPS], 2014). Pharmacists are also undertaking NHS Health Checks, for example, for vascular disease, 39men's health, blood pressure, blood glucose monitoring and Body Mass Index (BMI) assessment (Department of Health, 2008). [6]

❖ THE COMMUNITY PHARMACY CONTRACT

In 2005, a new NHS Community Pharmacy Contractual Framework (CPCF) was introduced in the UK (Department of Health, 2005a). Although dispensing of prescriptions remained the mainstay of the contract together with supply of appliances and disposal of waste, new clinical services were introduced in the CPCF. Under the new CPCF, pharmacy services were placed into three categories: essential services, locally commissioned services and advanced services to incorporate the basic pharmacy services as well as the extended roles of the pharmacists (Department of Health, 2005a; Noyce, 2007). A description of these services is given below.[6]

❖ ESSENTIAL SERVICES

Under the CPCF, the essential services are: dispensing, public health, repeat dispensing, signposting, supply of appliances, support for self-care, disposal of unwanted medicines and clinical governance (PSNC, 2014). These eight services are the traditional pharmacy services that represent the core pharmacy contract and failure to provide these services constitutes a breach. [6]

❖ LOCALLY COMMISSIONED SERVICES

Locally commissioned community pharmacy services can be contracted via various routes and by different commissioners, including Local Authorities, Clinical Commissioning Groups and NHS England's area teams (PSNC, 2014). [6]

❖ ADVANCED SERVICES

The current four advanced services offered within the CPCF are: Medicine Use Reviews (MURs), NMS, Appliance Use Reviews and Stoma Appliance Customization (PSNC, 2014). Community pharmacies can choose to provide any of these services as long as they meet the requirements set out in the Secretary of State Directions (PSNC, 2014). MUR and NMS are the two most dominant advanced services offered by pharmacists. MUR was the first advanced service introduced in the new CPCF. A MUR is a consultation offered by the pharmacist to the patients about their medicines. It allows pharmacists to explain the medication use to patients about all their medications including both prescribed from the doctor as well the non-prescribed such as the OTC medications. In October 2011, three national target groups for MURs were introduced. The three national target groups introduced were: patients taking high risk medications including NSAIDs, anticoagulants, antiplatelets and diuretics, patients recently discharged from the hospital with changes in their medicines and, patients taking medications for respiratory diseases such as asthma and Chronic Obstructive Pulmonary Disease (COPD). The NMS is the fourth advanced service that was introduced in the NHS CPCF on 1st October 2011. The Department of Health (2010) has projected an increasing number of patients with long term conditions in the UK. Furthermore, adherence to medicines by patients with long-term conditions is poor (World Health Organization, 2003; Tomaszewski et al., 2014). The next part of this section explains the background behind the development of NMS and the potential role of this service in the management of long-term medical conditions.[6]

❖ THE NEW MEDICINES SERVICE (NMS) FOR CHRONIC CONDITIONS

A pivotal study published in the British Medical Journal (BMJ) reported that approximately 30% of newly diagnosed hypertensive patients stop taking their blood pressure medication by six months and 50% stop by 12 months (Vigens, Vincze, Christianto, Urquhart & Bernier, 2008). The blue line in Figure 1.2 represents the decrease in compliance to blood pressure medications by the percentage of patients who were still taking their blood pressure medications following the commencement of their treatment (Vigens et al., 2008). around 50% of the patients had discontinued their blood pressure medications by 12 months. Similar rates of persistence with prescribed blood pressure medications were reported in another study that assessed 82,824 patients (Morgan &Yan, 2004). Only 51% of these newly-treated hypertensive patients obtained their hypertension prescriptions for at least one full year (Morgan & Yan, 2004) Poor medication adherence does not only contribute to morbidity and death (Osterberg & Blaschke, 2005) but is also associated with a significant financial impact on the health services through medicines waste. For example, a study evaluating the scale, costs and causes of medicine waste in England reported that the cost of medicine waste is estimated to be around £250 – £300 million per year in England. This figure equates to around £1 in every £25 spent on NHS medicines (Trueman, Taylor, Lowson, Bligh, Meszaros, Wright et al., 2010). The likelihood of poor medication adherence by patients seems to be greater with their new medications as opposed to the existing ones (Barber, Parsons, Clifford, Darracott & Horne, 2004). According to this longitudinal survey of 258 patients, around one third of the patients did not take their new medication as prescribed (Barber et al., 2004). However, this study used patients' self-reports of adherence that may not reflect the true incidence of nonadherence (Barber et al., 2004). A RCT involving 500 patients was conducted in the UK (Clifford, Barber, Elliott, Hartley & Horne, 2006). The study assessed the impact of a telephone-advisory service provided by the pharmacist (Clifford et al., 2006). At the 4-week follow-up, patients who received the advisory service from pharmacists experienced fewer medication problems than the patients in the control group (23% vs. 34%, $p = 0.021$). Similarly, non-adherence to medications was lower in the intervention group compared to control group (9% vs. 16%, $p = 0.032$) (Clifford et al., 2006). The finding of this study led to the introduction of the NMS in the community [6]

