2017

Impact of Staff Education on Geriatric Polypharmacy

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This is to certify that the doctoral study by

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2017

Abstract

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MSN, UCLA, 2009

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2017

Abstract

Polypharmacy, the simultaneous use of multiple drugs to treat a single ailment or condition, is a major health problem among the elderly population that contributes to adverse drug side events, health risks, hospital readmissions, morbidity, and mortality. Therefore, a staff education program geared toward reduction of such adverse drug events was implemented at a single site. The purpose of the project was to determine if the staff education program would increase knowledge of adverse drug events due to geriatric polypharmacy. The Orem theory provided the theoretical support for the project, and the Iowa model guided the evidence-based practice change process. Topics covered in the education program included medication safety, appropriate drug usage, medication interactions, and other use issues of commonly prescribed drugs for elderly patients. Twenty staff members from 1 assisted-living facility were recruited for the education intervention. Assessments of staff member knowledge were collected before and after the education intervention. Descriptive statistics were used to compare preintervention and postintervention knowledge. Scores on the pretest ranged from 10% to 50% correct on the 10 items, and posttest scores ranged from 40% to 70% correct on the same items. The project is expected to produce social change due to reduced incidence of geriatric polypharmacy and, ultimately, decreased adverse drug effects resulting in patient morbidity, hospitalization, and mortality.

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Section 1: Nature of the Project

Introduction

Polypharmacy is becoming a major health concern, particularly in elderly patient populations with advanced or multiple health conditions. Polypharmacy is defined as the use of multiple drugs in the management of a single disease (Shah & Hajjar, 2012). As the number of drugs prescribed increases, so do the adverse drug effects and drug reactions, which in turn increase health care costs related to office visits, emergency department visits, hospitalizations, readmissions, and overall patient morbidity (Shah & Hajjar, 2012). The avoidable and preventable outpatient visits, hospitalizations, and readmissions increase the cost of treatment by as much as 30% (Hilmer, Gnjidic, & Le Couteur, 2012).

An example of a patient at risk for polypharmacy was an elderly patient who was receiving treatment for both coronary disease and high blood pressure. The patient received up to four types of medications, including diuretics, beta blockers, calcium channel blockers, and nitrates. This multiple drug use resulted in greater health risks such as reduced drug clearance, increased drug-drug interactions, and drug dependence. Elderly patients, such as the one in this example, may lack health literacy or the cognitive capability to manage the complex medications required to treat their specific ailments. Polypharmacy also can be expected to occur when a prescribing cascade is initiated. In this situation, the provider fails to recognize the adverse effects of drugs and treats drug reactions or interactions as new diseases or medical conditions and administers additional medications (Scott et al., 2015).

Polypharmacy is rising in the geriatric population, and the incidence of adverse drug effects and complications is increasing as well. This population health problem is evident at the state and federal levels because many of the affected patients are Medicare and Medicaid recipients. The consequences of polypharmacy include increased costs of health care, increased adverse drug events (ADEs), medication nonadherence, reduced functional capacity and well-being, and geriatric syndrome that entails falls, cognitive decline, and incontinence (Cadogan, Ryan, & Hughes, 2013; Gnjidic, Le Couteur, Kouladjian, & Hilmer, 2012). The increased cost of health care affects various stakeholders, including healthcare systems, communities, families, and patients.

Problem Statement

The problem that was addressed by the Doctor of Nursing Practice (DNP) project was the lack of knowledge of geriatric polypharmacy and associated ADEs among nursing staff at the assisted-living facility. Geriatric nurses have viewed this issue as a primary concern because patients are living longer and have numerous diseases that require drug therapy. This concern is difficult to manage as patients may be seeing multiple specialist providers and may be undereducated regarding the management of their medications (Shah & Hajjar, 2012). Healthcare providers strive to increase patients' life span by treating the numerous comorbid diseases prevalent among the elderly population (Maher, Hanlon, & Hajjar, 2014). Therefore, in addition to prescribing pharmaceutical treatments for best clinical outcomes, it is important for prescribers, physicians, advanced practice nurses, and nursing staff who administer

medications to understand the risks and signs and symptoms of ADEs associated with polypharmacy.

In 2005, over 4.3 million-hospital visits resulted from ADEs (Maher et al., 2014). Geriatric patients were more susceptible to drug interactions and polypharmacy, especially patients with large numbers of medications. In particular, frail patients were at higher risk for drug interactions, with a 15% to 40% likelihood of interactions (Maher et al., 2014). The risk for polypharmacy complicated medication prescribing and administration significantly. ADEs related to a medication regimen occurred most frequently when the patient took more than three medications, which is very common among elderly patients with multiple chronic diseases (Shah & Hajjar, 2012).

Purpose

The purpose of the project was to determine if an education intervention for nursing staff at an assisted living facility could increase knowledge of the occurrence of polypharmacy and associated ADEs. There was a meaningful gap-in-practice regarding the staff nurse's role in preventing polypharmacy and associated ADEs. As a result, it was imperative to address this practice problem with a project that focused on the effect of staff education on knowledge that could be converted to nursing interventions. In this DNP project, a developed and tested staff education program with the aim of reducing the cases of polypharmacy-associated ADEs in the assisted-living setting is assessed for its impact. The project purpose was to determine if staff education could be an effective method to improve nursing staff knowledge that may, upon

application, help to avert or recognize early polypharmacy-related ADEs among at-risk residents of the assisted-living facility.

