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Evidence-Based Approaches to Screening for Polypharmacy in Older Adults

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Abstract

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By

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MS, Sagrado Corazon University,2014

BS, Turabo University at Gurabo,2012

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

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Abstract

Polypharmacy is the concomitant use of five or more medicines and is associated with a higher risk of being prescribed potentially inappropriate or interactive medications. Polypharmacy in adults over 60 years of age may correlate with adverse outcomes of multimorbidity such as functional impairment, low quality of life, high healthcare use, and increased costs. Health practitioners need to be aware of tools and methods to manage polypharmacy-related issues to optimize patient safety. The gap in practice is that a primary care practice did not have a comprehensive clinical guideline for a systematic and ongoing assessment of appropriateness of medication use as well as reduction of inappropriate medicines in older adults. The purpose of this scholarly project was to involve an interprofessional team in the development of polypharmacy clinical practice guidelines for the primary care of older adults. The practice-focused question involved whether an interprofessional team can develop a clinical guideline (CG) for regular medication management protocols. Guidelines involved developing suitable treatment goals to meet patients' most pressing issues while focusing on the rationale for individual prescriptions and recognizing improper prescribing using Beers criteria and START (Screening Tool to Alert to Right Treatment) STOP (Screening Tool of Older Persons' Prescriptions)criteria. The AGREE (Appraisal of Guidelines, Research and Evaluation II) test was used to assess the proposed CG's methodological quality, and 100% of team members (N = 4) from medicine, nursing, nutrition, and pharmacy strongly agreed that the CGs were acceptable. The use of clinical practice guidelines in primary care settings may leadto social change by ensuring patient safety, reducing adverse effects, encouraging more efficacious drug use, and potentially reducing hospitalizations.

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Section 1: Nature of the Project

Introduction

Polypharmacy is the concomitant use of five or more medicines (Halli-Tierney, 2019). It is associated with a higher risk of being prescribed potentially inappropriate or interactive medications (Abdulah et al., 2018). Inappropriate polypharmacy may harm patient health. Polypharmacy in adults over 60 years of age may result in adverse outcomes involving multimorbidity such as functional impairment, low quality of life, high healthcare use, and increased costs (Chew-Graham et al., 2017). This large medical practice does not have a guide for screening patients for polypharmacy or protocol for deprescribing. The purpose of this project was to use multidisciplinary team to develop clinical practice guidelines to address this situation. Guidelines were intended to better protect patients from the hazards of polypharmacy and enhance their wellbeing.

Problem Statement

Polypharmacy is the term used for regular intake of at least five medications and is common in older adults (Sirois et al., 2019). It affects 45% of older adults with chronic illnesses (Morin et al., 2018). An increase in the number of prescriptions is associated with higher risks for adverse drug events, especially among older adults (Avery et al., 2016). Older adults are among those most vulnerable to medication misuse and abuse because they have more chronic conditions and use more prescription and over the counter (OTC) medications compared to other age groups (Beuscart et al., 2019). Older adults with chronic illness are also more likely to visit multiple providers who may not

have access to comprehensive electronic medical records. Older adults may face difficulties in terms of managing, administering, taking, or storing medications (Beuscart et al., 2019). As people age, their metabolism changes, which may impact drug clearance rates.

The American Geriatrics Society (AGS) originally developed the Beers Criteria, a guide involving medications that should be avoided in older patients, potential adverse effects, and methods for evaluating safe medications for the older adult patient population. The framework allows providers to access specific patient factors to determine the potential for polypharmacy and implement interventions that help mitigate the adverse effects of polypharmacy. Medication reconciliation (MR) at hospital admission and discharge to primary care follow-up is required. However, new strategies and tools are needed for ongoing nursing and primary care assessment of the appropriateness of medication use and reduce use of inappropriate medicines in older adults. In this large primary care practice, the team, including the preceptor and Doctor of Nursing Practice (DNP) practicum student, detected a need to make some changes to address the high incidence and risks associated with polypharmacy. Development of clinical practice guidelines was used to address this gap in practice. Additionally, these guidelines assisted nurse practitioners (NPs) and nursing staff in terms of working with patients in primary care, consistent with the AGS' focus on ensuring the safety and wellbeing of older patients.These guidelines may be applicable to other primary care settings.

Purpose Statement

The gap in practice is that the primary care practice does not have a comprehensive clinical guideline for systematic and ongoing assessment of the appropriateness of medication use and reduction of inappropriate medicines. The purpose of the DNP project was to use an interprofessional team to develop clinical practice guidelines for a primary care practice. The practice-focused question was: Can an interprofessional team develop an evidence-based clinical guideline for regular medication management protocols? A systematic approach should help reduce polypharmacy. This guideline included a page for MR in the electronic medical record (EMR) system and protocols for providers regarding managing patients who take five or more medications.

Nature of the Doctoral Project

I used Walden's guideline for development of clinical practice guidelines. I used an interprofessional team to develop clinical practice guidelines. Data were gathered from the literature and respected professional resources and led to evidence-based recommendations. A team of *medical* doctors (MDs), doctor of pharmacy (PharmD), nurse practitioners (NPs), nutritionists, and an alternative medicine physician met using virtual conferencing to discuss and reach a consensus regarding the guideline. The multidisciplinary team then rated this guideline using the AGREE II tool (see Appendix A) to assure consistent agreement. The guideline was also sent to the practice committee for adoption and piloting. The goal of this project was to reduce polypharmacy and

inappropriate medication consumption among older adults. This project was intended to add new guidelines at the facility decrease the unnecessary prescription among older adults.