pharmacy contract. The NMS is a free NHS service, offered through the pharmacy, to help patients understand their condition and get the most out of their new medicine. The NMS can be provided to 43patients who have been newly prescribed a medication in any of four long-term therapeutic areas or treatment options: asthma and COPD, type 2 diabetes, antiplatelet/anticoagulant therapy and hypertension. The service is designed to help patients to find out more about the new medicine they are taking and to help them sort out any problems identified with their new medicine (PSNC, 2013). Eligible patients receive the NMS service in two stages: an intervention stage within two weeks of starting the new medication conducted in the pharmacy or over the telephone, and a follow-up stage three weeks later (PSNC, 2013). The uptake of NMS by community pharmacies has been successful (PSNC, 2014). There were 11,495 community pharmacies in England on 31st March, 2013 (Health and Social Care Information Centre UK, 2013). Of the 11,495 pharmacies, more than 90% of the pharmacies in England have provided NMS to their patients (PSNC, 2014). The NMS was initially commissioned until March 2013, which was later extended to September 2013, then to December 2013 and subsequently extended to March 2014. Now it has been extended until 31st March 2015 subject to an evaluation commissioned by the Department of Health, UK (PSNC, 2014). This evaluation work was a RCT and was carried out by the Nottingham University on behalf of the Department of Health, UK (Elliott, Boyd, Waring, Barber, Mehta, Chuter et al., 2014). This trial involved 504 patients and reported that NMS had improved medicine adherence in patients by 10% (Elliott et al., 2014). However, this study did not explain the reasons or factors which contributed to the improvement in medication adherence. Chapter 4 extends the previous assessment of the NMS on medication adherence by defining the reports of concerns about medication safety, efficacy and use, and the resolution both of adverse effects of drugs and patient problems with use of their medications. 44This part of the section explains the background behind the development of NMS and the potential role of this service in the management of long-term medical conditions. The NMS also provides an opportunity for community pharmacists to report suspected ADRs through the national Yellow Card Scheme (MHRA, 2014). Spontaneous reporting of suspected ADRs is

fundamental in the post-marketing surveillance of medicines and helps in ensuring medicine safety (MHRA, 2014). The next part of this section evaluates the level of ADR reporting by community pharmacists. [6]

❖ REPORTING OF ADRS BY COMMUNITY PHARMACISTS

The thalidomide tragedy in 1961 led to the establishment of Committee on the Safety of Drugs (CSD) in the UK (RPS, 2011). CSD was a voluntary scheme that worked in close collaboration with the pharmaceutical industry to ensure an early detection of ADRs. One of the actions of CSD was the setting up of a voluntary scheme known as the Yellow Card Scheme (RPS, 2011). The responsibility of monitoring ADRs was later taken over by the Committee on Safety of Medicines (CSM) that introduced a new version of the Yellow Card Scheme. It was this scheme that identified the eye damage caused by the anti-hypertensive medication known as protocol (RPS, 2011). In 1975 a "black triangle" symbol was introduced to monitor the safety of new medicines for at least two years after marketing (RPS, 2011). The Yellow Card Scheme was originally confined to doctors. In 1997, this scheme was extended to hospital pharmacists and in 1999, all community pharmacists in the UK were permitted to report ADRs (RPS, 2011}.[6]

