

2021

Staff Education Module on Beers Criteria for Geriatric Patients

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Walden University

College of Nursing

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Eyvonne Hinton

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2020

Abstract

Staff Education Module on Beers Criteria for Geriatric Patients

by

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MS, Walden University, 2016

BS, Walden University, 2014

Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

Walden University

December 2020

Abstract

One of the main problems affecting geriatric patients over the age of 65 is the heightened risks of severe complications and mortality from adverse drug events (ADEs). Beers Criteria is a suitable framework for identifying potentially inappropriate medications (PIMs) for such at-risk population. The purpose of this project was to develop an evidence-based educational intervention for use by health practitioners to increase their knowledge and confidence regarding the 2012 American Geriatrics Society (AGS) Beers Criteria for PIMs. Lewin's change theory provided the conceptual framework for the project. The method to evaluate the scores used involved a descriptive analysis of scores of the participants at the pretest and posttest interval of the educational staff module. The participants included a 10-member interdisciplinary team of experts who interacted with geriatric patients. The study period was 2 days, and the education was administered to two five-member groups per day. The study included a pre and post-test to measure change in practitioners' knowledge of PIMs in prescribing different alternatives, the level of confidence in identifying PIMs, and provider and patient engagement. The initial overall score of the pretest was 90.38% and after the educational intervention the score was 100%. An increase in the scores from the pretest and post-test showed a 9.62% increase in knowledge to full compliance with the content. This supported an increase in knowledge at the conclusion of the educational intervention. Social change implications include improving the staff's knowledge regarding potential poor health outcomes from PIMS and empowerment of nursing staff to identify potential PIMs and intervene on their patient's behalf to prevent ADEs and improve health outcomes.

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Dedication

I want to dedicate this research thesis to my two sons, Eugene Jackson and Chaz Jackson. The duo kept encouraging me to keep going and have been a source of great inspiration throughout this long journey. They have always been my best cheerleaders. Special thanks go to my sister, Angela Clay, who has always been there to encourage me. Moreover, I want my two granddaughters, Mackenzie and Amilliana, to use this tool as they grow up as a guidance towards their academic journey.

Acknowledgments

I would like to acknowledge the support of people who assisted me in realizing the success of this thesis. First, I would like to pass my heartfelt appreciation to my chair, Dr. Joanne Minnick, who has been there for me all through. She never hesitated to provide necessary assistance whenever I called her, even at odd hours. The great counseling feedback she gave me kept me fully motivated. Further, the university management was also of great importance in enabling me to access research materials that allowed me to construct a formidable thesis.

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Section 1: Nature of the Project

According to the United States Census Bureau, people over the age of 65 are expected to reach 77 million by 2034. The United States Census Bureau also estimated that the number of older people would increase from 14% of the general population in 2012 to 20% in 2030. In the geriatric population, medication-related morbidity and mortality have a significant impact and creates a burden on available healthcare resources (Cahir et al., 2019). In addition, older people experience greater morbidity with a corresponding increase in drug use, resulting in a greater risk of adverse drug events (ADEs). In the United States, over 90% of geriatric patients take at least one medication, and more than 66% take three or more in a month (American Geriatrics Society [AGS], 2019b). Medications play an important role in the health and well-being of older adults. Identifying potentially inappropriate medications (PIMs) for the older population is important in the prevention of ADEs and improving safe and effective care for this patient population. ADEs make up over one-third of all hospital adverse events, which affects over 2 million hospital stays each year (“National Action Plan,” 2014). The AGS developed the Beers Criteria, which contain recommendations about medications that may not be safe or appropriate for older adults. The evidence-based education intervention in the current project included the Beers Criteria to improve the knowledge of the participating practitioners in identifying PIMs in older adults. Zeenny et al. (2017) described the Beers Criteria as an exclusive evidence-based set of

recommendations targeted at older adults (65 years and above) who come from diverse settings of care, except hospice and palliative care. The list of PIMs is meant to guide clinicians concerning ways to optimize medication selection for older adults that will better meet their health care needs. The current project addressed the potential knowledge gap of practitioners regarding appropriate prescribing strategies for older patients. The goal was to formulate a staff education project that would include an evidence-based intervention premeditated by physicians to increase the confidence level and knowledge of the staff about Beers Criteria for older patients, safe alternatives to assist with prevention of ADEs, and effective care for the older patient.

Project Setting

The setting for this project was a clinic in Los Angeles, CA that treats patients between the ages of 65 and 80. An education module was developed for the staff treating this patient population to orient, educate, and train them about Beers Criteria. The staff who were targeted included any clinicians who prescribe medications (medical doctors [MDs], osteopathic doctors [Dos], advanced practice nurses [APNs], physician assistants [PAs]) and any who provide patient education regarding prescribed medications (RNs, bachelor of science nurses [BSNs]).

Problem Statement

The problem was that patients over the age of 65 are being prescribed medications that have the potential to cause ADEs, which can result in severe health complications and death. Despite the recognition of this problem and attempts at mitigating the risks for geriatric patients, the issue persists. The problem statement question for this project was

the following: Will a staff education module for the clinic's clinicians (MDs, DOs, APN, PAs, RNs, and BSNs) on potentially inappropriate medications (PIMS), Beers Criteria, and safe alternatives for older adults improve their knowledge about appropriate prescribing practices for these patients over a 12-week period?

Purpose of the Study

The purpose of this project was to design and implement an evidence-based educational intervention that would be premeditated by physicians and used to increase the confidence level and knowledge of the staff concerning the Beers Criteria for older patients. The project was also conducted to create safe medication alternatives to assist with the prevention of ADEs and to provide effective care for older patients. The goal of the project was to improve the knowledge of prescribing clinicians and nurses who provide patient education regarding PIMs, and to promote safer prescribing practices for geriatric patients. The literature indicated that there was a knowledge gap among prescribing clinicians and that they do not recognize the seriousness and depth of the problem.

Nature of the Doctoral Project

The number of people over the age of 65 is estimated to be 73 million, and that figure is expected to increase as the baby boomer population ages (United States Census Bureau, 2019). Due to the aging population in the United States, it is urgent that prescribing practices for older patients be addressed and safety measures put in place to protect them. The Beers Criteria, which identifies PIMs, is one tool that can be used by providers to guide them in making safe medication choices for older adults (Tavolaro-

Ryley, n.d.). Older patients have complex medical needs, and certain classes of medications can be detrimental if prescribed to them. This should be avoided, or different doses should be prescribed to prevent ADEs. An update in 2019 included new evidence-based recommendations that address specific metabolic changes that occur in older adults, helping clinicians overcome the challenges of treating these patients.

Beers Criteria may also be used in educating and training nursing students, prescribing clinicians, and experienced nurses to aid their understanding of PIMs that are unique for older patients. This multifaceted doctoral project included essential elements of the scientific process and evidence-based information from peer-reviewed journal articles. The project required critical thinking and creativity, along with an in-depth understanding of the study topic. The education module that was developed and implemented for this project included evidence-based information that would provide an effective training experience for providers who prescribe medications and nurses who provide patient education.