Significance

Addressing polypharmacy will benefit patients, primary care practitioners, and overall costs of healthcare. The appropriate management of patients with polypharmacy can prevent unplanned hospital admissions (Pazan&Wehling, 2021). Primary care nurse practitioners are positioned to identify older adult patients at risk for polypharmacy, which plays an important role in regular medication evaluation (Mathew et al., 2018). As an advocate, the NP influences health policy locally, state, national, and international levels. NPs support research and dissemination of evidence-based practice by developing clinical research questions. The nurse practitioner also conducts or participates in studies, implementing quality improvement (QI), and incorporates into practice (AANP, 2021)**.** To help address workforce challenges involved with caring for older adults, public and private organizations have emphasized greater use of registered nurses (RNs) and NPs in terms of providing both primary and geriatric care. The Health Resources and Services Administration Geriatrics Workforce Enhancement Program and Josiah Macy Foundation have recommended that nursing education programs increase preparation of RNs who are capable of providing primary and geriatric care in addition to urging physicians and primary care practices to expand the RN role in terms of delivering these services (Bodenheim & Bauer, 2016; Bodenheimer& Mason, 2016). RNs are the largest health

professional workforce, and their numbers are projected to grow rapidly through 2030 (Auerbach et al., 2017).

This project has the potential to enlighten healthcare practitioners about the benefits of implementing a multidisciplinary team to support patients who are receiving many treatments. A multidisciplinary team may be able to provide feasible practices for modifying and tailoring complex drugs for patients (PuigDemont et al., 2019).

Summary

Polypharmacy is a significant challenge for the American healthcare system. Older adults receive more medications than any older group. The gap in practice is lack of evidence-based guidelines for addressing and managing polypharmacy in older adults. The development of new guidelines for primary care practice has the potential to reduce polypharmacy in older adults. Section 2 includes background information about the topic and relevance to nursing practice.

Section 2: Background and Context

Introduction

The overall purpose of this project was to decrease the risk of adverse effects associated with polypharmacy. This large multidisciplinary primary care practice has a large older adult Medicare and Medicaid population on multiple medication regimens. The practice does not have a comprehensive clinical practice guideline for systematic and ongoing assessments of the appropriateness of medication use and reduction of inappropriate medicines among patients. I developed guidelines to minimize risks of polypharmacy. Section 2 includes the conceptual framework, relevance to nursing practice, and context and role of the DNP.

Concepts, Models, and Theories

The specific theoretical approach is Roger's five-step change theory. Roger's five-step theory is useful because it involves incorporating communication and social aspects of healthcare change and outcomes processes. Roger's diffusion of innovation (DOI) theory involves five-step innovation-decision process, where potential adopters of a change go through five stages. The first stage is the knowledge stage, which is exposure to the new idea. The next step is the persuasion step. This step typically involves the individual being interested in the idea and seeking further information or details. The third stage is the decision stage, where the individual assesses the value of the idea and decides whether to adopt or reject it. The implementation stage is the fourth step. This is the stage where the individual typically decides to adopt the idea in question, depending

on context and information. The final stage is the confirmation stage, where the individual will normally resolve the decision to continue the innovation or change, making maximum use of it (Rogers, 1983).

There are several elements of this theory that are important for this project. According to Ober (2020), innovation in this case refers to any idea, practice, or project seen as new by adopters. Innovation does not restrict the change process to completely new ideas. Consequences refer to different changes that occur either in individual or social systems because of different processes of innovation (Rogers, 2003).

To improve chances of adoption, individuals involved must be informed of consequences, which should be classified according to levels of desirability (Rogers, 2003). These include functional or dysfunctional, direct versus indirect, and anticipated as well as unanticipated effects. In this case, adopting the clinical practice guideline developed by the multi- professional team would essentially be a new process. Further understanding consequences of this adoption or lack thereof in terms of assessing the appropriateness of medication use and results when reducing the use of inappropriate medication among older adults contributes to social support and acceptance among the elderly.

The second element of the innovation diffusion process is the communication channel. Communication is the process through which participants create and share information to reach a mutual understanding (Rogers, 2003). Channels refer to the means through which a message comes from the source to the receiver. The influence and

effects of communication channels are especially important because innovation diffusion is inherently a social process that involves interpersonal communication relationships. The likelihood of success and effectiveness of communication depends on the degree of homophily between interacting individuals. Homophily is the degree to which two or more individuals who interact have similar attributes like beliefs, education, or socioeconomic status (Rogers, 2003). Success requires some level of similarity in terms of these attributes.

When considering social elements, the new clinical practice guidelines will depend upon providers who are members of the interprofessional team and older patients to determine the likelihood of adoption. The first element is compatibility, which in some cases is conceptualized as relative advantage that the new system provides. Compatibility refers to the extent to which the innovation or clinical practice guidelines are considered consistent with values, past experiences, and needs of potential adopters, in this case, older adults or at-risk younger populations (Rogers, 2003). If the innovation is incompatible with needs of individuals and organizations, then it is likely that rates of polypharmacy will increase. Complexity is the second element that mediates interaction and adoption of innovations and new clinical practice guidelines. Complexity negatively correlates with rates of adoption of organization, providers, and patients (Rogers, 2003). The final element is observability, which is the extent or degree to which results of an innovation are visible to others (Rogers, 2003).

Relevance to Nursing Practice

Nurses are pivotal in terms of helping older patients manage medications and prevent polypharmacy. Keys to reducing polypharmacy risks are information and discussions with patients about the need to keep an accurate list of all medications, including generic and brand names, dosages, dosing frequency, and reasons for taking drugs. Patients should keep a complete list of medical providers and their contact information and post names and telephone numbers of local pharmacies. Transition of care is movement of a patient from one care setting (hospital, ambulatory primary care practice, ambulatory specialty care practice, long-term care, home health, rehabilitation facility) to another. Three categories involving the role of nurses in terms of safety of medication management in transitional care were: medication reconciliation process, collaboration with other healthcare providers, and provision of support to healthcare recipients (Mardani et al., 2020). Nurses play a crucial role in terms of medicines management during transitional care. Therefore, they should be empowered and more involved in medicine management initiatives in the healthcare system. Health professionals should be aware of the role of nurses in medicine management to ensure medication safety during transitional care (Mardani et al., 2020). Physicians and NPs should identify and prioritize medications to discontinue and discuss potential deprescribing with patients (Halli-Tierney et al., 2019). When deprescribing, it is imperative to consider patient/caregiver perspectives regarding goals of therapy, including views of medications and chronic conditions as well as preferences and

priorities involving their primary care physicians. Patients are more likely to consider deprescribing if the primary care provider recommends it.