❖ HISTORICAL PERSPECTIVE

Historically, "in the nineteenth century, pharmacy was a profession—and pharmacists were professionals—founded on materials, medicine, and compounding services." A pharmacist was traditionally known as a drug molecule expert and was expected to have their clinical knowledge "tested daily through the act of compounding and dispensing." Therefore, the traditional functions of a pharmacist were more based on the preparation of drugs from ingredients, the supply of drugs and chemicals, intellectual skills and abilities, and the manufacturing of drugs according to special requirements. Moreover, the pharmacist also had to ensure the availability of quality supplies. The early dispensing pharmacists were quacks who followed the traditional compounding of emollients, lotions, and potions suitable for application on the skin. In recognition of this expanding role, the International Pharmaceutical Federation (FIP) has extended its definition of pharmaceutical care as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life." The pharmacist's role has evolved more towards health and disease prevention services, including the population's health prescription services, the provision of antibiotics for children for minor illnesses, the provision of health promotion and modification of health status using sophisticated dispensing methods, chronic disease management based on reducing comorbidity, and reducing the consumption of cigarettes and alcohol. In particular, professional services delivered to patients with chronic diseases have led to significant improvements. It is in this context that services provided by the pharmacist have facilitated the early identification of prevalent chronic diseases, their efficient management, and their safety in the community. There are no limitations on the type of chronic disease, and the complications that have been found could be managed by pharmacists. (Bates et al., 2020).[5]

❖ PHARMACISTS 'CONTRIBUTION' TO CHRONIC DISEASE MANAGEMENT

Though multiple healthcare professionals contribute to the care of patients with chronic diseases, pharmacists are particularly important. There are several critical ways that pharmacists help in the management of chronic diseases. One of the most direct activities that pharmacists engage in that is essential to effective chronic disease management is medication therapy management. This includes adjusting drug regimens, educating patients about their medications, and assisting patients with adherence to therapy. Pharmacies can serve as a site for optimal communication between members of the patient's healthcare team. Additionally, pharmacists have important roles in educating patients about chronic disease and coaching them in the skills of self-Management. Pharmacists are also often involved in the management of specific chronic diseases, particularly those that are very medication heavy, such as diabetes, asthma, or hypertension. In these capacities, pharmacists are often the professionals that patients are in most frequent contact with, particularly "ambulatory care" or "clinical" pharmacists who practice directly in the doctor's clinic. In these scenarios, pharmacists often engage in patient education, medication adjustments, laboratory monitoring, referrals to other providers, and communication with

the patient's healthcare team. Finally, pharmacists across healthcare settings are increasingly involved in the development and evaluation of clinical practice guidelines, particularly in the area of medications and medication related care. Pharmacists function as "drug experts" in these purviews, working with a diverse team of other health professionals to translate medical and practice issues into specific information about the pharmacist's role and responsibility in patient care. They also conduct practice-based research, using scientific reasoning to develop evidence for drug therapy to support guideline development.[5]

❖ COMMUNITY PHARMACIST'S ROLE IN DISEASE MANAGEMENT

Community pharmacists are in a strong position to contribute towards improved patient care by providing certain chronic disease management services. Several major trials worldwide have documented the community pharmacists' role in the management of certain chronic conditions. The documented roles of the community pharmacist in chronic disease management. [3]

❖ ASTHMA MANAGEMENT

Asthma care programmers involving community pharmacists have been shown to improve the quality of life and clinical outcomes.19-23 Reported benefits include reduced symptoms of asthma, improved perception of asthma control, increased peak expiratory flow, reduced. [3]

❖ CARDIOVASCULAR DISEASE MANAGEMENT

Community pharmacists are well placed to help patients who have cardiovascular disease or who are at risk of this.25 Community pharmacy-based interventions have resulted in reduction in risk behaviors and risk factors for coronary heart disease (CHD). Studies have demonstrated their role in improving surrogate outcomes for patients with cardiovascular disease by managing hyperlipidemia, hypertension, and secondary prevention medications. Evidence from studies support the wider provision of community pharmacy interventions for smoking cessation and management.[3]

❖ DIABETES MANAGEMENT

Community pharmacists are in a strategic position to provide extended diabetes care for several reasons. There is considerable evidence of effectiveness of diabetes management services provided by community pharmacies.30 A patient with diabetes may see his/her pharmacist 5 times more often than his/her primary care physician.31 Pharmacists have significant training in the pharmacotherapy of diabetes and cardiovascular disease and can make valuable drug therapy recommendations to physicians. Pharmacists are also skilled at identifying adherence problems and addressing adverse drug effects, and many pharmacists are trained to educate and motivate patients on diet, exercise, and diabetes self-care activities.32 One meta-analysis showed that pharmacist interventions can significantly decrease HbA1c levels across a variety of settings, including clinics and community pharmacies.30 Evidence from Australian studies suggests community pharmacy-based diabetes management services lead to a significantly greater reduction in HbA1c compared with controls.15 A randomized controlled trial done by McLean et al33 showed that pharmacy-based targeting of people with risk factors for diabetes, incorporating 'point of care' blood glucose testing prior to referral was more effective and cost effective than targeting and referral alone.33 Community pharmacy-based diabetes monitoring and information.[3]