Nature of the DNP Project

In the proposed project, nursing staff members of an assisted-living setting were the population of interest. The staff members participated in a drug education program to increase knowledge of polypharmacy and ADEs. The staff members' knowledge was tested before and after a two-session education intervention. A comparison was completed of the knowledge of polypharmacy and associated ADEs prior to and after the education. The participants were to be asked to complete a 10-item preintervention test and a postintervention test (see Appendix A) to assess the impact of the education on knowledge of polypharmacy causes, risks, and prevention. An increase in the nursing staff knowledge of polypharmacy after the intervention was the expected outcome of the project. The project occurred over a 2-week time frame.

Significance

Geriatric polypharmacy is increasingly becoming a major health problem among elderly patients. Research on prevention programs to reduce polypharmacy have been conducted and continue to be important due to the effects on elderly patients' functional ability, life satisfaction, financial status, quality of life, and risk for premature death (Dagli & Sharma, 2014; Maher et al., 2014). The incidence of ADEs and the need to reduce the rates of polypharmacy were the drivers of this project. A review of the literature revealed that educating staff on drug administration and patient self-care needs greatly reduced the health implications associated with polypharmacy (Riva, Malik, Burnie, Endicott, & Busse, 2012).

Because the incidence of polypharmacy and ADEs in the elderly was rising, carrying out an education program for staff proved beneficial.

The results of this project were expected to be helpful for the participating staff and demonstrate that reduction of ADEs could be attained in assisted-living settings by implementing staff education that facilitated nursing actions related to prescribed drugs and signs and symptoms of drug interactions. The project findings may be informative for both policy makers and the assisted-living management in designing future ADE prevention programs.

Summary

The purpose of the DNP project was to develop a staff education program with the aim of increasing knowledge of polypharmacy and associated ADEs in an assisted-living setting. The education intervention was to teach staff about the risks for and potential hazards of polypharmacy. The education program focused on factors that contributed to polypharmacy such as over-the-counter (OTC) drug interactions with prescription medicines, age-related alterations in response to medication, prescribed drug-to-drug interactions, and the interactions between herbal products and prescribed medications. Creating, implementing, and evaluating a drug education intervention that targeted nursing staff who administer medications to elderly patients with chronic medical conditions was expected to reduce hospital admissions, readmissions, health care costs, and excess patient morbidity and mortality in the long term.

Section 2: Background and Context

Introduction

The purpose of the project was to determine the effect of staff education on knowledge of geriatric polypharmacy and associated ADEs. To plan and develop the education program, it was imperative to search the literature for best practices in educating staff about polypharmacy and how to avoid it. In this section of the proposal, the study presents a review of the literature, the theoretical frameworks that supported the translation of evidence to address the gap-in-practice, the relevance of the literature to nursing practice, the local background and context, the role of the DNP student, and a summary.

Concepts, Models, and Theories

The theoretical support for this project was based on the Iowa model and the Orem self-care theory. The Iowa model defined and directed the clinical practice change through evidence-based questioning and analysis of the evidence (Titler et al., 2001). The basic aspects of the Iowa model include (a) identifying a problem, (b) defining a plan, (c) forming a team, (d) gathering evidence, (e) analyzing and critiquing present evidence, (f) determining the appropriateness of the collected information, (g) evaluating what change is appropriate for practice, (h) implementing the change, and (i) disseminating the results (Nilsen, 2015; Titler et al., 2001). Use of this model directed the planning of the staff education intervention, collection and assessment of evidence, and the evaluation of the success of the intervention.

In 1971, Orem first published her theory of self-care and self-care deficit in nursing practice. Orem (1971) emphasized that the care recipients should be self-reliant and

responsible for their care and that when they have knowledge of potential health problems, this knowledge would positively promote self-care behaviors. When patients fail in self-care endeavors, the theory of self-care deficit suggests staff nursing actions are needed. The nurse is expected in these situations to perform the care needed by the patient. Implementation of staff education plays a critical role in preparing staff members to educate and care for patients. In the case of polypharmacy and associated ADEs, the nurses must be able to identify problems, advocate on the patient's behalf, and provide prescribers with effective support in preventing complications of polypharmacy occurrences.

Relevance to Nursing Practice

Elderly patients are more prone to disease and multiple chronic ailments and, as a result, take more medications than most persons in other age groups (Shah & Hajjar, 2012). In fact, many patients, especially those over the age of 75, take at least five medications for treating chronic ailments (Shah & Hajjar, 2012). Shah and Hajjar (2012) reported that over 51.9% of patients admitted to a hospital were taking more than five medications. The number of affected patients rose to 67% after hospital discharge (Shah & Hajjar, 2012). Patients took these multiple medications in a haphazard manner and in combination with OTC medications and required additional medication to treat the effects arising from the medication interactions. Nurses needed education on the more common polypharmacy practices observed within the population and the signs and symptoms of ADEs they were likely to observe.

According to the literature, there was a compellingly strong relationship between polypharmacy and negative clinical consequences (Farrell, Shamkir, Monahan, & Merkley,

2013). In most cases, staff in an assisted-living facility lacked adequate knowledge about medications prescribed to residents and the ability to manage these drugs (Farrell, et al., 2013). If nursing staff were educated about lower dosing strategies, this knowledge reduced harm in the long-term (Farrell et al., 2013). Maher et al. (2014) also found education had a significant impact on geriatric polypharmacy as it enabled healthcare professionals to reduce excessive use of medication among the elderly that could cause complications.

