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Staff Education on Medication Screening Tool for Nursing Home Residents

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This is to certify that the doctoral study by

Jinkee Beltran

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Walden University
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Abstract

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MSN, Walden University, 2012

BSN, University of Makati, 2006

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The prevalence of potentially inappropriate medications (PIMs) among nursing home residents continues to be high. Researchers have demonstrated that the use of a medication screening tool identifying PIMs can improve medication safety among older adults. Screening tools, such as the Beers criteria and the Screening Tool for Older Persons' Prescriptions (STOPP), are evidence-based guidelines that use several validated criteria to identify PIMs in older adults' medication regimens. While the use of these tools is standard in the acute care setting, limited studies have been conducted regarding their use in the nursing home setting. The purpose of this project was to determine if an educational intervention geared toward PIMs and the use of the STOPP tool would increase the knowledge and commitment of tool use among nurses working in nursing homes. Fifteen staff nurses from a midsized urban nursing home in Texas voluntarily participated in the study. A 10-item pretest/posttest was administered. The educational intervention was guided by Knowles theory of adult learning. The average score of the pretest was 6.26 (1.22) with a range of 4 to 8. The average score of the posttest was 7.80 (1.01) with a range of 6.0 to 9.0. Using a Wilcoxon signed-rank test to estimate the data, a significant difference between the pretest and posttest was noted, indicating an increase in knowledge among the participants following the educational intervention ($z = –3.16$, $p = 0.02$). Additionally, 100% of the participants indicated they would support the use of the tool in practice. The results of this study has the potential to effect positive social change by addressing medication challenges among older adults in long-term care facilities by reducing adverse drug effects and improving quality of life.

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Dedication

For my son, Sebastian Bruno Beltran: may this serve as your inspiration to seek learning, even by study and also by faith. May you continue to try to leave this world a little better than you found it.

Acknowledgments

I would like to thank the following individuals whose expert scholarly guidance and support allowed me to complete this DNP project: Dr. Melissa Rouse, PhD, APRN, CNS-BC, NEA-BC, contributing faculty, Walden University College of Nursing, committee chair; Dr. Lyn Stankiewicz Losty, PhD, MBA, MS, RN, contributing faculty, Walden University College of Nursing, second committee member; Dr. Cheryl McGinnis, DNP, APRN, university research reviewer, Walden University College of Nursing.

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Section 1: Nature of the Project

Introduction

The U.S. Census Bureau estimates that over 25% of the U.S. population will be 65 years and older by 2050. The National Center for Health Statistics (2019) reported that of those ages 65 years and older, 5–7% will be living in nursing homes or long-term care facilities (LTCFs), with 1.3 million Americans currently residing in nursing homes. While older adults prefer to remain in their current residences as long as possible (Chan & Ellen, 2017), the reality of mobility difficulties and the need for assistance with activities of daily living make this an unrealistic situation. Weight loss, exhaustion, weakness, slow walking speed, and low physical activity, which are criteria for frailty, are some of the reasons older adults decide to move to nursing homes. Kojima (2018) reported that 90% of older adults in nursing homes are frail and are therefore most vulnerable to receiving potentially inappropriate medications (PIMs).

Older adults in nursing homes are prescribed multiple medications to manage complex and chronic diseases. On the average, elderly residents in U.S. nursing homes take 6.7 routine prescription medicines daily, and at least one of the drugs is potentially an inappropriate medication (Alhawassi et al., 2019; Davidoff et al., 2015; Lavan et al., 2017; Miller et al., 2017). Medications are considered appropriate for prescribing when there is a clear and evidence-based indication for use (O'Connor et al., 2012). When side effects and risks of these medications outweigh the benefits, medications become potentially inappropriate.

Healthcare providers are positioned to assess and review appropriateness of medications using their professional experience and the validated criteria for identification of PIMs. Several validated criteria come in the form of screening tools, such as the Beers criteria and the STOPP tool and START tools. These tools are evidence-based prescribing indicators to help identify PIMs in older adults.

A literature review revealed several studies on the use of validated criteria or screening tools in nursing homes around the globe (Bor et al., 2017; Da Costa et al., 2016; Harrison et al., 2018; Huang et al., 2019; Maclagan et al., 2017; Nyborg et al., 2017). Fewer researchers have looked at the implementation of tools in nursing homes and LTCFs in the United States (Khodyakov et al., 2017; Kim et al., 2018; Miller et al., 2017). These experts have demonstrated that the role of an evidence-based tool has been crucial in identifying PIMs. Hence, experts assert the need for increased awareness among healthcare staff about screening tools for medication use and side effects among older adults.

Nursing knowledge and expertise about medications and screening tools for appropriateness of medications is paramount. Thus, the purpose of this DNP project was to determine if an educational intervention geared toward PIMs and the use of the STOPP tool would increase the knowledge and commitment of use among nurses working in nursing homes. Potential outcomes of this project include knowledge translated into practice and educated nurses committed to using a medication screening tool to advocate for reduction of PIMs among residents living in nursing homes.

The medication screening tool selected for use in this study was the STOPP/START tool. The STOPP/START tool is two-fold. The STOPP tool focuses on decreasing or stopping the use of 80 PIMs. The START tool, on the other hand, looks at potential omissions in therapy of elderly patients and demonstrates 34 possible scenarios in which medications are appropriate. For the purpose of this study, only the STOPP tool was used to determine if an educational intervention about PIMs and use of the STOPP tool would increase the knowledge of and commitment to using the tool among nurses working in nursing homes.

Problem Statement

Compared to community dwelling older adults, older adults in nursing homes have more multiple and complex medical problems. The general approach physicians and providers take to treating multiple chronic conditions and diseases in the older population is prescribing medications for each condition, at times necessitating adding medications to the treatment regime to treat side effects from prescribed medications (Kantor et al., 2015). Older adults are at greater risk for adverse drug reactions (ADRs) due to age-related physiological changes that contribute to a decrease in organ function resulting in altered pharmacodynamics responses, the most common of which is increased risk of toxicity (Lavan & Gallagher, 2016). Friedrichs et al. (2018) pointed to inappropriate prescribing as a major contributor to avoidable ADRs. Use of PIMs in older adults can cause drug-drug interactions and/or drug-disease interactions that contribute to cognitive impairment, falls, higher mortality, lower quality of life, and needless medication expenditures.