Only one-third of older adults specifically discuss healthcare decision-making priorities with their primary care physicians (Butterworth et al., 2019). One in two elderly patients is affected by polypharmacy, and more than one in 10 by severe polypharmacy (Halli-Tierney et al., 2019). This can be associated with self-medication and use of OTCdrugs. Polypharmacy and multimorbidity result in an illness and treatment spiral, where an increasing number of co morbidities require treatment by multiple specialists, entailing use of more medications, which in turn contributes to damage to subsequent organs (Uchmanowicz et al., 2018).

Polypharmacy involves taking many medications at the same time to treat coexisting medical conditions such as hypertension and diabetes (Baruth et al., 2020). Polypharmacy is an issue particularly when patients are prescribed too many drugs by multiple healthcare practitioners who are functioning independently of one another (Baruth et al., 2020). Nurses have three roles to play regarding management of polypharmacy situations: instruction, information, and organization (Saljoughian, 2019). Nurses are directly involved in talking to patients and providing information about keeping an accurate list of medications, including Screening Tool to Alert to Right Treatment prescribed dosages, the dosing frequency, and reasons why the dosage was prescribed. They often have discussions with patients concerning dietary restrictions for specific medications, potential side effects, and information about both lookalike and

sound-alike medications. These are often done via face-to-face meetings that facilitate strong relationships with patients (Saljoughian, 2019).

According to Rogers (2003), healthcare providers act as communication sources, ensuring they provide good communication with each other and patients. This not only minimizes the possible problems associated with polypharmacy but also encourages adherence to the medication. Nurses advise patients to take medications according to the instructions given to them by the prescribers and not to stop taking the medication without consulting the prescriber (Saljoughian, 2019). The challenges of therapeutics in primary care are complicated by polypharmacy and the associated factors of adverse drug interactions, potentially inappropriate medications, and therapeutic duplication (Bergman - Evans, 2020).

Safe discontinuation of medications requires a thorough plan (Bergman - Evans, 2020). The key steps to rational discontinuation plan include the establishing the indication for the action, identification, and prioritization of meds to be stopped, and creation of a plan that includes communication and coordination with other providers and the means to monitor effects. Nurse’s practitioners effectively meet the complex health care needs of older adults. NPs acting as primary care providers have been shown to achieve positive outcomes including improved chronic disease care and to promote functional health and decrease polypharmacy, falls, restraint use, and transfers (Bergman - Evans, 2020).

Many techniques are often used to analyze and manage the use of medication and prescription. The typical process involves medication reconciliation at admission and discharge (Meguerditchian et al., 2013). This process should then be repeated in the medical office during follow up visits. There are various other systemic screening and analysis tools, including the screening tool of older people' prescriptions (STOPP) and screening tool to alert to right treatment (START) as well as the Medication Appropriateness Index (Meguerditchian et al., 2013). For a copy of STOPP and START, see Appendix B.

Beers Criteria

The AGS unveiled its latest update to one of long-term care's most frequently cited reference tools: The 2002 Beers criteria for potentially inappropriate medication use in older adults considering diagnoses or conditions is in Appendix C. The AGS Beer Criteria for Potentially Inappropriate Medication Use in Older Adults. The AGS Beer Criteria is a compendium of medications potentially to avoid or consider with caution because they often present an unfavorable balance of benefits and harms for older people. With more than 90% of older using at least one prescription and more than 66% using three or more in any given month, the AGS Beer Criteria plays a vital role in helping health professionals, older adults, and caregivers work together to ensure medications are appropriate (American Geriatrics Society, 2019). "Medications play an important role in health and wellbeing for many older people", note Donna M Fick, PhD, RN, FGSA, a co-chair of the expert panel responsible for the 2019 AGS Beers Criteria. With this new

update, we hope the latest information on what makes medications appropriate for older people can play an equally important role in decisions about treatment options that meets the needs of older adults while also keeping them as safe as possible (American Geriatrics Society, 2019).

The AGS Beers Criteria includes lists of certain medications worth discussing with health professionals because they may not be the safest or most appropriate options for older adults. Though not an exhaustive catalogue of inappropriate treatments, the five lists included in the AGS Beers Criteria describe medications with evidence suggesting they should be avoided by most older people (outside of hospice and palliative care settings), by older people with specific health conditions, and avoided in combination with other treatments because of the risk for harmful "drug-drug" interactions. Certain drugs are labeled use with caution because of the potential for harmful side effects or need for different dosing or avoided among people with reduced kidney function (American Geriatrics Society, 2019).

Deprescribing is not the sole responsibility of the physician, nurse practitioner, or pharmacist as nurses are key advocates in medication optimization, particularly homecare nurses who have frequent direct contact with the older adults and their informal caregivers in the community (Sun et al., 2019). Previous studies indicated that educational training for nurses about deprescribing has the potential to reduce the use of harmful medications and improve the quality of life among clients residing in assisted living facilities (Sun et al., 2021). With complete guidelines, providers will help reduce

polypharmacy in older adults and improve quality of life for these patients. Previous studies indicated that nurse collaboration with physicians and pharmacists contributed to safer medication administration and the prevention of medication errors (Sun et al., 2021). Nurses play an essential role in primary care; medication management is critical. Therefore, guidelines will support all providers in developing new approaches to decrease polypharmacy in primary care.

Local Background and Context

The site for this project was a large primary care practice in the Southeastern United States. Background evidence and contextual information supporting the need for the project were derived from the office electronic medical records by the preceptor regarding the prevalence of polypharmacy in this population. The site staff consisted of seven medical providers, including two medical doctors, three nurse practitioners, one podiatrist, one ophthalmologist, one nutritionist, one pharmacist, nine medical assistants, and three chart reviewers. The potential patient impact totals 500 Medicare patients from age 65 and older with five or more prescribed medications.