A pre-and-post test was given to the participants before and after they received an educational training via a Zoom PowerPoint presentation. The following practitioners participated in the survey: a Doctor of Nursing Practice (DNP), RN, RN-BSN, nurse educator, Director of Nursing (DON), clinical pharmacist, and two physicians (MD and DO). The results of the pre-and-post tests were statistically examined. The results of this analysis indicated whether the evidence-based practice change and educational training increased the knowledge and confidence level of the staff using Beers Criteria with older patients.

Significance

Khamis et al. (2019) stated that older adults take an average of 14 different drugs in a year, and they experience age-related physiologic changes that may affect the actions of these medications. Because the geriatric population in the United States disproportionately utilizes the health care system compared to other populations, ensuring that the medications geriatric patients are prescribed are safe and effective is necessary to improve patient outcomes. The lack of health care professionals with expertise in geriatrics is concerning, and the absence of training has led to prescribing clinicians and nurse educators who are not adequately educated about the changes that occur in the pharmacokinetics and pharmacodynamics of medications prescribed for the older population (Moss et al., 2019). PIMs that are prescribed to geriatric patients increase the risk of ADEs.

The AGS created the Beers Criteria as a guide for prescribers that identifies PIMs in older adults. Due to the increasing population of people over the age of 65 and the lack of geriatric training, inappropriate prescribing has become an urgent issue that needs to be addressed. The current project was intended to decrease the knowledge gap of prescribers and improve prescribing practices in the study site clinic.

Summary

The health and well-being of adults over the age of 65 who have multiple comorbid conditions depend on their providers prescribing the appropriate medications that will control their symptoms. However, many clinicians (MDs, DOs, APNs, PAs, RNs, and BSNs) are unaware of the potential of certain drugs or combinations of drugs to

produce ADEs in the geriatric patient population. This has become an enormous problem due to the polypharmacy of older adults and lack of knowledge about PIMs. The AGS created the Beers Criteria to give clinicians guidance when prescribing for this population of patients. However, the problem is increasing because of the rapidly aging population. The current project focused on designing and implementing an education and training module for prescribing and patient education of staff at a clinic in Los Angeles, CA. The desired outcome included making a positive impact on social change by educating all practitioners within the clinic and improving prescribing strategies for older patients, thereby reducing ADEs, increasing health outcomes, and decreasing disparities.

Section 2: Background and Context

In a nursing study, scientific discovery is the relationship between the process of investigation (research) and the results of knowledge (theory; Saleh, 2018). The main purpose of utilizing theory in nursing is to advance clinical practices so that the health, quality of life, and outcomes of patients are improved. The foundation of nursing is practice, research, and theory, and the relationship between practice and theory is reciprocal; nursing practice is based on the development of theory, and nursing theory has to be validated in clinical practice. Research questions are generated by areas of clinical practice where knowledge gaps exist. Nursing theory guides the development of practice changes that directly affect patient care (Saleh, 2018). The current project addressed a knowledge gap in prescribing practices for patients over the age of 65 that needed to be examined using nursing theory as the guiding principle for discovery.

Concepts, Models, and Theories

Lewin's (date, as cited in Ogochi, 2018) change theory consists of the three main concepts: driving forces, restraining forces, and equilibrium. Equilibrium is a state in which opposing forces are balanced. The driving forces push in a direction that results in desired change and causes the equilibrium to move towards change. In comparison, restraining forces counter the driving forces and obstruct change by pushing in the opposite direction. The changes that occur between the driving and restraining forces cause a shift in the equilibrium. There are also three stages involved: unfreezing, change, and refreezing. Unfreezing involves finding a strategy that allows people to let go of an unfavorable practice, which may require overcoming resistance from individuals and

groups. The change stage comprises the process of change that deals with the associated feelings, behaviors, and thoughts. Finally, refreezing is incorporating the change into daily practice and allowing it to become standard practice. “Motivation for change must be generated before change can occur” (Ogochi, 2018, p. 3).

The first step of developing an education and training module, according to Lewin’s theory, was to validate the need to change prescribing practices to protect older patients from ADEs. There was resistance from the clinicians who preferred to do things the way had always been done. Therefore, the reasons for the changes needed to be straightforward and clear. The change stage involved creating the content of the module and presenting it in a way that would motivate trainees to accept and embrace the change in practices and acknowledge that they would be the new standards for the organization (the refreezing).

Relevance to Nursing Practice

Polypharmacy is a common practice in the treatment of older adults due to the frequency of multiple comorbid conditions in this patient population (Alhawassi et al., 2019). However, older patients have a higher risk of being prescribed PIMs. PIMs are medications that should not be prescribed due to their risks when there are drugs that are equally effective but have lower risks. PIMs are associated with negative health outcomes and reduced quality of life. Using PIMs increases the risk of hospitalization, ADEs, and poor health outcomes. When sedatives or hypnotics are prescribed to older adults, the risk of falls, delirium, and hallucination are substantially increased (Alhawassi et al., 2019).

Clinical practice guidelines are created to improve the quality of care and

outcomes that are important to patients; however, these guidelines can also have significant drawbacks with the occurrence of unintended consequences, especially when clinicians do not understand how to apply them to patient care (Steinman & Fick, 2019). The downside to following disease-specific practice guidelines when treating geriatric patients is that recommendations that are meant for individual patient situations are seen as either black or white with no opportunity to provide individualized care. The AGS developed their Beers Criteria to provide a list of recommendations of drugs to avoid prescribing to older adults. These criteria have risks and benefits, so to optimize the use of Beers Criteria a paper was published that provided instructions about how to interpret and correctly apply the criteria. According to Steinman and Fick (2019), there were seven principles found in the paper:

1. Medications listed in the criteria are potentially inappropriate, and not definitely inappropriate.
2. It is important to read the rationale and recommendations statements for each because the caveats and guidance listed are important.
3. Understand why medications are included and adjust the approach to those medications accordingly.
4. Optimal application of the criteria involves identifying PIMs and where appropriate offering safer nonpharmacologic and pharmacologic treatments.
5. Beers Criteria should be a starting point identifying and improving medication appropriateness and safety.
6. Access to medications included should not be excessively restricted by prior

authorization requirements and/or health plan coverage policies.

7. The AGS Beers Criteria are not equally applicable to all countries.

These principles are meant to optimize the benefits while mitigating the inadvertent injuries that may occur if they are misinterpreted.