Prescribers often found it difficult to determine the best medication for their elderly patients, especially when the patient history was inadequate (Compton, 2013). Polypharmacy can result when prescribers are reluctant to withdraw prescribed medications for fear of drug withdrawal problems or disease exacerbation. This reluctance to change prescriptions only increased the incidence of polypharmacy and, ultimately, led to increased hospitalization from drug interactions and geriatric syndrome (Cadogan et al., 2015). Of the recommendations about managing geriatric polypharmacy, staff education programs and nursing staff communication with providers were advocated as critical in the reduction of the complications associated with multiple medications (Farrell et al., 2013). In addition to education, it was important for nursing staff and prescribers alike to reevaluate the goals of therapy and perform a medication reconciliation to ensure that the patients received only the currently prescribed and necessary medications.

In administering medication to elderly patients, it is important to take into consideration various age-related changes occurring due to differences in drug absorption, metabolism, distribution, and excretion. The risk for drug-related problems is increased among elderly

patients due to increased patient frailty, memory issues, and several medical problems occurring simultaneously (Davies & O'Mahony, 2015). Nursing staff must understand the consequences of geriatric polypharmacy, the reasons for the medications, and whether the patient is concurrently using any OTC or herbal medications that could result in adverse drug events (Scott et al., 2015). Drug prescription is a crucial and complex task that requires the prescriber to determine the appropriate drug, correct schedule, and drug amount suitable for the patient's physiological status. Nurses are expected to monitor the effectiveness of the drugs prescribed and observe for toxicity. Therefore, it is vital for nurses to understand any side effects patients may experience from the prescribed drugs.

Some electronic medical records (EMRs) have a built-in function to address the issue of polypharmacy. EMRs use medication reconciliation to help prompt the nurse to review the medications. However, a gap-in-practice continues to exist. Previous researchers found that staff education significantly reduced the incidence of polypharmacy through increased knowledge about the most common presentations and effects of polypharmacy (Farrell et al., 2013). This DNP project was designed to fill the gap-in-practice by the provision of staff education about nursing actions to take in prevention of geriatric polypharmacy-associated ADEs.

Local Background and Context

The project was conducted in one assisted-living facility over 2 weeks. Approximately 100 patients resided in the senior assisted-living facility, and about 25% had experienced adverse consequences related to geriatric polypharmacy. Participants in the project were the

assisted-living staff members, which included licensed vocation nurses, certified nursing aides, registered nurses, and administrative staff who agreed to participate. The medication technicians are usually certified nurse aides who assist patients during the self-administration of medications. The medication technicians or aides were vital in the staff education project because their primary responsibilities included medication management and personal care services. They often ensured that the patient received the right medication, the right dosage, and oversaw the use of OTC medications.

Definition of Terms

To better understand this project, it was essential to define the terminology used:

Adverse drug events (ADEs): Injuries or complications that occur as results of medications (Davies & O'Mahony, 2015).

Evidence-based practice: Applying the best, most reliable, and available results in health care to practice (Melnyk & Fineout-Overholt, 2011).

Geriatric: Elderly (Chiang et al., 2012).

Polypharmacy: Spontaneous use of multiple drugs and medications to treat one health condition (Compton, 2013).

Role of the DNP Student

My role during the project included assuming a leadership position as staff educator within the assisted-living setting while planning, implementing, and evaluating the evidence-based change. I was not employed by the facility, but I had entered this clinical setting under the supervision of my DNP preceptor. I worked closely with my clinical

preceptor to administer the staff education. The assisted-living management and the entire facility Board needed to provide evidence of support for the DNP project work. The Institutional Review Board (IRB) at Walden University was presented with an application for the approval of the proposed DNP project prior to any data collection from the assisted living facility staff.

Summary

The purpose of this project was to increase nursing staff knowledge about polypharmacy and ADEs. The project ultimately was expected to lead to increased life expectancy and overall general health of the residents in the assisted-living community. Geriatric polypharmacy prevention is currently a priority due to the increased number of elderly individuals in the population. Critique and synthesis of the project findings are essential to determine whether there is sufficient evidence to support ongoing staff education on geriatric polypharmacy and ADEs. In Section 3, I discuss the project question and the sources of evidence in support of the project.

Section 3: Collection and Analysis of Evidence

Introduction

The purpose of the project was to determine the effects of staff education on knowledge of geriatric polypharmacy and associated ADEs. The project plan was to implement staff education to facilitate nursing actions that reduce the number of episodes of geriatric polypharmacy and ADEs at an assisted-living facility. To evaluate whether the intervention was successful, it was imperative to collect data and analyze the evidence.

Practice-Focused Question

In order to address the project purpose, the following project question was formulated: Will educating nursing staff members increase knowledge of ADEs related to geriatric polypharmacy?

Sources of Evidence

Two sources of evidence were used in the project: a literature review and project-generated data. According to the literature, there was a strong relationship between polypharmacy and negative clinical consequences, which resulted from lack of knowledge about medications (Farrell et al., 2013). Research findings indicated there was a reduction in the incidence of geriatric polypharmacy and ADEs if education was utilized appropriately (Farrell et al., 2013). A quasi-experimental quantitative design with a convenience sample was used in this project. The methodology chosen for this DNP project was based on the assumption that introducing an education intervention increased knowledge so that staff nurses

could help identify and manage polypharmacy and ADEs. A convenience sample of nursing staff was recruited for the education program. The participants attend two 30-minute luncheon education sessions regarding geriatric polypharmacy over a 2-week time span. I delivered the education via PowerPoint presentation. A pretest-posttest design was implemented to measure and compare the knowledge of polypharmacy and ADEs before and after the education intervention. These tests were administered and collected by my preceptor.