Recognizing the effects of ADRs on older adults, Dr. Mark Beers developed the landmark initiative in defining criteria for PIMs (Beers et al., 1991). The Beers criteria are widely used in the United States as a valuable tool in identifying medications that may have adverse effects in older adults. In 2011, the American Geriatric Society assumed responsibility for updating and maintaining the Beers criteria. The most recent Beers criteria were updated and released in 2019. However, Gallagher et al. (2008) pointed out that the Beers criteria did not address drug-drug interactions, duplicate drug prescriptions, and underprescribing of drugs. As such, the STOPP and START criteria were developed to address the weakness in the Beers criteria. The STOPP/START tool was then validated in Ireland in 2008 using a Delphi consensus methodology by a panel of 18 experts addressing the weaknesses in the Beers criteria.

The STOPP/START criteria were revised in 2015 to reflect 80 STOPP criteria and 34 START criteria (O'Mahony et al., 2015). The study demonstrated a significant reduction in ADRs if the STOPP/START criteria were applied within 72 hours of admission. The STOPP tool identifies PIMs that are significantly associated with ADRs, while the START tool aims to address potential prescribing omissions.

Using the STOPP criteria, Da Costa et al. (2016) were able to detect a significantly higher proportion of PIMs among nursing homes residents in Portugal. Similarly, Huang et al. (2019) detected PIMs in 67.3% among elderly patients in Japan, and Garcia-Caballero (2018) identified 67.8% of nursing home residents had at least one PIMs alert using the STOPP tool. Morin et al. (2016) not only demonstrated that nursing home residents are exposed to PIMs, they also suggested an increase in prevalence over

time. These experts spoke to the importance and relevance of using the STOPP tool in identifying and detecting PIMs as well as potential prescribing omissions and reducing the time spent on the review of the warnings and alerts generated from use of the tool.

Healthcare professionals play a significant role in ensuring appropriateness of medications prescribed and administered to older adults. Staff nurses are the primary healthcare professionals involved in the preparation and administration of medications in nursing homes. Although staff nurses are not able to write or change residents' prescription orders, they are able to influence the decisions of doctors/providers to review medications. Staff nurses in nursing homes have limited familiarity with PIMs, thus contributing to continued use of PIMs in older adults (Wahab, 2015). The simpler the tool is perceived, the higher is the likelihood for staff nurses to adopt the tool. (Titler, 2008). For this reason, the STOPP tool was selected for this project.

Providing education to staff nurses about the use of tools to determine PIMs may improve patient safety and increase quality of life for residents of nursing homes. The purpose of this DNP project was to determine if an educational intervention geared toward PIMs and the use of the STOPP tool would increase the knowledge and commitment to use the tool among nurses working in nursing homes. The potential outcome of this project was that the knowledge would translate into practice and the educated nurses would commit to using a medication screening tool to advocate for reduction in use of PIMs among residents living in nursing homes.

Purpose Statement

Notwithstanding awareness and evidence of potential adverse effects in older adults, the prescribing and use of PIMs remain common and widespread in nursing homes in the United States (Beyer & Choi, 2017). If left unaddressed, the health and quality of life of vulnerable older adults across the globe could continue to be compromised; therefore, this practice should be evaluated. The practice-focused question is: Does an educational intervention geared toward PIMs and the use of the STOPP tool increase the knowledge and commitment to use the tool among nurses working in nursing homes?

Nature of the Doctoral Project

A search was performed using CINAHL, MEDLINE, PsychInfo, and ProQuest Nursing & Allied Health Source databases (2016-2020) for studies on use of PIMs in older adults living in nursing homes. Key search terms included *STOPP, Beers, potentially inappropriate medications, nursing homes, long-term care facilities. Exclusion criteria include hospital, hospitalized,* and *acute care*. For this project, I followed the steps in the Walden University DNP Manual for Staff Education. The signed site approval form for staff education doctoral project was submitted to the Walden University Institutional Review Board (IRB) for approval.

A literature review was conducted to demonstrate knowledge in the field of PIMs use among older adults in nursing homes. Cooper's (1998) taxonomy of literature review was used as a framework to organize selected literature. Cooper suggested that evidence

be classified according to six characteristics: (a) focus, (b) goal, (c) perspective, (d) coverage, (e) organization, and (f) audience.

The purpose of the project was to demonstrate the value of the STOPP tool in nursing homes in the United States. The STOPP tool and other PIMs screening tools are widely used in nursing homes across the globe. These tools are also widely used in hospitals in the United States. However, there are limited studies that demonstrate use of the STOPP tool in nursing homes in the United States. With this study, I sought to create and administer an educational intervention on PIMs and the STOPP tool to close the gap in practice.

Significance

There are over 15,000 certified nursing homes in the United States serving over one million senior residents (Kaiser Family Foundation, 2019). Eighty-five percent of these residents are age 65 and older (KFF, 2014). This project was conducted in a midsized urban nursing home facility in the southern United States. According to data presented during the nursing home's quality assurance meeting in June 2019, residents at the facility have an average of 11 prescribed medications. Through this project, I emphasized the important role that staff nurses play in nursing homes as it pertains to advocating for the reduction of PIMs use among elderly residents. Staff nurses are at the forefront of medication management. While staff nurses do not have prescriptive authority, it is certainly within their scope of practice to observe and monitor residents for possible medication side effects and partner with other healthcare providers in notifying

resident status and recommending the reduction or termination of medications that contribute to such change in status.

The global population continues to age, a trend that is also demonstrated in the United States. The 2018 Profile of Older Americans Report showed the population aged 65 and over had a 35% increase over a period of 10 years (2007–2017), with the 85 and over population projected to double by 2040. McKearney and Coleman (2020) attributed the increase in life expectancy to overall improvement of treatment approaches as well as availability to effective treatment options. This increase in life expectancy has resulted in an increased number of frail older adults who live longer but sicker lives. As a result of the presence of chronic illnesses and multiple comorbidities, older adults are susceptible to polypharmacy, increasing the risk of being prescribed PIMs (Skinner, 2015).

Medication management among the older adult population is crucial as one in five medications has been identified as potentially inappropriate, where the risks of taking certain medications outweigh the benefits (Alrasheed et al., 2018). The STOPP tool has been widely used in acute care settings and in nursing homes. Knowledge and commitment of staff nurses in LTCFs to using validated tools to identify PIMs will support positive social change by improving resident safety and quality of life across the healthcare continuum. This study has the potential to effect positive social change by addressing medication challenges among older adults in LTCFs, thus reducing adverse drug effects and improving the quality of life among this population.