Role of the DNP Student

Polypharmacy is a serious concern among adults as it is a major contributor to increased rates of morbidity and mortalities in this population group. DNPs can play a critical role in the development of the needed competencies for increasingly complex practice, enhancing knowledge to improve patient outcomes and nursing practice as well as strengthening nursing leadership and health care delivery (Farrell et al., 2013). DNP

graduates are prepared to develop and evaluate care delivery approaches to meet the current and future needs of patient populations based on the available scientific findings. DNP leader plays a crucial role in the development and adoption of leadership skills to strengthen nursing practice. Having identified the effects of polypharmacy on the patient outcomes among older patients, the nurse leaders could play a critical role in analyzing and recommending for adoption suitable prevention strategies for the management of diverse patient cases.

Leadership roles are vital for DNP graduates to improve patient and healthcare outcomes. This will support the attainment of objectives seeking to eliminate health disparities while promoting patient safety and excellence in nursing practice. I developed the first draft of the guidelines to provide to the project team for their review, input, and final agreement. This project advanced my knowledge andhelped to be better equipped to offer improved patient care particularly in the area of information literacy skills. Armed with this knowledge, the DNP can assist other nurses in utilizing information more effectively and support growth in the professional discipline.

Role of the Project Team

Many studies have shown the benefits of working in a multidisciplinary team. A recent cross-sectional study discovered that collaborating in multidisciplinary teams may benefit patient care and even develop professional competence (Rossell et al., 2018). Thus, each team member within the project team is vital in their contribution to establishing the most successful practice for treating patients. Furthermore, opportunities

must exist for each person to express their perspective, and each team member should prepare to make educated decisions based on the information supplied by their fellow team members. Hence, efficient communication and teamwork are critical to establishing the best effective treatment strategy.

During the early phase, the team would discuss the project, and each individual would provide their consent to contribute. The project team would be given a project synopsis and a PowerPoint presentation in which the details and contents of the project are highlighted with sufficient research. Following the formation of the team members, a drafted project would be distributed by email, and the project team would contribute their perspectives and knowledge to assist in constructing the subsequent phases of the project. Furthermore, responsibilities of each team member will be explicit to ensure that timelines are met and the overall success of the project. The team members are to provide their feedback on the project within two weeks and understand their specific role and contribution to the project.

Nurses and pharmacists in primary care can be pivotal in helping older patients manage their medications and prevent polypharmacy (Saljoughian, 2019). Nurses and pharmacists have a unique opportunity to help identify patients who are at risk for inappropriate polypharmacy and to educate patients and families about adherence and risk reduction. Medication safety is an important factor that must be considered when treating the older population, particularly those vulnerable to polypharmacy. This responsibility is particularly important in pharmacy, whose role has greatly expanded

from medication distribution to medications reconciliation which aims to not only educate patients on their medications, but to also optimize their medication regimens through improving patient adherence and detecting potential adverse drug events (ADEs) (Young et al., 2021). Nurse practitioners effectively meet the complex health care needs of older adults in long term care facilities. NPs acting as primary care providers in long-term care facilities have been shown to achieve positive outcomes including improved chronic disease care and to promote functional health and decrease polypharmacy, falls, restraint use, and transfers (Bergman-Evans, 2020).

Summary

The global population has been aging over the past few years. Higher life expectancies and low birth rates have resulted in a situation where there are more elderly people than ever, with the numbers only expected to increase going into the future. In this particular practice, most of the elderly suffer from multimorbidity, meaning that they usually have to deal with multiple medications.This purpose of this project is the development of clinical practice guidelines to assess the appropriateness of medication use and ultimately result in the reduction of inappropriate medicines in older adults. Section 3 will describe the collection and analysis of evidence.

Section 3: Collection and Analysis of Evidence

Introduction

This project was based in a large multidisciplinary primary care facility with a large older adult Medicare and Medicaid population on multiple medication regimens. The practice did not include a comprehensive clinical practice guideline for the systematic and ongoing assessment of appropriateness of medication use and reduction of inappropriate medicines among older adults. I focused on creating a new clinical practice guideline. The National Academies of Science Engineering and Medicine (NASEM, 2018) defined clinical practices guidelines as "statements that included recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative options

Clinical guidelines are a fundamental approach for translating knowledge policy and practice because they involve synthesizing the totality of evidence in terms ofa given condition, disease, procedure, or therapy, and provide recommendations that support decision-making for healthcare planning, delivery, evaluation, and improvement (Kim et al., 2020).

Local Problem

As a primary care provider in multiple clinical settings, I face daily challenges with elderly patients who do not have complete medication lists. Furthermore, due to the lack of guidelines for managing multiple medications, the challenge also involves clinical medical assistants, nurses, and pharmacists. Additionally, older persons have access to

OTC medications that do not appear on the clinical chart. A lack of a thorough medication review may result in not just duplicate prescriptions, but also adverse interactions. Staffs who understand how to follow a clinical guideline may aid in terms of reduction of polypharmacy, particularly among older patients.

This QI initiative was carried out at a primary care clinical location where the vast majority of the patients are over the age of 65. These patients also have specific prescription regimens involving specialty care and post hospitalization requirements that need medication evaluation and reconciliation in order to prevent overmedicating the patient group. Stakeholders in this initiative included medical physicians, NP, medical assistants, and clinical pharmacists. A new clinical guideline was followed by staff during each follow-up clinical appointment with patients, which was beneficial to the organization.

My goal was to minimize polypharmacy among older persons in the facility by educating medical practitioners about new evidence-based practice recommendations involving reducing polypharmacy in older adults. The purpose of this project was to educate medical professionals regarding use of clinical guidelines medications review (CGMR) and assess usefulness of the tool in clinical practice. Evaluation of medications in accordance with a clinical guideline would be beneficial to both staff and older patients in order to prevent polypharmacy. Having a clinical guideline to follow enables medical assistants, NPs, nurses, and clinical pharmacists to provide the most effective medical treatment possible.