Published Outcomes and Research

In order to understand the magnitude of the geriatric polypharmacy population health problem and identify common signs and symptoms of ADEs, a literature review was conducted. Online databases searched for the project included PubMed, Medline, EBSCO, and Cochrane. In the search for peer-reviewed scholarly articles, the following keywords were used: *polypharmacy, adverse drug effects, geriatric medication, hospital emergency cases*, and *patient education*. According to the literature reviewed (see Appendix B), there was a compellingly strong relationship between polypharmacy and negative clinical consequences (Farrell et al., 2013). In most cases, staff lacked adequate knowledge on medications resulting in missed opportunities to intervene on behalf of the patient.

The participants in the project included all the nursing staff working in one assisted-living setting who consented to participate in a 2-week education intervention to improve knowledge of polypharmacy and ADEs. The inclusion criteria included nursing staff (a) working in the assisted living facility, (b) who consented to participate in the project, and (c) who could read, write, and understand the English language. The exclusion criteria included

staff members (a) who could not accurately follow the outlined protocol, (b) who did not provide consent to participate, and (c) who were non-English speaking. Individuals were recruited to participate in the project through flyers and announcements during staff meetings. The flyers contained a full description of the project design as well as the specific methods and procedures that were to be used during the project (see Appendix A).

<div align="center">**Evidence Generated for the Doctoral Project**</div>

The success of this project largely depended on the commitment and willingness of the stakeholders to cooperate and effectively carry out the project. The steps to accomplish the DNP project comprised of the planning phase, the implementation phase, and the evaluation phase.

Planning phase. The literature suggested that there was a strong relationship between polypharmacy and negative clinical consequences, which resulted from lack of knowledge about medications (Farrell et al., 2013). This DNP project was focused on increasing awareness about polypharmacy among staff members to reduce ADEs. At the outset of the project, I designed a staff education intervention based on the literature that explained the risks of using multiple drugs and the need for clear and detailed communication with the healthcare provider about all medications, OTC drugs, and herbal remedies. The educational program consisted of one luncheon session each week over a 2-week period.

The need for staff education was discussed with the assisted-living facility management and the nurse, physician, and pharmacy stakeholders. I conducted a meeting with the staff using an informal conversational style to discuss the need for the education program and to

address their concerns. Based upon the feedback from the stakeholders, I made all the necessary changes and modifications to the project plan to ensure that the protocol was clear and easy to follow in order to obtain reliable results.

Implementation phase. The educational program consisted of one 30-minute luncheon session each week over a 2-week period. I provided the education using PowerPoint presentations and handouts; my preceptor administered and collected the pretest and posttest paper and pencil knowledge assessments from the nurse participants. I played the role of the team leader, assigning duties, placing calls, gathering materials, and making sure the plan of the project protocol was followed. This administrative oversight provided the support necessary to carry out the project successfully. I completed the process by requesting a postevaluation regarding the effectiveness of the education from the nursing staff who participated.

Evaluation phase. Two types of evaluation of the education were used. Pretest and posttest questionnaires about polypharmacy and ADE knowledge were collected from the staff participants. I analyzed the data collected. The pretest and posttest scores were used to measure the statistical significance of the change. The study achieved statistically significant change in the knowledge related to polypharmacy and ADEs following the educational intervention in this small-scale project. I presented findings to the relevant stakeholders and recommended expansion of the project across the facilities owned by the same stakeholder. The staff evaluation of the education delivery and content was collected after the education intervention. This evaluation allowed me to identify recommendations for changes in the approach and/or

content to better serve the educational needs of the nurses. My preceptor distributed and

collected the evaluation and I analyzed the data.

In order to carry out the DNP project, it was essential to ensure the ethical guidelines

were met for the participants. The plan to ensure compliance with human subject requirements

is outlined below:

Approval letter. I provided the nursing administrator with a copy of an approval letter

for carrying out the proposed project. The director of nursing, administration, and education

approved the letter before the project could be commenced.

IRB approval. The Walden University IRB reviewed and approved the DNP project

plan for the patient education intervention. The IRB approval number was 07-12-17-0648274.

Stakeholder meeting. The patient care director of the assisted-living facility and the

nursing administrator provided and responded to feedback and questions raised by both me and

the participants. The timing of the project and the project protocol addressed the collaborative

decisions and input from the facility pharmacists, nurses, administrators, and physicians.

Staff education program. The education program, teaching materials, and the content

were based on the review of the literature and the model of medication administration provided

by the nursing team. The DNP project was designed with the intent to improve staff knowledge

of drugs, appropriate usage, and safe medication practices. The participants learned the

following factors that contributed to geriatric polypharmacy and its prevention:

1.   The "Beer's List" criteria for identifying inappropriate drugs for elderly people

and the drugs that have the most significant side effects. The American Geriatrics Society

compiles this list of medications that may be ineffective or unnecessary, known as "Beer's List," which also helps reduce adverse reactions to medication among elderly.

2.   The need to consult with the provider to ask about the medicines that could be eliminated.

3.   The need for adequate information about all the medication taken by the elderly individual.

4.   The ability to read medication labels to identify substances that adversely affect the liver when taken in large quantities.

When staff nurses increase their knowledge, there is a higher likelihood of improving health care outcomes, minimizing health care costs, and reducing morbidity and mortality rates associated with inappropriate medication practices.

Planning, implementation, and evaluation. Throughout the project, meetings were carried out and planning conducted with stakeholders. The project preceptor and I disseminated the results from the evaluations of the education intervention to the stakeholders through staff meeting presentations.