Summary

Staff nurses are on the frontline of medication preparation and administration for nursing home residents. Staff nurses who are knowledgeable about inappropriate medications can participate in the reduction of the use of PIMs, which is considered a major contributor to ADRs. In Section 1, I introduced the nature of the project, purpose, and significance. In Section 2, I will introduce the Malcolm Knowles theory of adult learning; the evidence supporting this project; the local background for the project; and my role in planning, implementing, and evaluating this DNP project.

Section 2: Background and Context

Introduction

Several validated screening tools are available to help healthcare professionals determine appropriateness of medications prescribed to older adults. However, the prevalence of prescribing PIMs among the elderly in LTCFs remains high. The practice-focused question is: Does an educational intervention geared toward PIMs and the use of the STOPP tool increase the knowledge and commitment of use of the tool among nurses working in nursing homes? In this section, I introduce Malcolm Knowles' theory of adult learning as the framework for implementing an educational intervention; the evidence supporting this project; the local background for the project; and my role in planning, implementing and evaluating this DNP project.

Concepts, Models, and Theories

The Knowles theory of adult learning was used as a framework for the implementation of this project. As the father of andragogy, Knowles (1980) established that there is a difference between andragogy (the art of helping adults learn) and pedagogy (the art of helping children learn). Andragogy as a concept was used to explain the conditions and principles behind adult learning (Knowles, 1988). The Knowles theory of adult learning assumes that adult learners, such as the staff nurses participating in this project, learn best when they understand the reason for the education.

A four-person panel comprising of healthcare professionals from the field site participated as experts to establish the content validity of the staff education program and the pretest and posttest. The expert panel was comprised of a physician, a nurse

practitioner, a pharmacist, and a registered nurse. The staff education program was developed using the principles of Knowles' theory of adult learning as presented on Table 1.

Table 1

Knowles Theory on Development of Staff Education Program

Principles of Knowles theory of learning	Application to the project
Adults are internally motivated and self-directed.	The staff education program was designed to capitalize on motivating nurses by starting with a good engagement activity.
Adults bring life experiences and knowledge to learning.	Staff nurses drew on their accumulated professional and personal experiences which is influential in their learning. I provided opportunities for nurses to share experiences and demonstrate knowledge of the topic.
Adults are goal-oriented as such adult learning is problem-centered rather than content-oriented.	During the staff education program, I provided opportunities for nurses to apply their knowledge through activities that allowed them to participate and provide input.
Adults are relevancy oriented.	Staff nurses are adult learners, and adult learners are most interested in learning topics that have relevance to their professional or personal life. Relevance was emphasized by connecting the content and activities to what the nurses already know, to what is important to them, and to what they will be doing in the future.
Adults are practical.	I focused more on the process rather than on the content by encouraging engagement from the nurses, such as role playing, self-evaluation, or games.
Adults desire respect.	A welcoming atmosphere was fostered by preparing nametags, greeting staff nurses by name, providing refreshments, and acknowledging nurses' time and participation in the education program.

Relevance to Nursing Practice

In this section, I demonstrate the relevance of the use of PIMs among nursing home residents. This justifies the practice-focused question: Does an educational intervention geared toward PIMs and the use of the STOPP tool increase the knowledge and commitment of use of the tool among nurses working in nursing homes?

Aging Population and Nursing Homes

Data have demonstrated a steep growth in global population (Henderson et al., 2017). The Unites States likewise mirrors an unprecedented growth in its population. The combination of a decrease in birth rates and an increase in life expectancy has resulted in a significant increase in older and frailer adults with multiple comorbidities. The aging of the baby boomer generation (between ages 55 and 73 in 2019) is projected to contribute to the increase in the number of older Americans requiring nursing home care from 1.2 million in 2017 to 1.9 million in 2030 (Mather et al., 2019).

Coexistence of two or more chronic conditions or multimorbidity is associated with a decrease in quality of life, mobility, and functional ability as well as an increase in hospitalizations, mortality, and use of healthcare resources (Masnoon et al., 2017). The multiple physiological deficits increase the frailty of these individuals and predispose them to nursing home placement. Kojima (2018) demonstrated that 90% of nursing home residents are frail and are admitted to nursing homes for nursing care services. Likewise, frail individuals are more vulnerable to receiving multiple medications.

Concerns of Polypharmacy

Older adults admitted to nursing homes take multiple medications. As new symptoms develop or new diagnoses are identified, more medications are prescribed and introduced to the residents. Polypharmacy is a significant problem for nursing home residents. The most common definition of *polypharmacy* is the concurrent use of five or more medications (Masnoon et al., 2017). One of the dangers of polypharmacy in the elderly is the risk of being prescribed a PIM. As the number of prescribed medications in an older adult increases, so does the risk that at least one of the medications is potentially inappropriate. Morin et al. (2016) emphasized that polypharmacy is the main driving factor for PIMs use. Thus, the need for medications to be assessed in terms of their indication, efficacy, and potential for harm with each other is essential. However, there is limited literature that supports that nursing homes in the United States consistently use validated tools in medication review and reconciliation.

Medication Administration in Nursing Homes

Managing medications for nursing home residents presents many challenges on different levels. Seven out of 10 nursing home residents have a confirmed dementia diagnosis, requiring extra time for medication administration (Bergman-Evans, 2013). On top of the presence of multiple chronic diseases, nurses administer an average of 6.7 medications per resident. Nurses in the nursing home setting have higher nurse-to-patient ratios, not allowing them sufficient time to evaluate the medications being administered or notify the physician if inappropriate medication is noticed. Nurses in nursing homes often function as medication dispensing aides rather than acting as clinically focused

resident advocates. Registered nurses (RNs) are considered to have the highest level of knowledge in nursing care and in medical competence. Both RNs and licensed practical nurses/vocational nurses (LPN/LVN) perform medication reconciliation as part of their job descriptions. However, Vogelsmeier et al. (2017) demonstrated that RNs are more concerned about accuracy and safety in medication administration, whereas LPNs are more concerned about time. The Centers for Medicare and Medicaid Services (CMS) reported that nursing homes are staffed with more LPNs. Nursing homes or LTCFs continue to run their operations without RNs on staff (CMS, 2019). CMS (2018) emphasized the proven relationship of increased quality of patient care with higher RN staffing and made it a federal requirement to have an RN onsite for at least 8 hours a day, 7 days a week. With more LPNs deemed to be more concerned about passing medications in a timely manner, the concern for accuracy and safety in medication administration is diminished. This education intervention emphasizes the importance of screening for PIMs to prevent medication adverse effects to the residents in nursing homes.