Team Members and their Roles

Team members included two medical doctors, three NPs, one pharmacist, one nutritionist, four medical assistants, and two chart reviewers. Each member had a specific role to play in the development and review of clinical guidelines to manage and prevent polypharmacy. Medical doctors or physicians conducted systematic and one-on-one reviews of polypharmacy patient regimens to simplify, describe, and modify medication regimens while ensuring efficacy. They had an in-depth understanding of each medication and how to prescribe them in order to avoid polypharmacy in older adults. They were also tasked with reorganizing medication lists to identify potential interactions and recognize inappropriate and incorrect prescriptions. NPs were required to develop a NP-led protocol regarding polypharmacy. NPs effectively meet the needs of older adults in care facilities and have proven to be effective in terms of promoting functional health and decreasing polypharmacy **(**Bergman, 2020). Their role was to analyze integration of Medication Outcome Monitor (MOM) into the clinical guidelines. They reviewed clinical guideline effectiveness in terms of enhancing medication oversight and managing older adults in healthcare facilities.

Pharmacists worked with MR, dosages, and informed elimination of medication duplication to minimize incidences of polypharmacy. Nutritionist identified relationships between polypharmacy and malnutrition, which was informative in terms of how polypharmacy can lead to malnutrition and vice versa. The nutritionist provided vital information regarding nutrition status and its role in terms of polypharmacy and

providedeffective strategies tomanage nutrition status and reduce polypharmacy. The nutritionist and the pharmacist reviewed relationships between dietary supplements and OTC medications and pharmaceutical interactions. Medical assistants helped with monitoring beneficial and harmful effects of taking multiple drugs and advised on polypharmacy-managed competencies. Additionally, they reviewed issues associated with prescription medications.

Protection of Human Subjects

Participating individuals were treated as autonomous agents. The team sought to maximize benefits and minimize possible harm. The research burden and benefits were distributed equitably. Respect of persons was central to the interaction between the team. The team members were known to each other, and their names will be linked to internal documents. Their identifies will be protected in this project paper.

Practice-Focused Question

Can an interprofessional team develop an evidence-based clinical guideline for regular medication review?

Sources of Evidence

Sources of evidence were CINAHL, EBSCO Host, Cochrane Library, Medline, PubMed, OVID, and ProQuest. Articles were full text, English-only, and peer-reviewed sources which were published between2015 and 2022. The AGS originally developed the Beers Criteria, a guide for medications that should be avoided in older patients. This framework served as a template for the guideline. Key search terms *polypharmacy*, *older*

adults, primary care, multiple providers, inappropriate use of prescribing software, pharmacist interventions at pharmacies, and *standard precautions to prevent polypharmacy*. Articles were reviewed and synthesized using Grading of Recommendation Assessment Development and Evaluation (GRADE criteria. These criteria included transparent and structured process for developing and presenting summaries of evidence in terms of quality, systematic reviews, and recommendations for healthcare (Guyatt et al., 2011). GRADE criteria provided guideline developers with a comprehensive and transparent framework for carrying out steps involved in developing recommendations.

Organizational Approval

Expert committee participants served voluntarily as part of the practice's QI efforts. The hospital considered this part of their QI process and therefore did not require Institutional Review Board (IRB)approval. The study was submitted to the Walden University IRB for approval.

Analysis and Synthesis

Evidence is included in a summary table with key articles attached for the committee review. A prepared draft of the proposed guidelines for committee review and discussion has also been provided. The process of reaching consensus was completed with Google Docs and teleconferencing due to demanding schedules and the recent COVID upswing and need for distancing whenever possible. Google Docs allowed simultaneous comments from multiple persons that can be discussed during Zoom

meetings as the next revision is made. When most team members agreed, they were asked to assess the final document using the AGREE tool. Another team consisting of the practice medical director, the chief nurse and a consulting pharmacist were asked to review using the AGREE tool as an expert team. This process used the tool developed by the AGREE Collaboration (Appraisal of Guidelines, Research, and Evaluation), which established a generic instrument to assess guideline development and reporting of this process in the guideline (Brouwers, 2012).

The AGREE II instrument is designed to assess the quality of practice guidelines across the spectrum of health, provide direction on guideline development, and guide what specific information should be reported in guidelines (Brouwers, 2012).The instrument guides through six distinct domains: a) scope and purpose and overall aim of the guideline, b) stakeholder involvement role and expectations of stakeholders, c) rigor of development – gathering and summarizing the evidence, d) clarity of presentation-technical guidance e) applicability- barriers and facilitators to implementation, f)editorial independence- identifying potential biases(Appraisal of guidelines for research and Evaluation II , 2017).

Because of the nature of the consensus model, participants were familiar with one another and agreed to participate voluntarily. The use of Google Docs allowed each update to be unique and permitted the group to see each updated draft when edited by the project coordinator. The Google document was treated with confidentiality, and only shared for the project's use. No unique drafts were maintained in the tool. I hosted the

Google Doc site, and only the committee had access to the document. Once the document was final, it was downloaded, and then deleted. The final draft contained the names of committee members for senior leadership but not included in the Walden DNP paper to promote the confidentiality of participants.

Synthesis

The following were some of the key highlights of the specifications in the guideline: 1) establishing the appropriate goals of treatment with the team in order to meet the patients' most pressing needs; 2) reviewing drugs on a regular basis and when clinical conditions worsen, as well as assessing the rationale for specific prescriptions, including when the medication was first prescribed; 3) identify improper prescription, using the Beers Criteria and the START/STOP Criteria. 4) Medical personnel assess and consider unfavorable health problems, frailty, and cognitive impairment as potential barriers to drug adherence.

AGREE Tool and Results

The AGREE II instrument is intended to evaluate the quality of practice guidelines throughout the health care spectrum, give guidance on guideline creation, and determine what particular information should be presented in guidelines (Brouwers, 2012). Furthermore, the AGREE II tool was adopted to evaluate the methodological quality of the recommended clinical guidelines to address polypharmacy in older adults.