Analysis and Synthesis

In preparation for writing the project proposal, I reviewed research to determine if educating nursing staff could reduce geriatric polypharmacy. After examining best practices in the literature, I employed a pilot implementation in order to determine the impact of patient education in reducing episodes of polypharmacy. I recruited a sample of staff members working in one assisted living facility for the project. The project deliverables attached in the

appendices are the flyer used in the facility to recruit participants (Appendix A), the project

plan and project timeline (Appendix B), the PowerPoint presentation delivered to the nursing

staff as part of the education (Appendix C), the pretest-posttest evaluation instrument

(Appendix D), the education delivery (Appendix E), the content evaluation instrument and

results (Appendix F), the table displaying the findings of the pretest and posttest knowledge

analysis (Appendix G), and a list of recommendations for continuing and sustaining the project

based on the findings (Appendix H).

Summary

The DNP project was designed to investigate the effectiveness of staff education in

increasing knowledge of geriatric polypharmacy and ADEs. Polypharmacy has had significant

impact on the elderly population, and there are specific strategies nurses can employ to address

geriatric polypharmacy, including detecting drug-related issues, prioritizing the issues,

employing tapering approaches in consultation with providers, monitoring episodes of adverse

drug events, and employing compliance strategies (Maher et al., 2014). In this project, I

implemented staff education to supplement these strategies by empowering staff nurses to

monitor and report factors that led to polypharmacy and ADEs. In Section 4, I report the

findings of the project, the recommendations for future research and practice, and the strengths

and weaknesses of the project.

Section 4: Findings and Recommendations

Introduction

Polypharmacy in the geriatric population has been a challenge, as there has been an increase in the number of ADEs observed in the community. There has been a gap in the knowledge among nursing professionals concerning geriatric polypharmacy, which has led to the development of unrecognized ADEs and complications, including the death of patients simply because the nursing staff were not aware that such complications developed due to the simultaneous use of commonly prescribed medications for chronic diseases. In this project, I focused on whether educating the nursing staff members on the issues of geriatric polypharmacy would increase knowledge about ADEs caused by medications and what to look for when assessing patients in order to identify ADEs.

Findings and Implications

At the conclusion of the project, a difference was noted in the knowledge about geriatric polypharmacy among of the nursing staff participants about geriatric polypharmacy. The pretest questionnaire scores revealed that the nurses did not have the necessary knowledge to manage elderly patients with various types and numbers of medications. The general performance was below expectations for the examination concerning knowledge about drug interactions and other adverse effects that may affect geriatric patients. After the project was carried out and the nursing staff participants had been trained, posttest examination scores significantly improved. The participants, a sample of 20 individuals on the pretest on July 14, 2017 and the posttest on July 25, 2017, performed better than they did before the training had

taken place (see Appendix F). This finding demonstrated that there was a need to educate the

nursing staff concerning polypharmacy in the geriatric population and that staff could acquire

the necessary skills needed for providing services to the elderly patient population of the

facility. The posttest results showed that participants' knowledge improved, but ongoing

education is needed about the management of patients taking more than three drugs. Through

the project, therefore, I demonstrated that there was a gap in the training of the facility nursing

staff on polypharmacy in the geriatric population, which could lead to ADEs and even

mortality among residents if not well-addressed. The educational program resulted in a

substantial difference in knowledge possessed by the subjects with a difference as large as 50%

between the pretest and the posttest. The details of these findings are listed in Appendix G. If

the course can have that much of an impact on the knowledge of the subjects, perhaps this may

have some implications for the field as a whole.

<p align="center">**Recommendations**</p>

Geriatric polypharmacy is a factor in increased morbidity and mortality in the elderly

population. Drug-drug interactions and ADEs may contribute and, in some cases, may be more

of a concern for both the morbidity and mortality of the patients than the condition being

treated. Frequent training may be necessary to ensure that all the nurses taking care of the

geriatric population are well-trained about the polypharmacy issue, are able to recognize the

ADEs, and can make appropriate notifications and referrals. Additionally, nurse practitioners

should be informed about geriatric polypharmacy to prescribe the right medications to patients

and avoid ADEs.

There is a need to emphasize the many drugs that can lead to polypharmacy, especially in the aging population. Development of teaching modules is encouraged in nursing training programs, during the orientation of nursing staff members, and throughout the employment of nursing staff. These teaching modules must be comprehensive enough to ensure that the nursing staff acquire the knowledge and skills needed in the management of diseases and conditions in the geriatric population that require more than one drug. Policy makers in the clinical practice setting should develop protocols and guidelines concerning geriatric polypharmacy so that all the nursing staff working in geriatric care settings are able to support patients adequately. Having a protocol standardizes service delivery so that there is uniformity in the knowledge and practice of staff members. Uniformity will increase safety in practice and will reduce the incidence of ADEs among patients who take multiple medications due to a chronic medical condition.

Introducing a polypharmacy course or module in basic nursing education is highly recommended. This recommendation was based on the project finding that 70% of the participants did not perform as expected during the pretest examination. It is expected that any licensed nurse should have knowledge concerning geriatric polypharmacy. The expectations may not have been high, but at least half or a majority of the participants should have at least known enough to succeed on the pretest. The posttest findings were that 80% of the participants succeeded in the testing. The 80% success rate was much more assuring, and the success rate increase of 50% from the pretest to the posttest demonstrated the effectiveness of the course. This finding meant that education concerning geriatric polypharmacy was

necessary among already licensed nursing staff. There is the need to investigate why 20% of the participants did not perform as expected on the posttest so that the education content and delivery can be adjusted for better outcomes.