One of the main treatment strategies used for geriatric nursing home residents is pharmacotherapy (Alenius & Graf, 2016). When correctly prescribed, medications can enhance residents' quality of life and prolong their life span. However, when incorrectly prescribed and/or administered, the risk of injury in the older adults is higher compared to other populations. Anderson et al. (2018) emphasized that nursing homes have liability for providing the highest quality of nursing care and services to the residents. At the

frontline of nursing homes are nursing staff who residents rely on to interpret and deliver care to meet their needs and preferences.

Current Tools

Researchers demonstrated that different tools implemented worldwide provide concise explanation of inappropriateness of medications. Motter et al. (2018) identified that there are 36 validated PIMs tools available. The most commonly studied tools are: Beers criteria (Fick et al., 2015); Screening Tool of Older Person's potentially inappropriate Prescriptions (STOPP) tool (O'Mahony et al., 2016); Norwegian General Practice (NORGEP) criteria (Rognstad et al., 2009); and, Fit fOR The Aged (FORTA) criteria (Wehling, 2008).

The American Geriatric Society has been the steward of the Beers criteria for PIMs use in Older Adults since 2011. However, O'Mahony et al. (2017) demonstrated that the criteria in the STOPP Tool demonstrated better association with ADRs than the 2003 Beers criteria.

The National Health Service Herefordshire Clinical Commissioning Group (NHS, 2016) endorses the STOPP/START Tool. STOPP (Screening Tool of Older People's potentially inappropriate Prescriptions) lists prescriptions that are potentially inappropriate in persons aged ≥ 65 years. START (Screening Tool to Alert doctors to Right (i.e. appropriate, indicated) Treatments), recommends treatments that should be considered for people ≥ 65 years of age, where no contraindication exists.

Nursing home residents rely on physicians and other primary care providers to initiate medication reviews during the mandated periodic visits as required by the Centers

for Medicare and Medicaid (CMS, 2017). However, evidence continues to show high prevalence of PIM use; thus, there are many opportunities to improve by using a validated tool to determine appropriateness of medications in the older adults. The STOPP Tool had been selected for this study. The STOPP Tool has been widely used in acute care settings, as well as in nursing homes globally. Knowledge and commitment to using validated criteria or tools to identify PIMs will support positive social change by improving resident safety and quality of life across the healthcare continuum, across the globe. This study has the potential to effect positive social change by addressing medication challenges among older adults in LTCFs.

Appropriate prescription of medications should be based on a scientific, research-based indication. However, there are limited randomized controlled drug studies that involve the older population. Older adults are often excluded from drug studies due to co-morbidities; therefore, physicians and other providers, including pharmacists, rely on validated criteria-based tools and indicators for PIMs (O'Connor et al., 2012). Several of these tools have been studied globally emphasizing the importance and even the urgency of addressing the problem of PIMs. However, as of this writing, prevalence of use of PIMs in nursing homes worldwide continues to be extensive (Curtin et al., 2019; Motter et al., 2018; Nyborg et al., 2017). Morin et al. (2016) reported that 43% of nursing home residents had PIMs prescribed to them.

Nursing Home Regulations

CMS (2017) requires physicians to review the resident's total program of care, including medications and treatments, at each visit. Total program of care is defined as

"all care the facility provides to maintain or improve their highest practicable physical, mental, and psychosocial well-being" (p. 415). This care includes medication management. Medication management should include complete medication reconciliation, recommendations for discontinuation of PIMs, and a recommendation to simplify medication regimen (Rankin et al., 2018). The physician is expected to develop, monitor, and modify the medication regimen, and collaborate with the resident, their representatives, and other professionals or direct care staff.

Local Background and Context

I attended a quality assurance meeting at my field site, a midsized urban nursing home facility in the southern United States where their pharmacy consultant presented a report that demonstrated that their residents have an average of 11 daily medications including over the counter medications. This report made me think of the impact of polypharmacy and potentially inappropriate medication and its effect on resident safety.

The field site is an urban for-profit nursing home in the southern United States. The facility has 208 certified beds, an average daily census of 110. Certified beds refer to number of beds that has met requirements and achieved approval from CMS to provide post-hospital skilled care services. The nursing department at the field site is comprised of 25 RNs and/or LVNs and 45 certified nursing assistants (CNAs). Prior to the development of this DNP project, the nursing administration agreed that there is a need to enhance staff nurses' role in identifying and advocating for the reduction of PIMs; and therefore, carrying out this project is feasible.

The mission of the organization is to enrich residents' experiences in virtually all aspects of community life. The mantra of the organization is "Everything we do, we do for residents". This is aligned with my personal philosophy of seeking ways to improve the quality of life of older adults in the nursing home setting.

Role of the DNP Student

As a regional nurse consultant for LTCFs, the outcome of this project is of great interest to me as it has the potential to directly benefit the clientele our facilities serve. I oversaw the development of a staff education program on use of STOPP Tool for staff nurses. The goal was to implement its use in a midsized urban nursing home in the southern United States. I visited the site and met with organizational leadership to clarify project goals and procedures, and obtained commitment of support.

A staff education plan was developed and a four-person expert panel comprising of healthcare professionals at the field site was requested to participate to establish the content validity of the program, as well as the pretest and posttest. The expert panel comprised of a physician, a nurse practitioner, a pharmacist, and a registered nurse. Once the content was approved, I sought approval for the rollout of the education program at the facility as well as approval from the Walden University Institutional Review Board. Staff RNs and LVNs who administer medications at the facility were asked to participate voluntarily. Pretests and posttests were administered and results were analyzed for a final report to the organizational leadership.

The outcome of this project has the potential to contribute to positive patient outcomes and improved care related to medication management in LTCFs as well as to

prevent ADRs, thus resulting in positive social change. With knowledge and commitment to use a medication screening tool, the STOPP Tool, staff nurses can advocate for reduction in polypharmacy and use of PIMs.