❖ HYPERTENSION MANAGEMENT

A systematic review of 13 trials found evidence of effectiveness of pharmacist input in significantly reducing systolic blood pressure.34 A controlled study showed that blood pressure control improved in the intervention arm of a community pharmacy-based 'health promotion programme'.35 In a study on 14 community pharmacies in Edmonton, Alberta, Canada pharmacists and community nurses were trained to deliver the study intervention on risk prevention strategies to control hypertension. Intervention was randomly assigned to adult diabetic patients with blood Hypertension Management pressure (BP) higher than 130/80 mm Hg. The intervention

included active BP monitoring and recording in a wallet card, cardiovascular risk education and counselling, and hypertension education. Primary outcome measure was the difference in change in systolic BP between the 2 groups at 6 months. Over the trial period, systolic BP decreased in both groups, however the decrease was significantly greater in the intervention group after adjusting for baseline covariates. The pharmacist and nurse team-based intervention resulted in a clinically important improvement in BP. [3]

❖ MEDICATION THERAPY MANAGEMENT

Patients with chronic diseases often have comorbid conditions and are frequently treated by multiple healthcare providers, which can make the medication treatment plan difficult to understand and follow. Interpretation of data from the Institute of Medicine of the National Academy of Sciences indicates that at least 3.8 million avoidable adverse drug events occur each year because of inadequate TPM services, a significant portion of which could be reduced through pharmacist-delivered disease state management services. The Joint Statement on Comprehensive Medication Management (CMM) from the ASHP, ACCP, and national PAHO/NPC provides clarity and consensus on the responsibilities of a qualified pharmacist in providing CMM. Generally speaking, upon the provision of these services, it was found that there was a decrease in the overall volume of healthcare resources and a significant decrease in the costs of care, mainly as a result of the decrease in the number of hospital admissions and ED visits. In sum, there was also a 21% increase in medication therapy adherence. Medication therapy management (MTM) has been described in the Centers of Medicare & Medicaid Services (CMS) final rules on MTM, and through the efforts of under a cooperative agreement with CMS, it was defined as a service or group of services that optimizes pharmacotherapy for a patient through improved medication use, enhanced medication adherence, and reduced adverse drug events. [6]

❖ PATIENT EDUCATION AND COUNSELING

According to different studies, the inability to adhere to the diet is a primary contributing factor to poorly controlled diseases. Several researchers stressed that dietary and weight management counseling may be helpful in controlling diseases. Sophisticated medications have been introduced for chronic diseases, and diet seems less important than before. However, it has been suggested that a poor diet could be responsible for poor control in a number of patients. There are several roles that pharmacists can assume. They can provide patients with disease-related and medication-related information and dietary advice on the newly prescribed regimen. Most importantly, they can work with the patient continually to reinforce the education at the start and after his or her next appointment (follow-up) and to assess understanding and adherence. This serves to convey to the patient the importance of the drug in meaningful terms. Such counseling can help determine why a patient is not taking his or her medication. Supportive educational and counseling services thus aim at increasing "improvement" in various outcomes, particularly drug-related outcomes. Pharmacists may also be in the best position to refer patients to other healthcare professionals. Pharmacists need to develop effective methods for ensuring proper screening, documentation, and monitoring of services because they work within a team and can leverage other existing team resources. Overall, patient education and counseling are the cornerstones of ambulatory care interventions provided by pharmacists. Providing disease, medication, and dietary information and working on case. [2]