According to Curtin et al. (2019), Beers Criteria are used more frequently to analyze prescribing PIMs in patients over 65 years of age. The purpose of the Beers Criteria is to promote better care of older adults by reducing inappropriate medication use as well as ADEs. The Beers Criteria are also meant to educate clinicians about appropriate medications for specific chronic diseases. The criteria have not been approved for hospice or palliative care settings. Beers Criteria were developed by a committee with experts in nursing, clinical pharmacy, geriatric medicine, research, and quality measures. As is usual for clinical practice guidelines, each criterion has a quality of evidence and strength of recommendation rating assigned to it with explanations of each rationale provided. There are 88 medications or medication classes in five categories:

1. Drugs and drug classes to avoid independent of diagnosis or condition.
2. Drugs and drug classes to avoid certain diseases or syndromes.
3. Drugs and drug classes that should be used with caution in older adults.
4. Non-anti-infective drugs that should be avoided or adjusted in older adults with renal disease.
5. Non-anti-infective drug interactions that should be avoided in older adults.

Providing continuing education and training for prescribing clinicians is vital; however, not all providers who care for older people have the expertise in geriatric pharmacotherapy to safely prescribe to them (Curtin et al., 2019). For that reason, having specific tools that facilitate the optimization of medication prescribing through alerts to the prescriber that PIMs exist may decrease the risk of ADEs.

Although Beers Criteria is frequently referred to when discussing PIMs in older adults, they are not the only tool that can be effective in alerting clinicians to the possibility of ADEs and drug interactions. The Screening Tool of Older Person's inappropriate Prescriptions; Screening Tool to Alert Prescribers to Right Treatment (STOPP-START) criteria were developed as a tool to assess prescribing practices for older patients; they criteria have been found to be more accurate than Beers Criteria when predicting ADEs in geriatric patients (Fahmi et al., 2019; "Medication Errors and Drug Events," 2019). Fahmy et al. (2019) defined an ADE as an adverse drug reaction, but also included adverse drug withdrawal, which involves clinical symptoms related to the discontinuation of a drug, and a treatment failure in which the goals of therapy are not met or are inadequately covered.

Fahmi et al. (2019) compared the STOPP criteria to the 2002 Beers Criteria and found that the STOPP criteria identified a greater number of medications that were associated with ADEs, which Fahmi et al. suggested may be a more relevant clinical tool. Other studies have corroborated these findings indicating that the STOPP-START criteria prevented a significantly larger number of PIMs that were associated with preventable hospital admissions. To date, comparison studies of the newer 2019 Beers Criteria and

the STOPP-START Version 2 have not been published. Because Fahmi et al.'s findings were based on the older version of Beers Criteria, their comparisons were not significant to the current project. There is one other list of criteria for mitigating the risk of PIMs in the older population, which is the European Fit for the Aged list (Curtin et al., 2019). This list was developed in 2008 and updated in 2015 and included 264 drug classes and in 26 groups; it has been approved for use in Germany and Austria. A randomized clinical trial that evaluated the list had significant limitations making it unusable for the current project.

Role of the DNP Student

As a clinical nurse, I have had the experience of caring for geriatric patients who have been admitted to the hospital with significant symptoms that resulted from being prescribed PIMs. As an advanced care practitioner, I play a role in familiarizing clinicians with appropriate prescribing practices for older patients and providing them with a tool to guide them in optimizing patient outcomes concerning medication side effects and interactions. ADEs are a major health issue that are preventable; therefore, I concluded that development of an education module would best mitigate the risks for older adults. Identifying the knowledge gaps for prescribing clinicians must be addressed at an organizational level with the focus on improving outcomes and the health and well-being of older adults. My role in this project was to work with the project team to create the education and training module, a plan for its implementation, and clear goals and objectives. Once the project is implemented, participants will be identified, and informed consent will be obtained. The results of this project may contribute to geriatric care by

raising awareness of the effects of PIMs and reducing ADEs in older adults, thereby enhancing outcomes.

Section 3: Collection and Analysis of Evidence

The purpose of this project was to contribute to scholarship by developing a clinic-based education program that would improve the awareness of clinicians of regarding the high risk of PIMs and ADEs in adults over the age of 65. In Section 3, I present the practice-focused question and outline the sources of evidence that were utilized for this project. I also describe the analysis and synthesis of the evidence.

Practice-Focused Question

The increasing incidence of hospital admissions of older adults due to significant symptoms from inappropriately prescribed medications and the gap in knowledge of clinicians about drugs that are better suited for older patients were the issues motivating this DNP project. The literature review revealed that polypharmacy is a common practice in the treatment of older adults due to the frequency of multiple comorbid conditions, which are associated with negative health outcomes and reduced quality of life. In addition, most clinicians are not experts in treating the complexities that come with geriatric patients. To address this problem, the following practice-focused question was formulated: Will a staff education module for the clinic's clinicians and nursing staff on potentially inappropriate medications (PIMS), Beers Criteria, and safe alternatives for older adults improve their knowledge about appropriate prescribing practices for these patients?

The purpose of this project was to achieve the following objectives geared towards increasing the confidence level and knowledge of prescribing clinicians and nurse educators concerning the Beers Criteria for older patients:

1. Develop a method of assessing the knowledge of prescribing clinicians and nurse educators concerning PIMs and ADEs in older adults.
2. Develop guidelines for the education module using an evidence-based practice model to guide care.
3. Design an education module that would motivate staff and clinicians to change their prescribing practices.
4. Implement the program in a clinic setting that would provide support and motivation for practitioners to make changes and accept them as standards of practice.

Sources of Evidence

The target population for this project included all prescribing clinicians (MD, DO, DNP, APN, PA) and nurses (RN, BSN) in a clinic that treats geriatric patients between the ages of 65 and 80. The following steps were taken in the development of this education and training module:

1. Develop the module guidelines using evidence-based information from the literature review.
2. Develop a PowerPoint presentation to be used to present the information.
3. Utilize the literature review for the program design, development, and implementation, and create an outline that ensures that the program aligns with the mission and vision of the clinic.

A pre-test consisting of 13 multiple-choice questions from “a” through “d” that addressed significant areas of Beers Criteria was emailed to the participants 1 week prior

to the educational training. A PowerPoint presentation was then given on 2 different days with the 10 team members; five members were in each session. Each presentation took approximately 20 minutes. Afterwards, a post-test was emailed to the participants with the same set of multiple-choice questions to assess whether participants' understanding of Beers Criteria had increased. Because of the COVID-19 pandemic, the tests were emailed to each participant through the private email of Dr. Bahadori to ensure security and encryption of the information and to protect the confidentiality of each. Dr. Bahadori delivered the completed pre-and-post tests during a planned meeting. The tests were in two separate envelopes marked pre-test and post-test with seals on them. Also, the clinic has a private storage area for emails that are discarded after 1 year.

Prior to the beginning of the project, I requested approval from the Institutional Review Board at Walden University to ensure that the participants would be ethically protected; and their confidentiality would be guaranteed. The clinic where the project was implemented did not have an institutional review board; therefore, only approval from Walden University was obtained. Informed consent was obtained from each participants in writing.

Analysis and Synthesis

The staff who participated in the education and training module included a DNP, APN, RN, RN-BSN, PA, nurse educator, DON, clinical pharmacist, and two physicians (MD and DO). A pre-and-post test was given to determine the participants' knowledge before and after completing the education module. In addition, all participants were allowed to give feedback about the module and give suggestions about improving it.