Summary

Malcolm Knowles' theory of adult learning, the evidence supporting this project, the local background for the project, and my role in planning, implementing and evaluating this DNP project were introduced in Section 2. Section 3 will define the practice-focused question, and will present sources of evidence, as well as analysis and synthesis of literature.

Section 3: Collection and Analysis of Evidence

Introduction

Despite availability of screening tools to determine appropriateness of medications prescribed to older adults, the prevalence of prescribing of PIMs in nursing homes remains high. The practice-focused question guiding this study was: Does an educational intervention geared toward PIMs and the use of the STOPP tool increase the knowledge and commitment of use of the tool among nurses working in nursing homes? Through the synthesis and analysis of literature, this section will demonstrate the effects of PIMs in older adults in nursing homes.

In this section, I introduce the sources of evidence and the evidence generated for this doctoral project, including identifying participants, step-by-step descriptions of the procedures, and ethical protections provided to participants and the organization. The analysis and synthesis procedures used to address the practice-focused question will also be presented in this section.

Practice-Focused Question

Does an educational intervention geared toward PIMs and the use of the STOPP tool increase the knowledge and commitment of use of the tool among nurses working in nursing homes?

Sources of Evidence

A search was performed using CINAHL, MEDLINE, PsychInfo, and ProQuest Nursing & Allied Health Source databases (2016-2019) for studies on the use of PIMs in older adults living in nursing homes or LTCFs. Key search terms included *STOPP, Beers,*

medications, nursing homes, care homes, and *LTCFs*. Exclusion criteria included *hospital, hospitalized,* and *acute care*.

A literature review was conducted to demonstrate knowledge in the field of PIMs use among older adults in nursing homes and use of validated tools in determining PIMs use. Cooper's (1998) taxonomy of literature review was used as a framework to organize selected literature. Cooper suggested that evidence be classified according to six characteristics: (a) focus, (b) goal, (c) perspective, (d) coverage, (e) organization, and (f) audience.

Evidence Generated for the Doctoral Project

Participants

Participants were staff nurses (RNs and LVNs) as well as nurse supervisors at the field site. The staff nurses and nurse supervisors at the field site are relevant to the study as the practice-focused question is geared toward demonstrating if an educational intervention on PIMs and the use of the STOPP tool would increase the knowledge and commitment of use of the tool among nurses working in nursing homes.

Procedures and Protections

Following IRB approval, I performed the following:

1. Used current literature to develop an education program that reflects the nature of the STOPP Tool and how to use the tool.
2. Created a 10-question pretest/posttest questionnaire based on the education program.

3. Assessed content validity (Polit and Beck, 2006) of the education program and the pretest/posttest questionnaire from a four-member panel comprised of healthcare professionals at the field site: a physician, a nurse practitioner, a pharmacist, and an RN.
4. Met with the director of nursing at the field site to coordinate training dates and times. Four training dates were scheduled to allow for more opportunities to participation while complying with social distancing during the meeting.
5. Posted flyers in break rooms and near time clocks to promote nurse interest and attendance. I also reached out to the nurses personally to encourage attendance at the educational training, as attendance at the training would be voluntary.
6. Had participants complete the 10-item pretest questionnaire plus five demographic questions to describe the sample prior to the educational intervention. No identifying information was collected; however, each participant was asked to create a unique identifier to identify their pretest with their posttest.
7. Conducted a 40-minute educational intervention. Following the educational intervention, the participants completed the posttest as well as one question asking the participants for their commitment to using the STOPP tool once implemented.

The pretest and posttest data were then compared and put into a spreadsheet and transferred to IBM SPSS. Descriptive statistics was used to describe the sample and inferential statistics was used to determine if there was an increase in knowledge and commitment to use the tool.

Analysis and Synthesis

The intended outcome of the project was to determine if an educational intervention geared towards PIMs as well as the STOPP Tool will increase knowledge and commitment to use the tool, by staff nurses working in nursing homes. Responses from the pretest and posttest was gathered and collated into MS Excel format and transferred into a statistical analysis software, IBM SPSS. Descriptive statistics was used to describe the sample and inferential statistics was used to determine if there was an increase in knowledge and commitment to use the STOPP Tool once it is implemented.

Summary

Section 3 defined the practice-focused question and presented sources of evidence. Analysis and synthesis of literature were also presented. Section 4 will present the findings and implications of the project. Recommendations will be made and the strengths and limitations of the project will also be defined.

Section 4: Findings and Recommendations

Introduction

As effective treatments to chronic diseases continue to be discovered and made available, life expectancy continues to increase. Older adults who can no longer care for themselves at home look to nursing homes for alternative housing with the advantage of having services around the clock from healthcare professionals. Thus, healthcare is inundated with sicker, older adults who are prone to being prescribed more medications to address different health concerns. Polypharmacy increases the likelihood of older adults being prescribed inappropriate medications.

Staff nurses in nursing homes are on the frontline of medication preparation and administration for nursing home residents, yet the majority of these nurses are not aware that such medication review tools, such as Beers criteria and the STOPP tool, exist. With this study, I aimed to address the following practice-focused question: Does an educational intervention geared towards PIMs and the use of the STOPP tool increase the knowledge and commitment of use of the tool among nurses working in the nursing home setting? The STOPP tool is widely used around the world in the acute care setting (Chandrasekhar & Samjas, 2019; Counter et al., 2018; Martin et al., 2018). However, there is huge potential for this tool to be implemented in nursing homes and LTCFs, as nursing homes cater to the older adult population.

Literature on use of PIMs in older adults living in nursing homes or LTCFs were gathered using CINAHL, MEDLINE, PsychInfo, and ProQuest Nursing & Allied Health Source databases (2016-2019). Studies were identified using key search terms *STOPP,*

Beers, medications, nursing homes, care homes, and *LTCFs*. Exclusion criteria were *hospital, hospitalized,* and *acute care*.

Fifteen nurses voluntarily participated in the study. A demographic questionnaire was given to participants to be completed prior to the administration of a 10-item pretest. A 40-minute educational intervention was then presented using the Knowles theory of adult learning as the framework. Immediately after the educational intervention, the posttest was administered. An extra question was included in the posttest asking the participants for their commitment to use the STOPP tool in the medication review process. Responses from the pretest and posttest were gathered, collated, and put into SPSS Version 27.