❖ COLLABORATIVE CARE MODELS

It has long been understood that chronic diseases are complex. At their core, chronic diseases require constant vigilance by care providers and ongoing management by patients on a day-to-day basis, as well as interdisciplinary collaboration among care teams in many cases. This presents an opportunity for the evolution of the previously discussed pharmacists' care roles. Pharmacists have begun playing a central role in medication management with increased autonomy under collaborative care models that embrace the scope of care management required to support the patient population most affected by chronic disease. Numerous models exist that bring interprofessional collaborators, especially pharmacists, onto chronic disease treatment teams in the role of care manager or coordinator. In these models, medication is perceived as one aspect of the total care

regime that needs specific, regular management as it is the source of treatment for some conditions. It can both improve or complicate concurrent management of other conditions related to medicine, making each chronic illness more complex when assessing and treating the condition using the framework of Interprofessional Education Collaborative (IPEC). Team-based management can leverage all specialties for an effective result for common diseases or individuals with multiple, complex illnesses. Pharmacists providing care in this new setting take on responsibility that has been defined by their professional governing organizations as provided by "ambulatory care specialists" and similar ultra-specialist job descriptions and practice definitions. Ranging from elevated roles in clinical service provision in primary care practices to working as "patient care coordinators," there are many collaborative care models that have been published or piloted across the United States between pharmacy and other healthcare practitioners—and more are in development across the country. These models exist in academic or proprietary healthcare settings, in community or outpatient practice settings, and alongside specialists from all domains of healthcare—from geriatrics to diabetes to transitions of care—and have already made direct-influence publications in quality-of-care outcomes in hypertension, diabetes, obesity, anticoagulation, and other chronic disease states. The net commonality of their characteristics is that each of them is a pharmacist. (Abdulrahim et al., 2020) (Khaira et al., 2020).[6]

❖ INTERPROFESSIONAL COLLABORATION

One of the key components of chronic care models is interdisciplinary or collaborative care. This approach organizes care for patients with chronic diseases across multiple providers and within a variety of different health settings. The purpose of this approach is to ensure that patients can receive evidence-based, patient-centered care that will enhance the patient's experience, improve clinical outcomes, and lower costs of care. The research study involved an on-site clinical pharmacy in a primary care clinic. This on-site clinical pharmacist coordinated care with the care team for the complex medical patients who have poorly controlled chronic conditions. In addition to prescribing medications and modifying any current drug therapy, the on-site clinical pharmacy would provide education to the patients and work with them to set self-management goals. The clinical pharmacy would also assess risk factors and refer patients to other healthcare providers for additional care as needed. The research study involved an on-site clinical pharmacy in a primary care clinic. This on-site clinical pharmacist coordinated care with the care team for the complex medical patients who have poorly controlled chronic conditions. In addition to prescribing medications and modifying any current drug therapy, the on-site clinical pharmacy would provide education to the patients and work with them to set self-management goals. The clinical pharmacy would also assess risk factors and refer patients to other healthcare providers for additional care as needed. Older adults with chronic diseases are at a particularly high risk for medication-related problems, and these problems frequently result in medication misadventures. Currently, pharmacists within the interdisciplinary team have a significant impact working with this elderly population, which has multiple chronic conditions. The goal of the pharmacy is to help increase the standard of care provided to elderly patients with chronic conditions. However, the pharmacist is involved with all patients with diabetes, congestive heart failure, and hypertension.[5]

❖ PHARMACISTS' IMPACT ON PATIENT OUTCOMES

While several other healthcare professionals also play a significant role in patient-related clinical outcomes, increasingly, studies include the role pharmacists play in terms of chronic disease management in conjunction with their medication management expertise. Pharmacist intervention has been shown to be particularly significant in terms of changes in patient adherence and persistence. Readily "measurable" and accepted by healthcare professionals, it seems intuitive that cash patients would present a higher propensity to non-adhere/persist with their therapy than fully insured patients. This was evidenced by research on dyslipidemia patients in Henderson and Tierney's Purdue University-based retrospective claims data study conducted during the period 2009–2011, which revealed that 31 percent of dyslipidemia cash-paying patients per population did not fill/obtain any cholesterol fluctuating medication (CFM) prescription during the 365-day study period, compared to only six percent of those with Wright-Patterson Air Force Base insurance in the ORDER cohort. [7]