Analysis and synthesis of the data using descriptive statistics was performed after the pre-and-post tests were received from the participants. Utilizing descriptive statistics in research is a method for describing and calculating the data so that the researchers can present it in a way that logically explains the findings of the study (Vetter, 2015). The descriptive statistics used in the current study were the mean, median, and mode. As the project progressed, the effectiveness of the staff education was monitored and reevaluated upon its completion. If the data supported educating and training clinicians about the use of Beers Criteria, the program would be implemented at the clinic and would potentially be applied to other clinical settings.

I used the following process for the project study:

- Project change determined: Current literature was reviewed and found to be supportive.
- The lead stakeholder, the DNP student, coordinated the project and implemented the education PowerPoint presentation. During the development of the project, a multi-disciplinary team consisting of a DNP, APN, RN, RN-BSN, PA, nurse educator, DON, clinical pharmacist, and two physicians (MD and DO) contributed their expertise to evaluate the usefulness and value of the education module.
- Integrated theories and models: Lewin's change theory provided the framework for the project.
- Developed a timeline: Timelines kept the project on target with predicted goals and consistent evaluations.

- Motivated and cultivated change: Effective communication and collaboration with stakeholders and team members through routine meetings to discuss identifiable barriers cultivated change.
- Educational materials: The educational PowerPoint presentation and 13-question pre-and-post tests were developed.
- Implemented the project change.
- Presented the PowerPoint presentation through Zoom.
- Collected the pre-and-post tests from the participants.
- Statistically analyzed the data: Data analysis was an integral part of determining the authenticity of the findings in the project.
- Reported findings and recommendations.

Summary

In 1991, the Beers Criteria included about 30 drugs that were not supposed to be used by geriatric patients when dealing with their diagnosis. The Criteria were updated in 2003 and later sorted into two classes. The first class was the list of medications to help geriatric patients avoid being exposed to the higher risks of the adverse effects, and included safer medications that were already available. The second class was the list of medications that would help geriatric patients avoid different clinical circumstances. In 2012, the AGS and experts in the care of the geriatric patients and pharmacotherapy, reached an agreement on the 2012 AGS Beers Criteria. About 53 medications encompassing the final criteria were updated and divided into three classes: PIMs that the geriatric patients should avoid certain medications, the syndromes that could be

exacerbated by the listed drugs, and the medications that the geriatric patients were to use with caution. The study's main aim was to determine the prevalence of medication use, and identify potentially inappropriate drugs, per the Beers Criteria, for geriatric patients.

Section 4: Findings and Recommendations

Geriatric patients have been experiencing challenges and are a vulnerable group. The number of older Americans has been increasing, and this calls for comprehensive and effective health maintenance screening aimed at ensuring geriatric patients' safety. The health maintenance screening should take into account the AGS 2019 Beers Criteria. As a result of this problem, the U.S. Preventive Services Task Force identified sensory perception, postural hypotension, gait impairment, and accidents to which geriatric patients are exposed. This calls for intervention and the application of evidence-based educational criteria to ensure that geriatric patients receive the treatment and interventions on sensory perception, postural hypotension, gait impairment, and injury (Griebing, 2019).

The current project addressed how the best evidence-based practices can be utilized to ensure that older adults, whose numbers are increasing, will be safe when medical practitioners treat them. Existing predictions on the population pattern suggested that in the next 30 years, the U.S. population of those 65 years old and above will increase (Latifi, 2020). As a result, there must be a well designed program that will incorporate the AGS Beers Criteria.

The purpose of this doctoral project was to identify PIMs for geriatric patients and develop an evidence-based education program that could be applied to ensure that geriatric patients are safe. The project was intended to provide education through an education module on Beers Criteria to help medical practitioners eliminate inappropriate medications. Griebing et al. (2015) argued that staff will know how to respond to

geriatric patients' medical requirements and avoid using drugs that lead to ADEs. With the increasing population of geriatric patients, primary care physicians will have to be more knowledgeable about handling patients and the disproportionate rate at which older patients use medical resources. Physicians will also need to develop ways of evaluating and managing the unique needs of geriatric patients (Edward, 2016). To obtain information relevant to the project, simple screening instruments were identified to determine geriatric patients at risk.

Findings and Implications

The pre-test consisting of 13 multiple-choice questions from “a” through “d” was sent to the participants 1 week prior to the PowerPoint presentation via the private email of Dr. Bahadori to ensure security and encryption. Once all pre-tests had been completed, the Zoom PowerPoint presentation was given on 2 different days with the 10 team members; five members were in each session. Afterwards, a posttest was emailed to the participants with the same set of multiple-choice questions through the email of Dr. Bahadori. The results of both tests were statistically analyzed, and a mean score was calculated, as shown in Table 1. The comparison of the mean values for the number of wrong answers on the pre-and-post tests showed a slight reduction in the post-test. Overall, the participants strongly agreed that the educational presentation provided a better understanding and increased knowledge about the use and importance of Beers Criteria when prescribing for older patients. The feedback provided by the team members further validated the findings, which strengthened the project in achieving its goals and maximizing the outcomes.

Table 1*Mean Calculations of Wrong Answers for Pre-and-Post tests*

Participant	Pretest number wrong	Posttest number wrong
DO	10	8
Nurse educator	9	5
DNP	1	4
APN	5	2
MD	6	4
RN-BSN	6	8
RN	6	6
PA	3	4
DON	4	4
Clinical pharmacist	2	2
Mean	5.2	4.7

From the project, it was established that the cost of conducting a comprehensive geriatric assessment was unclear because the illnesses associated with the geriatric patients vary among different patients making it difficult to come up with a comprehensive assessment. As a result of this, it was established that simple screening tools are efficient in determining the health risk problems associated with geriatric patients. Therefore, the assessment process can be considered multidisciplinary as it requires time-intensive evaluation of geriatric patients. The study also established that this evaluation is unrealistic and cannot be achieved in most primary care settings and is only occasionally used by practicing physicians. The success of outpatient geriatric

evaluation depends on long-term management through primary care. The use of simple screening tools enables physicians and other health care practitioners to identify problems among older patients, which will help them develop a common way of dealing with those problems. The use of simple screening tools also allows them to shift focus from disease-specific interventions to preventive and proactive medical management. The initial overall score of the pretest was 100% and after the educational intervention the score was 90.38%. A reduction in the scores from the pretest and post-test showed 9.62%. This supported an increase in knowledge at the conclusion of the educational intervention.

Recommendations

The U.S. Preventive Services Task Force, in its second edition, outlined some of the clinical prevention services in 1996. The recommendations highlighted some of the beneficial treatment options that were not available a few years ago. The primary care physicians inquired from the geriatric patients their frequency of using seatbelts and bike helmets (Markovchick, 2011). The information was used to determine the frequency of having injuries that may arise from accidents, which are common among geriatric patients. Geriatric patients' annual accident rate is estimated at 25%, but this number rises to 50% for patients above 80 years old. Among the geriatric patients, accidents and traumatic injuries are responsible for most deaths.