Findings and Implications

Fifteen staff nurses (RNs and LVNs) participated in the educational intervention (n = 15). The majority of the participants were female (n = 14) and African American (n = 8) with 60% (n = 9) of the participants self-reporting being 50 years and older. More than half (53%) of the participants had 10 or more years of experience, and most of the participants (n = 14) were employed full-time. Ten of the participants (67%) reported being LVNs, with the majority of the participants (n =9) reporting having a diploma in nursing as presented in Table 2.

Table 2

Demographics of the Participants

	Frequency (n)	Percentage
Gender		
Male	1	6.7%
Female	14	93.3%
Ethnicity		
Hispanic	2	13.3%
Black/African American	8	53.3%
Asian/Pacific Islander	5	33.3%
Age		
26 to 30	1	6.7%
31 to 25	0	0.0%
36 to 40	2	13.3%
41 to 45	2	13.3%
46 to 50	1	6.7%
Over 50	9	60.0%
Title		
RN	5	33.3%
LVN	10	66.7%
Education		
Diploma	9	60.0%
Associate degree	1	6.7%
Bachelor degree	5	33.3%
Employment		
Full-time	13	86.7%
Part-time	1	6.7%
PRN/Per diem	1	6.7%
Years of experience		
0 to 2	1	6.7%
3 to 5	5	33.3%
6 to 8	1	6.7%
9 to 10	0	0.0%
More than 10	8	53.5%

To establish the usability of the educational program, the pretest, and the posttest, the content validity (S-CVI) and content validity index (CVI) were used as a proxy (Polit & Beck, 2006). Four experts (nurse practitioner, RN, physician, and pharmacist) were identified and invited to participate in establishing relevance of the materials to be used for this project. The experts were asked to review the presentation and pretest/posttest questionnaire and to rank each question for relevance. All the items on the pretest/posttest were ranked as *highly relevant* and *quite relevant*. Thus, I-CVI scored a 0.8. The S-CVI of the questionnaire was calculated to be at 1.0, as presented on Table 3 and Table 4, respectively.

Table 3

Rating on a 10-Item Scale by Four Expert Panels: Items Rated 3 or 4 on a 4-Point Relevance Scale

	Rater/ Panel 1 (NP)	Rater/ Panel 2 (Pharm)	Rater/ Panel 3 (RN)	Rater/ Panel 4 (MD)	Number in agreement	Item CVI
Question 1	X	X	X	X	4	1.00
Question 2	X	X	X	X	4	0.75
Question 3	X	X	X	X	4	0.75
Question 4	X	X	X	X	4	1.00
Question 5	X	X	X	X	4	0.50
Question 6	X	X	X	X	4	0.50
Question 7	X	X	X	X	4	1.00
Question 8	X	X	X	X	4	1.00
Question 9	X	X	X	X	4	0.75
Question 10	X	X	X	X	4	0.75
					Mean I-CVI	0.8

Note. 1 = not relevant; 2 = somewhat relevant; 3 = quite relevant; highly relevant

Table 4

Computation of an S-CVI for a 10-Item Scale With Four Expert Panels

	Rater/Panel 1 (NP)	Rater/Panel 2 (Pharm)	Rater/Panel 3 (RN)	Rater/Panel 4 (MD)
Items rated 1 or 2*	0	0	0	0
Items rated 3 or 4^	4	4	4	4
Total	4	4	4	4
S-CVI =	10/10 = 1.00			

S-CVI = content validity index or the scale
*Ratings of 1 = *not relevant*; 2 = *somewhat relevant.*
^Ratings of 3 = *quite relevant;* 4 = *highly relevant.*

The pretest and posttest consisted of 10 questions. The average score of the pretest was 6.26 (1.22) with a range of 4 to 8 (Table 6). The average score of the posttest was 7.80 (1.01) with a range of 6.0 to 9.0 (Table 7). Using a Wilcoxon signed-rank test to estimate the data, there was a significant difference between the pretest and posttest, indicating there was an increase in knowledge among the participants following the educational intervention ($z = -3.17$, $p = 0.02$) as presented on Table 5. Additionally, 100% of the participants ($n = 15$) indicated they would support the use of the tool in practice.

Table 5

Wilcoxon Signed Ranks Test

	N	Mean rank	Sum of ranks
Negative ranks	1[a]	3.00	3.00
Positive ranks	13[b]	7.85	102.00
Ties	1[c]		
Total	15		
Z	-3.168[d]	[a] *Posttest < Pretest;* [b] *Posttest > Pretest* [c] *Posttest = Pretest;* [d] *Based on negative ranks*	
Asymp. Sig. (2-tailed)	0.002		

Table 6

Participants' Answers to Pretest Questions

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	
	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Pre	Total
Participant 1	x							x		x	7
Participant 2	x							x			8
Participant 3	x								x	x	7
Participant 4	x							x	x		7
Participant 5								x		x	8
Participant 6			x			x		x		x	6
Participant 7	x				x			x	x	x	5
Participant 8	x				x			x			7
Participant 9	x	x						x		x	6
Participant 10	x		x		x	x		x		x	4
Participant 11	x				x			x		x	6
Participant 12	x		x					x			7
Participant 13	x	x		x				x		x	5
Participant 14	x		x			x		x		x	5
Participant 15			x			x			x	x	6
# of participants who answered correctly	3	13	10	14	11	11	15	2	11	4	

Table 7

Participants' Answers to Posttest Questions

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	
	Post	Post	Post	Post	Post	Post	Post	Post	Post	Post	Total
Participant 1	x							x	x	x	6
Participant 2								x			9
Participant 3		x						x			8
Participant 4	x								x		8
Participant 5								x			9
Participant 6								x		x	8
Participant 7	x									x	8
Participant 8		x	x					x			7
Participant 9	x									x	8
Participant 10		x	x		x			x			6
Participant 11	x							x			8
Participant 12	x										9
Participant 13		x							x	x	7
Participant 14	x	x						x			7
Participant 15									x		9
# of participants who answered correctly	8	10	13	15	14	15	15	6	12	10	

Recommendations

The outcome of this project has significant relevance in the nursing home/long-term care setting. The prevalence of PIMs being prescribed to nursing home residents continues to be high. Through this project, I was able to demonstrate that an educational intervention on a medication screening tool for nurses working in the nursing homes/long-term care setting resulted in a significant increase in knowledge among participants. Likewise, all participants reported that they were willing to support the use of a medication screening tool, specifically the STOPP Tool if implemented at their facility.