In other research, investigational analysis was recently completed that quantified that non-treatment propensity and found that the fraction of patients who did not pick up at least one statin medication (the subsequently most used for cholesterol maintenance/fluctuation) three years post-overall date of adjudication approval in one commercial "self-insured" claims database (referred to as BCBS1) was 47 percent, in contrast to just 3 percent on the other commercial "self-insured" claims database (referred to as In group). Moreover, it was revealed that more recently cured/attained impaired fasting glucose or type II diabetics picked up at least one anti-diabetic medication (predominantly a metformin medication) three years from adjudication approval, which was 19 and 30 percent, respectively, in these two commercial "self-insured" patient populations compared to 37 and 27 percent in the two commercial "fully insured" cohorts. A survey was conducted on the commercial (self-insured and fully-insured) patients with diabetes; of those not receiving insulin, be it new-to-therapy, possibly non-adherent, or adherent, a combined 7953—1591, or 20 percent, were not picking up any oral agents, and it was the biggest opportunity for pharmacist intervention in the survey. The employer survey revealed that of the patients who did not pick up at least one antidiabetic prescription (and despite the fact they are new to or uncontrolled on oral diabetic medications), only 69 percent own a glucometer. (Gupta et al., 2021) [7]

❖ PRIMARY CARE CLINICAL PHARMACIST AND CHRONIC DISEASE MEDICATION ADHERENCE

The NHS Long Term Plan emphasizes the vital role of prevention in the NHS. Optimizing patients' medical management of chronic disease is an opportunity for primary care. Primary Care Network-based Population Health Management interventions have the potential to augment existing services. Pharmacist-led interventions to improve chronic disease medication adherence have been shown to be effective.2–4 A study of the New Medicine Service offered by community pharmacies in England showed 70% self-reported medication adherence at 10 weeks in the intervention group compared with 60% in the control.5 A Quality Improvement Project in a socioeconomically deprived general practice in Nottinghamshire led to a clinical pharmacist telephoning 30 patients with sub optimally managed lipid profiles and cardiovascular risk. Fourteen patients were prescribed and repeatedly dispensed simvastatin, atorvastatin, or rosuvastatin. Eight (-57%) of those confided in the clinical pharmacist that they were non-adherent with the lipid-lowering medication regime. Patients had recently consulted with GPs and nurses prior to the intervention. Clinical pharmacist consultation may lead to more candid discussions about medication. A study of primary care in rural Australia6 reported a similar finding. Clinical pharmacists asked 50 patients about their drug history. Forty per cent of patients reported they were not adherent to their prescribed medication regime. All but one of the eight non-adherent Nottinghamshire patients agreed to restart medication after consultation. The most given reason for non-adherence was not feeling any benefit from taking pills regularly. The pharmacist reflected that most patients had a weak understanding of the primary or secondary prevention rationale for treatment. A 2016 metanalysis found health literacy to be positively correlated with medication adherence and that intervention can increase both. The effect of intervention was more pronounced in patients with lower incomes.7 Selective intervention by clinical pharmacists may add health benefit above usual care by increasing adherence to long term medication regimes. Low levels of health literacy in areas of socioeconomic deprivation may be a factor amenable to pharmacist intervention. Patients with greater socioeconomic deprivation and markers of poor disease control such as lipid profiles, HbA1C, and blood pressure could be prioritized inside a Primary Care Network footprint to maximize health grain.[8]

❖ LIMITATIONS

There were several limitations in this study. The sample size was small and results may not be APPLICABLE to the general physician population. Surveys were collected via two different methods. In-person survey collection by a pharmacist researcher may have introduced bias by introducing the topic rather than having participants read about the study on their own. All physicians from Vancouver, WA in this study is employed by a single outpatient clinic. The outpatient clinic has an established relationship with a community pharmacy chain and the familiarity may introduce a bias in their responses.[4]

❖ CONCLUSION

When it comes to the management of chronic diseases, community pharmacies play a crucial role. They are able to provide key healthcare services by utilizing their accessibility, competence, and frequent interactions with patients. Pharmacists make a contribution to increased medication adherence, better disease control, and enhanced patient outcomes through the administration of drug therapy, the education of patients, the counseling of lifestyle choices, and clinical assessments. Despite the enormous benefits, integrating community pharmacy into the management of chronic diseases presents a number of hurdles. These challenges include restricted funding, regulatory barriers, and the requirement for greater collaboration with other healthcare professionals. It is essential, in order to maximize the impact that community pharmacies have on the management of chronic diseases, to address these problems through initiatives such as extending training, incorporating pharmacists into collaborative care models, and using technology. Increasing the autonomy of community pharmacists and removing the obstacles they encounter are two ways in which the healthcare system can improve the quality of care provided to patients who suffer from chronic diseases, as well as improve the outcomes for public health and lower the costs of healthcare. There is no question that community pharmacies play a crucial part in the management of chronic diseases, and the contributions they provide are absolutely necessary in order to achieve improved health outcomes for patients and communities.[9]

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