There is a need to conduct additional research on the importance of training nursing staff members on clinical skills concerning geriatric polypharmacy so that there is more evidence, including long-term outcomes, for introducing the content into the in-services education for the nursing staff members in geriatric settings.

Contribution of the Doctoral Project Team

Together with my preceptor and the project team, I was able to collect and analyze the pretest and posttest data and provide recommendations for changes based on the project findings. Clarifications were sought from the project team, and even the participants were involved in the generation of recommendations concerning their experience in the project. This project laid the groundwork for the next project that another team may carry out so that more evidence is obtained to add to the body of knowledge concerning geriatric polypharmacy issues, especially adverse effects of multiple medications and how to prevent them from occurring or identifying them if they do occur.

Strength and Limitations of the Project

The participants were ready to take part in the project and, therefore, there was no limitation on that part of participation. The resources that had been allocated by the site to be used in the project were sufficient for carrying out the project to completion. However, the number of participants was not large enough to influence major changes in the introduction of

guidelines and protocols in the teaching of nursing. Therefore, for future projects by other groups, the project team recommended that they should consider recruiting a greater number of participants for training in the future that can provide statistically significant evidence of the knowledge improvement and long-term changes realized through geriatric polypharmacy education.

Section 5: Dissemination Plan

The results and recommendations of this project are relevant for healthcare providers who deal with the geriatric population. Plans have been put into place for the dissemination of the project report to the relevant stakeholders and the institutional decision-makers so that the polypharmacy education conducted for this project can be a basis for conducting another project or assisting in guideline and protocol development. The final report for this project will be available as both an electronic document and a hard copy for dissemination when it is submitted for facility review. Additional avenues for the dissemination of the project findings include presentations to other assisted-living institutions that need the information in order to provide better health care to residents. The findings of the project can be disseminated with a copy of the final report in both electronic and hard copy.

The final paper will be revised and sent to geriatric publications for consideration. The final report will be highlighted in a PowerPoint presentation; I will explain the project purpose, design, findings, and practical implications of the project. A presentation has been scheduled for my preceptor and me to present during an administrative meeting that will include the project stakeholders. The meeting is scheduled to take place in the fall of 2017. The PowerPoint presentation will be followed by a session of questions and answers. In this presentation of the final report, the recommendations concerning the need for future projects will be emphasized as well as the reason for continuing to focus on geriatric polypharmacy in the institution. The information will also be used to urge the stakeholders to add the geriatric

polypharmacy education as part of the employment onboarding process for new nursing staff members in order to prepare trainees to manage geriatric patients taking multiple drugs.

Future presentations concerning the project subject matter can be presented as continuing education so that more providers can be educated. The forum has been suggested so that brainstorming sessions can occur concerning the development of the various protocols and guidelines at the facility level necessary for managing geriatric polypharmacy patients. This project can serve as way to enhance interest and ability in developing evidence-based services for elderly patients so that they can have the best possible outcomes. A significant use of ineffective medications and prescriptions is occurring among elderly patients (Davies, 2015). Education about and advising against these forms of treatments in favor of more effective methods should improve the quality of care for geriatric patients overall. It seems like common sense, yet many ineffective treatments are still being used today. Projects such as this one attempt to remedy this very real and consequential contemporary issue.

Analysis of Self

As a nurse practitioner, I was able to carry out a project that was meant to add to the knowledge of the nursing staff members at an assisted-living facility. As a scholar, translation of evidence into practice remains one of the most important parts of my career in nursing practice. I was able to improve staff knowledge and engage other nurses in in intellectual discussions that will improve the health care delivered by staff at the facility. Recommendations in the final report include the need to carry out more research on the subject matter of the project so that more evidence is available concerning how best to train staff

nurses in a position to address geriatric polypharmacy. The project was carried out with

minimal challenges, and the results reflected the gap anticipated by the literature review.

Summary

In conclusion, there is the need to train nurses concerning geriatric polypharmacy so

that they are better equipped for attending to such patients. Well-educated nurses will be able

to monitor and detect the development of anticipated complications due to polypharmacy in the

management of chronic conditions and diseases among the elderly. In partnership with

providers, nurses can help to avert or identify polypharmacy and promote better quality and

quantity of life for seniors living in geriatric resident settings.

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Appendix A: Flyer Used in the Facility to Recruit Participants

Investigating the Impact of Staff Education on Knowledge of

Geriatric Polypharmacy

RECRUITMENT INFORMATION SHEET

RECRUITMENT GOALS

Our goal is to recruit participants to determine if a staff education program would increase knowledge of adverse drug events due to geriatric polypharmacy. Staff from one assisted living facility will be recruited for the education intervention. An assessments of the knowledge of staff member knowledge will be collected before and after the education intervention.

RECRUITMENT PROCESS

For staff members: We will provide you with recruitment flyers at the assisted living facility and conduct. The participants in the project will include all the nursing staff working in one assisted living setting who consented to participate in a 2-week education intervention to improve their knowledge of polypharmacy and ADEs. The inclusion criteria included: (1) nursing staff working in the assisted living facility, (2) consented to participate in the project, (3) could read, write, and understand the English language.

WHAT PARTICIPATION ENTAILS

The educational program consisted of one luncheon session each week over a 2-week period. I will provide the education using PowerPoint presentations and handouts. My preceptor will administer and collect the pretest and posttest paper and pencil knowledge assessments from the nurse participants. I will complete the process by requesting a post-evaluation from the nursing staff who participated in the education.