The next step is to present the data collected during this project to the leadership at the facility level. The results of this project will also be presented to the leadership at the corporate level for possible dissemination to other sister facilities. Future considerations include a delayed posttest to investigate and determine if knowledge is sustained among participants and use of the tool is occurring.

Strengths and Limitations of the Project

A noted strength in this staff education project is that the sample (n=15) was able to demonstrate a statistically significant increase in knowledge. To increase the reliability and validity of the tools utilized in this project, content validity (S-CVI) and content validity index (CVI) were used as a proxy. Through this project, I was able to demonstrate that a tool being used in the acute care setting can be transferred to the long-term care setting to demonstrate positive social change by increasing patient safety and quality of care.

A limitation in the project is the small sample size (n=15). The data collected from this project were obtained from one nursing home in an urban facility in Texas. Findings from this project may not be generalizable across nurses in other nursing home settings. To strengthen and further improve nurses' knowledge and commitment to use a medication review tool, future study and analysis should be continued to determine compliance and sustained use of the tool.

Another limitation in the data collection is that specific details about the participants may be lacking as a number of the variables were measured on a nominal/ordinal level. Therefore, the age and years of experience do not have the same

gaps so a mean cannot be used to assess central tendency. Despite these limitations, this project is one of few attempts of the translation of a tool utilized in the acute care setting that can be adapted to the nursing home/long-term care setting.

Section 5: Dissemination Plan

The findings of this project were disseminated to the facility leadership comprised of the executive director, administrator, director of nursing, assistant directors of nursing, and nurse supervisors. The findings were also shared with the regional leadership overseeing four other communities in their portfolio. Disseminating the initiatives, innovation, and evidence should be wider than just the organization where the problem was identified (Oermann & Hayes, 2019). Publishing the findings of a project is essential to building the knowledge base of nursing. As such, I plan to pursue publication in the *Clinical Scholars Review: The Journal of Doctoral Nursing Practice*, *The Director: Journal of the National Association of Directors of Nursing Administration in Long Term Care*, or in the *Applied Nursing Research Journal*.

KFF (2017) reported that over 1.2 million older adults in the United States are living in over 15,000 certified nursing homes. This project is a good start to adapting tools widely used in acute care into the nursing home setting. Addressing medication challenges among older adults in nursing homes and LTCFs can result in a positive social change.

Analysis of Self

The opportunity to translate this evidence-based project solidified my confidence in my ability to replicate the process of translating research into practice to improve nursing practices in the nursing home setting. As the nursing home setting continues to increase in acuity and complexity, a DNP nurse leader should be prepared to practice at the highest level of nursing by expanding knowledge beyond mere discovery. As a

scholar, the process of synthesizing, translating, and applying the most sophisticated evidence into the clinical practice should be second nature.

Going through the process of selecting a question or problem in my area of practice, conducting a literature review, selecting approaches, implementing the project, and making recommendations strengthened my confidence in my skills to advance nursing knowledge by using evidence-based research. McBride et al. (2017) described a scholar as one who possess a strong foundation in evidence-based practice and research, alongside personal qualities of passion for learning, intrinsic motivation, and resilience. Without these qualities, I would not have been able to successfully implement this project under normal circumstances let alone during the COVID-19 pandemic that was occurring during this process.

Summary

The desired outcome of this project was to determine if an educational intervention geared towards PIMs and the use of the STOPP tool will increase the knowledge and commitment of use of the tool among nurses working in the nursing home setting. The prevalence of the prescription of PIMs (PIMs) among older adults in nursing homes continues to be high. It is evident from the literature that an educational intervention will increase knowledge among nurses in nursing homes, about PIMs. This was supported by the outcome of this project which demonstrated a statistically significant increase in knowledge, as well as 100% of the nurses committing to use the STOPP tool if implemented. If staff nurses in nursing homes are educated about PIMs as

well as the use of the STOPP tool, nursing home residents will have better advocates to help reduce use of PIMs.

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Appendix A: Pretest/Posttest Questionnaire

1. Which is the best example of polypharmacy?
    a. A resident is taking more than 3 medications.
    b. A resident is taking more medications than is clinically required.
    c. A resident fills prescriptions at more than one drugstore.
    d. A resident takes multiple medications to manage co-morbid conditions.

2. Residents become non-compliant to multiple medications due to:
    a. Side effects
    b. Complexity of regimen
    c. Too hard to remember
    d. All of the above

3. Which of the following is NOT one of the major categories of ADRs?
    a. Hypersensitivity
    b. Toxic reactions
    c. Idiosyncratic responses
    d. Prescribing errors

4. Why do older adults pose more risk when prescribed and/or are taking several medications?
    a. Older adults like taking a lot of medications.
    b. Older adults are less likely to see a physician.
    c. Older adults are more likely to have co-morbidities that require different medications.
    d. None of the above.

5. Adverse drug reactions (ADRs) often involve:
    a. Anticoagulants
    b. Opioids
    c. Diabetic Medications
    d. All of the above

6. The Centers for Medicare and Medicaid Services (CMS) regulations state that residents of nursing homes should only receive medications when:
    a. Prescribed by geriatrician.
    b. The potential benefits outweigh the risks
    c. The nurse observes that the resident takes the medication
    d. The adverse effects can be managed by additional medications.