The tool is comprised of 6 quality domains: scope and purpose; stakeholder involvement; rigor of development; clarity of presentation; applicability; and editorial

independence. The tool also includes two final general assessments that require the appraising team to provide overall judgments of the recommended clinical guidelines. The data collection instrument has 23 items organized into three distinct domains to appraise the quality level of the defined practice guidelines. Each question in the instrument utilizes a 7-point Likert scale measuring the extent to which a recommended guideline should be used, with 1 being *strongly disagree* and 7 *strongly agree*.

Once comments were received from the interprofessional team, the guidelines were revised to incorporate the various points of view. Based on the findings of the AGREE II evaluation, the expert panel found that evidence provided for the CG was supportive of the cause. The health professional team agree to continue using the Screening Tool of Older Patients Prescriptions (Appendix B) and educating other staff on the potential danger of polypharmacy amongst elderly adults.

Summary

In this section,I provided sources of evidence that were used during the process of data collection. The team used Roger's five-step model of change to achieve consensus. The guideline was evaluated using the AGREE II tool. Section 4 includes the process and resulting outcomes.

Section 4: Findings and Recommendations

Introduction

According to Morin et al. (2018), over 45% of older adults with chronic illnesses experience polypharmacy. A rise in the number of prescriptions is associated with higher risks for adverse drug events, especially among older adults (Avery et al., 2016). Older adults are among those most vulnerable to medication misuse and abuse because they have more chronic conditions and use more prescription and OTC medications than other age groups (Beuscart et al., 2019).The purpose of the DNP project was to use an interprofessional team to develop clinical practice guidelines for a primary care practice. The practice-focused question was: Can an interprofessional team develop an evidence-based clinical guideline for regular medication management protocols? A systematic approach was used to help reduce polypharmacy. This guideline included a page for MR in the EMR system and protocols for providers regarding managing patients who take five or more medications.

Findings and Implications

Summary of Literature

Evidence-based studies were selected to inform the development of clinical guidelines to address polypharmacy. Studies were systematically appraised for validity and completeness of evidence via GRADE criteria. Several studies were identified as appropriate in terms of developing clinical guidelines addressing polypharmacy. National guidelines were included in the review according to the AGS. The Beers Criteria is

effective in terms of identifying phonetically-inappropriate medication use among older adults. The criteria are widely used among educators, regulators, clinicians, researchers, and health administrators (AGS, 2019). Evidence provided in the study informed the integration of Beers Criteria to address the project problem. According to Kim et al. (2020), clinical guidelines improve care delivery and outcomes. Patient engagement and adherence is critical in terms of clinical guideline development in order to reflect patient interests and preferences that are associated with recommended guidelines, risks, and benefits. The project team discussed insights involving engaging patients when developing clinical guidelines, but this was not included in the development of the initial guideline.

The literature review provided the team with information regardingthe association between polypharmacy and older adults. Pazan and Wehling (2021) said older adults experienced the highest prevalence of polypharmacy, especially nursing home residents and hospitalized patients. This study informs approaches to enhance polypharmacy appropriateness and improve clinical outcomes among older adults.

The team needed insights regarding tools for developing and reviewing clinical guidelines. The AGREE II tool was adopted to appraise recommended guidelines. It is effective in terms of identifying variations in guideline quality and measuring vital outcomes associated with guideline adoption.

Procedures

Clinical guidelines for addressing polypharmacy were developed using a thorough evidence-based methodology. They were reviewed to ensure they were rigorously developed, relevant, and applicable to the research problem. First, the team analyzed evidence-based resources that involved integrating best practices. They appraised draft guidelines and offered suggestions to strengthen them. The team analyzed drafts to check whether guideline recommendations were valid and offered an accurate representation of current status. The third step involved analyzing whether all relevant outcomes were considered when developing guidelines. Since an evidence-based methodology was used to develop guidelines, the team reviewed whether integration or inclusion of appropriate studies was complete and whether development was based on current best evidence. The team reviewed management of conflict of interest and its undue impact on guideline panelists. The team also reviewed methods used to evaluate quality of evidence to determine whether the right evidence materials were used to develop guidelines. The requirement to educate patients regarding self-care skills and illness management can make managing polypharmacy patients in the outpatient environment difficult for nurses and other healthcare professionals. When establishing an education program for polypharmacy patients to improve self-care management, health literacy is important to consider. The team recommended included a page in the EMR system for MR, as well as instructions for doctors regarding how to manage patients who take five or more drugs.

Recommendations

It is critical that staff adhere to proposed standards, which direct them to work diligently with patients and families, get an accurate list of medications, use caution when deprescribing, and search for inappropriate and inaccurate prescriptions. When prescriptions are recorded into patients'EMRs, staff should categorize medications by conditions and diagnosis.

Lack of knowledge and guidelines to reduce polypharmacy in the primary care clinical setting represented barriers in terms of medications' adverse effects on older adults. Medications reviews, screening tools, and education interventions are essential in order to stop polypharmacy among older adults.

Strength and Limitations of the Project

A key strength was the inclusion of multiple disciplines in the development and review of guidelines. One limitation is that this will be piloted at only one site in a specific geographic location. It is recommended that these guidelines be shared with other medical groups for implementation and evaluation.

Section 5: Dissemination Plan

An interprofessional workgroup created clinical guidelines for this project. As previously stated, a panel of MDs, PharmD, NPs, nutritionists, and alternative medicine physicians met via video conferencing to discuss and reach an agreement regarding disseminating guidelines. Data were obtained from reputable professional resources and literature, and evidence-based suggestions were compiled and shared in educational seminars. To distribute guidelines, each member of the team will meet with their team to provide basic training and demonstrations regarding using clinical guidelines based on summarized evidence-based recommendations. Appropriate training is critical to the program's success, as was ensuring all parties involved were supportive of enhancing education among polypharmacy patients and realized the potential value of promoting positive change in the system. Informing health professionals, understanding the definition of polypharmacy, and being able to identify patients at risk for polypharmacy or patients who are likely to return due to poor health literacy and dependency on more than five medications were among the goals for disseminating this work within the institution.

Once this guideline is implemented, specific formative evaluation measures will be put into place to track success involving use of the guideline in terms of managing polypharmacy. These results will be presented at regional and national meetings and published in appropriate journals.