Incorporating extrinsic and intrinsic factors as outlined by Edward (2016) helps in the risk assessment for accidents physical examination of the ability to balance on one leg. The geriatric patients who cannot balance using one leg have a high possibility of falling. Geriatric patients are also encouraged to have frequent vision and hearing screenings. The screenings allow identification of any malfunction in the eye, and

appropriate actions can be taken. Edward showed that a high percentage of community-

based patients—about 72%—have impaired vision. Impaired vision has several implications; for example, it can lead to falls and also poor judgment. Edward also found that hearing problems are common among geriatric patients, but only 20% of primary care physicians inquire from geriatric patients whether they have had hearing problems. Hearing is important because it can prevent accidents that result from not being able to hear clearly (hooting). As a result of financial constraints prevalent among geriatric patients, only 32% of the total population with hearing impairments use a hearing aid.

Edward (2016) developed recommendations to address the problems. Edward recommended that the health practitioners caring for geriatric patients should be knowledgeable about the needs and requirements of those patients. The knowledge will equip them with the best ways to handle the patients and make them avoid prescribing potentially inappropriate drugs. The knowledge will also allow them to know the patients' demands in line with the Beers Criteria and the AGS. Periodic screening should also be intensified among geriatric patients, thereby ensuring earlier diagnosis of any disease. To prevent hearing impairment, patients need to use ototoxic drugs cautiously, and hearing aids will allow them to operate normally. The recommendations, if applied, would lead to a reduction in the loss of geriatric patients and would also lead to a reduced dependency ratio. In the educational module in the current project, to be used by practitioners treating geriatric patients, practice should be in line with the AGS recommendations and Beers Criteria.

The team also recommends frequent nutritional health screening of geriatric patients. The team pointed out that malnutrition and undernutrition among geriatric

patients is a problem. Therefore, the team recommends nutritional health screens, which will ensure that geriatric patients are not exposed to illnesses and dangers associated with poor nutrition. The screening tool was identified as effective and efficient as it can be used by a family member's health care professional. The use of this assessment tool will lead to a healthy older population.

Contributions of the Doctoral Project Team

The team members who helped collect evidence and information were dedicated to ensuring that this project would be completed. Each member displayed a high level of discipline and enthusiasm in ensuring the project would be a success. In addition to collecting information, the team was helpful in the analysis and synthesis of the data. However, the project team did not manage to get all information related to older patients. Therefore, there should also be analyses of the medications that can be considered inappropriate for geriatric patients (Firstenberg & Stawicki, 2017). The team concluded that the development of the evidence-based educational intervention through the 2012 AGS Beers Criteria would increase health practitioners' knowledge in dealing with geriatric patients. The model will promote desirable and appropriate ways of handling, evaluating, and treating diseases associated with geriatric patients (Zeenny et al., 2017). Further study, however, is recommended.

Strengths and Weaknesses of the Project

The team managed to capture all of the areas of interest regarding geriatric patients in the development of an evidence-based approach. As shown in previous studies, older adults are faced with challenges that calls for the development of

interventions to address the problems they encounter in their lives. The current project outlined alternative ways of handling some of the problems geriatric patients' experience, such as accidents related to hearing loss and also nutritional issues. The team provided recommendations for dealing with the problems. We experienced a number of limitations in conducting the research. One limitation was that the project did not address all of the geriatric patients' problems. Further, because the research focus was new in nursing, it was not easy to find a practitioner who was well equipped with information concerning the research. The preparation of a clear strategy through which future nurse practitioners can identify potentially inappropriate medication use among older patients begins with the current project's findings. Another weakness that I encountered in this project was the mode of presentation as a result of the COVID-19 pandemic. Because physical interactions have been limited as a precautionary measure, I had to do my presentation through Zoom. It was tedious to have a Zoom presentation with two different groups, with five people each on 2 different days.

Figure 1 shows the prevalence of PIMs using Series 1. In Region A, the rate of prevalence was high compared to Region B. However, in Regions C and D, the prevalence rate increased. Therefore, more research should be concentrated on Regions C and D to establish the reasons behind the high prevalence.

Figure 1

Prevalence of PIMs in Series 1

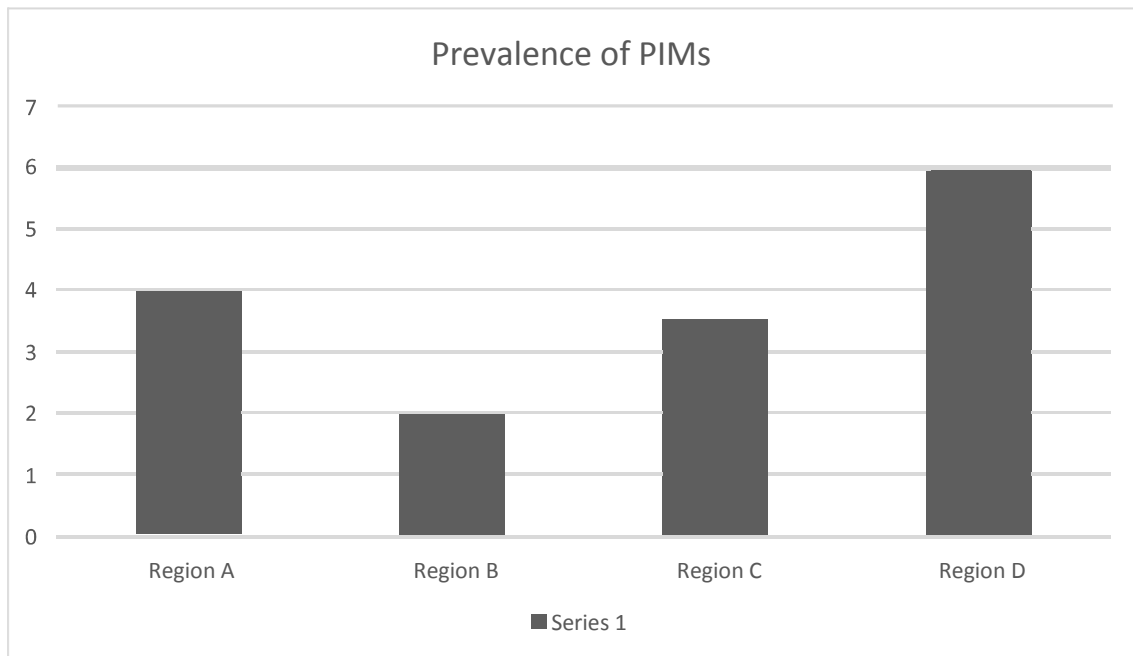


Figure 2 contains data obtained from questionnaires responded to by different physicians. Figure 2 shows that Physicians A and D interact more with older patients, whereas Physician B has the lowest frequency of interaction. Therefore, more research needs to be conducted in the region where Physician B is based compared to where A and D are located.