RECRUITMENT AND DATA COLLECTION TIMELINE

July 3 - July 28, 2017: Recruit, screen, and complete pretest and posttest with all participates who agree to participate.

Appendix B: Project Plan and Project Timeline

Investigating the Impact of Staff Education on Knowledge of

Geriatric Polypharmacy

RECRUITMENT GOALS

Our goal is to recruit participants to determine if a staff education program would increase knowledge of adverse drug events due to geriatric polypharmacy. Staff from one assisted living facility will be recruited for the education intervention. An assessments of the knowledge of staff member knowledge will be collected before and after the education intervention.

TIMELINE

Recruitment period: July 3 to July 10, 2017

Appendix A completion date: 7/10/2017

Pre-test date: 7/14/2017

Luncheon session #1: 7/10/2017

Luncheon session #2: 7/17/2017

Posttest date: 7/28/2017

Postevaluation: 7/28/2017

Appendix C: PowerPoint Presentation Delivered to Nursing Staff

Definition

Polypharmacy is the simultaneous use of multiple drugs to treat a single ailment or condition.
Consequences of polypharmacy may include increased cost of healthcare, an increase in the number of Adverse Drug Events, and reduced functionality capacity in geriatric patients.
In 2005, over 4.3 million-hospital visit were as result of ADEs particularly in geriatric patients (Maher, Hanlon, & Hajjar, 2014).

Background: Why it's important

► Polypharmacy can lead to potentially devastating falls, broken hips, and head injuries, many of which account for preventable visits to emergency care and higher mortality risk overall.

Background: Why it's important

- Older adults without private drug insurance, Medicare or Medicaid pay for meds out-ofpocket decreasing $$ for other needs
- New Medicare plan saves 10-25% on meds
- Monthly premium - $35
- Deductible of $250
- Pays 75% of costs $250-2250 then 100% from $2250-3600 then 95% over $3600.

How Does Polypharmacy Happen?

- Seeing multiple physicians and pharmacies
- Hoarding of medications
- Inaccurate reporting of ALL medicines concurrently being taken
- Assuming that when medication starts, they can continue indefinitely
- Changes in daily habits
- Changes in cognition, depression, insufficient funds, declining function, living alone

Did You Know That A Typical Older Adult…..

▶ Takes 4 to 5 prescription and 2 OTC drugs at a time; fills 12–17 prescriptions/year

▶ Is on fixed income, whose main source of income is Social Security

▶ Spends an average of $955 for medications

▶ In ambulatory: 2 – 4 prescription drugs

▶ In long term care: 2 – 20 prescription drugs

Polypharmacy Can Lead To…

▶ Adverse drug reactions

▶ Drug-drug interactions

▶ Decreased medication compliance

▶ Poor quality of life

▶ Unnecessary drug expense

Adverse Drug Reactions: A Preventable Problem

- ▶ Nearly one third of adverse drug events in ambulatory settings are preventable.
- ▶ Half of adverse drug events in nursing facilities are preventable.
- · Elderly 7 times more likely to have unwanted side effect and 2-3 times more likely to have ADRs
- · Multiple meds is the factor most strongly correlated with increased risk of ADRs
- · Exponential increase in ADRs with addition of more drugs to a regimen (2 drugs-15%, 5 drugs-50-60%)

Adverse Drug Reactions That Look Like Aging Signs

- ▶ Unsteadiness
- ▶ Dizziness
- ▶ Confusion
- ▶ Nervousness
- ▶ Fatigue
- ▶ Insomnia
- ▶ Drowsiness
- ▶ Falls
- ▶ Depression
- ▶ Incontinence

How Can We Prevent Polypharmacy?

- ► Careful written medication instructions
- ► Counseling to take meds even though feeling well
- ► Use the "Beers List" to identify the drugs that have the most significant side effects.
- ► Discourage pill-sharing
- ► Assess other remedies patient maybe ingesting
- ► Encourage pill boxes, phone checks, pill counts or other med monitoring plans
- ► Brown Bag Test: At least yearly have patient bring in all meds, Rx, OTC, vitamins, supplements, herbal preps, etc

Learning Objectives of the Project

► The staff will learn to use the "Beers List" to identify the drugs that have the most significant side effects.

► The staff will consult with their provider and ask about the medicines that can be eliminate.

► The provider will need to have adequate information of all the medication taken by the elderly individual.

► The staff will read the medication label to identify substance that can adversely affect the liver when taken in large quantities

In Summary
Polypharmacy can leads to:

► Adverse drug reactions (ADR) – 10-20% of those admitted to medical services due to OTC meds

► – # of drugs is single greatest risk for ADR

► Drug-drug reactions

► Decreased medication compliance

► Poor quality of life

► Unnecessary drug expense

► Please discuss any further concerns with your provider!