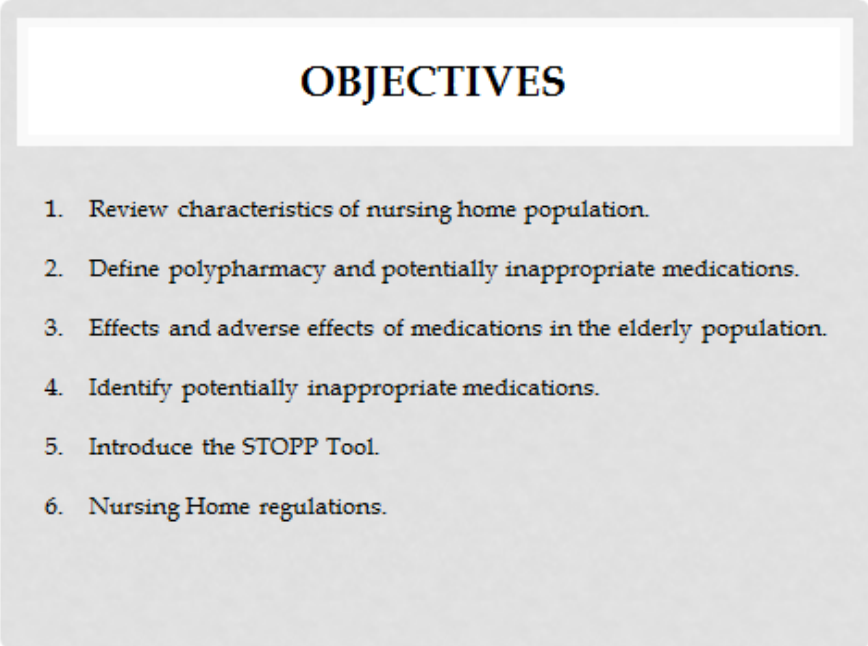
7. If residents in nursing homes are found to be prescribed medications with no clear indication of use, The Centers for Medicare and Medicaid Services (CMS) can impose non-compliant citation called:
    a. F-Tag 880 – Infection Control and Prevention
    b. F-Tag 757 – Unnecessary Medications
    c. F-Tag 689 – Free from Hazard
    d. F-Tag 600 – Free from Abuse/Neglect

8. Potentially inappropriate medications (PIMs) should be avoided in older adults because:
    a. They cause higher risk of adverse effects in older adults.
    b. They are more expensive.
    c. They are difficult to swallow.
    d. They have been tested on animals.

9. The Screening Tool of Older Person's potentially inappropriate Prescriptions (STOPP) criteria are organized according to:
    a. Adverse drug effects
    b. Medication class
    c. Physiologic system
    d. Specific diseases

10. Benzodiazepines (e.g. Ativan, Xanax) should not be taken longer than 4 weeks because:
    a. Risk of prolonged sedation
    b. Can cause withdrawal syndrome when abruptly stopped
    c. No indication for prolonged treatment
    d. All of the above.

Appendix B: Educational Intervention



QUESTION #1

In your 12-hour shift, what **task** take up the most part of your day?

a. Talking to physicians/providers/family
b. Documentation
c. Medication Administration
(including pulling out meds, signing, administering PRN meds, awaiting resident to take meds)
a. Taking breaks

QUESTION #2

On the average, how many medications do you administer **per resident per shift**? *(Consider the least and the most number and estimate an average).*

a. Less than 5
b. 5-10
c. More than 10

CONCEPT #1

- Older adults in nursing homes are sicker than those in community.
- Older adults in nursing homes take an average of 6.7 daily medication.
- Older adults are at greater risk of **adverse drug reactions.**
- Older adults are often excluded from drug trials → few actual studies.

SO YOU ARE NOW THINKING….

I don't have prescriptive authority.

This should be the job of the doctor… or pharmacist.

Why should I care?

NURSES ARE AT THE FRONTLINE OF MEDICATION ADMINISTRATION

Administering 5, 7, 10 or more medications?
STOP and THINK

QUESTION #3

What is the term used to refer to the practice of concurrently administering many different medications?

_____

POLYPHARMACY

Administration of more medications than clinically required.
There is no correct number – most common is more than 5.

POTENTIALLY INAPPROPRIATE MEDICATIONS

Drugs that should be avoided among older adults due to:

1. High risk of adverse reactions; and/or,
2. Insufficient evidence of their benefits.

ADVERSE DRUG REACTIONS

- Significant economic burden to the healthcare system, (450,000 ER visits annually for older adults).
- Adults older than 65 years of age are nearly seven times more likely to be hospitalized after an emergency visit than those younger than 65 years of age.
- Most hospitalizations among older adults are due to poor monitoring of:
  - anticoagulants,
  - diabetes medications,
  - anticonvulsants, and
  - opioids

ADVERSE DRUG REACTIONS
(FIVE MAJOR CATEGORIES)

1. Side effects,
2. Hypersensitivity,
3. Idiosyncratic response,
4. Toxic reactions, and
5. Adverse drug interactions.

EXAMPLES OF PIMS

1. Proton Pump Inhibitors (PPIs):
   - Only 1-2 months for uncomplicated peptic ulcer.
   - If no ulcer, possibly PRN. Review annually.
2. Loop diuretics:
   - As treatment for hypertension.
3. ACE Inhibitors or ARBs:
   - In patients with hyperkalemia
4. Aspirin
   - Monotherapy for stroke prevention in AFib

EXAMPLES OF PIMS

5. Anti-muscarinic bronchodilators:
   - With history of narrow angle glaucoma
   - With bladder outflow obstruction
6. Benzodiazepines or hypnotics:
   - For longer than 4 weeks – risk or prolonged sedation, withdrawal syndrome.
7. Bisphosphonates:
   - If greater than 3-5 years treatment
   - In patients with upper GI disease
8. NSAID
   - With moderate-severe heart failure
   - Do not use diclofenac or celecoxib at any stage of HF.

WHAT IF THERE IS A TOOL TO REMIND YOU TO STOP & THINK?

STOPP

Screening Tool for Older People's Potentially inappropriate prescription

INTRODUCING TO YOU..... THE... STOPP/START TOOLKIT

- Reminds healthcare professionals to ensure that patient care is clinically safe

Screening Tool for Older People's Potentially inappropriate prescription

STOPP

START

Screening Tool to Alert doctor to Right Treatments

STOPP TOOL

Screening Tool for Older People's Potentially inappropriate prescription

- 80 criteria - arranged according to physiologic system
- Supported by several studies.
- Used in acute setting many years now.
- Address the prevalence of inappropriate prescribing in older adults.
- Help in drug optimization.

NURSING HOME REGULATIONS

CMS regulations state that nursing facility residents receive medications when:

- Potential benefits outweigh the risks or burden of treatment
- Clear clinical indication and diagnosis for any medication, and
- Prescribed medications should be given for the proper duration at the correct dose.

CMS
CENTERS FOR MEDICARE & MEDICAID SERVICES

NURSING HOME REGULATIONS

- Surveyors assess for unnecessary medications.
- Facility may receive a citation (**F-Tag 757**) for violating the CMS requirement to avoid unnecessary medications.

COMMITMENT

- How do you feel about this tool to guide your practice?
- If the STOPP Tool will be part of medication review regimen, will you support its use?