Figure 2

Physicians' Frequency of Interacting With the Geriatric Patients

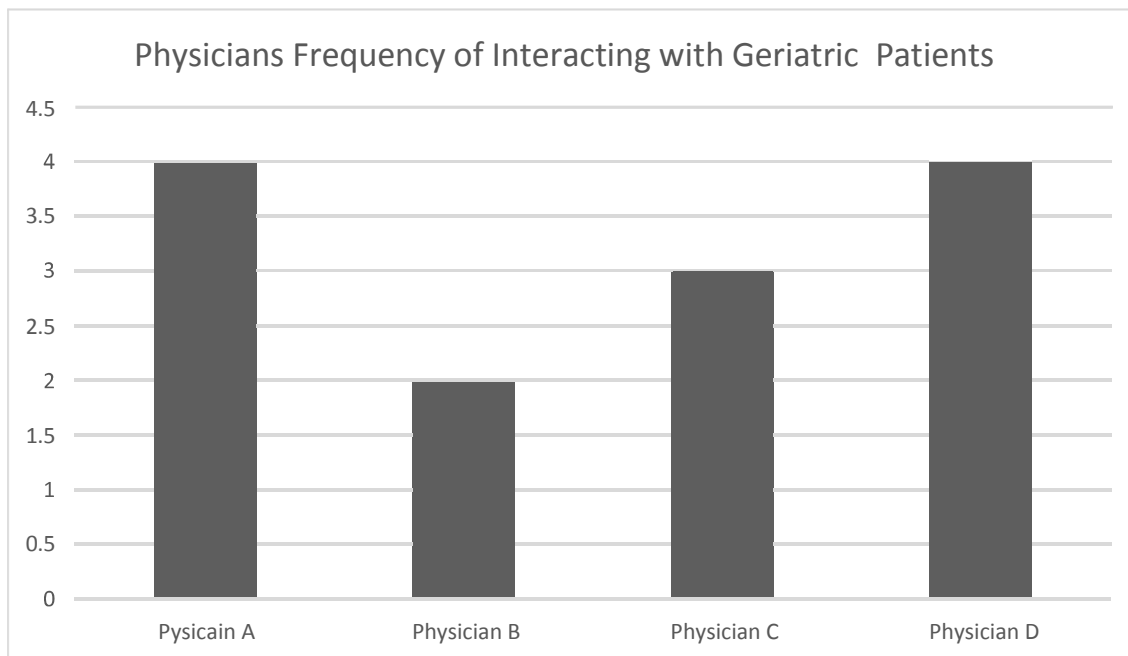


Table 2 shows the number of deaths that resulted from the use of medically inappropriate medications from data collected from Regions A, B, and C. In the next 10 years, with the application of the education module, the number of deaths will be reduced.

Table 2

Number of Deaths Attributed to the Use of Medically Inappropriate Medications

Year	Region A	Region B	Region C
2010	60	100	90
2020	50	150	60
2030	20	70	30

As shown in Table 3, the population of geriatric patients will increase between 2020 and 2050. The predicted increase can be attributed to the application of medications

that are not harmful to the health of older adults. The predicted increase can also be attributed to the implementation of recommendations from researchers whose objectives are to improve ways of treating geriatric patients.

Table 3

Percentage Changes in Senior Population

Region	2010	2020	2030	2040	2050
A	10%	8%	10%	40%	70%
B	11%	13%	20%	60%	70%
C	8%	10%	15%	50%	70%

Section 5: Dissemination Plan

The team's findings will be distributed to clinicians, educational institutions, and home-based caregivers of geriatric patients to reduce ADEs. The Beers Criteria will help ensure that clinicians are equipped with knowledge that will provide ways of reducing the dangers to which geriatric patients are exposed. PIMs, despite having adverse effects on geriatric patients' health status, have continued to be used by clinical physicians. In the staff education module on Beers Criteria, health care providers will be provided with interventions on dealing with the problems associated with geriatric patients. The AGS Beers Criteria will also provide procedures to handle geriatric patients.

This team's dissemination objective is to reach the population of people who deal with geriatric patients to provide them with helpful knowledge aimed at bettering the way they handle older patients. The distribution will also ensure that health care providers are familiar with the AGS Beers Criteria and the effects of certain drugs on older patients' health status. The venues may include medical institutions, seminars, campaigns, and community health centers. Dissemination will target health practitioners and provide them with alternative ways of treating geriatric patients. The module will be implemented in all health departments, from the nurses to the physicians, thereby equipping them with information on handling, evaluating, and treating geriatric patients.

Other dissemination include publishing the project's findings in a scholarly journals, thereby allowing broader access to the project. Findings may also be presented at national forums and meetings of professional associations. The program materials may reach a larger population and be more effective and efficient in reaching health care

communities.

The key audiences who will receive the work include state associations of county and city health officials, hospital associations, public health associations, caregiver groups, and health care providers and centers. These groups have been identified because they deal with patients, including geriatric patients. Findings from the current project may be of great help to them by providing insights into dealing with geriatric patients' conditions. Findings may also help state associations, especially health associations, in planning for geriatric patients, thereby ensuring that the government provides funds to cater to the health demands of the older population. Zeenny et al. (2017) recommended that community health volunteers should be equipped with the skills and knowledge to handle the older population.

Analysis of Self

The negative effects of some drugs outweigh the positive effects that are accompanied by those drugs. The use of PIMs among older adults has been on the rise despite recommendations to avoid using the medications in different settings where geriatric patients receive treatment. The current project team aimed to provide alternative ways of handling geriatric patients that would reduce the injuries or harm they might receive during treatment. The team created a comprehensive, evidence-based educational intervention. The AGS Beers Criteria provided important insights into dealing with the older population, and this helped in the formulation of recommendations that are in line with the medical requirements of geriatrics patients. My objective was to improve how the AGS 2015 Beers Criteria are utilized by caregivers and clinicians.

As Stegemann (2016) pointed out, health practitioners have a role to play in identifying and differentiating inappropriate drugs for certain conditions. These distinctions will help indicate the types of drugs for use in dealing with certain health complications, thereby reducing harm that might arise from using inappropriate medications. Practitioners need to be mindful during the administration of drugs for use by geriatrics patients. Scholars also need to conduct further studies on the usage of certain drugs among geriatric patients to reduce misleading information on certain drug use. Scholars should also intensify research on how the AGS Beers Criteria can be updated to include all potentially inappropriate drugs. The current study addressed a long-term solution to the problems that geriatric patients have been experiencing, and the team sought to provide all the necessary knowledge on potentially inappropriate drugs, as well as staff education modules on Beers Criteria, to equip health practitioners with necessary information on geriatric patients.