Appendix D: Pretest and Posttest Evaluation Instrument

Pre-test/Post-test

1   What is polypharmacy?
A) A patient that is taking potentially inappropriate combinations of medications
B) Greater than or equal to 5 drugs, or use of multiple medications.
C) A patient taking 3 non-prescribed over the counter medications
D) None of the above

2   What are risk associated with polypharmacy?
A) Death
B) Increased compliance
C) Medication interaction
D) A & C

3   In the elderly, these physiologic changes influence polypharmacy except?
A) Longer duration of medication activity
B) Shorter duration of medication activity
C) Decreased renal clearance
D) An increase in adverse drug reaction

4   What is not a complication associated with polypharmacy?
A) Confusion
B) Increased Fall risk
C) Decreased mortality
D) Hospital readmission

5   True or False: Do geriatric patients account for a great amount of hospital readmissions?
A) True
B) False

6   All are Adverse Drug Reactions that resemble signs of aging except?
A) Dizziness
B) Falls
C) Change of appetite
D) Confusion

7   True or False: Hospital readmissions can increase the cost of treatment by as much as 30% of hospital readmissions?
A) True
B) False

8   Polypharmacy can lead to all of the following except?
    A) Poor quality of life
    B) Improved medication compliance
    C) Drug to drug interaction
    D) Unnecessary drug expense

9   All are benefits of using Beer's except?
    A) It improves safety for geriatric patients taking medication
    B) Reduces the quality of care
    C) Reduces problems of polypharmacy
    D) Reduces drug interactions

10 Which of the age–related changes affect the pharmacokinetics in the elderly?
    A) Altered gastrointestinal functioning that causes decreased drug absorption
    B) Decline in creatinine clearance in older patients
    C) Decreased body fat components
    D) None of the above

    Answer Key

    1) B
    2) D
    3) B
    4) C
    5) A
    6) C
    7) A
    8) B
    9) B
    10) B

Fact Sheet: Geriatric Polypharmacy

Learning Objective
- ➢ The staff will learn to use the "Beers List" to identify the drugs that have the most significant side effects.
- ➢ The staff will consult with their provider and ask about the medicines that can be eliminate.
- ➢ The provider will need to have adequate information of all the medication taken by the elderly individual.
- ➢ The staff will read the medication label to identify substance that can adversely affect the liver when taken in large quantities

Definition
- ➢ Polypharmacy is the simultaneous use of multiple drugs to treat a single ailment or condition.

Symptoms
- ➢ Unsteadiness
- ➢ Dizziness
- ➢ Confusion
- ➢ Nervousness
- ➢ Fatigue
- ➢ Insomnia
- ➢ Drowsiness
- ➢ Falls
- ➢ Depression
- ➢ Incontinence

Causes
- ➢ Receiving treatment for many co-existing conditions.
- ➢ Lack of medication reconciliation.
- ➢ Multiple specialist clinicians
- ➢ Increased use of over the counter medicines

Risk Factor Associated with Polypharmacy
- ➢ Adverse drug reactions
- ➢ Drug-drug interactions
- ➢ Decreased medication compliance

- ➢ Poor quality of life
- ➢ Unnecessary drug expense

Complications
- ➢ Polypharmacy can lead to potentially devastating falls,
- ➢ broken hips, and head injuries,
- ➢ Many of which account for preventable visits to emergency care and higher mortality risk overall.

Solutions
- ➢ Beers list- Are guidelines for healthcare professionals to help improve the safety of prescribing medications for older adults. The benefits of beers list include:
    - o It improves safety for geriatric patients taking medication
    - o Reduces problems of polypharmacy
    - o Reduces drug interactions

Coping and Support
- ➢ Know purpose for the drug.
- ➢ Recognize potential side effects.
- ➢ Keep medication records or a journal.
- ➢ Always carry a current medication list including prescribing doctor's name.
- ➢ Annual Brown Bag.
- ➢ Inform physician about over-the-counter drug use, herbals and supplement use.
- ➢ Avoid self-medicating

Appendix F: Content Evaluation Sheet

Investigating the Impact of Staff Education on Knowledge of Geriatric

Polypharmacy

Content Evaluation
How Are We doing?

Please Rate the following aspects of the project

               Excellent   Good   Adequate   Poor   Unacceptable
N/A

1   Meeting the overall objective-

2   Ease and effectiveness of the scheduling of the program-

3   Providing meaning information to the participate-

4   Communicating at the participate level-

5   Materials/Information used for teaching-

6   Meeting the needs of the staff-

7   Style of teaching-

8   Pretest and posttest questionnaire-

9   Overall performance of the project-

10 Please provide additional comments on ways to improve the delivery of the
     project

Appendix G: Table of Pretest and Posttest Knowledge

	Pretest % correct	Posttest % correct	Difference
Knowledge of definition of polypharmacy	40%	90%	50%
Knowledge of risk factors	50%	100%	50%
Knowledge of physiologic changes influencing polypharmacy	20%	80%	60%
Knowledge of complications	50%	100%	50%
Knowledge of polypharmacy facts	50%	90%	40%
Knowledge of adverse drug reactions	40%	80%	40%
Knowledge of hospital readmissions that polypharmacy accounts for	20%	75%	55%
Knowledge of consequences of polypharmacy	30%	85%	55%
Knowledge of beers list	10%	75%	65%
Knowledge of the age–related changes that affect the	15%	85%	70%

pharmacokinetics in
the elderly

Appendix H: Recommendations for Continuing and Sustaining the Project

Recommendations

➢ Have regular training concerning the subject matter of geriatric polypharmacy.
➢ Clinician should perform monthly medication reconciliation for all patients.
➢ Staff education must emphasize the many drugs that can lead to polypharmacy, especially in the aging population.
➢ Encourage pill boxes, phone checks, pill counts, or other medication monitoring plans
➢ Use the "Beers List" to identify the drugs that have the most significant side effects
➢ Introduce a polypharmacy course or module in basic nursing education.
➢ Use the Brown Bag Test: At least yearly, have patients bring in all medications, over the counter (OTC), vitamins, supplements, herbal medicines, etc. for review