Analysis of Self

Plan-Do-Study-Act (PDSA) Cycle in respect to the Doctor of Nursing Practice (DNP)essentials are delineated here to address the foundational competencies that are core to all advanced nursing practice roles. The PDSA model is in Appendix D.

Essential I: Scientific Underpinning for Practice

According to the American Association of Colleges of Nursing the DNP program equips graduates to integrate nursing science, apply scientific-based theories and ideas, and design and assess novel practice initiatives. This Plan-Do-Plan-Do-Study-Act (PDSA) Cycle Study-Act (PDSA) Cycle involved using a comprehensive literature review to address lowering polypharmacy among older individuals in primary care settings. The DNP project was performed using the Plan-Do-Study-Act (PDSA) cycle.

Essentials II: Organization and Systems Leadership for QI and Systems Thinking

DNP graduates must be able to lead organizations and systems in order to enhance patient and healthcare outcomes. Following a comprehensive evaluation and assessment of the organization, I focused on the requirement for medical personnel to adopt a guideline that reduces polypharmacy in older individuals using the STOPP/START tool.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

Scholarship and research are the hallmarks of doctoral education. I used analytic methods to critically appraise existing literature and other evidence to determine and

implement best evidence for practice and design. In addition, I implemented processes to evaluate practice outcomes and patterns and systems of care within a healthcare organization.

Furthermore, I considered the community against national benchmarks, further allowing the team to determine variances in terms of practice outcomes and population trends as well as design, direct, and evaluate QI by collecting appropriate and accurate data to generate evidence for nursing practice, inform and guide the design of databases that generate evidence for nursing practice, analyze data from practice, design evidence-based interventions, predict and analyze outcomes, examine patterns of behavior and outcomes, and identify gaps in evidence for practice.

Essential IV: Information System/Technology and Patient Care Technology for the Improvement and Transformation of Healthcare Plan-Do-Study-Act (PDSA) Cycle

Knowledge and skills involving information systems/technology and patient care technology prepare the DNP graduate to apply new knowledge, manage individual and aggregate level data and information, and evaluate efficacy of patient care technology that is appropriate to a specialized field of practice. Information systems and technology enable use of budget and productivity tools, information systems and decision supports, and web-based learning or intervention tools to enhance and improve patient care. EHRs were the primary source of data collection, and from there, I developed resources for evaluating and monitoring polypharmacy. Furthermore, staff was trained to correctly evaluate medications when serious adverse effects appeared on the screen.

Essential V: Healthcare Policy for Advocacy in Healthcare

Healthcare policy, whether developed via legislative acts, institutional decision making, or organizational norms, is a framework that can either assist or impede the delivery of healthcare services as well as provider capacity to participate in practice to address healthcare requirements. My goal was to create a new set of guidelines for the institution. However, no procedures were implemented to support decrease of polypharmacy medication reconciliation. Staff is being educated about reducing polypharmacy in older adults and how to apply Beers Criteria to ensure patients' well-being.

Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes

Contributions of highly competent and informed personnel from a variety of professions are critical in today's complex and multitiered healthcare system. In order to meet IOM requirements for safe, timely, effective, efficient, equitable, and patient-centered care in a complex setting, healthcare professionals must work as highly collaborative teams (AACN, 2004; IOM, 2003; O'Neil,1998). DNP team members have extensive training involving interprofessional components of healthcare, allowing them to support collaborative team functioning and overcome barriers involving interprofessional practice.

Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health

DNP Essential VII consists of health promotion, reducing risk, and preventing illness in a group of individuals. Nursing theory has its foundation in health promotion and risk reduction; however, the DNP degree further prepares graduates to evaluate and interpret epidemiological, biostatistical, occupational, and environmental information imperative to improving the health of both individuals and communities. This essential also equips Doctor of Nursing practice with the skills to synthesize the psychological dimensions and cultural impacts of population health. This DNP project focused on the gaps in proper medication reconciliation, lack of knowledge of the staff at the facility in deprescribing, and prevention complications among older adults experiencing polypharmacy in primary care.

Essential VIII: Advanced Nursing Practice

The DNP practitioner displays advanced levels of clinical judgment, systems thinking, and evidence-based care delivery with the objective of improving patient outcomes. This component focuses on providing thorough needs assessments, teaching other nurses, and assisting patients through complex and challenging situational changes.

Summary

DNP essentials outline the curriculum components that must be included in DNP programs. Each essential is associated with one or more outcomes and they are to be

prioritized DNP fundamentals were applied in the project's design, implementation, and outcomes.

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Appendix A: AGREE II Instrument Tool Reviewer Scores

AGREE II Tool Reviewer Scores Scoring system: 1: Lowest possible quality, 7: Highest possible quality					
	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4	Domain Composite Score
Domain 1. Scope and Purpose					100%
1. The overall objective(s) of the guideline is (are) specifically described.	7	7	7	7	
2. The health question(s) covered by the guideline is (are) specifically described.	7	7	7	7	
3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.	7	7	7	7	
Domain 2. Stakeholder Involvement					100%
4. The guideline development group includes individuals from all relevant professional groups.	7	7	7	7	
5. The views and preferences of the target population	7	7	7	7	