There were certain challenges that I experienced during the process of carrying out the project. It was difficult to formulate an accurate and appropriate diagnosis among some geriatric patients. Misdiagnosis was identified as one reason that led to administering an inappropriate drug that caused an ADE. Some older patients had complex health histories and clinical scenarios, which required an experienced and skilled practitioner to overcome the diagnostic challenges. Another challenge was data collection due to limited information on geriatric patients. Most practitioners do not follow up on the treatment patterns of geriatric patients. As a result, it is difficult to trace and access the available information on PIMs and treatment of older patients. The challenges were,

however, overcome by involving senior physicians in the research process.

Summary

Practitioners need to be equipped with knowledge that will enable them to handle geriatric patients appropriately. The staff education module should be implemented as it outlines the ways to identify, evaluate, and treat geriatric patients. Implementation of the staff education module may result in a reduction in administering inappropriate medications that cause adverse effects on the older population. Different medical practitioners should implement the recommendations outlined in the project, as well as intensify research on geriatric patients. The medical practitioners should be taken through the Beers Criteria to understand patients' medical requirements. This may result in a reduction in the number of older patients harmed by PIMs.

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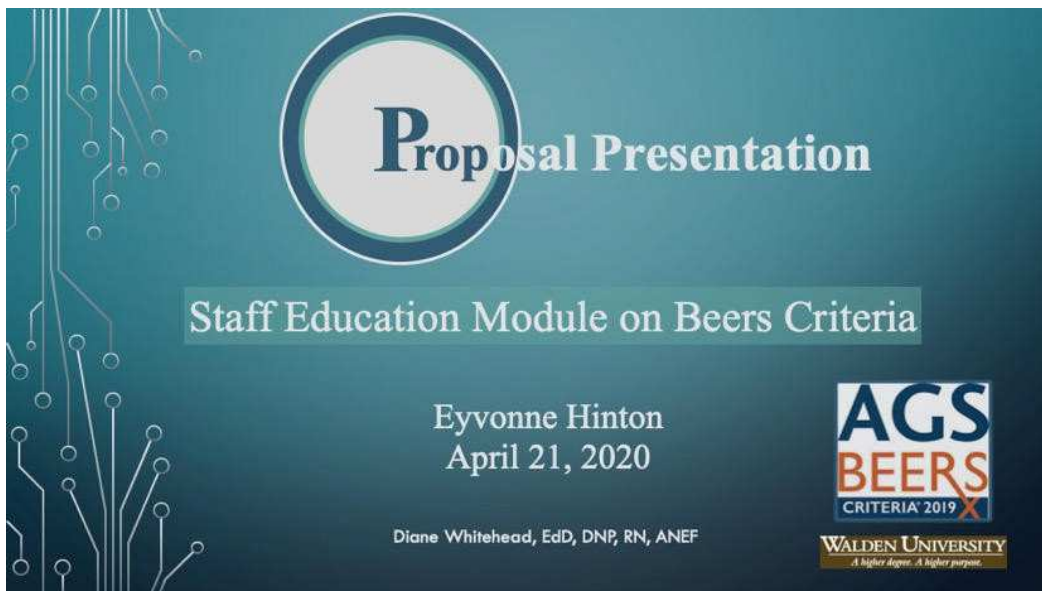
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Appendix A: Staff Education Module on Beers Criteria



Proposal Presentation

Staff Education Module on Beers Criteria

Eyvonne Hinton
April 21, 2020

Diane Whitehead, EdD, DNP, RN, ANEF

**AGS
BEERS
CRITERIA 2019 X**

WALDEN UNIVERSITY
A higher degree. A higher purpose.

The slide features a dark teal background with a white circuit-like pattern on the left side. The title 'Proposal Presentation' is centered in a large, white, serif font, enclosed in a white circle. Below it, the subtitle 'Staff Education Module on Beers Criteria' is in a smaller, white, sans-serif font. The presenter's name and date are listed below the subtitle. The logos for AGS Beers Criteria 2019 X and Walden University are positioned in the bottom right corner.



Problem Statement

PICOT Question:

“Will a staff education module for the clinic’s clinicians on potentially inappropriate medications (PIMs), Beers criteria, and safe alternatives for older adults improve their knowledge about appropriate prescribing practices for these patients over a 12-week period?”

Purpose Statement

Goals:

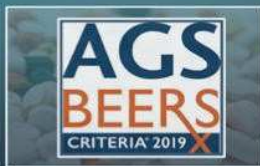
- Design and implement an evidence-based educational intervention to increase the confidence level and knowledge of the staff concerning Beers Criteria for older patients.
- Create safe medication alternatives to assist with prevention of ADEs and to provide effective care for the older patient.
- Improve the knowledge of prescribing clinicians and nurses who provide patient education regarding PIMs and promote safer prescribing practices for geriatric patients.

Project Setting and Participants

- Clinic that treats geriatric patients between the ages of 65-80.
- Education module will be developed for the staff treating this patient population to orient, educate, and train them about Beers criteria.
- The staff targeted include any clinicians who prescribe medications and any who provide patient education regarding prescribed medications.

Nature of the Project

Due to the aging population in the U.S., it is urgent that prescribing practices to elderly patients be addressed as well as safety measures put in place to protect them.



Significance

- Older adults take an average of 14 medications per year
- Age-related physiologic changes affect the actions of drugs
- Prescribed medications need to be safe to ensure good patient outcomes.
- Prescribing clinicians and nurse educators not adequately educated about PIMs and ADEs in the elderly.
- Inappropriate prescribing is an urgent issue that needs to be addressed and resolved.

Main Objective:

Decrease the knowledge gap of prescribers as well as have an impact on prescribing practices.

Section 2: Background and Content

Literature Review

- Nursing theory used to advance clinical practices so that the health, quality of life, and outcomes of patients are improved.
- Foundation of nursing is practice, research, and theory, and the relationship between practice and theory is reciprocal.
- Nursing practice is based on the development of theory and has to be validated in clinical practice.
- Nursing theory used as the guiding principle for examining the knowledge gap in prescribing practices for the elderly.

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Lewin's Change Theory



1. Determine what needs to change.
2. Ensure support from upper management.
3. Create the need for change.
4. Manage and understand resistance to change.

1. Communication
2. Dispel rumors
3. Empower action
4. Involve people in the process.

1. Anchor changes into the culture.
2. Develop ways to sustain change.
3. Provide support and training.
4. Celebrate success.

Interpretation and Application of Beers Criteria

1. Medications listed in the criteria are potentially inappropriate, and not definitely inappropriate.
2. It is important to read the rationale and recommendations statements for each because the caveats and guidance listed are important.
3. Understand why medications are included and adjust the approach to those medications accordingly.
4. Optimal application of the criteria involves identifying PIMs and where appropriate offering safer nonpharmacologic and pharmacologic treatments.
5. Beers Criteria should be a starting point identifying and improving medication appropriateness and safety.
6. Access to medications included should not be excessively restricted by prior authorization requirements and/or health plan coverage policies.
7. The AGS Beers Criteria® are not equally applicable to all countries.