(patients, public, etc.) have been sought.					
6. The target users of the guideline are clearly defined.	7	7	7	7	
Domain 3. Rigor of Development					100%
7. Systematic methods were used to search for evidence.	7	7	7	7	
8. The criteria for selecting the evidence are clearly described.	7	7	7	7	
9. The strengths and limitations of the body of evidence are clearly described.	7	7	7	7	
10. The methods for formulating the recommendations are clearly described.	7	7	7	7	
11. The health benefits, side effects, and risks have been considered in formulating the recommendations.	7	7	7	7	
12. There is an explicit link between the recommendations and the supporting evidence	7	7	7	7	
13. The guideline has been	7	7	7	7	

externally reviewed by experts prior to its publication.					
14. A procedure for updating the guideline is provided.	7	7	7	7	
Domain 4. Clarify of Presentation					100%
15. The recommendations are specific and unambiguous.	7	7	7	7	
16. The different options for management of the condition or health issue are clearly presented.	7	7	7	7	
17. Key recommendations are easily identifiable.	7	7	7	7	
Domain 5. Applicability					98%
18. The guideline describes facilitators and barriers to its application.	7	7	7	7	
19. The guideline provides advice and/or tools on how the recommendations can be put into practice.	7	7	7	7	
20. The potential resource implications of applying the recommendations have been considered.	7	7	7	7	
21. The guideline	6	7	7	7	

presents monitoring and/or auditing criteria.					
Domain 6. Editorial Independence					100 %
22. The views of the funding body have not influenced the content of the guideline.	7	7	7	7	
23. Competing interests of guideline development group members have been recorded and addressed.	7	7	7	7	
Overall guideline Assessment					
1.Rate the overall quality of this guideline.	7	7	7	7	
2.I would recommend this guideline for use.	Yes	Yes	Yes	Yes	

Appendix B: Screening Tool of Older Person's Prescriptions (START-STOPP)

Name of the Drugs	Severity Rating	Frequency (%)*
Generally should be avoided in older patients (Category A)		
Chlorphinaramine	High	113(12)
Hyoscine Butyl Bromide	High	98(10.43)
Piroxicam	High	57(6)
Chlorzoxazone	High	56(5.9)
Dicyclomine	High	48(5.1)
Indomethacine	High	43(4.6)
Diphenhydramine	High	38(4)
Cimetidine	Low	27(2.9)
Diazepam	High	23(2.4)
Bisacodyl	High	21(2.2)
Amitryptylene	High	17(1.8)
Nitrofurantoin	High	13(1.4)
Flurazepam	High	12(1.3)
Ketorolac	High	12(1.3)
Amiodarone	High	11(1.2)
Methyldopa	High	7(0.7)
Chlordiazepoxide	High	5(0.5)
Cyproheptadine	High	2(0.2)

Appendix C: The 2002 Beers Criteria

Disease/condition	Drug name/class	Concern	Severity rating (high or low)
Heart failure	Disopyramide, high-sodium-content drugs	Negative inotropic effect. Potential to promote fluid retention and exacerbation of heart failure.	High
Hypertension	Phenylpropanolamine, pseudoephedrine, diet pills, amphetamines	May produce elevation of blood pressure secondary to sympathomimetic activity.	High
Gastric/duodenal ulcers	NSAIDs, aspirin (>325 mg/day), excluding coxibs	May exacerbate existing ulcers or produce new/additional ulcers.	High
Seizures/epilepsy	Clozapine, chlorpromazine, thiothixene	May lower seizure thresholds.	High
Blood clotting disorders or receiving anticoagulant therapy	Aspirin, NSAIDs, diypyridamole, ticlodipine, clopidogrel	May prolong clotting time and elevate INR values or inhibit platelet aggregation, resulting in an increased potential for bleeding.	High
Bladder outflow obstruction	Anticholinergics, antihistamines, antispasmodics, flavonate, antidepressants, decongestants, tolterodine	May decrease urinary flow, leading to urinary retention.	High
Stress incontinence	Alpha-blockers, anticholinergics, TCAs, long-acting benzodiazepines	May produce polyuria and worsening of incontinence.	High
Arrhythmias	TCAs	Concern because of proarrhythmic effects and ability to produce QT interval changes.	High
Insomnia	Decongestants, theophylline, methylphenidate, MAOIs, amphetamines	Concern because of CNS stimulant effects.	High
Parkinson disease	Metoclopramide, conventional antipsychotics, tacrine	Concern because of antidopaminergic/ cholinergic effects.	High
Cognitive impairment	Barbiturates, anticholinergics, antispasmodics, muscle relaxants, CNS stimulants, dextroampheta-mine, methylphenidate, methamphetamine, pemolin	Concern because of CNS-altering effects	High
Depression	Long-term benzodiazepines, sympatholytic agents	May produce or exacerbate depression.	High
Anorexia/malnutrition	CNS stimulants, dextroampheta-mine, methylphenidate, methamphetamine, pemolin, fluoxetine	Concern because of appetite-suppressing effects.	High
Syncope/falls	Short/intermediate-acting benzodiazepines, TCAs	May produce ataxia, impair psychomotor function, produce syncope, and lead to additional falls.	High
SIADH/hyponatremia	SSRIs	May exacerbate or cause SIADH.	Low
Seizure disorder	Bupropion	May lower seizure threshold.	High
Obesity	Olanzapine	May stimulate appetite and increase weight gain.	Low
COPD	Long-acting benzodiazepines, nonselective beta-blockers	CNS adverse effects. May induce respiratory depression. May exacerbate or cause respiratory depression.	High
Chronic constipation	CCBs, anticholinergics, TCAs	May exacerbate chronic constipation.	Low

Abbreviations: CCB, calcium channel blockers; CNS, central nervous system; COPD, chronic obstructive pulmonary disease; INR, international normalized ratio; MAOI, monoamine oxidase inhibitor; NSAID, nonsteroidal anti-inflammatory drug; SIADH, syndrome of inappropriate antidiuretic hormone secretion; SSRI, selective serotonin release inhibitor; TCA, tricyclic antidepressant.

Note.
https://www.researchgate.net/publication/43342953_Polypharmacy_in_Older_Adults_with_Cancer/figures?lo=1

AppendixD: Plan-Do-Study-Act (PDSA) Cycle

Plan-Do-Study-Act (PDSA) Cycle: Weekly Evaluation of Improvement

1) **Plan:** Doctors, nurse practitioners, pharmacists, medical assistants, and chart reviewers formed the recruitment team. Project planning, IRB approval, goal statement, and describing and determining the cause of polypharmacy are all key components.
2) **Do**: Run chart: Using electronic medical information, compiling a list of patients who are taking more than five medications
3) **Study:** Complete the Data Analysis and PowerPoint. Summarize what we learned following training.
4) **Act:** Reflection on outcomes (improvement).