Categories of Medications in Beers Criteria



1. Drugs and drug classes to avoid independent of diagnosis or condition.
2. Drugs and drug classes to avoid with certain disease or syndromes.
3. Drugs and drug classes that should be used with caution in older adults.
4. Non-anti-infective drugs that should be avoided or adjusted in older adults with renal disease.
5. Non-anti-infective drug–drug interactions that should be avoided in older adults.

Other Tools to Guide Prescribing for the Elderly

STOPP-START Criteria

- Identified a greater number of medications that were associated with ADEs.
- May be more relevant clinical tool.
- Study comparisons made with older version Beers Criteria.
- No comparison studies have been performed with new Beers Criteria.
- No significance for this project.

EURO FORTE Criteria

- Approved for use in Germany and Austria
- Includes 264 drug classes and 26 groups.
- Randomized clinical trial (RCT) that evaluated the list had significant limitations making it unusable for this project.

Role of the DNP Student



- Familiarize clinicians with appropriate prescribing practices for elderly patients.
- Provide clinicians with a tool to guide them in optimizing patient outcomes concerning medication side effects and interactions.
- Identify knowledge gap at the organizational level.
- Work with the project team to create the proposal for the education and training module, plan for its implementation, and have clear goals and objectives.

Section 3: Collection and Analysis of Evidence

Objectives of the Project

1. Develop a method of assessing the knowledge of prescribing clinicians and nurse educators concerning PIMs and ADEs in older adults.
2. Develop guidelines for the education module using an evidence-based practice model to guide care.
3. Design an education module that will motivate staff and clinicians to change their prescribing practices.
4. Implement program in a clinic setting that will provide support and motivation to make changes and accept them as standards of practice.



Practice-Focused Question

Motivating Issues:

- Increasing incidence of hospitalizations from PIMs.
- Polypharmacy is common in elderly adults.
- Knowledge gap of clinicians.

Sources of Evidence



This project focuses on designing and implementing an education and training module for prescribing and patient education

- Health of elderly patients depends on clinicians prescribing safe and effective medications.
- Many clinicians unaware of the potential of certain drugs or combinations of drugs to produce ADEs in geriatric patients.
- AGS Beers Criteria guides clinicians when prescribing to elderly patients.
- Prescribing PIMs remains a problem for the health and well-being of older adults.

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Pre-and-Post Test Questionnaire

The test will be given to determine knowledge before and after completing the education module.

Test consists of 13 multiple choice questions. For example:

A 79-year-old female presents to her primary care physician complaining of being dizzy when she stands and states that she almost fell yesterday. Her medical history includes hypertension, anxiety, and moderate depression. Which medication should not be prescribed to this patient?

- A. HCTZ
- B. Metoprolol
- C. Lisinopril
- D. Losartan

TEST

Appendix B: Staff Education Module on Beers Criteria: Pre-and-Post test Questionnaire

The following questions are formulated to demonstrate the ongoing problems concerning the inappropriate administration of medications to the elderly:

1. Polypharmacy is common among elderly patients, who are at higher risk of adverse drug events (ADE) because:
 - a. Older adults have altered physiological responses that may affect a drug's pharmacokinetics and pharmacodynamics.
 - b. Interactions between two or more medications occurs more often in older adults.
 - c. Lower health literacy of older adults affects their understanding of what their medications are for and how/when to take them.
 - d. All of the above.
2. An adverse drug event is:
 - a. An injury resulting from medical intervention related to a drug.
 - b. An interaction between two or more drugs.
 - c. A side effect of a prescribed drug.
 - d. All of the above.
3. A potentially inappropriate medication (PIM) is defined as:
 - a. A medication that should not be given to older adults.
 - b. A medication that should be avoided due to its risks which outweighs the

- benefits and when there are equal or more effective but lower risk alternatives available.
- c. A medication that will interact with others increasing the risk of an ADE.
 - d. All of the above.
4. The purpose of the American Geriatric Society's (AGS) Beers Criteria is to:
- a. Provide clinicians with guidelines for prescribing medications to adults.
 - b. Provide clinicians with standardized practice guidelines for prescribing medications to patients over the age of 65.
 - c. Provide clinicians with lists of medications that may be potentially inappropriate to prescribe to patients over the age of 65.
 - d. All of the above.
5. The AGS Beers Criteria is important for all prescribing clinicians because:
- a. 90% of adults over the age of 65 are taking at least one medication and 66% take three or more.
 - b. Over half of hospital admissions due to ADEs are preventable.
 - c. ADEs cause greater morbidity and mortality in adults over the age of 65.
 - d. All of the above.
6. The AGS Beers Criteria consists of:
- a. Medications that should be avoided by older people with specific health conditions.
 - b. Medications that should be dosed differently or avoided among people with reduced kidney function, which impacts how the body processes medicine.

- c. Medications that should be used with caution because of the potential for harmful side effects.
 - d. All of the above.
7. The AGS Beers Criteria should not be used for:
- a. Patients in palliative or hospice care.
 - b. Adults over the age of 65 with chronic conditions.
 - c. Older adults taking more than one medication each month.
 - d. All of the above.
8. When prescribing an elderly patient a medication, Beers Criteria:
- a. Lists medications that always cause ADEs for adults over the age of 65.
 - b. Lists medications that should not be used for adults over the age of 65.
 - c. Lists potentially inappropriate medications but are not unacceptable for every patient.
 - d. All of the above.
9. The recommendations found in the AGS Beers Criteria are based on current literature and should be:
- a. Used as guidance for prescribing to older adults in order to avoid PIMs.
 - b. Used to dictate how to prescribe medications to older adults.
 - c. Used to restrict health coverage.
 - d. All of the above.

10. The AGS Beers Criteria:
- Contains tools for clinicians and patients to better understand the recommendations.
 - Can be used to develop quality measures for evaluating healthcare.
 - Can be used to create a discussion between healthcare providers regarding prescribing for a specific patient.
 - All of the above.
11. The AGS Beers Criteria can also be used by nurse educators to:
- Education patients/caregivers about how and when to take their medications.
 - Explain to patients/caregivers what each medication is for and the importance of adhering to the treatment plan.
 - Develop a treatment plan that the patient or caregiver is capable of following.
 - All of the above.
12. A 79-year-old female presents to her primary care physician complaining of being dizzy when she stands and states that she almost fell yesterday. Her medical history includes hypertension, anxiety, and moderate depression. Which medication should not be prescribed to this patient?
- HCTZ
 - Metoprolol
 - Lisinopril
 - Losartan
13. A 75-year-old male patient comes in to be evaluated for depression after losing

his wife to cancer six months ago. His medical history includes hypertension and type

2 diabetes. Which medication classes would be safe for him?

- a. SSRIs
- b. SNRIs
- c. Tricyclics
- d. MAOIs

Conclusion

It is imperative to be reminded of the indefectible reality that the fundamental responsibility of those of us in the medical field is to preserve and defend the lives of all our patients -- most especially, those who are the most vulnerable, the elderly. Hence, by drastically improving the protocols involving how medications are administered to the geriatrics, we would be doing our indefatigable duty of defending life.